



LATIN AMERICA: THE DEVELOPMENT CHALLENGE

POLICIES FOR A MORE
PRODUCTIVE, INTEGRATED
AND INCLUSIVE REGION



CAF DEVELOPMENT BANK
OF LATIN AMERICA

50
years



LATIN AMERICA: THE DEVELOPMENT CHALLENGE

POLICIES FOR A MORE
PRODUCTIVE, INTEGRATED
AND INCLUSIVE REGION



CAF DEVELOPMENT BANK
OF LATIN AMERICA

50
years

Title: Latin America: The Development Challenge. Policies for a more productive, integrated and inclusive region

Legal deposit: DC2021000564
ISBN: 978-980-422-225-2

Editor:
CAF

Academic coordination
and content edition:
Pablo Sanguinetti

General coordination:
Beatriz Guillén
Patricio Scaff

Editorial correction:
Ana Gerez

Graphic Design:
Good, Comunicación para
el Desarrollo Sostenible

The views and interpretations in this document are those of the authors and do not necessarily reflect the official position of CAF.

Printed in:
Panamericana Formas e Impresos S.A.
(in its role as printer exclusively)
Bogotá, Colombia – June 2020



The digital version of this book is available at: scioteca.caf.com

© 2020 Corporación Andina de Fomento
All rights reserved

*For our friend Guillermo Perry
(1945-2019), a brilliant and
unwavering economist fully
committed to Latin America's
development.*

CONTENTS

01

09 **Latin America:
Key Development Points**
Luis Carranza

02

29 **Half a Century of Economic
Development in Latin America**
Augusto de la Torre and Alain Ize

03

81 **The Productivity Issue**
Laura Alfaro and Fabio Kanczuk

04

119 **Infrastructure and Development**
Guillermo Perry, Carlos Guzmán
and Juan Benavides

05

157 **Natural Resources, Export
Diversification and Growth**
Patricio Meller

06

197

**State Capacities, Governance
and Corruption Prevention**

Eduardo Engel

07

231

Inequality and Social Policies

Nora Lustig

08

281

Regional Integration

Marcelo Olarreaga

09

313

**Digital Revolution and
Employment in Latin America**

Eduardo Levy Yeyati



Latin America: **Key Development Points**

01

Luis Carranza
CAF Chief Executive

For the past 50 years, Latin America seems to have been at a chronic standstill. In 1970, for example, the region took up 5.5% of international trade and 7.3% of worldwide production. Fifty years later, toward the end of 2019, these figures have remained almost unaltered, with 5.6% and 7.3%, respectively (World Trade Organization [WTO] 2020; World Bank 2020a).¹

In terms of labor productivity, there even seems to be a setback in Latin America. Compared to the United States' economy, labor productivity went from 27% in 1970 to 24% in 2017.² If we think that employment and capital have actually increased in Latin America, then, it is productivity that is decreasing. From 1970 up to this day, there has been a -0.37% average annual growth.

This relative paralysis is striking compared to other regions and countries that have shown a significant convergence process. That is the case, for example, of South Korea and Spain, where labor productivity in 1970, compared to the United States, was of 12% and 47%; 50 years later, it reached a relative weight of 61% and 76%, respectively (PWT version 9.1).

Social indicators have also shown a relative standstill. According to the Gini coefficient, Latin America is still the most unequal region in the world: it went from 0.54 in 1970 to 0.47 in 2018, with middle classes still a minority, reaching only 37% of the total population in 2018 (Center of Distributive, Labor and Social Studies [CEDLAS] and World Bank, 2020; Economic Commission for Latin America and the Caribbean [ECLAC], 2019; Padros, 2007).

Although there have been remarkable improvements in terms of absolute values for living conditions and access to basic services, the gap is still significant. For example, in the field of education, although it is true that illiteracy rates decreased from 21% in 1974 to 6% in 2018, Latin America occupies the last place in the Program for International Student Assessment (PISA). As to health, immunization coverage rates went up from 37% in 1980 to 81% in 2019, but the recent COVID-19 crisis arose when only four countries in the region had a sufficient number of doctors and hospital beds every 10,000 inhabitants.³ In terms of infrastructure, there are also substantial gaps: 8.6% of urban households in Latin America do not have adequate access to sanitation, and this figure goes up to 30.5% in rural areas; in addition, approximately 200 million Latin Americans do not have access to broadband Internet.

1 The trading data was estimated by adding up imports and exports in million USD.

2 Figures indicate the ratio of labor productivity between Latin America and the United States. Labor productivity is defined as the quotient between the real GDP expressed in current purchasing power parity (PPP) (in 2011 US dollars) and the number of people employed. Data from Penn World Table (PWT) version 9.1, developed by Feenstra, Inklaar, and Timmer (2015), and updated in 2019.

3 "A sufficient number" means values close to those established by the Organization for Economic Co-operation and Development (OECD) (36 doctors or 48 hospital beds per 10,000 inhabitants).

In the past 50 years, several integration initiatives were developed among countries that shared cooperation and prosperity objectives. Unfortunately, these efforts were mainly regulative or focused on projects that, in some cases, were successfully implemented but did not necessarily have the required sustainability to prompt virtuous cycles and dynamics of integration which could contribute to close productive gaps, boost trade circuits or modernize infrastructure. The percentage of intra-regional trade in Latin America is of 15%, as opposed to Europe or Asia, where indicators go up to 60% and 68%, respectively.

This apparent standstill of economic indicators is striking if we observe the extraordinary volatility of the economic activity registered by Latin America since 1970. As Augusto de la Torre and Alain Ize explain in Chapter 2 of this book, three very distinct stages can be observed: import-substitution industrialization, from 1960 to 1981; crisis, adjustment, and liberation, from 1982 to 2002; and the emergence of China, from 2003 to date. It is during the latter stage –in particular– that Latin America showed a strong recovery in terms of economic and social indicators.

At country level, the picture is very different. For example, there is the case of Chile and Peru, two countries that export raw materials, especially copper. In 1970, Chile had a slightly higher product per capita than Peru. However, 50 years later, the difference went up to 133%, but both countries still have a very similar productive structure, since 80% of their imports comes from raw materials.

Another case worth mentioning is that of small countries that managed to modify their productive structure by applying different methodologies. In 1970, Costa Rica and Panama represented 0.5% and 0.4% of Latin American production, respectively. Nowadays, both countries represent 0.8%. On the one hand, Panama increased its labor productivity compared to the United States, going from 30% in 1970 to 40% in 2017, thanks to the institutionalization derived from the handover of the Panama Canal in 1999 and a long-term approach to becoming the main center of logistic services. This approach has guided Panama's public policies. On the other hand, Costa Rica has started a transformation process of its productive structure, focusing on the exports of goods and services with high added value and becoming, together with Mexico, an economy with two-thirds of their exports being manufactured goods.

Even both strategies differ, they are based on long-term approaches that society supports as well. There are also critical challenges to respond to if these countries wish to continue their steady growth process, especially in Costa Rica, a country that needs to re-establish fiscal sustainability.

What does Latin America need to keep up a steady process of growth and development? From Chapter 3 onwards, we will put forward a series of suggestions to establish a set of public policies that will guarantee a road to prosperity in Latin America. However, a major and deep effort is required from each country if we wish to reach long-term agreements to guarantee these policies are implemented.

Before diving into the scope of these suggestions, it would be useful to reflect on what is implied with the phrase “development process.”

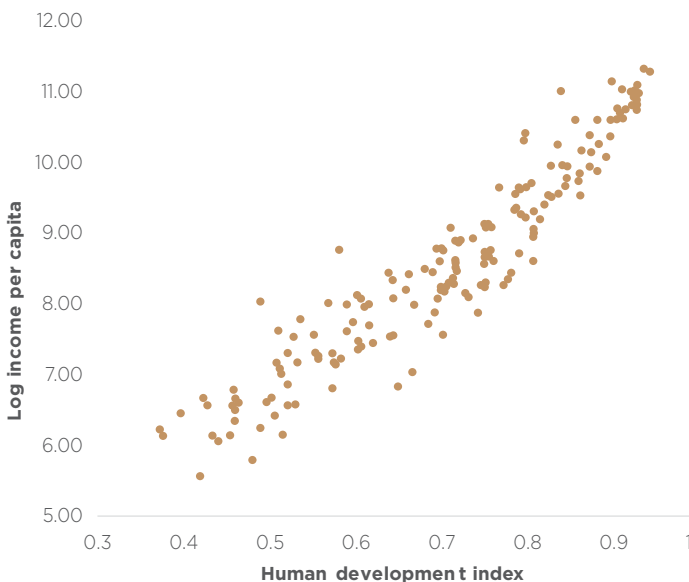
1. Understanding development

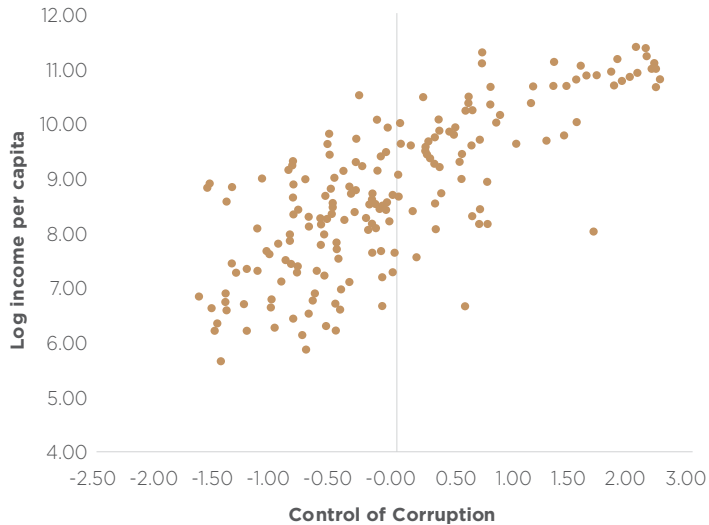
Countries are classified as developed, emerging or poor according to their income or GDP per capita. This means that a country with a level of income per capita of USD 12,375 is considered a “high-income” country, whereas a country is referred to as “low-income” if that figure is below USD 1,025. Although it is true that this categorization is limited to economic factors and it does not consider certain areas such as development of political institutions, standards of living, or social indicators, it is also worth mentioning that there is a strong correlation between economic development and standards of living and political institutions (or the quality of the current government).

Having said that, let us take a look at Chart 1, Graph A, in which we can see the strong connection between GDP per capita in every country and the human development index (HDI) published by the United Nations Development Program (UNDP). Now, let us move on to Graph B, which shows the close correlation between GDP per capita and the quality of political institutions, measured by the control of corruption indicator (CCI), one of the World Bank governance indicators.

CHART 1. Correlation between Income per Capita and both the Human Development Index and the Quality of Political Institutions.

Graph A. Income per Capita and Human Development Index



Graph B. Income per Capita and Quality of Political Institutions

Note: All indicators in the chart refer to 2018.

Source: World Bank (2020a) on income per capita, UNDP (2020) on HDI, and World Bank (2020b) on institution quality.

This strong correlation does not necessarily imply a direct causality between one variable value and another. Still, it is clear that there are no poor countries with healthy political institutions or rich countries with low standards of living. This leads us to think that, to set trends that will allow societies to prosper, certain basic conditions are necessary in the economic, social, and political spheres. Without these basic conditions, economic growth processes do not occur, and societies are held back or stalled.

For a deeper understanding about how the economic, social and political spheres interact, it is necessary to break down the social structure and analyze its basic elements.

1.1. Social basic elements

Individuals

Societies are made up of individuals. They respond to incentives established by the rules of the existing game in society (institutions). These are the foundations of Jeremy Bentham and John Stuart Mill's classical utilitarianism, reflected, for example, in neuroeconomic tests that show that the activation of the pleasure center of the brain can predict human behavior. However, individuals do not only react to incentives. Their behavior is also influenced by a sense of justice in the structure of retributions and compensations, as shown in experiments with the ultimatum game in certain societies, where a different solution is produced, not the rational one the economic theory

would foresee.⁴ Similarly, experiments carried out within the behavioral economics framework show that individuals are very far from the rational paradigm of the *homo economicus*, who only responds to incentives.⁵

Human beings as a collective

Human beings live in society. By interacting with other individuals, cooperation and competence opportunities arise and, if seized, societies prosper; however, if there are coordination flaws and individuals are incapable of working together to solve collective action problems, societies tend to stall. This can be found in Jean-Jacques Rousseau's stag hunt dilemma, which explains in detail a situation known as "the prisoner's dilemma" in literature. In order to achieve seamless human interaction with low transaction costs among individuals, it is vital to have coherence between institutions (for example, cohesive game rules that determine human behavior and which are actually created by the collective of humans itself) and culture (i.e., set of social preferences, values and beliefs). If, on the contrary, there are disagreements and institutions are not legitimized by a given culture, then equilibrium will be fragile, and transaction costs will be high.⁶ However, good institutions might help solve the prisoner's dilemma arising from human interaction, a dilemma that causes people to lose trust in each other, which, in turn, creates suboptimal equilibrium for society.

The State

In societies, the State emerges due to the need to establish certain institutions that will allow social optimal functioning and survival. There are three types of institutions that make up a State: i) those that regulate the provision of necessary public goods and services; ii) those that enforce the rule of law concept; and iii) those that guarantee the basic principles of citizens and limit the power of the State through control, transparency and power decentralization mechanisms. Fukuyama (2012) opens the debate about the interaction among each of these institutions and their evolution in the history of mankind.

The relative weight of these basic elements gives shape to different types of States. If society focuses on individuals and believes they only respond to incentives, it tends to create political structures that defend freedoms and rights to property, resulting in minimalist States, such as those proposed by Thomas Hobbes, John Locke, and, more recently, Robert Nozick. The most important role for this type of State is that of a guardian; which –according to this liberal doctrine– guarantees social prosperity.

On the other side of the spectrum, we have totalitarian regimes, where the focus is placed on the State over individuals; if more emphasis is placed on distributive justice and solving collective action problems, then we have a bigger State that intervenes in different social spheres.

4 See, for example, Camerer (2005).

5 See Kahneman (2011). It is important to mention that experiments with monkeys show that both incentives and a sense of justice affect animal behavior. As for incentives, see Chen, Lakshminarayanan, and Santos (2006); for justice, see De Waal and M. Berger (2000).

6 This topic is discussed in detail in Bowles (2004).

The important thing is to understand this interaction between individuals and, also, between individuals and the State in order to grasp how to create sustained development processes.

1.2. Systems

Individuals interact with each other according to the framework provided by existing institutions and culture. These interactions can be economic (which goods and services are produced, and how they are produced and exchanged), political (how rulers are elected, how conflicts among individuals are solved), and social (reciprocity bonds in the family, values, and beliefs present in society). Steady economic growth is indeed equal to the growth of goods and services produced in a given economy, so, basically, we are estimating the result of interactions in any economic system, but it is also worth mentioning that interactions between that economic system and the social and political systems also have an impact on the possibility to produce and exchange in any given society.

For example, changes in technology, which would originally affect the economic sphere, also bring about major changes in social relationships and political structures. In the 18th century, the industrial revolution in the Western world introduced drastic social changes that promoted mass production, but these changes also brought about new social challenges (a process of rapid urbanization, the rise of the nuclear family, the working class and the middle class, etc.) which led to far-reaching cultural and institutional changes. Thus, the transformation of old reigns and rural empires into States (as defined by Max Weber), together with the transformation of a group of ethnicities into nations that thrived in industrial societies, was accelerated. Since political institutions tend to be very passive, these processes of transformation were traumatic for Europe in the 19th century.

Along the same lines, the agricultural production crisis due to climate issues caused high social unrest and, depending on how this was handled in every particular case, it caused the collapse of political institutions (in Russia) or new political balance inside the same old institutions (Sweden).

Opinions differ when it comes to pinpointing the major causes of steady growth. The economic viewpoint will focus on the economic system, with the aggregate production function being its tool for analysis, leaving aside the other two aforementioned systems. For this approach, economic institutions (markets) are key, and there should not be any intervention so that individuals receive the right signs from the market and make optimal investment and labor decisions, according to their system of preferences and available technology. In the beginning, the focus is on how efficient the factors of production are to increase their own performance (for example, the human capital theory); then, the focus moves on the decision to invest in innovation processes and to create new products or production processes.⁷

7 See Helpman (2010).

However, what determines whether those economic institutions should actually exist? A very institutionalist perspective would focus on the political system and how political institutions affect economic institutions. In this sense, institutions that protect the rights to property and ensure free trade are associated with the rise of political institutions that restrict rulers' discretion and protect individuals. The dynamic interaction between both systems determines future social growth patterns.⁸

However, there is also a cultural viewpoint that focuses on the social system and how societies with a culture that rewards and promotes each individual's entrepreneurial spirit will progress faster (Joseph Schumpeter's vision). From a more historical standpoint, the presence of cultural values that promote a scientific explanation of natural phenomena and the use of science for practical purposes are key to understanding why the industrial revolution took place in the West and not anywhere else in the world.⁹

1.3. Development process

Leaving aside the discussion about which of those visions is correct, the truth is that in order to go through a process of steady growth, those three systems need to evolve, and their institutions need to be developed. It is also true that they will not necessarily evolve at the same speed, which might cause friction and tension. Hence, an economic system that does not improve the social system (for example, reducing inequality) will result in social movements and spark protests that will, in turn, affect political decisions and, in some extreme cases, the very same institutions, with very negative consequences for growth.

However, if economic growth impacts positively on the social system (increase of the middle class), it will also have a positive effect on the economic systems through two different channels: a direct and an indirect one. Firstly, the rise of the middle classes expands the market size (bigger scale of production) and strengthens human capital (improved efficiency of production factors). Secondly, the rise of the middle classes works in favor of improving political institutions (higher efficiency in providing public goods and services, and more transparency), increasing social growth capabilities. In this respect, Fukuyama (2014) mentions the United States' example in the 19th century and South Korea in the 20th century.

What has prevented Latin America from starting a process of steady development? In order to answer that question, Chapter 2, "Half a Century of Economic Development in Latin America," starts with a revision of its economic history from the mid-1960s to date. The historical analysis distinguishes between the three stages above: a period of imports substitution (1960-1981), a period of opening up and reforming which, all the same, witnessed major macro-financial crisis (1982-2002), and a third period in which the emergence of China in the world economy opened up new exports and growth opportunities in the region but which, at the same

⁸ See Acemoglu and Robinson (2012).

⁹ See Mokyr (2017).

time, had certain sub-stages, deeply marked by the rise and the drop of the price of commodities (2003-2019). The most relevant conclusion of the chapter is that, in the past few years, most countries in the region established a system of macro-financial policies that offered them certain stability in spite of important external shocks. Nevertheless, there is still a lot to be done in the field of public finance. Major efforts are required to develop a counter-cyclical fiscal policy, which is important for growth, especially in countries that export raw materials or are exposed to substantial short-term capital gains. Those efforts will have to be complemented with good, reasonable policies at a macroeconomic level in order to face and handle financial turbulence more efficiently. These strong macroeconomic policies aim at ensuring relative price stability, public finance predictability, and the right macroeconomic environment for long-term investments. Those are necessary policies, but they are still not enough to achieve steady growth. In order to promote growth, it is also necessary to solve market and State failures inside the economic system itself and to perform specific actions in the political and social systems.

2. The development agenda in Latin America

Which are the necessary actions to create a virtuous circle between systems so that Latin American societies can move toward prosperity?

2.1. The issue of productivity

Chapter 3, “Latin America: The Productivity Issue,” by Laura Alfaro and Fabio Kanczuk, examines more deeply certain problems in the economic system and concludes that Latin America’s poor performance in terms of GDP growth is largely due to the limited increase in productivity. The chapter devises a quantitative exercise, comparing countries in Latin America with the “frontier” countries, in terms of their per capita production. It is then concluded that certain sources of inefficiency restrict the capacity of Latin American economies to adopt more effective productivity practices.

The authors analyze several factors that could account for that inefficiency, among which we may find:

- i. The sectoral composition or economic structure understood as resource misallocation between big economic sectors.
- ii. Resource misallocation among companies from the same sector (company-sized distribution veering too much toward small and micro companies), caused by specific policies that punish certain companies that are more productive than others (for example, stricter work regulations for bigger companies).
- iii. Low levels of human capital, defined as learning adjusted years of schooling, that contribute to differences in productivity. This requires promoting statewide investments in health and education, especially for children and youngsters, and ease loan restrictions that are associated with private human capital financing.
- iv. Infrastructure below the level of more developed countries, probably due to regulations and legal restrictions that do not allow investments in infrastructure by the private sector, even though, theoretically, those investments could make a high return.
- v. A tax system that distorts company decisions when it comes to innovating and investing.
- vi. Low trade openness due to high custom tariffs and, above all, non-tariff barriers to trade.

After analyzing each of these causes separately, the chapter devises a quantitative exercise to assess the cumulative impact on growth if reforms were introduced in all those areas, leading to a considerable increase in productivity. If estimated as a simple average, any country in Latin America

would increase its productivity by 154% and would go from an average product per capita of 22% to 54%, compared with the United States.

2.2 Infrastructure

An action such as investment in infrastructure has an impact both in the economic sphere, increasing productivity and, in the social one, improving the standards of living of the population as a whole. However, in order to implement an ambitious infrastructure investment plan, certain basic conditions in the political system should exist: efficiency when managing infrastructure and ensuring the necessary fiscal space through long-term political agreements. In Chapter 4, “Infrastructure and Development,” by Guillermo Perry, Carlos Guzmán, and Juan Benavides, the focus is laid on analyzing the infrastructure conditions in Latin America, especially the channels through which those actions could impact family well-being and company productivity. It is worth mentioning that provision of different means to improve transportation ensures better access to markets and more significant market development. That is a vital channel that connects infrastructure and productivity. Other channels reduce congestion and commuting time for workers, and they also ensure better access to different public services (water and sanitation, education and health) that directly affect household comfort, not to mention the complementarity between infrastructure and capital or private investment.

In the chapter, the authors point out that improving infrastructure in Latin America is one key objective. The region has made progress in the past twenty years, but there are still serious challenges to face. Although access to basic services, such as water, sanitation, electricity, telephony, and Internet connection, has improved considerably in cities, there is still a substantial gap between urban and rural areas. As regards transportation infrastructure, which is extremely relevant for family well-being and company productivity, it should be mentioned that it is inferior to that of developed countries and even of other emerging economies. In terms of quality, deficiencies are even more noticeable. Many of these services have to deal with regular outages, acute bottlenecks, and congestion. In particular, the lack of maintenance is a serious problem that damages facilities and increases the cost of investment to repair them. In the context of tax consolidation processes, governments have set limits to investment in infrastructure, which has been partially replaced by private investment.

The chapter makes reference to Public-Private Partnership (PPP) schemes, which could be a suitable tool to promote private investment in this sector, although these schemes should be devised under institutional conditions that could avoid opportunism, both from governments and private concessionaires. It is highly important, in particular, to avoid renegotiations that are not connected to objective changes in the nature of the projects and which could not have been predicted during the bidding process. There are political restrictions (electoral cycle) and institutional restrictions (poor planning capacity, a public sector which is highly exposed to pressure groups)

to the implementation of policies that promote public and private investment in infrastructure. The chapter describes a series of rules, procedures, and institutional mechanisms that help solve those issues. These cover, on the one hand, strengthening the capacity to plan and assess investment by the public sector. On the other hand, as previously mentioned, the Public-Private Partnership schemes are very useful to channel private resources, even though they do not fully replace public sector investment in certain critical areas that are less profitable for the private sector, but which have a high social return (for example, water and sanitation, and tertiary roads in rural areas).

2.3. The role of natural resources

Natural resources are an important asset in Latin America and, even though they have highly influenced growth in the region, they have not been fully exploited to strengthen the countries' productive structure. Besides, there is palpable social tension when it comes to exploiting these resources due to the negative impact exploitation has on the environment. Chapter 5, "Natural Resources, Export Diversification and Growth," by Patricio Meller, addresses the issue of natural resources in the development of Latin America. For most of the countries in the region, these resources represent the main productive sector for foreign exchange earnings, and they are also an important financial source for public funding. Foreign exchange earnings from the exploitation of natural resources are the main source of international reserves and sovereign funds. However, it is also assumed that a productive structure that places too much focus on this sector may have limited the capacity for development in the region. On the one hand, raw material price fluctuations make it difficult to handle the macro-economy, so they are subjected to cycles and major shocks. On the other hand, exploitation and production of natural resource-intensive goods are not connected to the type of technological progress and innovation required to promote a steady increase in production and long-term income.

Despite these challenges, Meller shows that these resources may represent a source of wealth to foster long-term development in the countries of the region. Not only is this based on the experience of a great number of countries which are now developed, where these products were initially their main source of wealth, but it is also based on the experience of the region itself in the past few years, where we witness a process of export diversification in terms of products and markets where those goods are headed. The author argues that there is evidence that natural resources can lay the foundations for knowledge development and technological innovation. Such innovation and diversification processes are possible due to backward production linkages (capital goods and inputs) and forward ones (consumer goods and manufactured goods) that the exploitation of natural resources may generate. This process gives rise to new productive activities (many in the field of services) that promote development, even though they are vertically or horizontally related to the primary sector, thus fostering a more homogeneous growth in Latin American countries. The author highlights that, for that virtuous circle to be formed, a circle in which raw materials can represent a

long-term development factor in every country, it is highly critical to examine the quality of institutions that decide on public and private incentives for investment and on the use of funds obtained from those investments. These institutions focus, for example, on the creation of sovereign funds, which serve to transform natural resource-physical wealth into financial wealth, or public-private partnerships that could aim at promoting innovative activities in these sectors, the way some countries did by establishing productivity and competitiveness boards or high commissions.

2.4. State capacities

A central aspect of the reforms' agenda to foster development has to do with the ability governments have to design, implement, and assess public policies. This is one of the three institutional pillars that comprise the political system in every country. These abilities have not been fully developed in the countries in the region and, even worse, in the past few years, their legitimacy has been jeopardized by critical acts of corruption; not only have these acts resulted in squandering of public resources, but they have also betrayed the trust citizens place in their governments and in democracy itself. Chapter 6, "State Capacities, Governance and Corruption Prevention," deals with this topic. Its author, Eduardo Engel, starts by mentioning that, in the past 25 years, there has been progress in measuring different factors that convey State public capacity and certain aspects of governance, such as the control of corruption. There is this common belief that corruption in Latin American countries is higher than the income per capita, but the chapter, using the aforementioned indicators, goes on to show this phrase is actually inaccurate.

However, the discussion about corruption has become more popular in the public sphere due to several factors that have given certain events more visibility. Firstly, certain laws that grant access to public information, and which were passed in recent decades, have allowed us to know more about government activity. Investigative journalists have used this information and, together with social media and new technologies, have had a leading role in discovering and reporting conspicuous corruption cases, giving more voice to citizens, and demanding more accountability from authorities.

The rise in corruption records has put forward claims to develop prevention policies. Along these lines, the author mentions that there is general agreement regarding the challenges of establishing an anti-corruption agenda to address both its most overt manifestations and its deeper causes. Lack of transparency and regulation for political financing, both during campaigns and in the political parties themselves, is probably the main underlying cause for corruption scandals in the region. A second significant challenge is an efficient regulation of conflicts of interest. Nepotism, the revolving doors practices, and inefficient regulation of incapacities and incompatibilities in public office are some of the topics that worry citizens the most. Another important issue is how to spend public funding, including public procurement in general and, in particular, public infrastructure, apart from public sector employment, areas

that are all prone to corruption. In addition, there are sectors that provide the State with high income, for example, the extractive industries.

Engel also points out that there seems to be agreement on the main actions to achieve progress for the topics mentioned before. However, most reform initiatives either fail or do not make much progress at all. Not many initiatives could be qualified as “successful”, and there is not enough information to design reform strategies with a high chance of success. Different solutions have been put forward: to import an institutional framework, to create anti-corruption commissions, and to build political leadership around the fight against corruption. Many times, the starting point for these strategies is to benefit from the window of opportunity after big corruption scandals come to light and introduce reforms. Most of the time, the result has been partial and incomplete, but there have been a few successful cases for each of those strategies.

2.5. Social policies

If the growth process in any given society does not reduce inequality or, even worse, increases it, societies tend to come into conflict, with consequences in the political system or, at least, in the decisions taken as regards economic policies. This can have profound implications for long-term growth. Chapter 7, “Inequality and Social Policies,” by Nora Lustig, explores this topic.

The author mentions a first problem when it comes to measuring inequality: there is still not enough information to carry out a comprehensive assessment of the level of inequality and its evolution. This is because the source used to measure inequality –household surveys– does not record in detail income from other sources rather than jobs (capital, intangible assets, etc.) and which is condensed in the high-income strata; this might lead to underestimating the level of inequality.

Apart from this, Lustig points out that the recent history of inequality behavior in the region shows that public policies can actually modify it. More specifically, inequality reduction during the first decade of the 21st century can be traced back to two components of social policies: education expenditure, which resulted in higher levels of schooling of poor sectors of society, and the expansion of cash transfer programs focused mainly on populations that live in poverty. The increase in the number of years of schooling for poor populations is one of the factors that can bridge the education wage gap; this is, in turn, one of the factors that could reduce labor income inequality due to the decrease of the education relative return (the so-called “education premium”).

However, Lustig also highlights that, since 2012 (a year that roughly marks the ending of the raw materials boom), inequality reduction has not been sustainable in several countries of the region. Having to face these lower or even negative growth rates, the conditions in the job market actually turned against poorer sectors of society, while tax restrictions hindered the creation of mechanisms of compensation.

2.6. Integration

One of the key elements of development strategies in Latin American countries, which worked as counterparts for national policies, is the advocacy for higher economic integration, both at a regional and a global level. This is analyzed in Chapter 8, “Regional Integration,” by Marcelo Olarreaga. The need to expand internal markets accounts for this strategy, attracting investments that, together with a bigger scale of production, will bring in productivity profits and employment through resource reallocation toward sectors and companies which are relatively more productive or through better access to quality inputs.

The author mentions that, even though most countries in the region have witnessed higher integration to global markets, this was not the case at a regional level. Latin America and the Caribbean is one of the regions with the highest number of bilateral and regional trade agreements (among them, it is worth mentioning sub-regional initiatives, such as the Mercosur and the Pacific Alliance). However, the share of intra-regional trade is below the levels observed in other regions, such as North America, Europe, and Asia. The chapter explores the causes for this moderate increase in intra-regional trade, focusing, on the one hand, on the relatively high costs of regional trade and, on the other hand, on the need for better integration of the productive structures of countries in the region, which result in regional value chain engagement that is significantly lower than in other parts of the world.

As regards intra-regional trade costs, the author points out that changes in extra-regional trade costs have tended to decrease in Latin America, while intra-regional trade costs have remained steady or have increased. This is surely contributing to a decrease in intra-regional trade. The right policy to counteract this trend is to use tools that will promote infrastructure investments that would, in turn, foster the physical integration of countries in the region.

The other possible explanation for the low level of intra-regional trade is the lack of productive chain integration among different countries in the region (which, obviously, depends in part on the high costs of intra-regional trade). This results in intra-industry trade indices that are among the lowest in the world and a very low participation in regional and global value chains (with some exceptions in the case of global value chains, such as Mexico, Chile, Costa Rica, and Colombia). This trend could be attributed to a lack of coordination among the 47 groups of rules of origin in the region. Olarreaga states that a political answer to this problem could be to strengthen and coordinate existing agreements, as well as creating new ones among the bigger blocks of the region (Mexico and Mercosur, for example). In today’s world, with trade tension and wars that have already started affecting Latin American countries, strengthening the regional process could also serve as an insurance policy against a multilateral process that is giving signs of decay.

2.7. The digital revolution

Big technological changes have deeply affected societies in the economic, political, and social spheres. One of the most pressing issues is the impact of digitalization and artificial intelligence on inequality. This is analyzed in Chapter 9, “The Digital Revolution and Employment.” Its author, Eduardo Levy Yeyati, mentions that the potential impact new digital technologies could have on employment and the labor income distribution is alarming at a global level, and it has sparked off a debate about the future of jobs and the appropriate regulatory and political response to the new context. So far, evidence has confirmed that the digital revolution seems to have a mildly positive impact on the number of “human” employments and its aggregates: productivity profits increased by technology in any given industry leads to a decrease in employment in that industry (direct negative impact), but it boosts employment in other related ones (indirect positive impact) due to lower costs (if technology cheapens intermediate goods and services production) or higher demand (higher disposable income derived from cheaper final goods and services). In addition, more recent forecasting about jobs at risk, based on a “critical threshold” of automatable tasks (as opposed to thresholds defined by jobs), led to significantly lower job exposure rates than previously estimated. However, the degree of potential automatization of a certain task does not necessarily entail that task will actually be replaced by machines: technology adoption cannot occur in the short term, even when there is technical competence to do so due to issues related to profitability; legal, ethical and cultural restrictions, which are hard to predict; or with the political economy of technological change, which takes into account the socio-economic impact of job displacement.

The author also mentions that there are three aspects of the aforementioned analysis that suggest current partial conclusions should, at least, be toned-down. Firstly, theory and debate may be moving ahead of data. Since automatization has come true for practical purposes in the past few years, the empirical findings that inform debates cannot fully grasp the effect of automatization on jobs. Secondly, human capital is not expendable: labor competencies can only be partially transferred between occupations. This is why, even if technology created as many positions as it destroys, or even if changes in labor demand took place inside the same occupations, these could keep their name, but change their attributes and tasks, hence changing the profile of workers; the impact these changes could have on job composition would have immediate unintended socio-economical effects.

Finally, Levy Yeyati concludes that most part of the existing analysis is based on a few developed economies. One could guess that the two aforementioned issues are even more relevant in developing economies, where technology penetration is still incipient, and workers are less educated (their competencies are less transferrable). This is why we need to be cautious when we use evidence found for developed countries: *a priori* it is hard to foresee the impact technology could have in the realm of work in the region.

Latin America is at a crossroads. The set of proposals presented in the following chapters will allow Latin America to move forward on its road to

prosperity. It is vital to take on the political challenges in order to implement those proposals pragmatically because, apart from big structural gaps, we also have the pressing problems derived from the COVID-19 pandemic, which highly increased poverty and inequality amidst a weak economic recovery.

Bibliography

- Acemoglu, D. and Robinson, J. (2012). *Why Nations Fail*. Crown Business.
- World Bank (2020a). Income per capita, Atlas method *World Development Indicators*. World Bank. Accessed on October 1, 2020. Available at: <https://data.worldbank.org/indicator/NY.GNP.PCAP.CD>
- World Bank (2020b). *Worldwide governance indicators* [database]. Accessed on September 21, 2020. Available at: <https://info.worldbank.org/governance/wgi/>
- Bowles S., (2004). *Microeconomics: Behavior, Institutions, and Evolution*.
- Camerer, C. F. (2003) *Behavioral Game Theory: Experiments in Strategic Interaction*. Princeton University Press.
- Center of Distributive, Labor and Social Studies and World Bank (2020). *LAC Equity Lab* [database]. Accessed on September 21, 2020. Available at: <https://www.worldbank.org/en/topic/poverty/lac-equity-lab/poverty/head-count>
- ECLAC (2019). *Panorama social de América Latina 2019*. Santiago: Comisión Económica para América Latina y el Caribe (LC/PUB.2019/22-P/Rev.1).
- Chen M., Lakshminarayanan, V., and Santos, L. (2006). “How basic are behavioral biases? Evidence from capuchin monkey trading behavior.” *Journal of Political Economy*, 114(5): 517-537.
- De Waal, F. and Berger, M. (2000). “Payment for labor in monkeys.” *Nature*, 404, 563.
- Feenstra, R. C., Inklaar, R., and Timmer, M. P. (2015). “The Next Generation of the Penn World Table.” *American Economic Review*, 105(10), 3150-3182. Available at www.ggdc.net/pwt
- Fukuyama, F. (2014). *Orden y decadencia de la política. Desde la revolución industrial a la globalización de la democracia*. Ediciones Deusto.
- Fukuyama, F. (2012). *The Origins of Political Order: From Prehuman Times to the French Revolution*. Farrar, Straus and Giroux.
- Helpman, E. (2010). *The Mystery of Economic Growth*. The Belknap Press.
- Kahneman, D. (2011). *Thinking, Fast and Slow*. Farrar, Straus and Giroux.
- Mokyr, J. (2017). *A Culture of Growth: The Origins of the Modern Economy*. Princeton University Press.
- WTO (2020). GDP: proportional GDP in constant USD, 2010. Time series. World Trade Organization. Accessed on October 1, 2020. Available at: <https://timeseries.wto.org/?idSavedQuery=48a8ae1b-8133-4497-a6fb-f03acfaf06c9>

- Padros de la Escosura, L. (2007). Inequality and poverty in Latin America: A long-run exploration. In T. J. Hatton, K. H. O'Rourke, and A. M. Taylor (eds.) (2007). *The New Comparative Economic History*. Cambridge: MIT
- UNDP (2020). Human Development Index (HDI). *Human Development Report*. Accessed on September 21, 2020. Available at: <http://hdr.undp.org/en/indicators/137506#>



Half a Century of Economic Development in Latin America

02

Augusto de la Torre
*School of International
and Public Affairs
(SIPA), Columbia
University, New York.*

Alain Ize
*School of International
and Public Affairs
(SIPA), Columbia
University, New York.*

Augusto de la Torre (apd2151@columbia.com) and Alain Ize (alain.ize@gmail.com) are adjunct professors at the School of International and Public Affairs (SIPA), Columbia University, New York. Augusto de la Torre is Director of the Center for Economic and Enterprise Research from the University of the Americas, Quito, Ecuador. The authors thank Mateo Loaiza for his excellent support in this investigation and Patrice Franco, José Hidalgo, and Pablo Sanguinetti for their valuable comments.

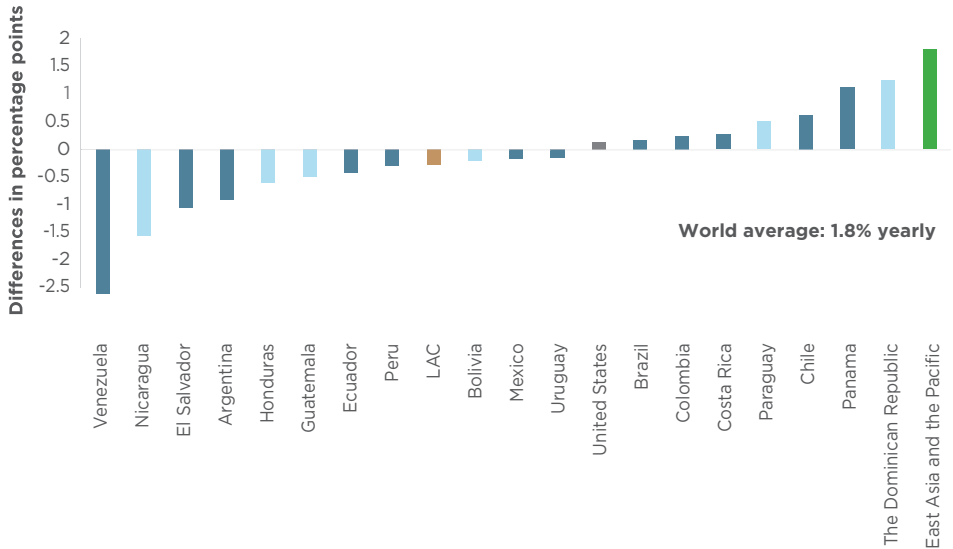
1. Introduction

Latin America's economic development experience has gone through stages of hope and disappointment since World War II. The region has been affected by major changes in the visions and paradigms of development, and deeply conditioned by a mix of low growth, high instability (macroeconomic, financial, and political), and high inequality. It has been very difficult for Latin America to find a strong and sustainable development path. The progress made in its development process has been insignificant at best. Latin America has struggled to keep up with the world average, despite the period of faster growth and greater social equity that dominated a large part of the region in the uptrend of the most-recent cycle of commodity prices.¹

In fact, the average annual growth rate of the Gross Domestic Product (GDP) per capita (the most common metric of a country's economic development and standard of living) between 1960 and 2018 was visibly below that of the world and the United States in most Latin American countries and in the region as a whole (Chart 1). During that period (of almost 60 years), income per capita increased faster than in the United States and the world in a few countries (mainly Paraguay, Chile, Panama and the Dominican Republic, and also, although to a much lesser degree, in Costa Rica, Colombia, and Brazil). Even in the relatively best-performing countries within the region, their average annual growth was well below that of East Asia and the Pacific.

¹ Throughout this chapter (unless otherwise specified), the term "Latin America" is used in reference to the following set of countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, the Dominican Republic, Uruguay, and Venezuela.

CHART 1. Latin American GDP per Capita Growth compared to World GDP per capita (Annual Averages, 1960-2019)



Notes: GDP per capita is defined in real terms and expressed in constant 2010 US dollars. The difference in percentage points is calculated by subtracting the growth of the world GDP per capita from the growth of each country's GDP per capita. The growth rates are annual geometric averages for the period 1960-2019. LAC means Latin America and the Caribbean. Weighted averages have been considered for LAC and the world. Countries in light blue had a GDP per capita below USD 1,500 in 1960.

Source: World Development Indicators (World Bank) and estimates from the most recent IMF World Economic Outlook report for 2019.

This chapter describes and analyses the saga of economic development in Latin America from World War II to date. Of course, it is not an easy task. The problem is not only that there are considerable fluctuations (outbreaks of increased income followed by large standstills or reversals), which are not necessarily symmetric, around the region's poor long-term development trend. There is also significant heterogeneity between the growth trajectories of individual countries, so the mix of leading countries and those left behind has been changing over time. For this chapter to be feasible, without oversimplifying, the analysis takes on three different lines.

First, the characteristics of the regional economic development are discussed at a macro level and introduced selectively, openly ignoring important fundamental aspects at a micro level, while outlining the most remarkable patterns.

Second, the chapter organizes the analysis using the data available for 1960–2019 and divides this entire great period into three stages marked by significant structural breakdowns. In the first stage, from 1960 to 1981, most countries in the region adopted a development strategy definitely directed toward the domestic market and based on import-substitution industrialization. The second stage, from 1982 to 2002, was characterized by recurring macro-financial crises and painful adjustment episodes, coupled with aggressive commercial and financial liberalization processes. The third stage, from 2003 to 2019, was deeply influenced by the irruption of China in the global economy and the resulting cycle (uptrend and downtrend) of commodity prices.

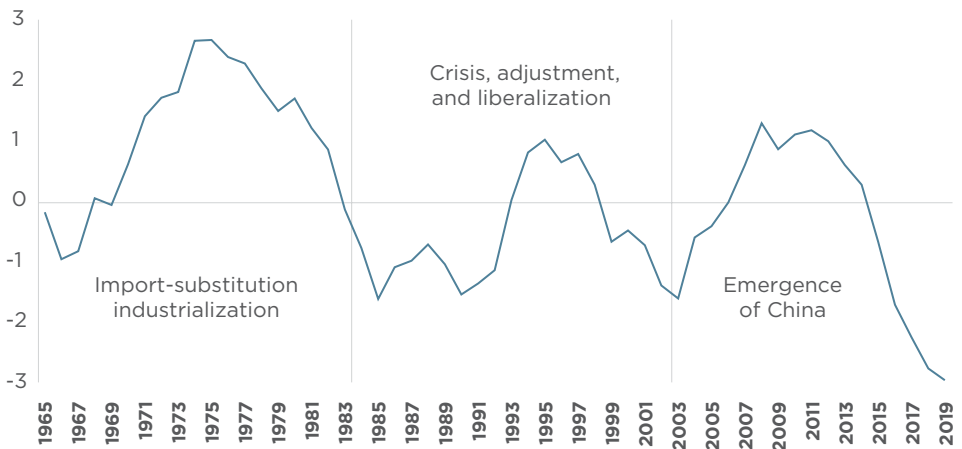
Third, since development is a multidimensional process, and it is not just about growth, this chapter includes two other vital dimensions: macro-financial stability and social equity. Thus, we will perform a more holistic assessment of development, and we will be able to verify whether Latin American countries have managed—in each of the three stages—to create virtuous circles (positive feedback among growth, stability, and social equity) or prioritizing the objectives of one aspect at the expense of the others has been the trend instead.

2. Half a century of economic development from a bird's eye view

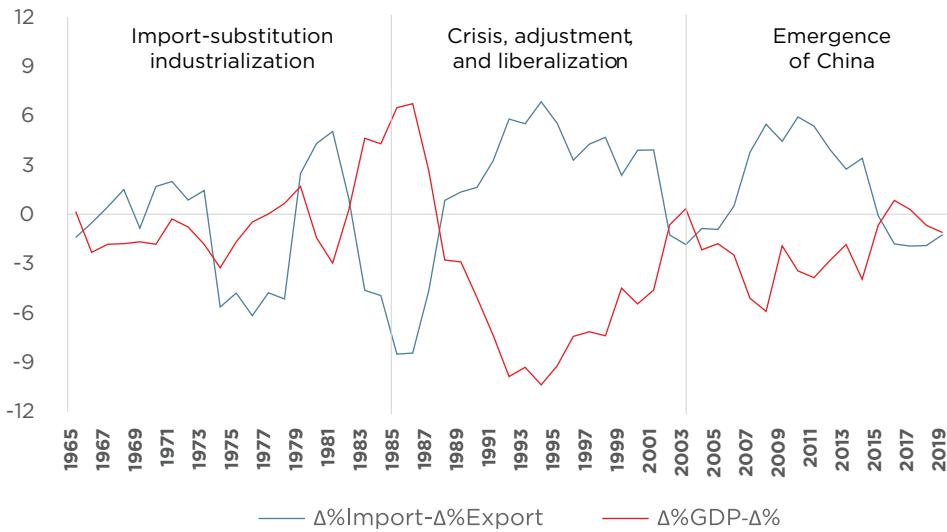
As a preamble to the analysis of the specific developments in each of the three phases, this section exhibits a bird's eye view of the period under review (1960-2019). It begins by describing the noticeable cycles of economic growth and their relationship with equally obvious variations in the external deficit and the domestic demand – a recurring topic in the region –. It then analyzes the differentiation process of the international trade structures of Mexico, Central and South America. This differentiation consolidated in the 1990s and interfered in the synchronization of the economic cycles of these countries and sub-regions in the 2000s. Finally, the section outlines the results of the economic development in terms of growth, stability and social equity. This overview sets the basis for a specific discussion of each of these three phases in the rest of the chapter.

CHART 2. Latin America: Cycles of Growth, Demand Fluctuations and Key Prices

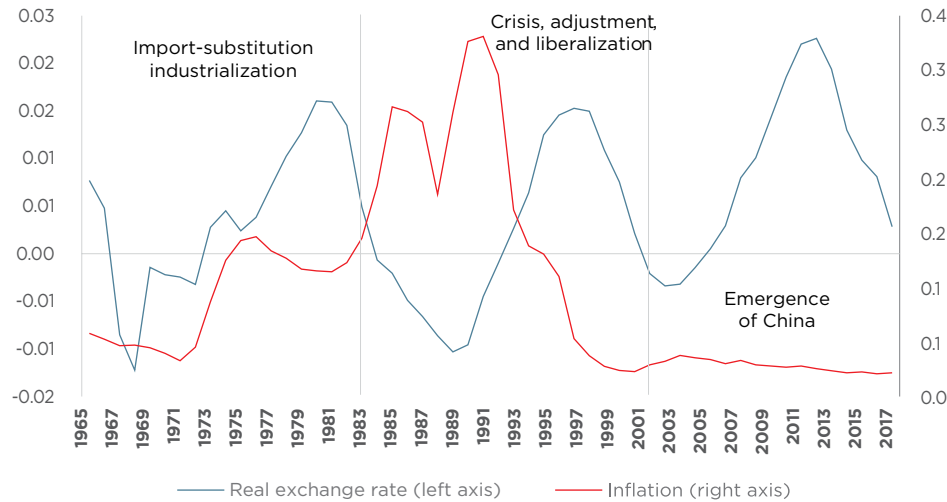
Graph A. Latin American GDP Growth compared to the World GDP Growth



Graph B. Import Variation compared to GDP and the External Deficit



Graph C. Inflation and Variation of the Real Exchange Rate



Note: The series show 5-year (2. A and 2. B) and 3-year (2. C) moving averages. Imports and exports include goods and services, in constant 2010 US dollars. Graph A shows the real growth of regional GDP minus that of the world. In Graph C, *P* stands for the logarithm of the regional annual inflation rate and *e* stands for the logarithm of the annual variation in the real exchange rate (adjusted by consumer price indexes) compared to the United States. The exchange rate is expressed in US dollars per local currency: an increase (decrease) represents an appreciation.

In terms of growth cycles, Chart 2, Graph A clearly shows that the region has gone through three noticeable and evidently delimited cycles in the last sixty years. The first cycle began in the 1960s, peaked in the mid-1970s and then fell into a standstill in the mid-1980s. The second cycle began in the late 1980s, peaked in the mid-1990s and, subsequently, fell to its lowest point in the early 2000s. The third cycle started with the irruption of China in 2002–2003, reached its peak in 2010–2011, and then declined to a much lower growth rate than that of the world, a fall that—at the time of this writing—did not seem to have found a bottom.

The region's growth cycles reflected, in turn, noticeable fluctuations in domestic demand, particularly in unsustainable increases in expenditure with unfavorable consequences. Expenditure booms were typically underpinned by improvements in the terms of trade (that is, increases in export prices in relation to import prices) or generous capital inflows and were enlarged by significant appreciations in the real exchange rate and credit booms. Because the boom was unsustainable over time, there followed a sharp reduction in expenditure resulting from the drops in the terms of trade, the sudden loss to access to external financing, or both, which was enlarged by harsh tax adjustments, credit reductions, and real exchange rate depreciation.

This cyclical pattern of domestic demand can be well noted in Chart 2, Graphs B and C. Let us consider the uptrend of the cycles first. There, the expenditure boom widened the external deficit (the volume of imports grew faster than that of exports [the blue line rises, as shown in Chart 2, Graph B]). This deficit was financed with extraordinary profits coming from improvements in the terms of trade, greater external financing, or both. Although driven by different factors, that process was associated with a strong appreciation of the real exchange rate (Chart 2, Graph C). In the second half of the 1970s, real appreciation was driven by accelerating inflation in a context of pegged exchange rates. While, in the 1990s, it was pressed by the gradual stabilization of inflation based on nominal exchange rate anchors. And, in the uptrend of the commodity cycle (2003–2012), such appreciation was driven by the strengthening of the nominal exchange rate in a context of more flexible exchange rate systems. Demand booms were not sustainable because they did not drive a higher supply growth, which is evidenced by the red line in Chart 2, Graph B that moves inversely to the changes in the external deficit (blue line). In the uptrend of the cycles, the red line falls below zero because import growth exceeds GDP growth.

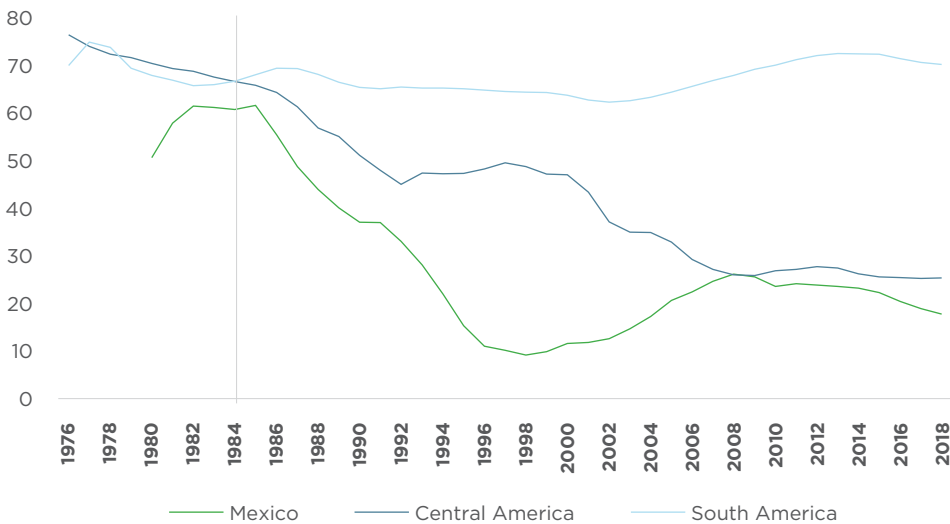
Let us now look at the downtrend of the cycles, typically triggered by a drop in the terms of trade or a sudden stop in capital inflows, which make the reduction in expenditure unavoidable. This is reflected in Chart 2, Graph B, in a reversal of the external deficit (the blue line falls), based mainly on the compression of imports in relation to GDP (the red line rises). Sharp depreciations of the real exchange rate, followed by inflationary spirals in the 1980s, lie behind those drastic external adjustments. However, no upturn occurred in the average regional inflation during the downtrend of the commodity cycle (from 2013 to date) (Chart 2, Graph C).

Therefore, it is clear that the last half-century of Latin America's development was marked by three noticeable cycles of economic activity driven by large fluctuations in the domestic demand and the real exchange rate. Unsustainable expenditure expansions have been a hallmark of the region and a decisive factor behind its low and volatile growth.

However, it should be noted that until the 1990s, it was reasonable to speak of the same growth cycle for the entire region. This statement ceased to be valid at the end of that decade, after Mexico, Central and South America took different international trade approaches. Said separation is clearly observed in Chart 3: it began in the mid-1980s and settled in the 2000s. Until the 1980s, practically all Latin American countries were commodity exporters. From then on, South America consolidated or intensified its dependence on commodity exports (Chart 3, Graph A), while Mexico was strongly oriented toward the exports of manufactured goods (Chart 3, Graph B)² and Central America gradually positioned itself as a service-exporting sub-region (Chart 3, Graph C).

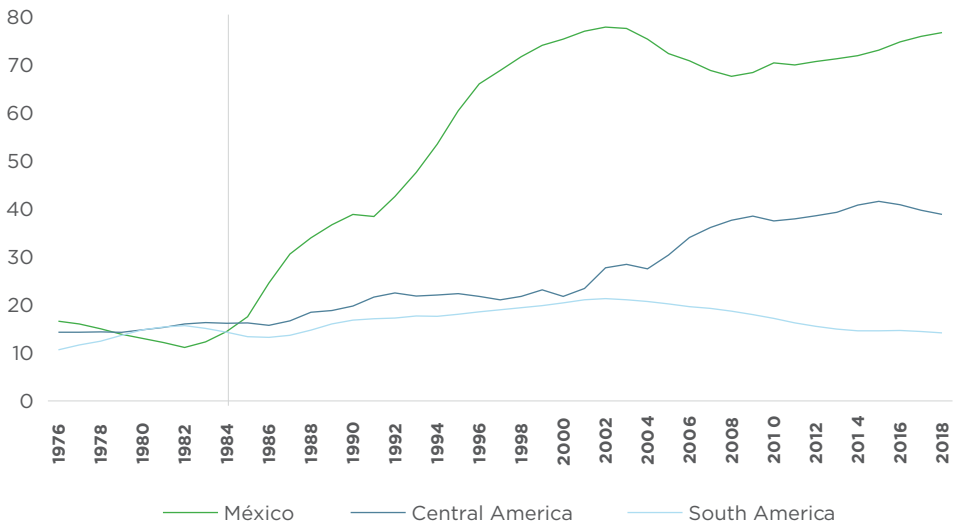
CHART 3. Share in Total Exports

Graph A. Commodities

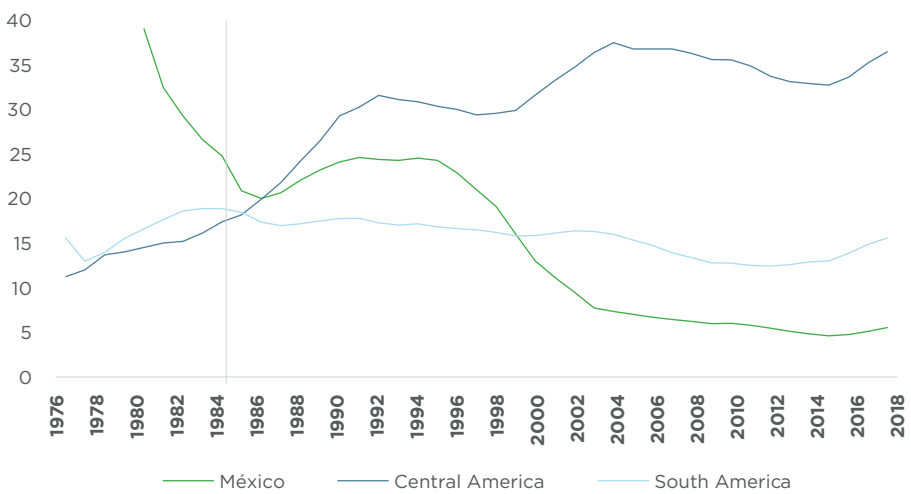


² The change in the structure of Mexican exports was originally driven by maquila activities at the border with the United States. These activities took advantage of the unilateral trade liberalization process that Mexico implemented in the mid-1980s. Later, this process received a decisive boost with the North American Free Trade Agreement (NAFTA).

Graph B. Manufactured goods



Graph C. Services

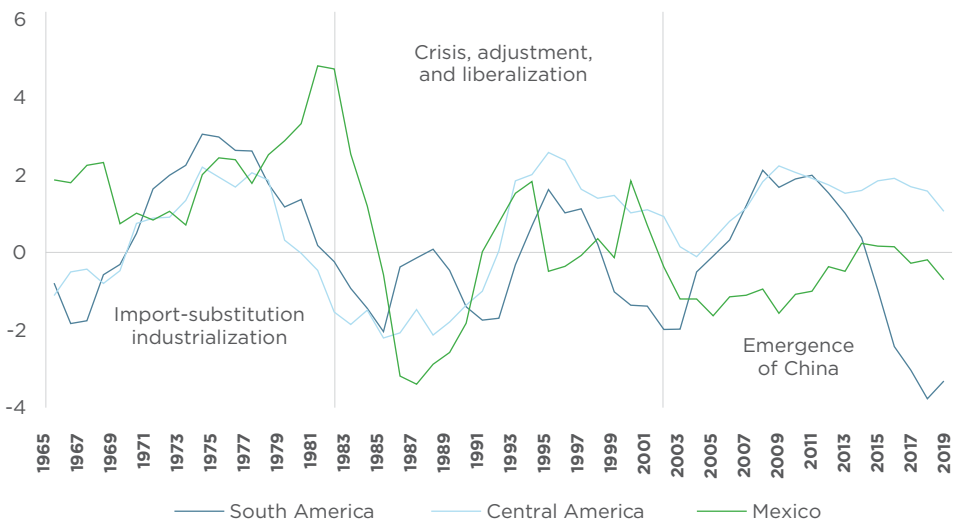


Note: The series on services and manufactured goods were taken directly from the World Development Indicators (World Bank). The commodity series was generated as a residual: the difference between total exports, on the one hand, and exports of manufactured goods and services, on the other.

Source: World Development Indicators (World Bank).

The classification of Latin American countries according to their several export structures (dominated by manufactured goods in Mexico, services in Central America, and commodities in South America) is a new key regional characteristic. It helps to explain the differences in the economic development of Latin America during the new millennium (in the third stage). This separation obviously shifted the exposure to terms of trade shocks. In the 2000s, it also interrupted the synchronization of the growth cycles of Mexico, Central and South America, which had been highly synchronized until the late 1990s (Chart 4).

CHART 4. Latin American GDP Growth compared to the World GDP Growth



Note: 5-year moving averages. The chart shows the real GDP growth minus that of the world GDP.

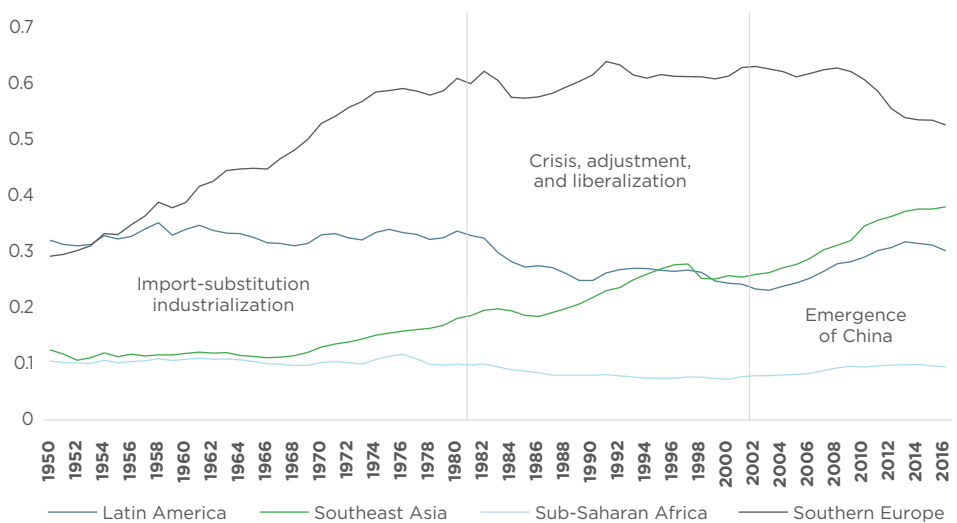
Source: World Development Indicators (World Bank).

Subsequently, this section includes the results of the economic development for the region throughout the entire period (1960-2019) in terms of growth, stability and equity. With this overview, we can compare and contrast, from a bird's eye view, the results among the three stages: i) the import-substitution industrialization stage from 1960 to 1981; ii) the crisis, adjustment, and liberalization stage from 1982 to 2002; and iii) the emergence of China stage from 2003 to date.

Let us start by considering the results in terms of growth with the help of Chart 5, which shows GDP evolution per capita of the United States. (The trajectory of this ratio reflects the unconditional convergence or divergence of the living standard in Latin America and other regions compared to that of the United States.)

Latin America started the 1950s with a GDP per capita close to that of the Southern European countries. Throughout the import-substitution industrialization stage, the region barely kept pace with the United States (its average level of income per person stabilized at about a third of that of the United States), but fell continuously compared to that of Southern Europe, which managed to reduce its gap with the United States by about a half. In the crisis, adjustment, and liberalization stage, income per capita in Latin America lost ground dramatically in relation to the United States and was exceeded by that of Southeast Asia. During the emergence of China stage, global demand growth and high commodity prices were key factors behind a faster growth in the income per capita in Latin America (and in most emerging economies), compared to that of the United States. For a while, Latin America even followed the uptrend of Southeast Asia, until the bursting of the bubble of the commodity prices (which started around 2012) pushed the region into what now appears to be another divergence phase. Note that, in 2016, after almost 70 years, the region ends at the same level as it was in 1950, which implies that the convergence process in the 2000s was only useful to recover what was lost in the previous two decades.

CHART 5. GDP per Capita as a Percentage of GDP per capita in the United States

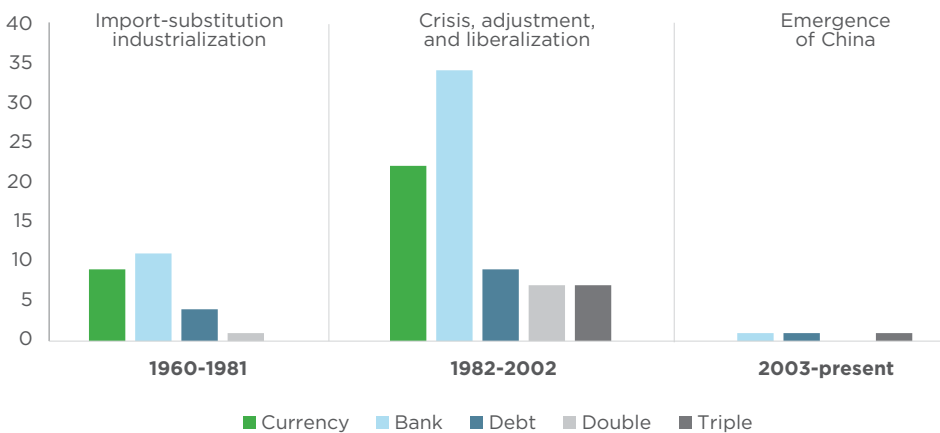


Notes: Latin America includes Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru, Uruguay, and Venezuela; Southeast Asia includes China, the Philippines, Indonesia, Malaysia, Singapore, Thailand, and Vietnam; Southern Europe includes Spain, Greece, Italy, and Portugal. All regional aggregates reflect simple averages. The variable used is the real GDP per capita in constant 2011 US dollars, the reference value for 2011 (suitable for comparing the growth of different countries).

Chart 6 refers to financial stability, another crucial dimension of economic development. The contrast between the three stages in this dimension is remarkable. The import-substitution industrialization period was characterized by little instability compared to the other stages, with an approximate rate of one crisis each year. In contrast, during the crisis, adjustment, and liberalization stage, Latin America was shaken violently by financial instability that transformed the region into the epicenter of the world's most frequent and devastating crises. During that period, Latin America suffered almost four crises each year. Instead, during the emergence of China stage, Latin America became quite immune to financial crises: the incidence of crises fell to 0.2 yearly.

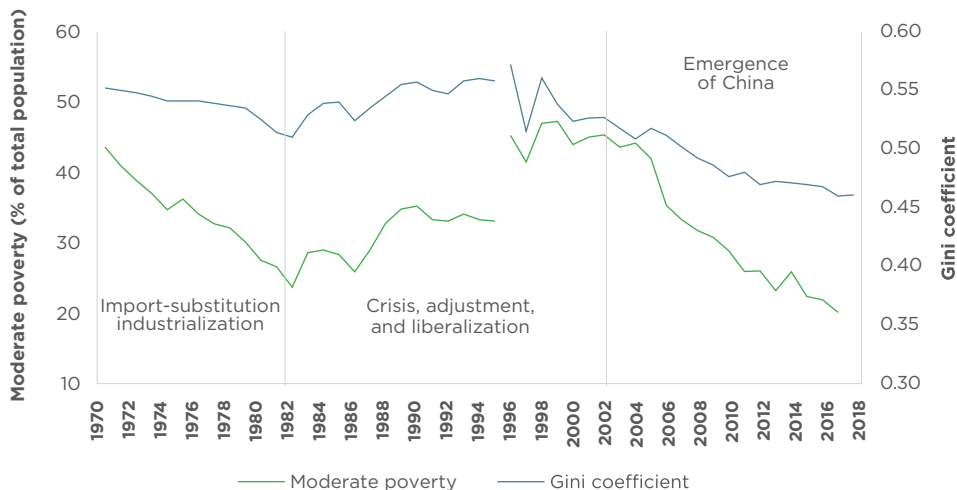
Clearly, the Latin American low-growth problem has not been independent of the incidence of crises. This is evidenced in Chart 7; countries that have a higher number of financial crises from 1960 to 2019 have also tended to register greater volatility in their growth rates (on the left), and higher growth volatility has been associated with lower growth (on the right).

CHART 6. Latin America: Number of Financial Crises



Notes: The five categories of crises are reciprocally selective. A double crisis is defined as the simultaneous happening (in the same year) of a banking and a currency crisis. A triple crisis is defined as the simultaneous materialization of a banking, a currency, and a sovereign debt crisis.

Sources: Laeven and Valencia (2008), Caprio and Klingebiel (1996), and Reinhart and Rogoff (2008).

CHART 8. Latin America: Poverty and Income Inequality

Notes and sources: The 1970-1995 series were taken from Londoño and Székely (2000). Both are weighted averages based on a sample of 13 Latin American countries. The series for 1996-2018 are simple averages and come from the World Development Indicators (World Bank), for moderate poverty, and from the United Nations (United Nations University - World Institute for Development Economics Research [UNU-WIDER]), for the Gini coefficient. Londoño and Székely set the moderate poverty line at USD 2 per day, in 1985 purchasing power parity terms. The World Bank sets that line at USD 5.5, regarding 2011 purchasing power parity.

The overall message from Charts 5 to 8 can be summarized as follows. On average, results in terms of development were varied for the region as a whole during the import-substitution industrialization stage. Results included some social progress, no convergence in income per capita, and a moderate level of financial instability. Instead, a *perfect storm* (divergence in income per capita, deterioration of social conditions, extremely high financial instability) was recorded during the crisis, adjustment, and liberalization period. In contrast, in the emergence of China stage, a powerful, but relatively short *virtuous circle* (convergence of income per capita, remarkable social progress, and minimal financial instability) materialized. In fact, the end of the commodity boom (which began around 2012) brought a sharp slowdown in growth, which again fell below world growth. Thus, the progress of economic development came to a halt again. In 2019, the region experienced a tidal wave of citizen dissatisfaction followed by violent protests in the streets in several countries.

The remainder of this chapter analyzes—in some detail—the performance of Latin America in terms of economic development during each of the three stages.

3. Import-substitution industrialization stage (1969-1981)

Import-substitution industrialization policies arose largely from the emphasis on capital accumulation typical of early development theories, and the idea that markets could be expected to function adequately in developing countries.⁵ According to this argument, economic development is too important to be left in the hands of market forces subject to failures of different kinds. Therefore, the State should lead the acceleration of capital accumulation by controlling the hubs of the economy and the deliberate mobilization and allocation of resources.⁴ This involved a considerable degree of essential planning and a wide range of interconnected government interventions, including price controls, high tariffs and instalments for the import of finished goods, currency rationing, interest rate management, and directed credit programs through State-owned companies and banks.

Undoubtedly, dirigism policies could have been implemented in foreign markets—as in the case of the Southeast Asia's experience—rather than in the domestic market. However, the intellectual currents that prevailed in Latin America at that time promoted such direction. That position was consistent with the structuralist vision promoted by the Economic Commission for Latin America and the Caribbean (ECLAC).⁵ According to that vision, a virtuous circle between growth based on manufacturing industry, and the expansion of domestic markets (and common regional markets) would allow Latin America to be released from what—at that time—was considered a long-term deterioration in the terms of trade. The inward direction was also consistent with the dependency theory, which interpreted the relationship between the “periphery” and the “core” as a weakening dependency: the structural subordination of economic activity in the periphery to the interests of the core, which overwhelmed technological dynamism and economic diversification in the periphery.⁶ Thus, dependency theory was combined with ECLAC's own structuralism to provide an intellectual basis for the import-substitution industrialization strategy, which was enthusiastically adopted by many countries in the region.

These currents of thought obviously ended up being legitimized thanks to the support of new political coalitions. Although import-substitution industrialization reduced the traditional power of large landowners, it also promoted migration to the cities and, likewise, the emergence of new political forces based on the interests of urban workers. Furthermore, the import-substitution industrialization gave birth to new groups of industrialists who

5 See, for example, Rosenstein-Rodan (1945), Gerschenkron (1962), Hirschman (1958), and Rostow (1959).

4 Those classic arguments have been recently reformulated in terms of externalities, scale effects, and principal-agent problems. See, for example, Hoff and Stiglitz (2001), and Murphy, Shleifer, and Vishny (1989).

5 The ECLAC's vision was based on the work of Prebisch (1950) and Singer (1950).

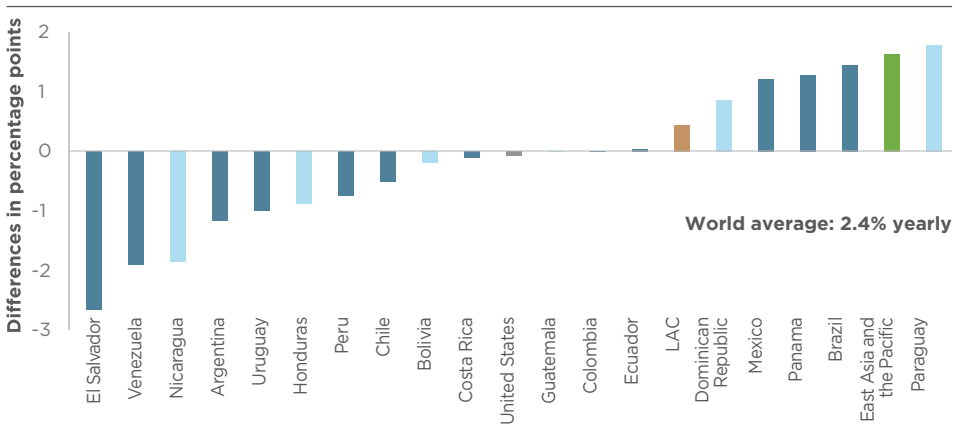
6 See, for example, Gunder Frank (1967), Furtado (1963), and Cardoso and Faletto (1979).

benefited from the protection of the State and gained political influence. In this way, dynamics in favor of import-substitution industrialization policies were generated, which subsequently became exceedingly difficult to break.⁷

The import-substitution industrialization stage yielded uneven development results. On average, they were moderately positive in terms of growth (in relation to the world) and more remarkable in terms of social progress, although concentrated in a few countries. There were no major macro and financial instability problems, though inflation reached high levels in the Southern Cone in the 1970s. The remainder of this section goes deep into some details of the three dimensions of development.

In terms of growth (Chart 9), an overwhelming economic expansion in the United States, Western Europe and Japan (the three main engines of global growth) boosted world trade significantly and increased the growth rate of the world's income per capita to an average of 2.4% annually, the highest of the three stages under review. Latin America grew marginally faster than the world, although this mainly reflected the “economic miracles” registered in Brazil and Mexico, the largest countries in the region. While a few small countries (Paraguay, Panama, and the Dominican Republic) also performed well, most of the countries in the region lost ground or barely kept pace compared to the world.⁸

CHART 9. Import-Substitution Industrialization Stage: Latin American GDP per Capita Growth compared to World GDP per Capita (Annual Averages, 1960-1981)



Notes: GDP per capita is measured in real terms and expressed in constant 2010 US dollars. The percentage difference is calculated by subtracting the growth of the world GDP per capita from the growth of each country's GDP per capita. The growth rates are annual geometric averages. LAC means Latin America and the Caribbean. Weighted averages have been considered for LAC and the world. The countries in light blue had a GDP per capita below USD 1,500 in 1960.

Source: World Development Indicators (World Bank).

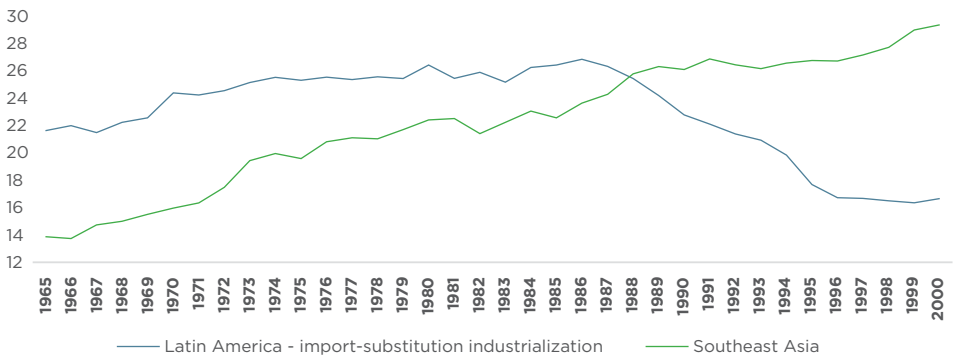
⁷ See, for example, Hirschman (1968), Baer (1972) and Bruton (1998).

⁸ The rapid growth of Paraguay and the Dominican Republic during the import-substitution industrialization stage reflects –in part– the simple fact that they started from a relatively low annual income per capita, below the USD 1,400 in constant 2010 US dollars. In the case of Panama, its vigorous growth (around 8% yearly) in the 1960s, also started from a relatively low base (USD 2,140 per capita in 1960) and reflected a solid growth in global trade and a boom in Canal-related activities.

It is true that the import-substitution industrialization gave Latin America an advantage compared to Southeast Asia in terms of the industry's GDP share. However, that advantage could not be maintained over time. There were substantial investments in the 1980s, as shown in Chart 10, which compares the average of Brazil, Colombia and Mexico (countries with remarkable industrial development directed to the domestic market) with that of a selection of countries in Southeast Asia (which adopted a decidedly export-oriented industrialization strategy). The manufacturing sector declined rapidly as GDP share in Latin America, while GDP continued to grow in Southeast Asia (Chart 10, Graph A). The growing share of manufactured goods in total exports—which has evolved roughly in parallel with that of Southeast Asia, but clearly below it (Chart 10, Graph B)— failed to compensate for the loss of relevance of the industrial sector in the economy as a whole. This is a clear manifestation that the local content of the manufacturing sector was relatively limited and the productive ties of manufacturing with the rest of the economy were rather weak. Ultimately, in the import-substitution industrialization stage, the region ended up promoting inefficient industries with little export potential and weak connections with the local productive matrix.⁹

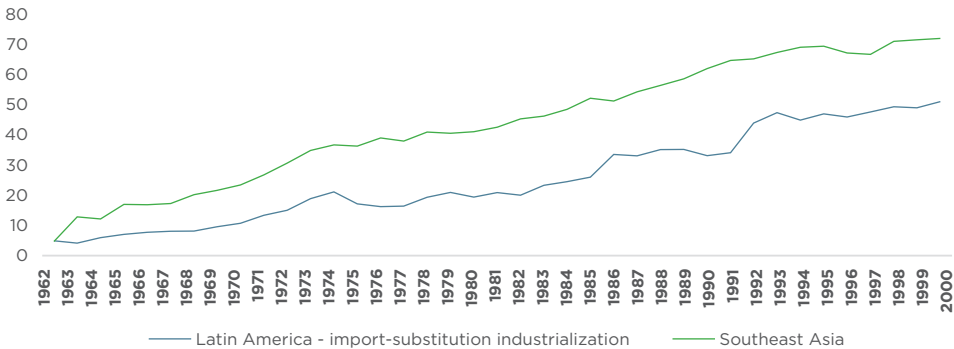
CHART 10. The Importance of Manufactured Goods in a Selection of Latin American and Southeast Asian Countries

Graph A. As GDP Share



⁹ See, for example, Krueger (1985) and Edwards (1995).

Graph B. As Exports Share



Notes: Southeast Asia includes South Korea, Malaysia, and Thailand. Latin America includes Brazil, Colombia, and Mexico.

Source: World Development Indicators (World Bank).

It is quite contradictory that, even though the import-substitution industrialization explicitly sought to free Latin America from its dependence on commodities, in fact, it accentuated said dependence.

Among the countries that adopted import-substitution industrialization policies, the best performers in terms of growth were those that offered the most diversified and rapidly expanding commodity exports (De la Torre and Ize, 2020). Even more than the country size, the key differentiating fact was, more specifically, the ability of large countries to attract more returns to scale in domestic market-oriented industrial production.¹⁰

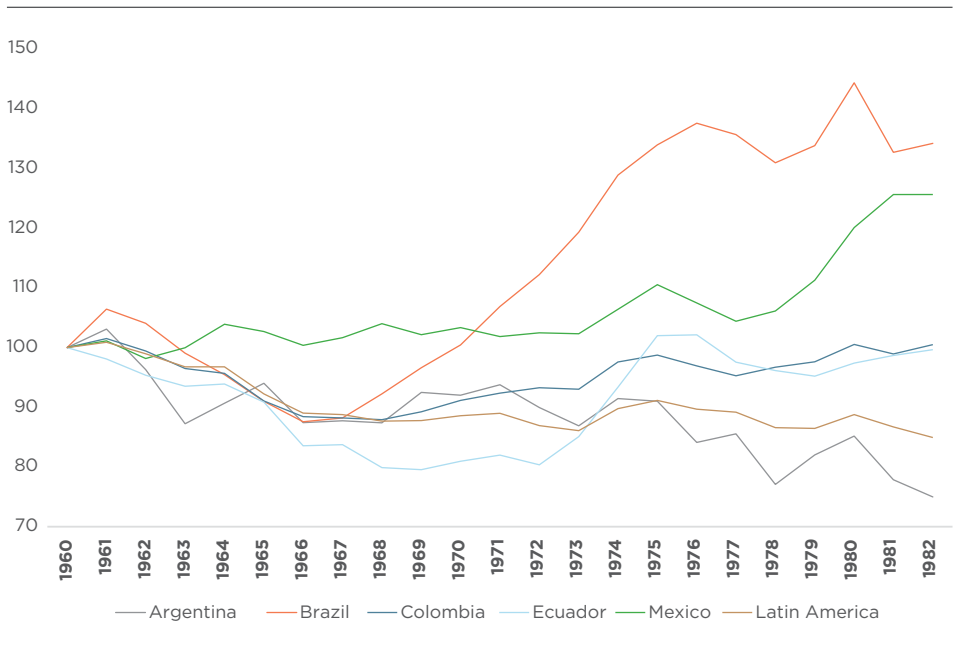
Why was the success or failure of the import-substitution industrialization ultimately dependent on commodity exports? Because it needed plenty of currency to finance the import of intermediate and capital goods to maintain a protected and import-intensive industrial sector. Locally industrialized products were sold within protected domestic or common regional markets, such as the Andean Pact. Therefore, commodity export (i.e. non-industrial products) was the only way of upholding the import-substitution industrialization. Had Latin America not been a raw materials-rich region, it would have been forced to dismiss the inward-oriented import-substitution industrialization strategy. That was precisely what happened to Southeast Asia: unable to count on commodity exports, it had no choice but to adopt an outward-oriented industrialization strategy.

The import-substitution industrialization dependence on commodity exports helps explain why, unlike Brazil and Mexico, other large countries in the region (for example, Argentina) which enthusiastically adopted that

¹⁰ The conventional thesis considers that the growth induced by import-substitution industrialization policies was the result of relative prices changes in favor of industry and to the detriment of agriculture. Because the productivity level of the industrial sector was higher than that of agriculture, this increased GDP growth. However, this process was limited when migration to the cities was exhausted, and the industrial sectors did not generate sustained increases in productivity. (Pages, 2010; McMillan and Rodrik, 2011; Sanguinetti and Villar, 2012).

substitution model could not increase their income from commodity export or generate high growth rates (Chart 11).¹¹ That dependence also helps to understand why certain smaller countries, which adopted import-substitution industrialization policies, such as Colombia and Ecuador, managed to accelerate economic growth in the 1970s (Chart 11).¹²

CHART 11. Import-Substitution Industrialization Stage: Income per Capita compared to that of the United States (index 1960=100)



Source: World Development Indicators (World Bank).

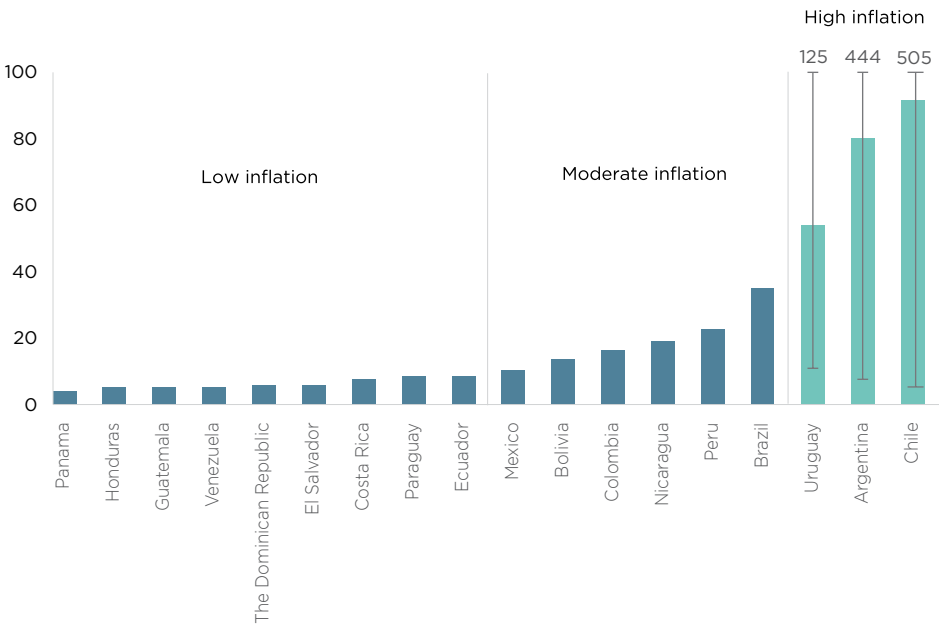
In terms of social equity, import-substitution industrialization did not explicitly prioritize poverty reduction or distributional goals. It was not a time of great innovation in social policies, either. The import-substitution industrialization strategy seems to have been rather in favor of the thesis that growth, by itself, would reduce poverty. As noted above (Chart 8), significant social progress was recorded between 1970 and 1980. Moderate poverty fell from 43.6% to 27.5% and income inequality fell marginally, from a Gini coefficient of 0.58 in 1970 to 0.55 in 1980. However, since those indicators are weighted averages, they mainly reflect the social progress of the largest countries (Brazil and Mexico), which registered high growth. There is not

¹¹ Relying on a novel breakdown method that emphasizes the relationships among growth, international trade, and macroeconomics, De la Torre and Ize (2020) show that Argentina's poor growth has been largely the consequence of its inability to generate a vigorous expansion of exports, coupled with great macro-financial volatility, which—in turn—has resulted from unsustainable excesses in domestic demand.

¹² De la Torre and Ize (2020) show that growth acceleration in Colombia and Ecuador during the import-substitution industrialization phase can be attributed mainly to the fact that these countries had a more diversified basket of commodity exports and could expand their income from said exports. Ecuador also benefited from a large oil-driven improvement in its terms of trade (De la Torre, 1987)—Ecuador became an oil exporter in the early 1970s, and Colombia in the mid-1980s.

enough data to have a clearer idea of the degree of relative social progress in most of the other countries in the region during the import-substitution industrialization stage.

CHART 12. Inflation in the Import-substitution Industrialization Stage (Annual Averages, 1960-1981)



Notes: Average inflation is calculated as a simple average of the inflation rates of the different countries. Inflation in Brazil in the 1960-1981 period was obtained from Ayres, García, Guillén, and Kehoe (2018).

Source: World Development Indicators (World Bank).

Finally, in terms of macro-financial stability, as already mentioned, the incidence of crises was relatively low (Chart 6). However, inflation accelerated, especially in the Southern Cone. It can be discussed whether this was attributable, at least partially, to import-substitution industrialization policies or other independent causes. As relative prices were distorted and dependence on raw materials was intensified, import-substitution industrialization policies weakened the foundations for future growth and contributed to the macroeconomic instability affecting the region in the 1980s. In addition, import-substitution industrialization policies pressed the prices of the goods traded within protected sectors upward, differently to international competitors. During the import-substitution industrialization stage, inflation was not on average a serious and widespread problem in Latin America (Chart 12). Around half of the countries in the region kept inflation below 10% a year,

and the majority registered annual inflation below 20%. High inflation tended to be concentrated in Brazil and other Southern Cone countries. There, the rise in prices accelerated in the 1970s parallel to exchange rate adjustments generally driven by the monetary financing of growing fiscal imbalances. However, it was in the import-substitution industrialization stage that the seeds of the inflationary process were planted, the lack of control of which would later cost many countries so much, especially in the crisis, adjustment, and liberalization stage.

The exhaustion of import-substitution industrialization became clear in the late 1970s, when commodity prices fell, and exports stopped generating enough currency to finance an import-intensive and domestic-oriented industrial sector. The resulting pressure on the fiscal accounts and the balance of payments gave rise to an aggressive debt process, eased by the enormous “petrodollars” recycling through the international banking system. Petrodollars were associated to the large current account surpluses of the oil-exporting countries. Latin America’s foreign debt skyrocketed, from 150% of its exports in 1974 to 300% in 1982 and 400% in 1986 (Bértola and Ocampo, 2012). Debt was, however, a desperate and ultimately unsuccessful attempt to extend import-substitution industrialization life, which collapsed under the burden of debt and macroeconomic crises. In that process, the well-known wrongs related to the import-substitution industrialization strategy emerged clearly: scarcely competitive industries at international level, distorted relative prices and corruption in resources’ allocation regarding tax, currency and credit areas, among others.¹⁵

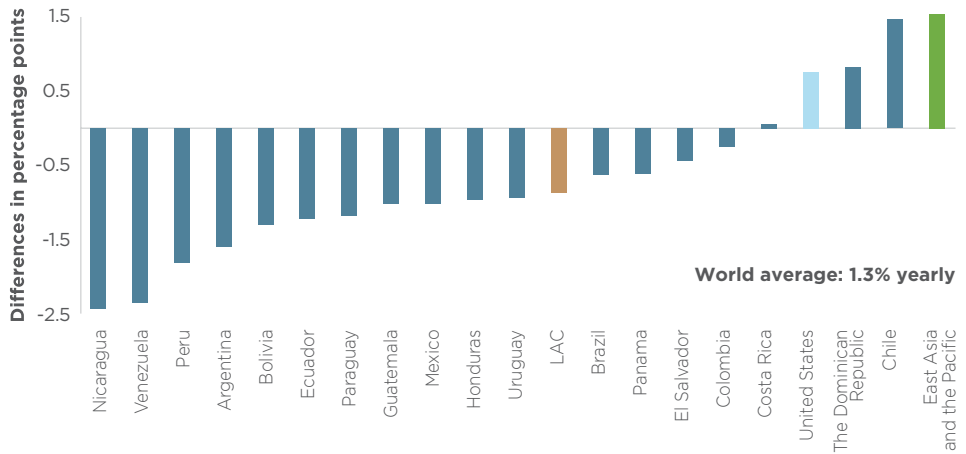
¹⁵ For further analysis, see, for example, Edwards (1995).

4. The crisis, adjustment, and liberalization stage (1982-2002)

The outbreak of the Latin American debt crisis was caused in 1982 by the sharp increase in the United States' interest rates and the fatal suspension of Mexico's foreign debt amortization payment. This crisis ended the import-substitution industrialization stage and opened up a new era in the economic development of Latin America: the crisis, adjustment, and liberalization stage. During this stage, the region experienced a perfect storm: a sharp drop in growth, extremely high macro-financial instability, and a remarkable deterioration in social equity indicators.

In fact, income per capita in most of Latin American countries lost ground considerably to the world and the United States during the crisis, adjustment, and liberalization stage (Chart 13). Only three countries in the region (Costa Rica, the Dominican Republic and Chile) grew faster than the world. Chile was the star country: GDP per capita expanded practically at the same rate as that of East Asia and the Pacific. Most of the countries whose growth dropped pronouncedly in comparison to the world growth were also devastated by hyperinflation (Argentina, Bolivia, Nicaragua and Bolivia) (Charts 13 and 14). The exceptions were Venezuela (where income per capita fell, but inflation remained moderate) and Brazil (which experienced hyperinflation, but income per capita growth exceeded the regional average). Inflation rose to moderate levels in the rest of the region, with Panama as the only exception (Chart 14). Between 1982 and 1995, the Gini coefficient of income inequality rose from 0.51 to 0.56, and the moderate poverty rate rose from 24% to 33% of the population (Chart 8).

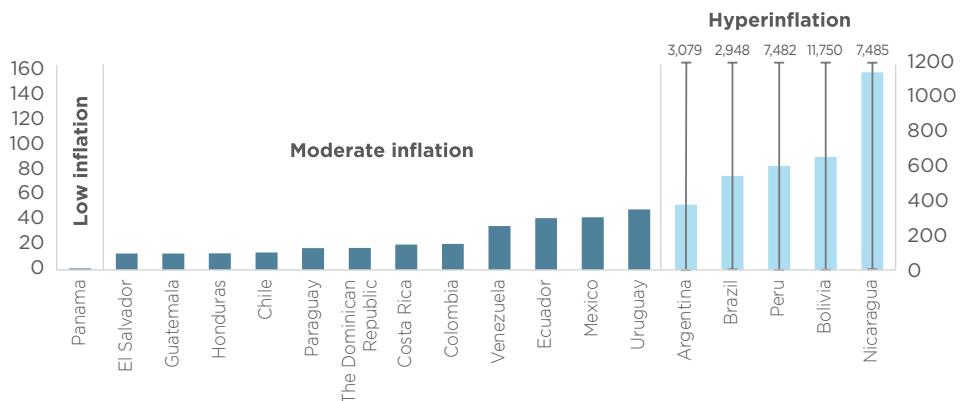
CHART 13. Crisis, Adjustment, and Liberalization Stage: Latin American GDP per Capita Growth compared to World GDP per capita (Annual Averages, 1982-2002)



Notes: GDP per capita is measured in real terms and expressed in constant 2010 US dollars. The percentage difference is calculated by subtracting the growth of the world GDP per capita from the growth of each country’s GDP per capita. The growth rates are annual geometric averages. LAC means Latin America and the Caribbean. Weighted averages have been considered for LAC and the world. The countries in light blue had a GDP per capita below USD 2,000 in 1982.

Source: World Development Indicators (World Bank)

CHART 14. Inflation in the Crisis, Adjustment, and Liberalization Stage (Annual Averages, 1982-2002)



Notes: Average inflation is calculated as a simple average of the inflation rates of the different countries.

Source: World Development Indicators (World Bank).

The crisis, adjustment, and liberalization stage can be divided into two phases, which can be clearly seen in Chart 2. The first phase comprised the 1980s and was referred to as the Lost Decade. It featured the economic regression marked by the debt crisis and recurrent and mostly unsuccessful of macroeconomic adjustment, inflationary spirals and an economic activity downturn. The second phase basically comprised the 1990s and was known as the Washington Consensus Decade. This period was marked by progress toward macroeconomic stability, and a large number of reforms favoring the market economy, including privatizations and commercial and monetary liberalization processes. However, said stability was interrupted by sudden stops in capital inflows and systemic financial crises. Let us provide further details about these two phases.

During the Lost Decade, Latin America lost access to voluntary private financing, as many of its countries went into default or faced chronic difficulties with the repayment of their debt. For most of that decade, the international creditor community (banks, G7 countries, the International Monetary Fund [IMF]) interpreted those difficulties as signs of temporary illiquidity. Therefore, that community managed said difficulties with agreed refinancing packages and fresh money, under the scope of the Baker Plan and IMF adjustment programs.¹⁴ By the late 1980s, however, the international community could no longer deny that the debt problem reflected insolvency and not illiquidity. This led to the late origin, in 1989, of the Brady Plan, which finally established an internationally accepted framework for negotiating sovereign debt reduction agreements. Ten Latin American countries joined the Brady Plan.¹⁵ The delay in acknowledging the insolvency situation meant that the problem of over-indebtedness would curse the region much longer than necessary, which –in turn– required tougher adjustment measures.¹⁶

The adjustment process resulted, in effect, in an incredibly high economic and social cost to the countries in the region. With a vanishing access to financing and a significant deterioration of the terms of trade, Latin America was shoved from an aggregate deficit of almost USD 2 billion in the current account of its balance of payments in 1981 to a surplus of over USD 59 billion in 1984 (Edwards, 1995). This enormous reversal in the current account (which can also be observed for the 1980-1986 period in Chart 2, Graph B) was accompanied by large devaluations and harsh restrictions on imports. To get their fiscal accounts in order, countries had to deal with deep and highly disruptive cuts in their tax expenditure, which disproportionately affected social programs and infrastructure investment. Inflation soared (Chart 2, Graph C) and GDP per capita shrank in absolute terms, at a rate of around 1% a year. All this implied drastic drops in the purchasing power of wages

14 Treating the debt problem as illiquidity was the preferred path for authorities in advanced economies as this allowed international creditor banks to delay the recognition of losses in their loan portfolios to countries with payment issues.

15 Mexico was the first Latin American country to restructure its debt under the Brady Plan. Other countries in the region that reached agreements to reduce their debts were Argentina, Brazil, Costa Rica, Ecuador, Panama, Peru, the Dominican Republic, Uruguay, and Venezuela.

16 This problem arises when the level of debt exceeds the repayment capacity of a country. Consequently, debt repayments work as a 100% marginal tax on investment, weakening growth. See, for example, Corden (1991), Krugman (1988), and Imbs and Ranciere (2005).

and the deterioration of employment conditions. The income per capita of all Latin American countries included in Chart 13 lost ground between 1982 and 1990 to the world average, while the GDP per capita of the region as a whole declined by 2% yearly if compared to the rest of the world.

However, this harsh adjustment prepared the region for a major shift in development thinking. With gradual and determined steps, a new model known as the Washington Consensus rose in the late 1980s and early 1990s.¹⁷ It prioritized macroeconomic stabilization and market liberalization. Unlike the import-substitution industrialization model, the new paradigm affirmed that economic development was too relevant to be left to government bureaucrats. Instead, the free action of the market forces should be trusted as the underlying factors of the pricing system that would coordinate countless decentralized decisions of companies and individuals, enable an efficient allocation of resources and open new spaces for entrepreneurship. According to this new vision, development policies had to let the markets breathe for them to generate proper price signals. Several official documents from the World Bank and the Inter-American Development Bank (IDB)¹⁸ published in the 1980s announced the beginning of this new era of development thinking.¹⁹ Even the ECLAC, which until then had been the bastion of import-substitution industrialization, saw the need to abandon the focus on domestic markets.²⁰

Although these new intellectual developments gave arguments to the Washington Consensus policies, the political feasibility of their implementation was largely due to the public understanding that the import-substitution industrialization model had collapsed, and the population was deeply unsatisfied with problems such as the economic reduction, the high inflation, the crisis and deterioration of social indicators that had been experienced in the 1980s.

The new development model laid the foundations for the implementation of a rather ambitious agenda of structural reforms. Lora (2001) identifies a “great wave” of reforms concentrated in the first half of the 1990s (Chart 15, Graph A), although with large variations among countries.²¹ The most aggressive commercial and financial reforms occurred in the liberalization area (Chart 15, Graph B). According to Lora (2001), the average rate of import duties in Latin America, which had fallen from almost 50% in the early 1980s to around 33% in 1990, continued to fall to 12% in 1999. And while the region was left behind the 1980s global wave of financial liberalization, it enthusiastically

17 For an assessment of the rise and fall of the Washington Consensus, see Birdsall, De la Torre, and Valencia (2011).

18 See, for example, the following World Development Reports by the World Bank: *International Capital and Economic Development* (1985), *Trade and Pricing Policies in World Agriculture* (1986), and *Industrialization and Foreign Trade* (1987), as well as the Inter-American Development Bank's Reports on Economic and Social Progress on Economic Integration (1984), *External Debt: Crisis and Adjustment* (1985), and *Agricultural Development* (1986).

19 Edwards (1995) summarized those changes well: “During the 1980s and early 1990s, there was a clear transformation of the economic thinking in Latin America. The previously prevailing position based on strong state interventionism, an internal direction and a lack of attachment to macroeconomic equilibrium slowly gave way to a new open, market-oriented and competition-based model.”

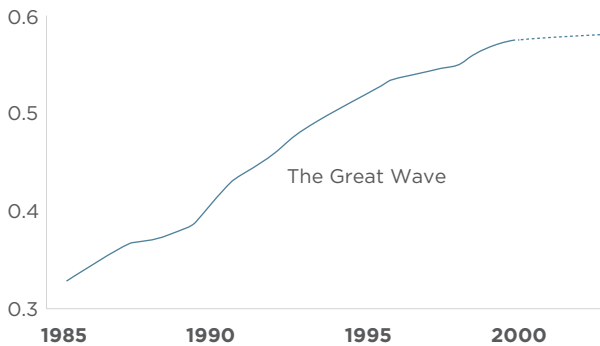
20 For example, Fajnzylber (1990) recommended implementing structural reforms to improve markets' activity combined with policies intended to aid poor people.

21 Lora summarizes and classifies the heterogeneity of the reforms' implementation as follows: countries adopting early reforms (Argentina, Chile and Jamaica); countries adopting gradual reforms (Colombia and Uruguay); countries adopting late reforms (Bolivia, El Salvador, Nicaragua, Paraguay, Peru and the Dominican Republic); and countries implementing slow reforms (Brazil, Costa Rica, Ecuador, Honduras, Mexico and Venezuela).

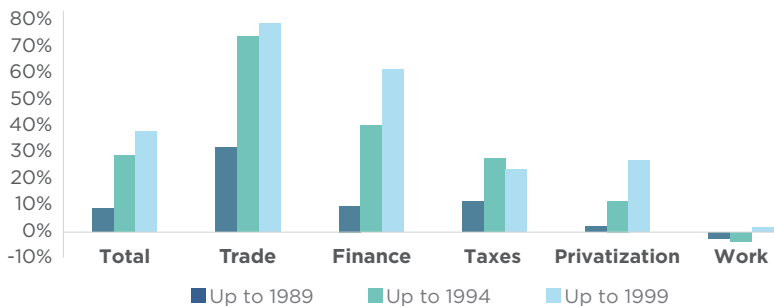
adopted such liberalization in the 1990s. According to a financial liberalization index compiled by Kaminsky and Schmukler (2003), it took the region only the first half of the 1990s to move from its relatively suppressed financial systems to a liberalization level like that of developed countries.²² In addition, there was a comprehensive updating on banks and capital market's legislation.²⁵

CHART 15. Latin America: Progress in Structural Reforms during the Crisis, Adjustment, and Liberalization Stage

Graph A. Structural Reform Index



Graph B. Progress of Structural Reforms



Notes: The progress of the structural reforms is measured as the margin of reform that already existed in 1985, and that was used in the following years.

Source: Lora (2001).

In the 1990s, there was also a wave of privatizations (of companies and public banks) and significant reforms in the pension systems. Between 1988 and 1997, more than 800 public entities were privatized for an aggregate of approximately USD 200 billion for the different states (Birdsall, De la Torre, and Valencia, 2011). In terms of pensions, Chile's pioneering reform in 1981

²² There was financial liberalization on both the domestic and foreign spheres. Credit controls were abandoned, and interest rates were deregulated. Restrictions on foreign investment and almost all controls on currency transactions and capital accounts were withdrawn. The arrival of foreign banks was welcomed.

²⁵ For a summary of the reforms related to capital markets during the 1990s, see De la Torre and Schmukler (2007).

was exemplary for the entire region. It shifted from a government-managed defined-benefit system to a private-sector-managed defined-contribution savings system. During the 1990s, Argentina, Bolivia, Colombia, Costa Rica, El Salvador, Mexico, Peru, and Uruguay adopted similar pension systems. In contrast, tax reforms were not very ambitious and labor markets were practically not reformed (Chart 15, Graph B).

The structural reforms in the 1990s proceeded in parallel with inflation stabilization. In fact, by the end of the decade, most of Latin America had beaten inflation, reaching a single-digit rate. After that achievement, there were important improvements regarding monetary policies and the institutional quality of the central banks. Although progress on the fiscal and debt spheres was less impressive than on the monetary sphere, the situation moved mostly forward toward greater fiscal viability, a process that, in several countries, was aided by debt reduction agreements. Public sector deficits narrowed to approach equilibrium.

The successful disinflation process, however, based on the use of exchange rate anchors (fixed exchange rates or with predetermined trajectories), generated systemic vulnerabilities. In effect, it led to a significant appreciation of the real exchange rate (inflation gradually fell compared to a fixed or strongly controlled exchange rate) (Chart 2, Graph C), which was aggravated by huge inflows of (short-term) speculative capital attracted by the coexistence of pegged exchange rates with high interest rates in countries fighting inflation. This encouraged an increase in private expenditure, enlarged by credit booms. This expansive syndrome was unsustainable and crises came up after severe external shocks: Mexico in 1994, Colombia in 1998, Brazil in 1999, Ecuador in 1999, Argentina in 2000, and Uruguay in 2001.

Note that, in general, the origin of the crises in the 1990s resulted from excessive private expenditure rather than from fiscal imbalances, which – as already mentioned – had been considerably corrected. The private sector euphoria concealed the underlying vulnerability of economies to sudden interruption in capital inflows. The consequences for the financial systems were devastating when these capital inflows ceased. The fragility of such systems became evident, mainly due to the growing international financial integration of the region. That integration was promoted by the large issuances of the “Brady bonds” resulting from the debt reduction agreements. Those bonds not only aided Latin America regain access to financing, but also shifted sovereign debt from the banking sphere (where loans are illiquid, and their value changes are gradually managed through provisions) to the capital markets’ sphere (where bonds are freely traded, and their price is determined in the market and in real time).

The serious financial instability became visible, mainly through the region’s disturbance brought about by the “Tequila” crisis suffered by Mexico in 1995, and the series of regional crises in the late 1990s and early 2000s, including catastrophic triple crises (with different types of deposit freezes) in Ecuador (1999), Argentina (2001) and Uruguay (2002). The trauma of recurring financial crises made it clear that, even though inflation and fiscal accounts

are under control, the rapid integration into international financial markets can be very harmful if the joining countries suffer from the “Unholy Trinity.” De la Torre, Schmukler and Yeyati (2002) defined the “Unholy Trinity” as the combination of three aspects: weak currency, fear of a floating exchange rate and unsatisfactory institutions, especially in the field of financial regulation and supervision. The region learned the hard way that under those conditions (which are aggravated when there is a high degree of financial dollarization), financial globalization can be a curse rather than a blessing.²⁴

It was largely due to financial volatility that the policies and reforms inspired by the Washington Consensus generated few benefits in terms of growth and social equity.²⁵ Latin America's GDP per capita improved in comparison to the Lost Decade, but it only grew by 0.8% yearly between 1990 and 2002, much more slowly than that of the world. Very few countries in the region (Panama, the Dominican Republic, and especially Chile) exceeded the growth of East Asia and the Pacific, even though growth in that region was adversely affected by the 1997 Asian crisis. Furthermore, income inequality was not noticeably reduced in the 1990s and, in fact, it increased in some countries (for example, Argentina). Finally, despite the slight recovery in regional growth in the 1990s, the poverty rate did not decrease in most countries either, once again except for Chile.²⁶

Given those circumstances, the Washington Consensus lost credibility (Birdsall, De la Torre and Valencia, 2011). Frustration in Latin American societies increased with the expectation (which, despite being clearly simplistic, was still popular in academic circles) that macroeconomic stability and markets' liberalization would automatically encourage growth. The reforms and economic policies inspired by the Washington Consensus, while necessary, were clearly insufficient. The crisis, adjustment, and liberalization stage concluded, therefore, lacking consensus on how to generate growth. The little consensus came down to the idea that there is no exact connection between growth and specific reform packages and that growth-oriented agendas must be customized to each individual country.²⁷ However, just when they were beginning to lose the compass of growth, the Latin American economies were rescued by the *big bang* of China, a phenomenon that originated the following stage.

²⁴ See Calvo (2002), and Calvo, Izquierdo and Mejía (2004).

²⁵ However, it is plausible to argue that the growth of Latin America would have been lower during the 1990s without the reforms applied in the Washington Consensus context. See Birdsall, De la Torre and Valencia (2011).

²⁶ Chile's poverty rate fell from 38.6% in 1990 to 20.2% in 2000, but the Gini coefficient of income distribution remained practically unchanged in that period, at around 0.55.

²⁷ As Hausmann, Rodrik, and Velasco (2008) point out, reform packages that “perform miracles in some places may have weak, unintended, or negative effects in others.” Empirical research on the factors determining growth does not provide strong evidence (or even no evidence at all) that specific reform packages have expected, substantial, and systematic effects on growth rates. See, for example, Rodrik (2006).

5. The emergence of China (2003-2019)

The economic development in Latin America during the emergence of China stage was, to a large extent, a reflection of how the region absorbed and adapted to the tectonic movements registered in trade, and to the global financial conditions generated by the powerful irruption of China in the world economic outlook. The different initial conditions (especially, differences in trade structures and factor endowments), as well as the significant improvements in policies related to macro-financial stability and social equity that, although not uniform, were spread in a considerable number of countries in the region and shaped the countries' ability to adapt to the emergence of China. Said improvements included –in particular– a considerable reduction in vulnerability to shocks due to the consolidation of more robust macroeconomic and financial policy frameworks, including monetary systems based on inflation targets and floating exchange rates, stronger fiscal institutions, and strengthened banking regulation and supervision system. In the social sphere, social assistance programs targeted to the poor multiplied in the region (mainly through conditional cash transfers and non-contributory pensions). These theses are explained next.

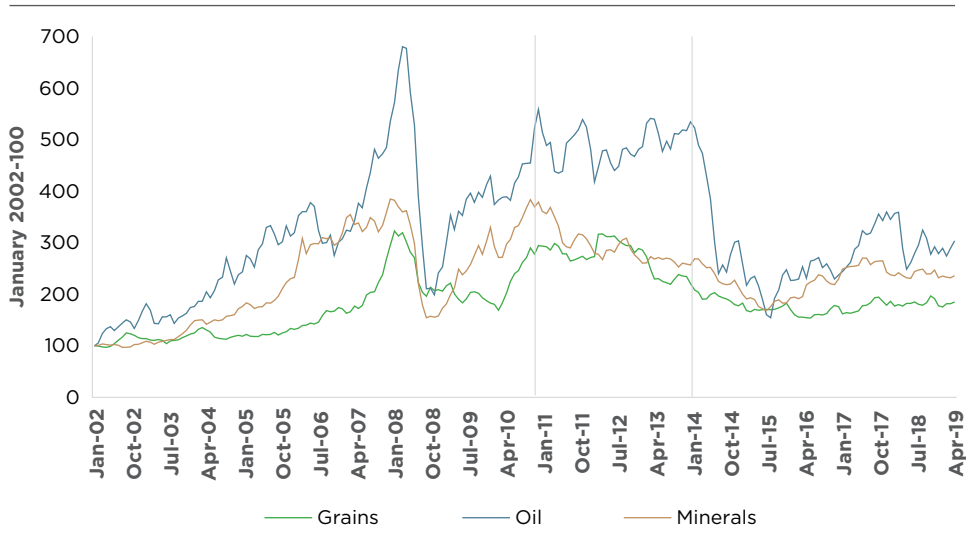
Let us start by highlighting the domino effects that China created all over the world. These effects can be categorized into three global shocks involving supply, demand, and financial consequences.²⁸

The *supply shock* reflected the huge expansion of China's exports, which lowered the prices (adjusted for quality) of manufactured goods worldwide. For Latin America, this implied, on the one hand, improvements in the net terms of trade of Chinese-product importers and, on the other, significant adjustment costs to compete with the products manufactured in China that replaced Latin American products, both in local and foreign countries.

The *demand shock* reflected the voracious appetite of the Chinese economy for raw materials, a crucial phenomenon that explains the unprecedented upward cycle (in terms of magnitude, coverage, and duration) of the commodity prices.²⁹ For commodity-exporting countries in Latin America, most of them located in South America, this generated a great boom in terms of trade, which started in 2002- 2003 and reached a peak in 2011-2014, depending on the type of commodity involved (Chart 16). During such boom in the terms of trade, export prices rose much more than import prices.

²⁸ See De la Torre, Didier, Ize, Lederman and Schmukler (2015a) for a detailed analysis of China's impact on Latin America.

²⁹ In contrast to previous commodity cycles, the rise of China generated a simultaneous increase in the prices of practically all commodities relevant to Latin American countries, and it continued for a relatively longer period. In that sense, it was a super-cycle. See Sinnott, Nash and De la Torre (2010).

CHART 16. South America: Evolution of Commodity Prices (index 2002 = 100)

Source: World Commodity Price Data.

The global supply shock prevailed over the demand shock, as evidenced by the large external surpluses observed at the epicenter of the global supply shock (China and other East Asian economies). Consequently, those two shocks led to a third one: a global *financial shock* associated with the international recycling of external surpluses (of net savings) of emerging countries in Asia, the Middle East and –even– Latin America. This contributed to a “global saving glut,” which put significant downward pressure on international interest rates.⁵⁰ Rich countries validated the historically low levels of those interest rates (which, in real terms, remained close to zero or even negative) with flexible monetary policies (central banks conducted quantitative monetary expansions to deal with the flight toward liquidity during the 2008 financial crisis, followed by low interest rate policies to stimulate the economy). The result –from the perspective of Latin America– was a significant reduction in financial constraints for countries experiencing external and fiscal deficits.

One of the most important differentiating factors to determine how the emergence of China impacted the region is the separation of the trade structures between Mexico, Central America, and South America (Section 2 of this chapter). Particularly, while the economic cycle of Mexico and Central America was tied to that of the United States, the cycle of South America was coupled with that of China. In addition, the northern countries that are non-predominant commodity exporters did not benefit from favorable movements in their terms of trade. In fact, they were rather affected, for example, Mexico (an exporter of manufactured goods) and Central America (service exporters).

⁵⁰ See, for example, Bernanke (2005), who attributes global saving's glut to rising Asian exports, high oil prices that benefited the Middle East, scarce investment opportunities, and aging population in advanced economies.

During the emergence of China stage, the regional economic development was also molded by the remarkable consolidation of macroeconomic and financial policy frameworks.⁵¹ To begin with, and with few and well-known exceptions, the region entered the emergence of China stage with strengthened tax institutions and more viable tax processes –although not clearly counter-cyclical–, as evidenced by the better performance of its primary fiscal balances, the lower proportion of debt over GDP and a less risky debt composition.⁵² Furthermore, banking systems' strength improved with the modernization of regulation and supervision, and stronger capital, provisions, and liquidity.⁵³ By far, the most important improvement was made in the monetary sphere, underpinned by more credible policies and more independent and professional central banks. There was a clear consolidation of monetary systems based on inflation targets and more flexible exchange rates in Brazil, Chile, Colombia, Mexico, and Peru. Other countries (Guatemala, Paraguay, and Uruguay) also started to implement systems of that kind. Currently, around 80% of GDP in Latin America is generated in countries with monetary policy frameworks based on inflation targets.

The adoption of more resilient macro-financial policies implied a silent revolution in Latin America. It constituted a break from the past in several spheres related to stability and included, among other aspects, a greater capacity to keep inflation low and stable, to recover the exchange rate as a tool to absorb shocks and to execute a counter-cyclical monetary policy. All of this reduced the propensity to suffer financial crises and improved the quality of international financial integration.

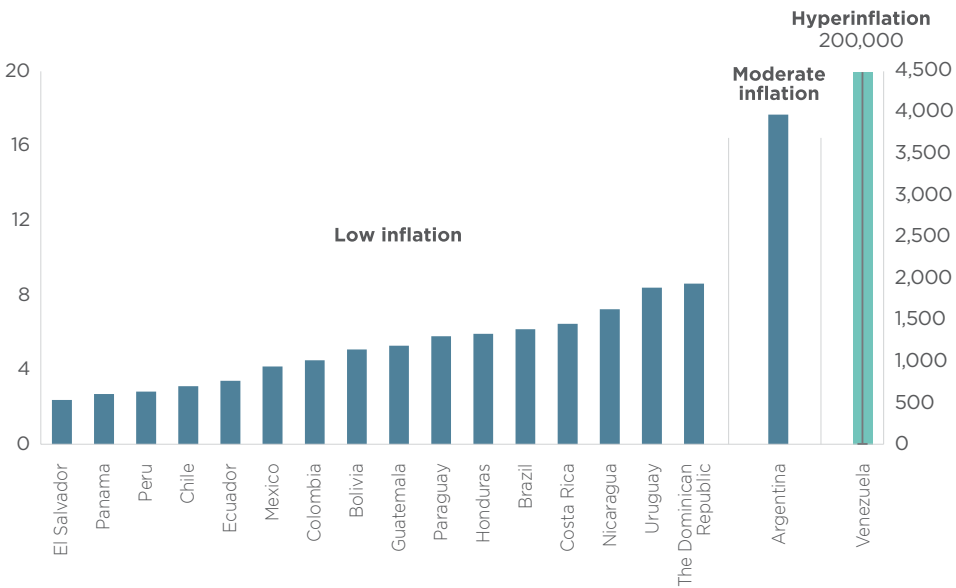
Chart 17 illustrates the progress in the inflation sphere. Except for Argentina (where inflation has accelerated in recent years) and Venezuela (which moved into hyperinflation), the rest of Latin America maintained a single-digit inflation rate during the emergence of China stage. In fact, inflation in dollarized countries (El Salvador, Panama, and Ecuador) and in most of the countries having monetary systems based on inflation targets (Peru, Chile, Mexico, and Colombia) converged toward the inflation in advanced economies.

51 See De la Torre, Calderón and Didier (2010), and Didier, Hevia and Schmukler (2012) on the progress toward the adoption of more resilient macro-financial policies in Latin America.

52 Better performance of the fiscal process contributed, together with debt management improved systems, to reduce the burden of public debt and to improve its composition (in terms of foreign exchange, interest rates and terms), with beneficial effects for the deepening of local currency bond markets. This allowed several countries in the region to implement some counter-cyclical fiscal policy in response to the 2008 global financial crisis. The fiscal and public debt position in Latin America weakened, however, as from 2010.

53 See De la Torre, Ize, and Schmukler (2012) for a detailed analysis on improvements in stability, and regulatory and supervisory standards in Latin American banking systems. Such improvements contrast with significant needs in the region in terms of the development of its financial sector.

CHART 17. Latin America: Inflation in the Emergence of China stage (Annual Averages, 2003-2019)

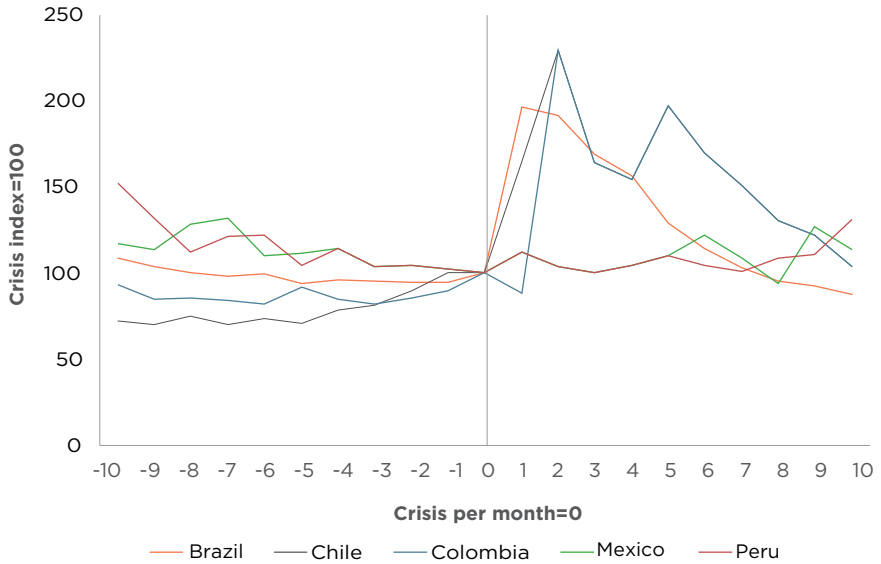


Source: World Development Indicators (World Bank).

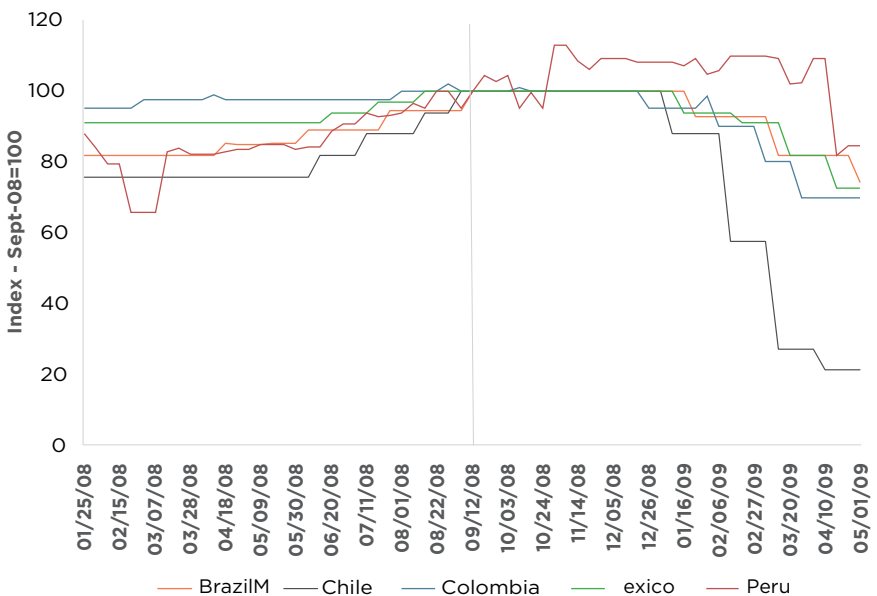
Chart 18, meanwhile, illustrates the remarkable recovery of counter-cyclical monetary policies (i.e., the option of using the interest rate to encourage or reduce aggregate demand when GDP is left behind or soars in relation to its potential) in countries with inflation targets. Before the emergence of China stage, the typical response of monetary policies in times of disturbances was procyclical: countries were forced to raise their interest rates to mitigate capital outflows and stabilize the exchange rate, aggravating the economic recession. In the disturbance associated with the 2008-2009 global financial crisis, on the contrary, the central banks of the countries with inflation targets managed to act in a counter-cyclical way (despite facing major slowdowns in capital inflows or even outflows), reducing the interest rate to cushion the drop in economic activity.

CHART 18. Interest Rate Policies in Latin American Countries having Inflation Targets

Graph A. Crises prior to 2008



Graph B. 2008-2009 Crisis

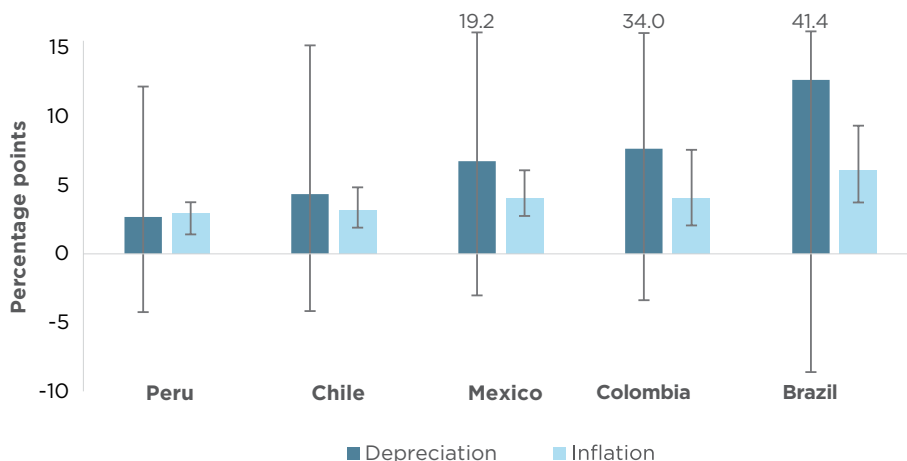


Notes: The first graph shows the crises in Brazil (October 1997), Chile and Colombia (April 1998), Mexico (February 1995), and Peru (August 1998).

The capacity of counter-cyclical monetary policies was the other side of the coin, with greater exchange rate flexibility and healthier and more credible currency. Countries with inflation targeting policies largely overcame the “fear of floating” (especially the “fear of depreciation”) of the exchange rate.⁵⁴ This was eased—on the one hand—by a marked process of financial de-dollarization, which reduced the adverse effects of depreciations on the solvency of debtors and, on the other hand, by a clear decrease in the exchange rate pass-through effect. Consequently, inflation-targeting countries could enjoy—for the first time in their history—the benefits of depreciation to absorb shocks without unduly encouraging inflation.⁵⁵ Currency depreciations in inflation targeting systems ceased to predict financial problems. Instead, they became part of a more efficient macroeconomic adjustment process to slowdowns induced by adverse external factors.

This is clearly evidenced in Chart 19, which compares the level and variability of the inflation rate and the depreciation rate in the main Latin American countries with monetary policies based on inflation targets during the downtrend of the commodity super-cycle (*circa* 2012 to 2019). The chart shows that those countries have largely succeeded in isolating the trajectory of their exchange rate from that of their consumer price index. They maintained low and stable inflation, although they significantly increased the currency depreciation rate and its volatility to cushion adverse external shocks.

CHART 19. Latin America Inflation-targeting Countries. Inflation Rates and Currency Depreciation (Annual Averages, *circa* 2012 to 2019)



Source: World Development Indicators (World Bank).

⁵⁴ The fear of floating, however, was not symmetrically overcome. Fear of currency appreciation increased visibly among inflation-targeting countries, especially during the uptrend of the commodity cycle (2002–2012).

⁵⁵ Inflation-targeting central banks do intervene in currency markets, but the nature of those interventions has radically changed. The intervention seeks to mitigate excessive exchange rate volatility and no longer, as in the past, defend indefensible exchange rates.

As a reflection and cause of the strengthened macro-financial situation already described, a great part of the region found a more secure way for international integration, as shown in Chart 20. Latin America radically changed its net external position: it moved away from debt in favor of capital. This reflected a two-pronged process: external deleveraging (external debt, particularly that of the public sector, was reduced or replaced by internal debt denominated in local currency) and accumulation of external assets, especially international reserves in central banks. At the same time, it reduced its position as a net debtor and thus mitigated the refinancing risk (rollover), and the region became an active user of foreign direct investment.⁵⁶

The strengthening of macro-financial policy frameworks and the quality of international financial insertion contributed to the drastic reduction in the frequency of financial crises in the region (Chart 6). Another consequence was the rise of the region's sovereign risk ratings, which converged toward those of Southeast Asia. In fact, six Latin American countries (Colombia, Chile, Mexico, Panama, Peru, and Uruguay) joined the club of "investment grade" countries during the 2000s.

CHART 20. Latin America: Net External Position



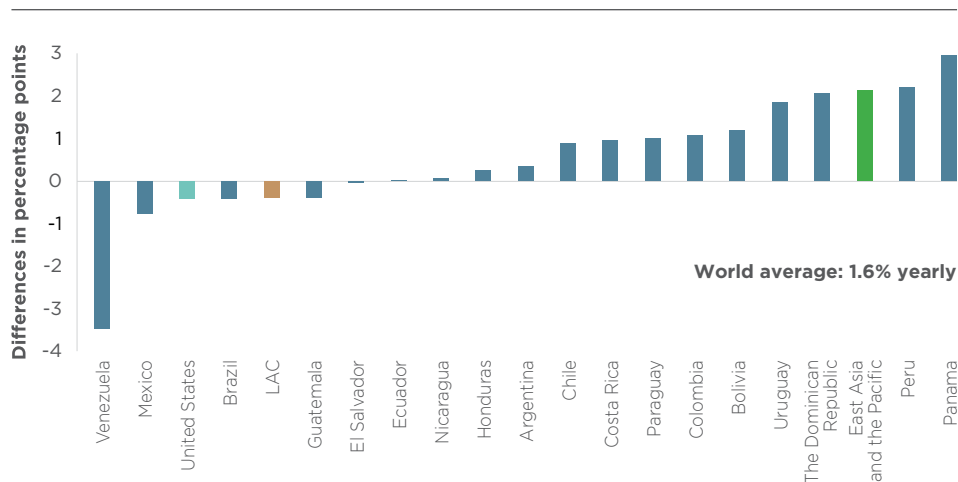
Notes: Latin America includes Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay.

Source: Lane and Milesi-Ferretti (2006), The External Wealth of Nations database.

⁵⁶ See De la Torre, Didier and Pinat (2014) for a discussion on Latin America's scope to limit the negative aspects of globalization and rather capture its positive aspects.

All those elements conditioned the impact of China and, therefore, the Latin American growth. Latin America recorded a visible increase in growth, even if the full cycle of commodity prices, with its boom and collapse (Chart 21) is considered. Specifically, while GDP per capita in Latin America grew at an annual rate of 1.3% throughout the entire 2003-2018 period, many countries in the region far exceeded the world growth rate.

CHART 21. Emergence of China stage: Latin American GDP per Capita Growth compared to World GDP per Capita (Annual Averages, 2003-2019)

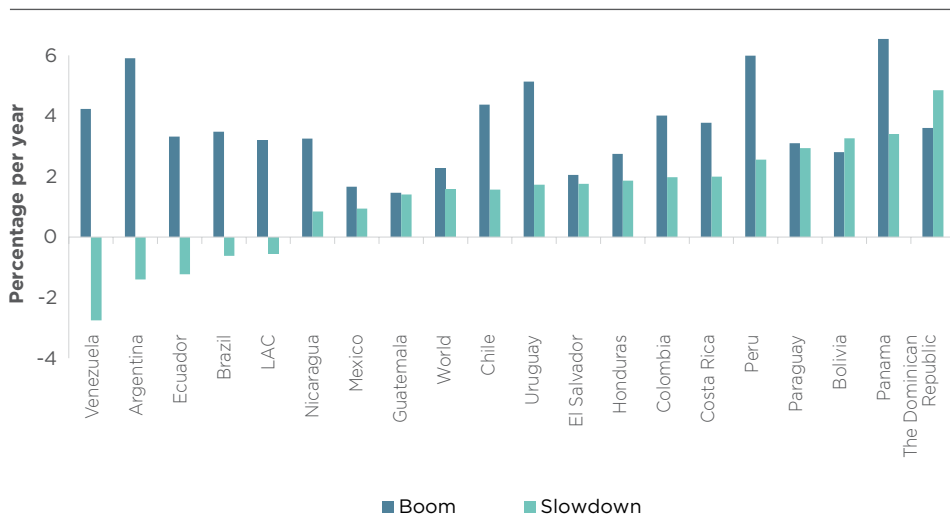


Notes: GDP per capita is measured in real terms and expressed in constant 2010 US dollars. The percentage difference is calculated by subtracting the growth of the world GDP per capita from the growth of each country's GDP per capita. The growth rates are annual geometric averages. LAC means Latin America and the Caribbean. Weighted averages have been considered for LAC and the world. The countries in light blue had a GDP per capita below USD 2,500 in 2005.

Source: World Development Indicators (World Bank) and World Economic Outlook (IMF) estimates for 2019.

The emergence of China stage must, however, be subdivided into two phases, as shown in Section 2, Chart 2 of this chapter. The first phase was a Golden Decade, which lasted from 2002 to 2012, and followed the uptrend of the commodity cycle. The second one was marked by a sharp slowdown in growth that began in 2012-2013, related to the downtrend of the commodity cycle. These two phases can be clearly observed for the region, taken as a whole, in Chart 2 and for individual countries in Chart 22. The collapse of the growth rate in the second phase was widespread. The region was growing at an annual average of 3.2% during 2003-2012 and began to shrink at an annual rate of 0.6% in 2013-2019. The biggest growth collapses occurred in Venezuela, Ecuador, Brazil, and Argentina (Chart 22).

CHART 22. GDP per Capita Growth: Boom and Slowdown (annual averages; boom: 2003-*circa* 2012; slowdown: *circa* 2013-2019)



Notes: GDP per capita is the variable used, measured in real terms and expressed in constant 2010 US dollars. The boom reached its peak around 2012, but this varies for South American countries, depending on the peak of their terms of trade. 2012 is used for the rest of the countries.

Source: World Development Indicators (World Bank).

The heterogeneity in growth performance within Latin America during the emergence of China stage does not, of course, admit simplistic explanations. The specific characteristics of each country played a key role in the results. However, it is possible to identify key drivers and patterns, as well as important differentiating factors. This is made clear by grouping the countries in the region according to their export structures, as explained in Section 2 (Chart 3). Therefore, it is imperative to differentiate between Mexico (exporter of manufactured goods), Central American countries (service exporters), and the South American countries (commodity exporters). De la Torre and Ize (2020) carried out an exercise of this type, using a novel methodology that breaks down growth into commercial and macroeconomic factors (the strength of exports, the dynamics of the current account, and the country's response to currency income). The main results and messages have been summarized below and provide important inputs to the debate on Latin America's growth.

Let us consider Mexico first. In a first approximation, it is paradoxical that this country come in second place, after Venezuela, with the region's worst growth performance. After all, Mexico has successfully moved toward an outward-oriented industrialization model, has an enviable credit rating ("investment grade"), administers good-quality macro-financial policies, and maintains an open trading system underpinned by the most important free trade agreement

in the region (NAFTA). Unlocking this paradox is not easy. It is clear that the problem of its low growth arises despite (and not due to) the strengths mentioned above, and it has nothing to do with its exports. Mexico's exports have grown strongly, and its basket of exports is not only the most diversified of the region but also comprises high-complexity industrialized products.⁵⁷

The paradox unravels by noting that the timing of Mexico's industrial boom was unfortunate: just as it was beginning to prosper, it was strongly hit by the great competition from China, especially in the US market, which is by far the main destination market for exports from Mexico. Despite such inappropriate timing, the main answers to the problem of Mexico's low growth must be sought in the factors that restrict the capacity of its internal economy to respond more elastically to the influence of the exports of its industrialized products.

Part of this internal response weakness may have developed during the import-substitution industrialization stage. Given the high protection of inefficient plants established at that time, the trade liberalization process that began in the mid-1980s resulted in a higher drop of Mexico's growth than the one observed —on average— in the rest of the countries with similar liberalization policies. Mexico suffered the dismantling of its manufacturing plants of products for import.⁵⁸ Therefore, it took longer to the country to rebuild the manufacturing sector, shifting from products for import to products for export with traction on the rest of the economy. From this point of view, the unusual size of the Mexican informal sector reflects the lack of formal jobs. An additional and complementary explanation places emphasis on the wide range of microeconomic distortions, such as those thoroughly documented by Levy (2018). This economist provides plenty evidence of a chronically misallocation of labor and capital (reflected in an unusually large and low-productivity informal sector), and states that it is the consequence of mistaken tax, labor market, and social security policies, aggravated by a poor contractual environment and monopolistic conditions, especially in internationally non-tradable markets.

Let us now analyze the case of the *commodity exporters from South America*. Why was there a significant variance between those countries' growth performances during the emergence of China stage, even though all of them benefited from similar improvements in the terms of trade? Leaving aside Venezuela (where the growth collapse derives from a failed state syndrome), there are two important growth differentiators. First, the countries with good performance (mainly Peru and Uruguay, and Bolivia, Colombia, Paraguay and Chile to a lesser extent) managed to maintain a more dynamic export activity and, as a consequence, increased their share in global exports. By contrast, underperforming countries (Brazil, Argentina, and Ecuador) lost ground in export markets. This suggests that avoiding the resource curse depends to a large extent on the ability to expand exports, of whatever type and especially in terms of their volume, which implies that the exported volume may be

57 Thanks to that change, Mexico improved its "economic complexity" and is now ranked as the first country in Latin America and the 25th in the world (ahead of Canada, Hong Kong and Spain, for example) in this regard, according to the Observatory of Economic Complexity (MIT).

58 See De la Torre and Ize (2020).

as important or even more important than the product to be exported. It also suggests that, while such a curse can be avoided even if dependence on commodity exports is high (as long as the volume of such exports continues to grow), that path may not be sustainable in the long term.³⁹

The second differentiating factor among commodity exporters was the quality of their macroeconomic management during the boom. Charts 18 and 19 make it clear that the countries with the weakest growth performance throughout the emergence of China stage (2003-2019) were those that registered the greatest fluctuations in their economic activity between the boom (2003-2012) and the slowdown (2013-2019). Those fluctuations, which weakened the growth throughout the cycle, were associated with expenditure excesses and its amplifiers. As shown by De la Torre, Ize, and Filippini (2016), the cost of adjustment (growth losses) in the downtrend of the commodity cycle tended to be proportional to the recklessness of macro-financial management during the boom.

Indeed, the worst-performing commodity-exporting countries were reckless with expenditure: their policies enlarged the response of domestic demand to the terms of trade prosperity. Thus, for example, they did not save enough during the terms of trade prosperity. The expansion of their fiscal expenditure was enormous and procyclical. They allowed an excessive expansion of consumer credit and experienced strong real appreciations of their currencies. The subsequent drop in the terms of trade found these countries overextended and, therefore, forced into harsh expenditure reduction adjustments. The message that emerges from this situation is that careful macro-financial policies are important for growth (and not just for stability), especially in contexts of volatile terms of trade. Conservatively and sensibly managing a boom can later mitigate the collapse of growth when the terms of trade fall, thereby elevating and making long-term growth more sustainable.

Finally, let us analyze the case of the *Central American service-exporting countries*. Most of Central American countries already were service exporters at the beginning phase of the emergence of China stage. However, there is a clear contrast between the countries with good growth performance (Panama, the Dominican Republic and, to a lesser extent, Costa Rica) and those with poor performance (Guatemala, El Salvador and Honduras) (Chart 21).⁴⁰ A key differentiating factor is the contrast between those two groups in the balance of payments dynamics: countries with good performance are largely financed by foreign direct investment (FDI), while countries with poor performance do so with remittances.⁴¹ The other side of the coin regarding

39 For example, the slowdown in Chile's growth since 2012 (Chart 19) reflected that country's inability to sustain, in the emergence of China stage, the expansion of its export volume, something that it had achieved in the crisis, adjustment, and liberalization stage. The slowdown materialized even though Chile made significant progress in diversifying its exports based on and around commodities, as Meller documents in another chapter of this book.

40 Nicaragua is a special case: it had high growth rates in the emergence of China stage until 2017, but then its growth reversed and turned negative, mainly due to political instability.

41 In the worst-performing countries, the inflow of remittances remained at approximately 15% of GDP per year, which compares with approximately 4% of GDP in good performing countries. By contrast, foreign direct investment reached the well-performing countries at a rate of around 6% of GDP per year, which compares with less than 3% of GDP in the worst-performing countries.

this phenomenon is that workers in the first group stay in their countries to take advantage of the employment opportunities offered by foreign direct investment, while workers in the second group emigrate to work abroad. This differentiating factor is particularly relevant because the arrival of foreign direct investment promotes learning and technology transfer and, therefore, improves productivity. On the contrary, the large number of remittances seems to weaken productivity systematically; however, it helps strengthening consumption and, therefore, easing poverty.⁴² There is no simple explanation for the contrast between depending on foreign direct investment or depending on remittances. However, the differences regarding the rule of law stand out as a pretty obvious decisive factor between both groups. Those differences reflect particularly in crime and violence statistics. Foreign direct investment and service clients are unlikely to reach very weak countries regarding the rule of law.

So far, we have examined Latin America's development during the emergence of China stage in terms of stability and growth. Let us now highlight the critical progress made regarding social equity.

Chart 8 (shown in Section 2) illustrates an unprecedented degree of social progress in Latin America. The purchasing power of the base population increased sharply; therefore, moderate poverty (the simple average of the poverty rates of the different countries) fell from 45% in 2002 to 24% in 2017. The reduction of extreme poverty was even higher: it dropped from 13.5% to 3.6% during the same period. At the same time, the Gini coefficient of income inequality (the simple average of the Gini coefficients for different countries) fell from 0.53 in 2002 to 0.46 in 2018, a downward trend that is confirmed even if alternative measures of income inequality are used.⁴³ Those social improvements were more noticeable in the South American commodity-exporting countries than in Mexico or Central America, as can be exhibited in chart 25 (below).

The simultaneous drop of poverty and income inequality caused an upward social mobility wave, as shown in Chart 23. Indeed, the social structure of Latin America, which seemed to be frozen before the 2000s, radically changed in just 15 years. Poor people (those earning less than USD 5.5 per day, adjusted by the purchasing power parity), who historically made up the largest socioeconomic class in the region, representing 45% of the population in 2002, became the smallest class in 2010 and, in 2017, they represented only 24% of the population. At the same time, the middle class (people who earn between USD 13 and USD 70 per day) rose substantially from 21% of the population in 2002 to 37% in 2017.⁴⁴ Trapped between those two groups, we find the so-called "vulnerable class." This class is formed by people who are no longer poor but do not belong to the middle class yet; it grew from 33% of the population in 2002 to 37% in 2017.

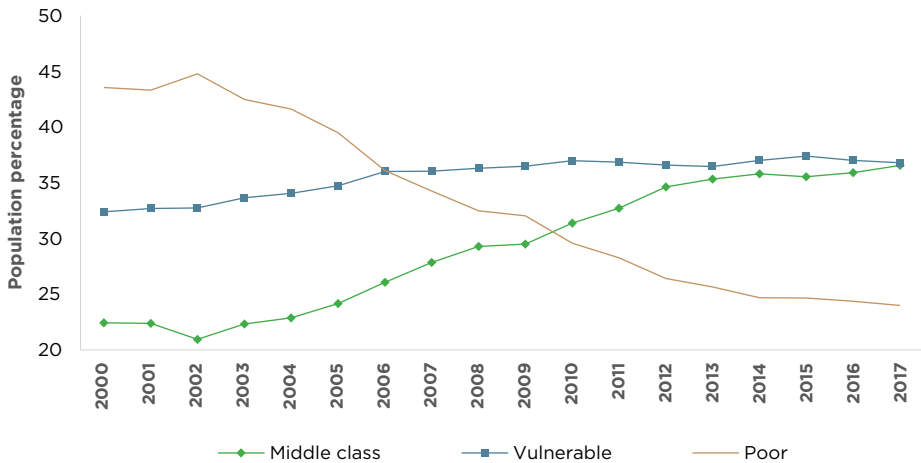
42 Shapiro and Mandelman (2014) conclude that remittances have adverse effects on productivity because they negatively motivate work and generate weaker dynamics in companies. Receiving more remittances is also associated with lower savings rates, another factor that generates slower growth.

43 See De La Torre, Didier and Pinat (2014).

44 Ferreira et al. (2015) consider that around 55% of Latin Americans who were "vulnerable" in 1995 experienced upward mobility and, by 2010, had already joined the middle class.

Therefore, in Latin America today, there are roughly similar numbers of people in the “vulnerable” class and in the middle class.

CHART 23. Latin America: Evolution of the Social Structure



Notes: Middle-class people earn between USD 13 and USD 70 per day, in purchasing power parity adjusted terms. Vulnerable people earn between USD 5.5 and USD 70 per day. Poor people earn less than USD 5.5 per day.

Source: LAC Equity Lab (Center of Distributive, Labor and Social Studies and the World Bank [2020]).

Although social policies, particularly cash transfers focused on poor groups,⁴⁵ remarkably reinforced the poverty-reducing effect of growth by lifting about 150 million Latin Americans out of poverty, the middle class’s expansion was mainly due to growth and employment dynamics. In fact, Ferreira *et al.* (2015) calculate that approximately 75% of the middle-class expansion in Latin America between 1995 and 2010 can be attributed to the increase in income per capita.

The extraordinary change in the social structure implied that Latin America began to transition from being a middle-income region to a middle-class region. However, it must be recognized that there are currently few countries in the region (Argentina, Chile, Costa Rica, and Uruguay) whose middle classes constitute more than 40% of the population. In a more important sense and considering that the definition used for middle class is one-dimensional (it is only based on the purchasing power of income). The question remains whether these new middle classes will contribute to generate stronger democratic institutions and a more united social contract in the region. The tie between an expanding middle class and a more engaged citizenship is not automatic, of course.⁴⁶

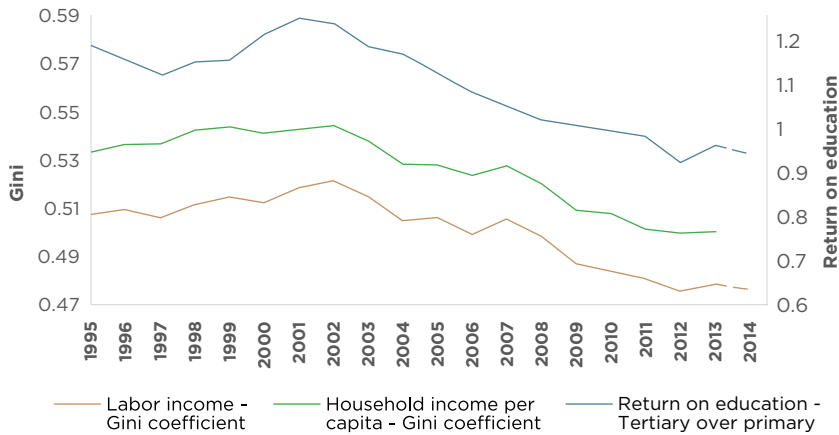
⁴⁵ See Ferreira and Robalino (2011). Currently, around 15 Latin American countries have well-established systems of conditional cash transfers aimed at poor families, and more than 10 countries have some type of non-contributory pension program (cash transfers aimed at the elderly who are poor).

⁴⁶ Ferreira *et al.* (2015) guess that the new middle classes tend to “choose to leave the social contract,” as illustrated, for example, by their preference to change their children from public to private schools or move to gated communities.

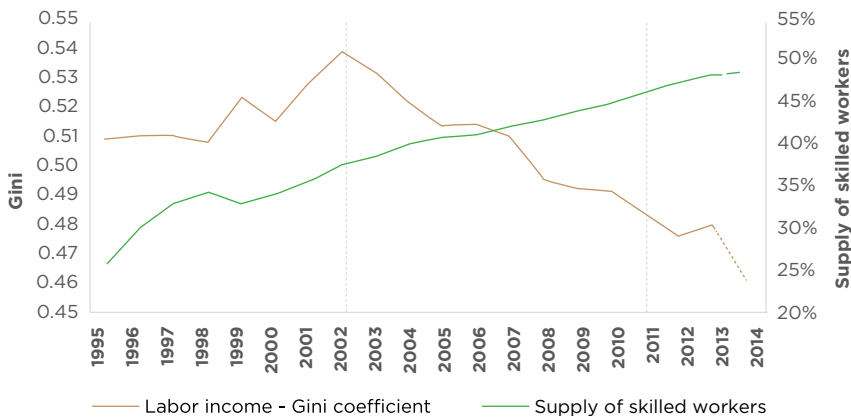
Regarding income inequality, its drop was mainly due to a reduction in wage inequality and not to an increase in labor income in relation to capital income.⁴⁷ In turn, the drop in wage inequality, which occurred in several dimensions (including a reduction in gender wage gaps)⁴⁸, was largely a reflection of a decrease in the skill premium, that is, a reduction of the gap between the salaries of workers with more education and those having less education (Chart 24, Graph A).

CHART 24. Latin America: Inequality and Skill Premium

Graph A. Inequality and Skill Premium



Graph B. Wage Inequality and Skilled Labor Supply



Note: The supply of skilled labor is defined as the proportion of the workforce that has completed at least secondary education.

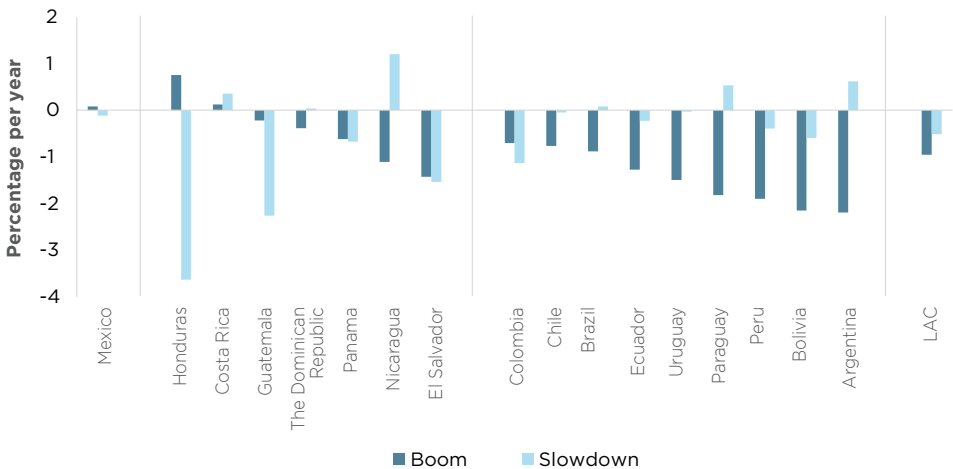
Source: LAC Equity Lab (Center of Distributive, Labor and Social Studies and the World Bank), and De la Torre, Ize, Beylis and Lederman. (2015b).

47 See López-Calva and Lustig (2010); Azevedo, Inchauste and Sanfelice (2015); and Rodríguez-Castelán *et al.* (2016).
 48 See, for example, Hoyos and Nopo (2010).

What does this decline in the skill premium trajectory in many Latin American countries since 2003 explain? The expansion of the education supply (a remarkable increase in educational coverage, which generated a constant increase in the workers' average years of education) was undoubtedly a key factor.⁴⁹ However, that cannot be all, because the supply of skilled labor also increased in the 1990s, but the skill premium remained constant or even increased (Chart 24, Graph B). Therefore, the factors relating to the demand cannot be disregarded. De la Torre *et al.* (2015b) affirm that the strong expansion of the domestic demand in commodity-exporting countries resulted in a labor-market dynamics that favored higher wages for the poorest and least educated workers, especially if we consider that the wage inequality, and the skill premium fell more noticeably in commodity-exporting countries (see Chart 25, Graph A).⁵⁰

CHART 25. Latin America: Average Annual Changes in Inequality and Poverty (boom: 2003-2012; slowdown: 2013-2018)

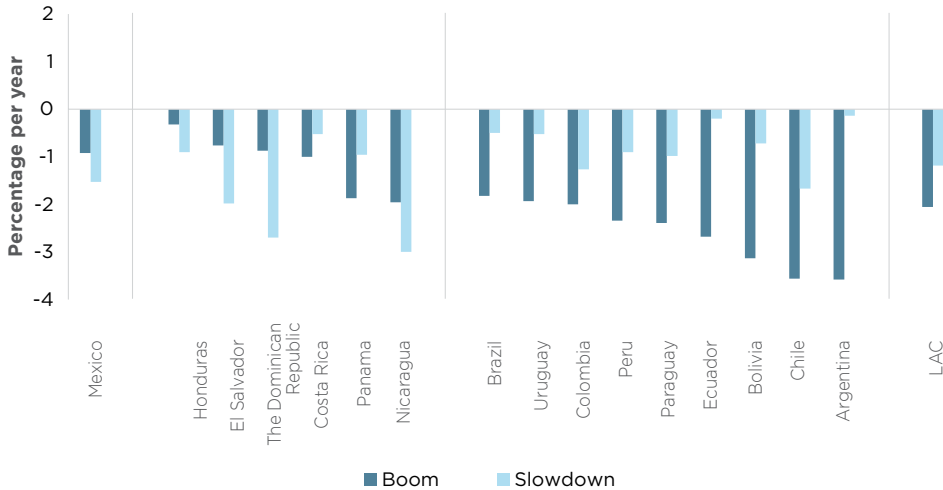
Graph A. Labor Income Inequality



49 Lustig, López-Calva and Ortiz-Juárez (2013) point to another factor on the supply side: the quality loss in secondary and tertiary education.

50 Messina and Silva (2018) highlight another factor related to demand, the drop in wage inequalities between companies for workers with the same level of education and skills.

Graph B. Moderate Poverty



Source: United Nations (United Nations University - World Institute for Development Economics Research [UNU-WIDER]) for the Gini coefficient of income distribution; Socio-Economic Database for Latin America and the Caribbean (SEDLAC) (Center of Distributive, Labor and Social Studies and the World Bank) for the Gini coefficient of labor income; World Development Indicators (World Bank) (2020) for moderate poverty.

With the slowdown after 2012, concern about the sustainability of the social progress achieved during the Golden Decade (2003–2012) increased, especially considering that the economic dynamics that drove such improvement seemed to have been largely a consequence of the commodity boom, a favorable but temporary exogenous shock. However, to date, despite at least six years of economic slowdown, social improvements have shown considerable resilience. Indeed, as shown in Chart 25, the process of reducing poverty and inequality has slowed down in most Latin American countries, but it has not been reversed (at least, for now). However, the standstill of social progress has become a powerful source of frustrated expectations.

6. Conclusions

The development of Latin America is once again at a standstill. The region is in a dilemma and is unsure about how to find the right path to greater growth with social equity. This challenge involves threats and uncertainties related to the global environment, in which the internal policies of Latin America cannot influence and therefore, must be taken as given. Global threats include: i) the risk of growing protectionism in advanced economies, ii) a possible long-term drop of global demand for commodities (especially oil and minerals), iii) unpredictable impacts on world trade – particularly in labor intensive industry– and in the inequality brought about by the relentless advance toward digitalization and automation, iv) the increase of growingly severe shocks related to climate change, and v) the adverse impact of the coronavirus pandemic.

Facing a worrying global context, a good number of Latin American countries could perhaps take comfort in the fact that macro-financial policies have improved, which reduces their vulnerability to external shocks. It is true that there have been clear improvements in the monetary and financial spheres. However, there is still a lot to be done in relation to public finances. Great efforts are required to develop the capacity to implement counter-cyclical fiscal policies, which are important for growth (and not only stability), especially in commodity-exporting countries or those exposed to large short-term capital inflows. To face and manage financial disturbances more effectively, those efforts will have to be complemented with good macroprudential policies. That said, however, and leaving aside the well-known exceptions, it could be stated that the macro dimension is no longer as binding a constraint on growth in the region as it was in the past. However, undoubtedly, substantial macroeconomic policies, although necessary, are not enough to generate growth with social equity. And it is precisely on these two spheres that the region's development ambitions run into the greatest challenges.

In addressing the obvious need to increase growth in Latin America, the emphasis should be on productivity, which (as has been discussed in this chapter) is closely tied to the development of a more dynamic and diversified tradable sector (the production of goods and services for export and for import). Productivity will improve as the region's products (both goods and services) succeed in international markets. However, since the external perspectives are adverse and subject to much uncertainty, many Latin American politicians may be tempted to underestimate the importance of targeting external markets and seek a return to an inward-oriented growth strategy, with the support of interventionist and protectionist policies.

That temptation must be resisted. Latin America's own experience and the numerous evidence on the ties between trade and growth are a clear warning that, although such an action plan could have advantages in the short term, it would disturb macro stability and be fatal for growth in the long term.

In fact, the region has no other viable growth-oriented agenda other than one that favors an outward direction (i.e., the development of the tradable sector, both for export and for import, regarding goods and services). This implies increasing the added value for commodity production, efficiency promotion in the manufacture of products for import, a higher development of better production chains (to increase the local added value of exports), an improved connection with international production chains and diversification of exports and their destinations as much as possible. A self-sustaining outward direction can be partially achieved with deeper economic integration (in the goods, services, labor, and foreign direct investment markets) within the region. The attempt to turn Latin America into a free-trade region must not be abandoned. This would allow better use of regional assets (regarding energy and infrastructure, for example) and the availability of larger markets with the scale economies they bring about. However, the South-South integration has its limits; it does not replace increasing the scope of export in the markets of the richest economies. Latin America must therefore develop and diversify its export base in global markets and seek South-South integration as a complement (and not as an alternative) to global integration. In addition, for most of the region (and especially for Mexico), being close to the largest consumer market on the planet continues to be a key advantage to be used.

Due to the anti-globalization feelings in the United States and in other advanced economies, efforts to gain export ground would be more politically viable if, instead of displacing companies and eliminating jobs in rich importing countries, Latin American exports were focused on goods and services that do not come into direct conflict with production and employment in advanced countries. This implies an improvement in creativity—only in productivity—and a repositioning to provide all kinds of services for export (for example, tourism, educational services, services for the elderly, and health and welfare services). On average, these services have a greater demand elasticity (i.e., constitute a growing proportion of global consumption) and generate more employment than industrialized products. By shifting labor from the informal to the formal sector, services for export expansion can also generate significant social gains.

The shift toward more dynamic sectors for export favors knowledge and efforts to attract and retain talent. Due to globalization, many non-commodity goods and many services can be produced anywhere in the world. Therefore, to grow, Latin America must become not only an *attractive place for investment and production*, but also an *attractive place to visit or live in*. This highlights the need for a more sophisticated outward-oriented growth strategy that emphasizes stronger institutions (especially the rule of law), societies united by greater equity, more efficient and better integrated infrastructure

(including digital infrastructure), safer environments to live in, a friendly, hospitable and well-educated citizenship, clean air, and well-preserved and exploited natural and cultural capital.

Growth without social equity would get Latin America nowhere. The simultaneous outbreak of violence and fury on the streets of several Latin American cities in 2019 is not just a wake-up call, but a strong reminder that progressive social policies must be essential to the economic development agendas in the region. In fact, social policies must go beyond targeted assistance to the poor (the importance of which is undeniable). It also addresses the frustrations and aspirations of the millions of Latin Americans who are no longer poor or who have recently joined the middle class, but who suffer unfair treatment (in access to basic services, to different opportunities, to justice, to have their voice heard, etc.) or who face excessive risks of losing their income, their health or their well-being in the old age. This directs attention to better public services (including those related to citizen security and transportation), stronger and fairer social protection systems (pensions, health), and better-quality public education.

In sum, both the rule of law and social policies and, increasingly, environmental sustainability, must be seen as core components of any growth-oriented reform agenda.

Bibliography

- Ayres J., García, M., Guillén, D. and Kehoe, P. (2018). “The monetary and fiscal history of Brazil, 1960-2016.” Federal Reserve Bank of Minneapolis, Research Division, Staff Report 575.
- Azevedo, J., Inchauste, G. and Sanfelice, V. (2013). “Decomposing the recent inequality decline in Latin America.” Working Paper 6715, World Bank.
- Baer, W. (1972). “Import substitution and industrialization in Latin America: Experiences and interpretations.” *Latin American Research Review*, Vol. 7, N° 1 (spring), pp. (95-122).
- Bernanke, B. (2005). “The global saving glut and the US current account deficit.” Speech 77. Board of Governors of the Federal Reserve System of the United States.
- Bértola, L. and Ocampo, J. A. (2012). *The economic development of Latin America since independence*. Oxford University Press.
- Birdsall, N., De la Torre, A., and Valencia, F. (2011). “The Washington Consensus: Assessing a damaged brand.” *The Oxford Handbook of Latin American Economics*. Oxford University Press.
- Bruton, H. (1998). “A reconsideration of import substitution.” *Journal of Economic Literature*, Vol. 36, N° 2 (June), pp. 903-936.
- Calvo, G. (2002). “Globalization hazard and delayed reform in emerging markets.” *Economía*, Vol. 2, N° 2 (spring), pp. 1-29.
- Calvo, G., Izquierdo, A. and Mejía, L. F. (2004). “On the empirics of sudden stops: The relevance of balance sheet effects.” IDB Working Paper 509 (July).
- Caprio, G. and Klingebiel, D. (1996). “Bank insolvencies: Cross-country experience.” Working Paper 1620 (July), World Bank.
- Cardoso, F. H. and Faletto, E. (1979). *Dependency and development in Latin America*. Berkeley (U SA): University of California Press.
- Corden, W. M. (1991). “The theory of debt relief: Sorting out some issues.” H.D. Evans and D. Greenway (ed.), *Developing countries and the international economy: Issues in trade, adjustment and debt*. London: Routledge.
- De la Torre, A. (1987). *Macroeconomic aspects of a petroleum boom: Ecuador 1972-1980*. Doctoral thesis. University of Notre Dame.
- De la Torre, A. and Ize, A. (2020). “Accounting for Latin American growth.” Mimeo.
- De la Torre, A., Filippini, F., and Ize, A. (2016). *The commodity cycle in Latin America: Mirages and dilemmas*. World Bank’s semi-annual report on Latin America (April).
- De la Torre, A. et al. (2015a). *Latin America and the rising South: Changing world, changing priorities*. Office of the Chief Economist, Latin America and the Caribbean, World Bank

- De la Torre, A. *et al.* (2015b). *Jobs, wages and the Latin American slowdown*. LAC - World Bank's semi-annual report on Latin America (October).
- De la Torre, A., Didier, T., and Pinat, M. (2014). "Can Latin America tap the globalization upside?" Working Paper 6837 (April), World Bank.
- De la Torre, A. *et al.* (2014). *Inequality in a lower growth Latin America*. World Bank's semi-annual report on Latin America (October).
- De la Torre, A., Ize, A., and Schmukler, S. (2012). *Financial development in Latin America and the Caribbean: The road ahead*. Office of the Chief Economist, Latin America and the Caribbean, World Bank
- De la Torre, A., Calderón, C., and Didier, T. (2010). *The new face of Latin America and the Caribbean: Globalized, resilient, dynamic*. World Bank's semi-annual report on Latin America (October).
- De la Torre, A. and Schmukler, S. (2007). *Emerging capital markets and globalization: The Latin American experience*. Stanford University Press and the World Bank.
- De la Torre, A., Levy Yeyati, E., and Schmukler, S. (2002). "Financial globalization: Unequal blessings." *International Finance*, 5:3, pp. 335-357.
- Didier, T., Hevia, C., and Schmukler, S. (2012). "How resilient and counter-cyclical were emerging economies to the global financial crisis?" *Journal of International Money and Finance*, 31(8), pp. 2052-2077.
- Edwards, S. (1995). *Crisis and reform in Latin America: From despair to hope*. Washington, DC: Oxford University Press and the World Bank.
- Fajnzylber, F. (1990). *Unavoidable industrial restructuring in Latin America*. Durham (U SA): Duke University Press.
- Ferreira, F. *et al.* (2013). *Economic mobility and the rise of the Latin American middle class*. Office of the Chief Economist, Latin America and the Caribbean, World Bank
- Ferreira, F. and Robalino, D. (2011). "Social protection in Latin America: Achievements and limitations." *The Oxford Handbook of Latin American Economics*. Oxford University Press.
- Furtado, C. (1963). *Economic growth of Brazil, a survey from colonial to modern times*. Berkeley (U SA): University of California Press.
- Gerschenkron, A. (1962). *Economic backwardness in historical perspective: A book of essays*. Cambridge (USA) Harvard University Press.
- Gunder Frank, A. (1967). *Capitalism and underdevelopment in Latin America: Historical studies of Chile and Brazil*. New York: Monthly Review Press.
- Hirschman, A. (1968). "The political economy of import-substituting industrialization in Latin America." *The Quarterly Journal of Economics*, Vol. 82, N° 1 (February), pp. 1-32.
- Hausmann, R., Rodrik, D., and Velasco, A. (2008). "Growth diagnostics." N. Serra and J. E. Stiglitz (ed.), *The Washington Consensus reconsidered*. Oxford University Press.
- Hirschman, A. (1958). *The strategy of economic development*. Yale University Press
- Hoff, K. and Stiglitz, J. E. (2001). "Modern economic theory and development." *Frontiers in development economics: The future in perspective*. New York: Oxford University Press.

- Hoyos, A. and Ñopo, H. (2010). "Evolution of gender gaps in Latin America at the turn of the twentieth century." IDB Working Paper 176 (May).
- Imbs, J. and Ranciere, R. (2005). "The overhang hangover." Working Paper 3673 (August), World Bank.
- Kaminsky, G. and Schmukler, S. (2003). "Short-run pain, long-run gain: The effects of financial liberalization." NBER Working Paper 9787.
- Krueger, A. (1983). *Trade and employment in developing countries: Synthesis and conclusions*. Chicago University Press.
- Krugman, P. (1988). "Financing vs. forgiving a debt overhang." *Journal of Development Economics*, Vol. 29, N° 3 (February).
- Laeven, L. and Valencia, F. (2008). "Systemic banking crises: A new database." IMF Working Paper 08/224 (September).
- Lane, P. R. and Milesi-Ferretti, G. M. (2006) "The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004." IMF Working Paper 06/69 (March). Available at: <https://www.imf.org/external/pubs/cat/longres.cfm?sk=18942.0>
- Levy, S. (2018). *Under-rewarded efforts: The elusive quest for prosperity in Mexico*. Inter-American Development Bank.
- Londoño, J. L. and Székely, M. (2000). "Persistent poverty and excess inequality: Latin America, 1970-1995." *Journal of Applied Economics*. Vol. III, N° 1 (May), 93-134.
- López-Calva, L. and Lustig, N. (ed.). (2010). *Declining inequality in Latin America: A decade of progress?* Washington, DC: Brookings Institution and the United Nations Development Programme.
- Lora, E. (2001). "Structural reforms in Latin America: What has been reformed and how to measure it." IDB Working Paper 466.
- Lustig, N., López-Calva, L. F., and Ortiz-Juárez, E. (2013). "Deconstructing the decline in inequality in Latin America." Working Paper 6552 (July), World Bank.
- Messina, J. and Silva, J. (2018). *Wage inequality in Latin America: Understanding the past to prepare for the future*. World Bank.
- McMillan, M. and Rodrik, D. (2011). "Globalization, structural change and productivity growth." NBER Working Paper 17143 (June).
- Murphy, K. M, Shleifer, A., and Vishny, R. W. (1989). "Industrialization and the big push." *The Journal of Political Economy*. Vol. 97, No. 5, pp. 1003-1026.
- Pages, C. (ed.). (2010). *The age of productivity*. Inter-American Development Bank.
- Prebisch, R. (1950). *The economic development of Latin America and its principal problems*. New York: United Nations.
- Reinhart, C. and Rogoff, K. (2008). "This time is different: A panoramic view of eight centuries of financial crises." NBER Working Paper 13882 (March).
- Rodríguez-Castelán, C. et al. (2016). "Understanding the dynamics of labor income inequality in Latin America." Working Paper 7795, World Bank.
- Rodrik, D. (2006). "Goodbye Washington Consensus, hello Washington confusion?" *Journal of Economic Literature*, Vol. 44, N° 4 (December), pp. 973-987.

- Rosestein-Rodan, P. N. (1945). "Problems of industrialisation of Eastern and South-Eastern Europe." *The Economic Journal*, Vol. 53, No. 210/211, pp. 202-211.
- Rostow, W. W. (1959). "The stages of economic growth." *The Economic History Review*. New Series, vol. 12, N° 1, pp. 1-16.
- Sanguinetti, P. and Villar, L. (2012). "Patrones de desarrollo en América Latina: ¿Convergencia o caída en la trampa del ingreso medio?" CAF Working Paper 2012/02.
- Shapiro, A. and Mandelman, F. (2014). "Remittances, entrepreneurship, and employment dynamics over the business cycle." Working Paper 2014-19 of Atlanta's Federal Reserve Board.
- Singer, H.W. (1950). "The distribution of gains between investing and borrowing countries." *The American Economic Review*, Vol. 40, N° 2. Papers and Proceedings (May), pp. 473-485.
- Sinnott, E., Nash, J., and De la Torre, A. (2010). *Natural resources in Latin America and the Caribbean: Beyond booms and busts?* Office of the Chief Economist, Latin America and the Caribbean, World Bank



Latin America: **The Productivity Issue**

03

Laura Alfaro
*Harvard Business
School and NBER*

*Fabio Kanczuk
Central Bank of Brazil*

The opinions expressed in this article do not reflect the position of the Central Bank of Brazil. We would like to thank Marcela Eslava, Pablo Sanguinetti, Fernando Álvarez and CAF workshop participants for their valuable contributions and suggestions.

1. Introduction

Latin America's poor performance in terms of Gross Domestic Product (GDP) growth can be attributed, mainly, to its deficient increase in productivity. In fact, the region's main problem has been its lack of efficiency to combine capital and labor force to produce. In this chapter, we explore possible reasons for low productivity in the region.

We compared Latin American countries with the “frontier” in terms of production per capita. In general, we noticed there has been little convergence between both, and that productivity in Latin America is far from the frontier's efficiency. In other words, there are certain sources of inefficiency that restrict the capacity of Latin American countries to adopt the more effective productivity practices followed by the frontier.

Then, we considered possible factors that could account for the low productivity in the region and estimated the impact of removing those inefficiency sources. We specifically analyzed the following:

i. Sectoral composition: Is low productivity in Latin America attributable to a misallocation of inputs among sectors? We compared sectoral productivity between some Latin American countries and the United States (country we assume to be the frontier). Then, we estimated the productivity increase obtained by reallocating inputs among sectors.

ii. Unequal distribution of resources: We compared the distribution by company size in Latin America and the United States –the frontier–. We assumed that certain distortions, such as taxes, incentives, political limitations, etc., result in an unequal distribution of resources among companies. This misallocation translates into some inefficient companies in terms of their size.

iii. Human capital: We assumed human capital (quality-adjusted years of school, mortality rate, etc.) also contributes to productivity differences. We analyzed the hypothetical consequences of having a human capital similar to that of the frontier (defined as the country with the highest human capital). To this end, we used information provided by the Human Capital Project (HCP), carried out by the World Bank.

iv. Infrastructure: Using data from the Global Infrastructure Hub platform (2017), we compared the infrastructure capital of several Latin American countries and that of the frontier. For this comparison, we adjusted infrastructure data according to infrastructure quality, each country's GDP and some geographical data. We considered the existence of certain elements, such as legal restrictions and regulations, that hinder the private sector from investing in infrastructure, even

though those investments theoretically entailed a high profitability. Then, we analyzed the potential consequences of removing such disincentives so that the quotient between infrastructure capital and GDP converged toward the reference value. We also estimated the impact on productivity measures.

v. *Tax system:* We estimated distortions in the Brazilian tax system. Therefor, we calibrated a traditional macroeconomic model in Brazil, focusing mostly on taxes. Then, we estimated the effect an integral tax reform would have on GDP per worker in that country. That allowed us to assess the effect of tax disincentives on productivity measures. Afterwards, we expanded that analysis to other Latin American countries and compared their tax burden with that of Brazil.

vi. *Opening of economy:* We used two different approaches to estimate the impact of reducing tariffs unilaterally. First, we estimated welfare increase, which is equivalent to the area of the triangle below the imports' curve. The second measurement –welfare increase after removing tariffs– is based on tax distortions. We expressed welfare increase in terms of a rise in productivity driven by opening the economy. Thus, we could actually estimate the impact that reform would have on productivity.

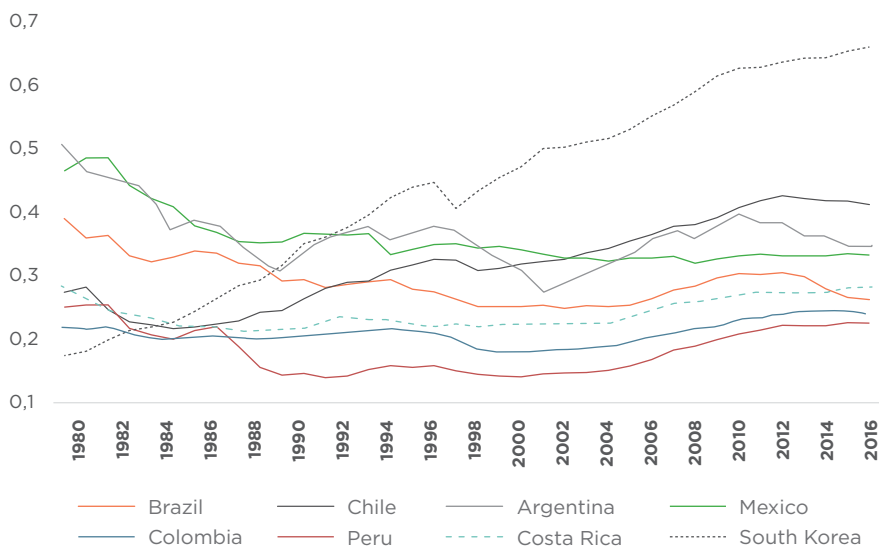
In the last section of this article, we assessed the difference in productivity between Latin America and the frontier if all the previously mentioned sources of inefficiency would be removed. We also added the effects of removing all the aforementioned disincentives. Even though distortions are not necessarily cumulative, this exercise is useful for policy-makers. We assessed growth resulting from implementing all those reforms.

2. Production and productivity evolution

Let us start with an overview of the evolution of some economies inside and outside the Latin American region in the past four decades. Chart 1 shows the evolution of GDP per capita in those countries, expressed as a share of GDP per capita in the United States. These variables reflect the ones explained in most bibliography on growth and development (see Hall and Jones, 1999). When comparing other countries to the United States, we implicitly assume the American economy is the “frontier” to which other countries could potentially converge.

Someone could argue that the United States’ economy is already developed (i.e., an economy that already applies the most adequate practices and technologies of the frontier itself). Since World War II, its growth has been almost steady, with rapid recoveries compensating for the decline after a recession. In general, its growth is mainly driven by innovation (new inventions) and not by introducing significant changes in its economic policies. In contrast, Latin American countries must be classified as “countries with developing economies.” If the “right policies” were to be implemented, these economies could be transformed and become as efficient as the United States’ economy. Converging toward the frontier or “catching up” would entail a more significant growth, at least during the development process of Latin American countries.

CHART 1. GDP per Capita as Share of GDP per Capita in the United States



Source: Authors' estimates with data from Penn World Tables 9.1.

Chart 1 shows that South Korea seems to be the only evident case of “catching up” from all the selected countries. At the starting point, in 1980, it was the poorest country in the sample, and its GDP per capita was below 20% of the United States’ GDP. By 2017, it reached 70%. It grew its GDP per capita over 3% for three decades to achieve that type of progress, with a slowdown in time. That is exactly the pattern to be expected. At first, the country achieves relatively fast growth by acquiring knowledge from rich countries, adopting their most recommended practices and accumulating capital. However, as the gap between this country and the frontier bridges, growth rates slow down. Chile is the only Latin American country that shows –to some extent– a similar development trajectory to that of South Korea, even though figures are lower.

Why have Latin American countries not caught up? Traditional economic theory explains production by studying the factors that make up the Gross Domestic Product. GDP is a monetary measure that considers labor force, capital, and productivity, which is simply the residual element. If we analyze how these three factors have evolved, we can trace the origins of the problem.

As regards *labor force*, it describes the number of hours worked to produce. By considering the GDP per capita, we are actually taking into account the number of people. However, we do not include the number of hours they work since, in most of our sample countries, there is no available data about hours worked. Nevertheless, this type of information is not vital for our task because the number of hours worked by a person cannot increase that much in the long term (i.e., there is a limit to the hours a person can work each day). During a recession, the number of daily hours worked per person may be drastically reduced, but this number goes back to its previous state in recovery times. In the long term, when we analyze growth over decades, the number of hours worked per person cannot significantly contribute to production.¹

As *for capital*, it is potentially different. In principle, any given economy could indefinitely accumulate large quantities of capital and have a very high GDP per capita. However, this is misleading. Because the marginal product of capital tends to decrease as the scale increases, an unusually abundant capital stock would generate low profitability or unprofitable investments. Therefore, the quantity of capital is closely associated with the economy’s level of productivity. In other words, disparities in the capital level do not significantly influence production disparities. In this context, productivity is –at best– the main factor that determines differences in production levels.²

A simple way to understand this would be to estimate the GDP per capita in Latin American countries as if they had an identical capital-product ratio –preserving their productivity levels– and identical productivity –preserving their capital levels– to the United States. Table 1 shows these estimates based on the average rate of investment and growth between 1980

1 It is worth mentioning that, in the Latin American countries where this information is available, there is no significant difference in the hours worked, if compared with developed countries, such as the United States (CAF, 2018).

2 CAF (2018) presents a similar, but more detailed estimate. Please refer to Table 1.1 of the report for an additional breakdown of the labor force, employment, hours worked, production per hour and productivity, intensity of physical capital and intensity of human capital.

and 2017, together with an assumption of the depreciation rate and capital charge (see Hall and Jones, 1999).⁵

TABLE 1. GDP per Capita as Share of GDP per Capita in the United States

| | 2017 | Same capital level as the United States (Theoretical) | Same productivity level as the United States (Theoretical) |
|-----------------------|------|---|--|
| Argentina | 0.35 | 0.37 | 0.95 |
| Brazil | 0.26 | 0.26 | 1.02 |
| Chile | 0.41 | 0.43 | 0.95 |
| Colombia | 0.24 | 0.25 | 0.96 |
| Costa Rica | 0.28 | 0.29 | 0.99 |
| Ecuador | 0.19 | 0.18 | 1.05 |
| El Salvador | 0.13 | 0.14 | 0.91 |
| Guatemala | 0.14 | 0.14 | 0.95 |
| Haiti | 0.03 | 0.02 | 1.54 |
| Honduras | 0.08 | 0.07 | 1.20 |
| Mexico | 0.33 | 0.30 | 1.12 |
| Nicaragua | 0.10 | 0.10 | 1.00 |
| Paraguay | 0.21 | 0.20 | 1.06 |
| Peru | 0.23 | 0.22 | 1.01 |
| Dominican Republic | 0.28 | 0.31 | 0.93 |
| Uruguay | 0.37 | 0.44 | 0.86 |
| South Korea | 0.66 | 0.67 | 0.99 |
| United States | 1.00 | 1.00 | 1.00 |

Source: Authors' estimates with data from Penn World Tables 9.1.

Clearly, the level of capital per worker does not explain the difference in income per capita between the United States and Latin American countries (and, sometimes, it even distances certain countries more from the frontier). On the contrary, productivity is highly relevant from a quantitative perspective. If Latin American countries had the same level of productivity as the United States, they would be significantly richer. For our debate about convergence, Latin American countries do not converge toward the frontier because their productivity does not meet richer countries' productivity.

⁵ The exercise assumes that countries in the region have the same level of productivity as the United States, and that the level or quality of human capital is similar.

In the next sections of this chapter, we will explore possible explanations for the big difference between Latin American countries' productivity levels and the frontier (the United States). These explanations may be considered as "sources of inefficiency." Certain distortions in the operation of Latin American countries hinder capital and labor force from producing most efficiently. If these distortions or disincentives were removed, the level of productivity would better resemble that of the United States.

Once we have identified the disincentives to development, we can formulate appropriate policies to trigger productivity growth. In other words, any given country's economy could adopt more effective practices (including policies to foster human capital) and more productivity-favoring guidelines if governments implemented policies against the sources of inefficiency. In turn, that economy would resume its process to catch up development and would bridge the gap with the frontier.

3. Composition: sectors and companies

3.1. Sectoral composition

One characteristic of the development process is to shift the economic activity from one industry to another over time. Economic development usually brings along a reduction in the agricultural sector activities. Participation in the industry builds up during the initial economic development stage, but it later slows down and is replaced by services.

Since agricultural labor productivity tends to be lower, this evolution of the sectoral composition initially increases productivity at a country level. However, as industry loses weight, aggregate productivity in the country may decrease as the service sector is not as productive as the industrial.

These observations have led some experts to claim that low productivity in some countries could be attributable to certain sectoral composition patterns. Particularly, those researchers claim that allocating too many workers to not-so “dynamic” activities (such as some service sector areas) could be the decisive factor that accounts for low aggregate productivity. In contrast, other experts claim that emerging countries show low productivity regardless of their sectoral composition. In other words, there are differences in productivity even when comparing the same sector (Herrendorf, Rogerson, and Valentinyi, 2014).

To test these theories, we compared productivity in different sectors of a selection of countries. Using information from the Socio-Economic Accounts database, we measured productivity in each sector, according to the quotient between added value and the number of workers in every industry. This database is part of the World Input-Output Database and contains information about 40 countries and 35 sectors, but it only includes the economy of two Latin American economies: Brazil and Mexico. Information is expressed in constant prices and in local currency for the 1995-2009 period. In order to draw comparisons at an international level, we converted data using the Purchasing Power Parity index, available on the Penn World Tables platform.

Table 2 shows worker allocation by sector in a selection of countries. Apart from Mexico and Brazil, we included the United States (the frontier), South Korea (a good example of development) and India (a country which is less developed than Brazil and Mexico).

TABLE 2. Sectoral Allocation by Country, 1995-2009 (in %)

| | Total | Agriculture | Industry | Services |
|---------------|-------|-------------|----------|----------|
| United States | 100.0 | 0.9 | 19.0 | 80.1 |
| South Korea | 100.0 | 7.4 | 25.9 | 66.7 |
| Mexico | 100.0 | 14.4 | 26.1 | 59.5 |
| Brazil | 100.0 | 17.4 | 20.5 | 62.1 |
| India | 100.0 | 53.7 | 19.9 | 26.3 |

Source: Authors' estimates with data from Penn World Tables 9.1 and World Input-Output Database.

Agriculture shows expected figures, and richer countries allocate less people to this sector. Service allocation is (almost) monotonic too. Richer countries tend to allocate more people to the service sector. As to industry, the pattern is less clear, but this is to be expected. Countries in the middle, i.e., South Korea and Mexico, have a relatively bigger industry than countries in the extremes (the United States and India).

Table 3 shows productivity (measured in 2009 US dollars, adjusted by the Purchasing Power Parity) for each sector throughout the country. In almost every country, the agricultural sector is less productive than the service sector, which is –in turn– less productive than industry (the only exception is India, where the service sector is more productive than industry). This means that, in the first stages of development, aggregate productivity increases as there is a shift from agriculture to industry. However, this also means that, in later stages of development, the shift that occurs from industry to services could contribute to a decline in productivity as well.

TABLE 3. Sectoral Productivity (Added Value per Worker, in 2009 US dollars, adjusted by the Purchasing Power Parity)

| | Total | Agriculture | Industry | Services |
|---------------|--------|-------------|----------|----------|
| United States | 90,088 | 66,271 | 109,937 | 85,647 |
| South Korea | 50,794 | 24,290 | 74,759 | 44,429 |
| Mexico | 25,644 | 6,109 | 31,423 | 27,836 |
| Brazil | 14,627 | 4,779 | 19,389 | 15,814 |
| India | 8,131 | 2,224 | 11,984 | 17,307 |

Source: Authors' estimates with data from Penn World Tables 9.1 and World Input-Output Database.

In contrast to this structural transformation stance, productivity tends to be lower in poorer countries, across all sectors. Hence, richer countries would still have much higher productivity, even if they relied only on agriculture.

The same happens with the industry and the services, with a minor exception: the service sector is less productive in Brazil than in India.

In order to assess the importance of sectoral allocation, we estimated aggregate productivity in a counterfactual case, in which every country has the same sectoral allocation as the economy of the United States. Table 4 shows that assumption and presents each country's productivity as a portion of the economy's productivity in the United States. This data also allows us to analyze conditional convergence.

TABLE 4. Counterfactual Reallocation (in 2009 US dollars and change in %)

| | Observed | Counterfactual | Change (%) |
|---------------------------|----------|----------------|------------|
| United States | 90,088 | 90,088 | 0.0 |
| South Korea | 50,794 | 50,010 | -1.5 |
| Mexico | 25,644 | 28,322 | 10.4 |
| Brazil | 14,627 | 16,394 | 12.1 |
| India | 8,131 | 16,160 | 98.7 |
| South Korea/United States | 0.56 | 0.56 | -1.5 |
| Mexico/United States | 0.28 | 0.31 | 10.4 |
| Brazil/United States | 0.16 | 0.18 | 12.1 |
| India/United States | 0.09 | 0.18 | 98.7 |

Source: Authors' estimates with data from Penn World Tables 9.1 and World Input-Output Database.

Sectoral reallocation would improve aggregate productivity by 10.4% in Mexico and 12.1% in Brazil. In the case of India, the improvement would be much more significant, as productivity would almost double. South Korea is an interesting case: sectoral reallocation would have a negative impact on aggregate productivity as it would reduce industry's proportion. This reduction, in turn, would highly neutralize the benefits obtained from reducing agriculture's percentage.

When analyzing convergence toward the United States, the effects of sectoral reallocation seem much less promising. Sectoral reallocation in Mexico would imply a productivity increase from 28 to 31%, when compared to the productivity of the United States. In the case of Brazil, there would be an increase from 16 to 18%.

What are the implications of these conclusions as to the policies that should be adopted? One question arises naturally: what is preventing workers in each of these countries from moving to a more productive sector? Such a change would likely imply higher salaries. Of course, this would not happen in the short term, but it should be possible in less than a decade. In our opinion, many distortions could explain this phenomenon. In other words, in general terms, there is no restriction (neither policies nor regulations) that could prevent workers from

changing jobs in Latin American countries. Evidently, this situation varies from country to country. CAF (2018) reaches a similar conclusion and claims: “From this analysis, we can conclude that Latin America’s production lag is not related to the higher proportion of workers, especially in low productive sectors, but to the productivity lag in all sectors.”

We assume restrictions to sectoral allocation reveal deeper issues, such as workers’ limited skills. We will address this topic in Section 4, which focuses on human capital.

3.2. Unequal distribution

Most of the bibliography about differences in income level per capita among countries has focused on the accumulation role of aggregate factors, and isolates such aspect from the heterogeneity of production units. This is the approach adopted by the human capital index, as explained in Section 4. However, many investigations use a different approach and focus on the unequal distribution of resources among different production facilities in sectors and sub-sectors (Hsieh and Klenow, 2009; Alfaro, Charlton, and Kanczuk, 2009). The studies’ working hypothesis ponders that it is crucial to analyze not only the factor accumulation levels but the allocation of factors among heterogeneous production units to understand differences in income level.

In terms of our framework of inefficiency sources, this means that the differential effects of policies and institutions in the business environment could deeply influence the distribution of resources to different companies. Consequently, these production units would end up having an inadequate –or inefficient– size. If we analyze the distribution of company sizes, and we compare it with an ideal reference, we can –by implication– find the existing distortions.

In this context, distortions should be interpreted as different kinds of policies that affect company size distribution. This could refer to non-competitive banking systems, inadequate regulation of labor and goods markets, corruption or commercial restrictions. For example, governments can offer special tax agreements or financed contracts by taxing other productive activities to specific producers; or a non-competitive banking system could offer loans with favorable interest rates based on non-economic factors. This could –in turn– result in an unequal distribution of credit among companies. Corruption and commercial restrictions could also promote bigger market share for businesses that are less productive.

As distortions increase, more resources are allocated to subsidized businesses. This leads to higher drops in production and productivity measures. In other words, the source of difference in productivity measures lies in the fact that less productive companies grow while more productive companies shrink. This means that –before distortions– all companies with an identical level of productivity have the same size in a distortion-free economy. However, in a distorted economy, there is a –well defined– non-degenerate distribution of the size of the facilities for a certain degree of productivity at company level. In consequence, there is an efficiency loss and it shows in the aggregate productivity measures.

To quantify the impact of such disincentive, we followed the guidelines proposed by Alfaro *et al.* (2009). These authors developed a simple model of heterogeneous production units in which the units have technologies with steady scale performance and a certain degree of market power. The dynamics between the companies and the distortions caused by certain policies are similar to the ones proposed by Restuccia and Rogerson (2008). Afterwards, the model was calibrated to reflect a set of data about company size distribution in different countries.

In practice, this calibration exercise allowed us to ensure that the size distribution of production facilities in each artificial economy matched the distribution observed in each country. We took the United States as the baseline economy, supposedly free of distortions, and found the specific distribution of productivity for each site needed to create a histogram with the companies' size of that country. Then, for Latin American countries, we identified specific distortions that matched the histogram of the companies' size of each given country, and we assumed it had the same productivity distribution at a company level—before distortions—as the United States' economy. This allowed us to estimate how much aggregate production is wasted due to the unequal distribution of resources among companies and that might be identified as the sources of inefficiency.

We used the WorldBase database by Dun and Bradstreet (D&B), which gathers public and private companies in 205 countries and territories to calibrate the model. Data is collected from different sources, including companies partnered with D&B in several countries, telephone directory records, websites and self-report data. Information obtained from local authorities that keep a record of insolvency cases and data from mergers, and acquisitions are later used for monitoring operations and changes in ownerships. All the information is centrally verified, with different manual and automatic inspections.

The size of this database is its main advantage. Our initial source contained almost 24 millions of private companies in every sector of the economy, including some in the informal sector. However, it is obvious it has its limitations. The number of observations per country varies, from over 7 millions of companies in the United States to less than 20 in Malawi. This variation reflects differences not only in country size, but also in the degree to which D&B collects samples in different countries. More settled companies (generally, bigger and older) may be disproportionately represented, which could bias results in countries that have not been thoroughly sampled.

In particular, we know Latin American countries often have an important informal sector with small production units. As D&B probably does not fully portray the informal sector, its sample will tend to underreport the number of small companies in those countries accordingly.

In order to address this issue, we divided data in different ways and re-estimated many possible cases. We truncated the data from all the countries to mitigate potential biases due to the lack of data about small companies in poor countries. Our benchmark exercise only included data from companies with a minimum of 20 employees, but we also adopted other thresholds to test how robust results are.

Table 5 shows the results of our estimates. First, let us explain specific details about the distribution of companies' size: the average number of employees, its variance and logarithmic deviation of the number of employees. It is important to highlight the negative correlation between the average and the variance and the country's GDP per capita (not included here). There is also no clear relation between distribution deviation and country productivity. That is to say, using this database and the sample selected, we found that rich countries tend to have a distribution with a lower variance and smaller average company size.⁴

It is also worth noticing that removing policies that distort company size tended to have a dramatic impact. In Latin American countries where data was available, the average distortion was 28.7%. As expected, Haiti and Paraguay were in both extremes. It may be surprising that Costa Rica showed a much more significant distortion than expected considering its productivity.

TABLE 5. Company Size Distribution and Distortions

| | AVERAGE | VARIATION (LOG) | DEVIATION (LOG) | DISTORTION (%) |
|-----------------------|---------|--------------------|--------------------|----------------|
| Argentina | 107.1 | 3.0 | 0.4 | 23.1 |
| Brazil | 45.6 | 2.1 | 1.0 | 23.1 |
| Chile | 161.3 | 2.8 | 0.2 | 25.8 |
| Colombia | 146.5 | 2.6 | 0.3 | 24.3 |
| Costa Rica | 354.1 | 2.6 | 0.6 | 65.5 |
| Ecuador | 146.6 | 2.4 | 0.3 | 23.2 |
| El Salvador | 172.9 | 2.4 | 0.1 | 24.4 |
| Guatemala | 139.3 | 2.2 | 0.4 | 22.2 |
| Haiti | 1,561.0 | 3.4 | 1.0 | 84.8 |
| Honduras | 163.5 | 2.3 | 0.4 | 24.3 |
| Mexico | 123.0 | 2.4 | 0.5 | 22.5 |
| Nicaragua | 103.8 | 1.9 | 0.1 | 16.1 |
| Paraguay | 117.6 | 2.7 | -0.2 | 18.7 |
| Peru | 76.7 | 2.6 | 0.6 | 19.4 |
| Dominican Republic | 177.1 | 2.6 | 0.5 | 28.0 |
| Uruguay | 107.3 | 2.7 | 0.3 | 22.0 |
| South Korea | 32.4 | 0.6 | 3.3 | 10.2 |
| United States | 20.4 | 1.3 | 1.1 | 0.0 |

Source: Own estimates.

⁴ WorldBase data from D&B was really enlightening for the question posed, despite its limitations. In our final sample, the number of observations per country varied and reflected differences in each economy's size and discrepancies in coverage (records from different countries include companies following other criteria).

4. Human capital

It is only natural that workers' productivity will increase if they have more skills, better health, more knowledge and higher resilience, i.e., when they have more human capital. Most of the bibliography about development emphasizes that human capital is a vital factor for growth (see Caselli, 2005). That factor is increasingly important since the nature of work has evolved as a response to rapid technological changes (Murphy and Topel, 2016). In addition to its role as a production factor, we assume that human capital (quality-adjusted years of school, mortality rate, etc.) contributes to the differences in the measured productivity (that comprises total productivity factors and work productivity). In this chapter, we analyze the consequences of having a similar human capital to that of the frontier (defined as the country with the highest level of human capital).

In order to measure human capital relevance in Latin American countries, we used the human capital index recently published by the World Bank (2018). This index measures the next generation's human capital, defined as the quantity of human capital that a child born today can expect to attain according to the quality of healthcare and education in the country where he/she lives. It is made up of three components:

i. *Survival*: This component reflects the fact that children born today need to survive until the process of human capital accumulation through formal education can begin. Survival is measured using the under-5 mortality rate.

ii. *Expected years of learning-adjusted school*: Information on the quantity of education a child can expect to obtain by age 18 is combined with a measure of quality: how much children learn in school based on countries' relative performance on international student achievement tests. By adjusting for quality, this component reflects the reality that children in some countries learn far less than those in other countries, despite being in school for a similar amount of time.

iii. *Health*: This component uses two indicators for a country's overall health environment: (1) the rate of stunting of children under age 5; and (2) the adult survival rate, defined as the proportion of 15-year-olds who will survive until age 60. The first indicator reflects the health environment experienced during prenatal, infant, and early childhood development. The second reflects the range of health outcomes that a child born today may experience as an adult.

The health and education components of the index are combined in a way that reflects their contribution to worker productivity, based on evidence

from rigorous microeconomic empirical studies.⁵ The resulting index ranges between 0 and 1. A country in which a child born today can expect to achieve both full health (no stunting and 100 percent adult survival) and full educational potential (14 years of high-quality school by age 18) will score a value of 1 on the index. Therefore, a score of 0.70 signals that the productivity as a future worker for a child born today is 30 percent below what could have been achieved with complete education and full health.

Because the theoretical underpinnings of the human capital index are in the development accounting literature, the index is linked to real differences in how much income a country can generate in the long run. If a country has a score of 0.50, then the GDP per worker could be twice as high if the country reached the benchmark of complete education and full health.

Table 6 shows the human capital index and some of its components for all Latin American countries for which information is available. We also show data from the United States, South Korea and Singapore. We decided to include the latter because it has the highest value for this rate (higher than that of the United States). Hence, in the case of human capital, we might say that Singapore is the frontier, and the United States is relatively inefficient. It is interesting that South Korea (the success case we mentioned regarding development) also has a higher value than the United States.

First, it is worth noting that there is a strong relationship between the human capital index and GDP per capita (not shown in the Table). Latin American countries with the highest and lower values are, respectively, Chile and Haiti, as expected. It is also worth mentioning that there is a correlation between the different components of the human capital index. Generally, a country with a relatively low survival rate will also have low values for stunting and schooling. However, there are some interesting exceptions. For example, Guatemala has an expected number of years of school that is disproportionately low. That indicates it is possible to adopt specific policies to reduce school dropouts in the country.

In order to understand the quantitative impact human capital has on development, we can use the simple average of the Latin American countries represented in Table 6. That representative country in Latin America would have 7 or 8 years of learning-adjusted school and a human capital index of 0.56. If that country could improve its human capital so that it could converge toward that of Singapore, there would be a profound impact on GDP per capita of 57%. In Table 6, the last column shows the impact on each country.

What are the implications of these conclusions in terms of the policies that should be adopted? Evidently, human capital is the driving force of productivity and sustainable growth. However, protecting investments in human capital can be challenging many times. After all, it might take a long time to reap the benefits of investing in people. Consequently, Latin American countries do not usually invest enough in human capital, hence missing an

5 For a debate on micro models and estimates of human capital and remuneration, see Heckman Lochner and Todd, 2006.

opportunity to increase their productivity. There are also specific problems related to political economy connected to investment deferrals (interest groups, the ability to propose alternative solutions, adopting the necessary reforms, etc.).

TABLE 6. Human Capital Index, 2018

| | Survival rate before the age of 5 | Expected years of school | Learning-adjusted years of school | Adults: Survival rate | Portion of children under the age of 5 without stunting | Human Capital Index | Distortion (%) |
|--------------------|-----------------------------------|--------------------------|-----------------------------------|-----------------------|---|---------------------|----------------|
| Argentina | 0.99 | 13.1 | 8.9 | 0.89 | — | 0.61 | 44.3 |
| Brazil | 0.99 | 11.7 | 7.6 | 0.86 | 0.94 | 0.56 | 57.1 |
| Chile | 0.99 | 12.8 | 9.6 | 0.91 | 0.98 | 0.67 | 31.3 |
| Colombia | 0.99 | 12.5 | 8.5 | 0.86 | 0.89 | 0.59 | 49.2 |
| Costa Rica | 0.99 | 12.5 | 8.6 | 0.92 | 0.94 | 0.62 | 41.9 |
| Ecuador | 0.99 | 13.2 | 8.9 | 0.88 | 0.76 | 0.60 | 46.7 |
| El Salvador | 0.99 | 11.3 | 6.5 | 0.83 | 0.86 | 0.50 | 76.0 |
| Guatemala | 0.97 | 9.7 | 6.3 | 0.84 | 0.53 | 0.46 | 91.3 |
| Haiti | 0.93 | 11.4 | 6.3 | 0.76 | 0.78 | 0.45 | 95.6 |
| Honduras | 0.98 | 10.0 | 6.4 | 0.86 | 0.77 | 0.49 | 79.64 |
| Mexico | 0.99 | 12.6 | 8.6 | 0.89 | 0.88 | 0.61 | 44.3 |
| Nicaragua | 0.98 | 11.6 | 7.3 | 0.86 | 0.83 | 0.53 | 66.0 |
| Paraguay | 0.98 | 11.5 | 7.1 | 0.86 | 0.94 | 0.53 | 66.0 |
| Peru | 0.99 | 12.7 | 8.3 | 0.88 | 0.87 | 0.59 | 49.2 |
| Dominican Republic | 0.97 | 11.3 | 6.3 | 0.84 | 0.93 | 0.49 | 79.6 |
| Uruguay | 0.99 | 11.8 | 8.4 | 0.90 | 0.89 | 0.60 | 46.7 |
| South Korea | 1.00 | 13.6 | 12.2 | 0.94 | 0.98 | 0.84 | 4.8 |
| United States | 0.99 | 13.3 | 11.1 | 0.90 | 0.98 | 0.76 | 15.8 |
| Singapore | 1.00 | 13.9 | 12.9 | 0.95 | — | 0.88 | 0.0 |

Source: Human Capital Index recently published by the World Bank (2018).

It is worth making one last observation about the relation between human capital and the sectoral composition analyzed in Section 3. As explained above, it is not really clear why a person would choose to work in less productive sectors. His/her low human capital level and, consequently,

lack of skills to work in more productive sectors seem to be an adequate explanation. When comparing distortions from human capital and the ones related to unequal sectoral distribution (in the two countries where data is available), we see that the distortion related to human capital is more important than the distortion associated to an unequal sectoral distribution. Hence, it is, at the very least, plausible that the distortion related to human capital should also include the distortion associated with an unequal sectoral distribution. Considering that, we decided to remove the unequal sectoral distribution from our list of distortions, focusing only on the issue of human capital and unequal distribution among companies, regardless of other distortions analyzed below.

5. Infrastructure capital

Bad quality infrastructure –regardless of quantity– is obviously a fundamental problem in Latin American countries, not only in absolute terms but also in relative terms. In other words, even if analyzed in the light of GDP per capita, infrastructure in those countries is worse than expected. First, we considered the existence of certain elements, such as legal restrictions and regulations, that hinder the private sector from investing in infrastructure, even though those investments theoretically entailed a high profitability. Then, we developed a scenario in which these disincentives (*tax wedges*) did not exist, so that the ratio of infrastructure capital by GDP converged toward the reference value. We estimated the impact in productivity measures, like in Barro (1990).

To estimate the impact of adopting “correct regulations” on infrastructure, we resourced to research and available data from the Global Infrastructure Hub⁶ and, then, we defined the quantity of capital required for infrastructure in many countries. One way of making the estimate, generally used in past research on the topic, is to analyze the volume of physical infrastructure in every country, using measurements such as road and railway length, number of telephone lines, etc. However, that approach left aside the quality of infrastructure: one kilometer of a road in the United States might be very different from one in Sub-Saharan Africa. The level of service that one kilometer of railway offers in Japan might differ significantly from what is available in some of the world’s poorest countries, for example.

The investigations adopted a different approach to overcome this problem and based their work on estimates of infrastructure value, including, at least, theoretically– information about infrastructure quality and quantity. The measure of “quality-adjusted” performance was contrasted among countries. It was then used to define the necessary expense required for countries to achieve some of the most efficient countries’ performance. The resulting “need for investment” was then compared with the actual trend of investments.

It is worth mentioning that simulating the best countries’ performance in terms of “need for investment” does not mean it is necessary to increase infrastructure stock per capita to a certain amount. It refers to a gap between current expense and expense required to simulate the best performance. This means improving performance in every aspect until reaching an acceptable level of infrastructure within the country’s context. The current infrastructure

6 Available at <https://outlook.gihub.org/>

value could be lower or higher depending on specific characteristics of the country, such as GDP per capita, population density, and so on.

Table 7 shows the current investment trend and the ideal investment required for each country. To estimate the distortion from insufficient infrastructure, we used the following approach, based on Barro (1990): we assumed production from the Cobb-Douglas' technology, in which capital infrastructure is one of the inputs and can be considered a sub-element of total capital. We also assumed total capital was three times the country's GDP and that the weight of total capital in the aggregate production function was 0.35. Then, we estimated the current and ideal infrastructure capital using the capital formation principle. We assumed a constant investment rate (such as % of GDP) would alternatively reflect the present and the ideal rates, the trend rate of growth assumed for that country, and a constant depreciation rate of 5%. When comparing the total capital and the ideal capital, we obtain the contribution of ideal capital –assuming they are both proportional–, hence finding the impact of modifying capital from the current level to the ideal one.

We could not access necessary data from many countries from Central America and the Caribbean (Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, and the Dominican Republic). We assumed that the infrastructure-related distortion in those countries was equal to the average distortion known in other Latin American countries: 7.1%. Consequently, investments in infrastructure below the ideal level of investment in infrastructure would reduce –on average– the product per capita accordingly. It is worth highlighting that the impact of the infrastructure gap is relevant. However, it is not as important as the impact of human capital distribution and the companies' size previously estimated. It is also interesting to note that, while South Korea and Singapore have infrastructure that closely resembles the ideal one, the United States could improve its productivity in this aspect.

TABLE 7. Investment in Infrastructure and Productivity Improvement

| | Current investment (% of GDP) | Ideal investment (% of GDP) | Distortion (%) (increase of GDP per capita) |
|--------------------|----------------------------------|--------------------------------|---|
| Argentina | 2.19 | 3.89 | 8.5 |
| Brazil | 2.68 | 4.74 | 9.4 |
| Chile | 2.56 | 3.19 | 2.9 |
| Colombia | 2.26 | 3.19 | 5.3 |
| Costa Rica | - | - | 7.1 |
| Ecuador | 2.28 | 3.83 | 10.6 |
| El Salvador | - | - | 7.1 |
| Guatemala | - | - | 7.1 |
| Haiti | - | - | 7.1 |
| Honduras | - | - | 7.1 |
| Mexico | 1.34 | 2.71 | 8.0 |
| Nicaragua | - | - | 7.1 |
| Paraguay | 5.54 | 7.15 | 9.7 |
| Peru | 4.23 | 5.13 | 7.5 |
| Dominican Republic | - | - | 7.1 |
| Uruguay | 2.76 | 3.29 | 2.4 |
| South Korea | 2.94 | 3.02 | 0.3 |
| United States | 1.52 | 2.18 | 2.6 |
| Singapore | 0.93 | 0.93 | 0.0 |

Source: Authors' estimates with data from Global Infrastructure Hub.

6. Taxes and redistribution

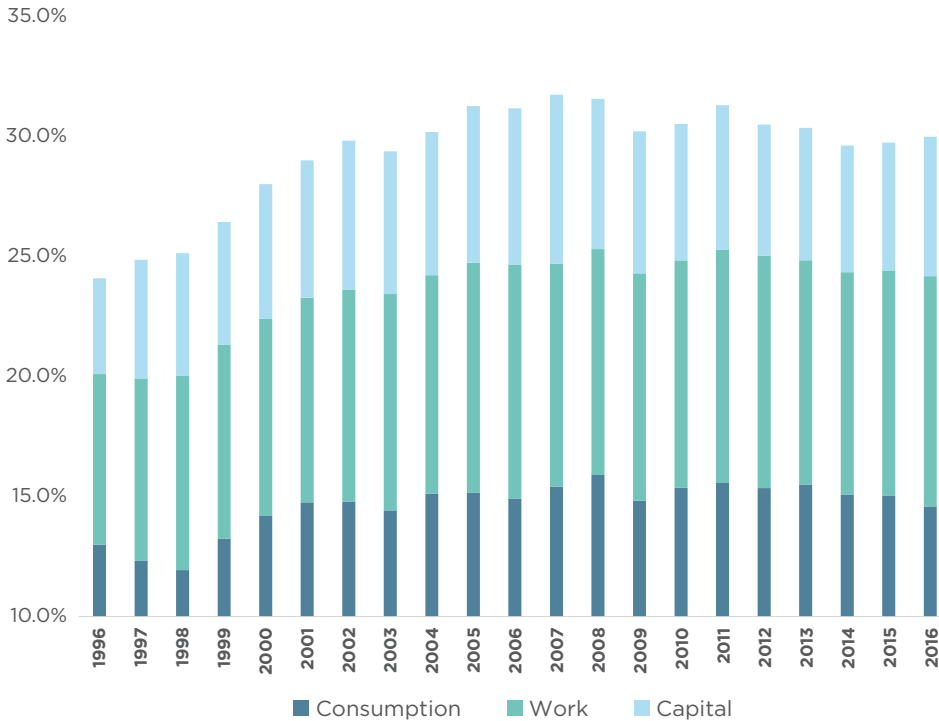
For public finance, there is one vital question: “How much should people pay in taxes?” As stated by Okun (1975), there should be a balance between efficiency and equality. In the quest to achieve a more egalitarian society, the government should collect taxes to obtain the necessary resources for redistribution. That poses a problem because some resources disappear before being distributed.

The standard version in textbooks (Atkinson and Stiglitz, 1980) is more elaborate but the result is the same. Redistribution policies through taxes and regulation make a private profit lower than social profit for several types of economic activities. This distorts incentives and produces suboptimal results, resulting in efficiency losses. This means that equality-promoting policies have a downside (less efficiency), and the political preferences determine the will to sacrifice efficiency for greater equality. Economists establish what shape the maximum level of balance might have, and people responsible for designing policies need to decide where to stand.

However, in many countries worldwide and, of course, in some Latin American economies, the maximum level of balance is quite irrelevant. In some countries, the tax system creates more distortions than necessary, and inefficient income redistribution programs receive enormous resources. Consequently, the economic policy pushes the economy to the limit between efficiency and equity. In other words, it is possible to promote more efficiency and equality by introducing changes in the tax system and the allocation of social programs.

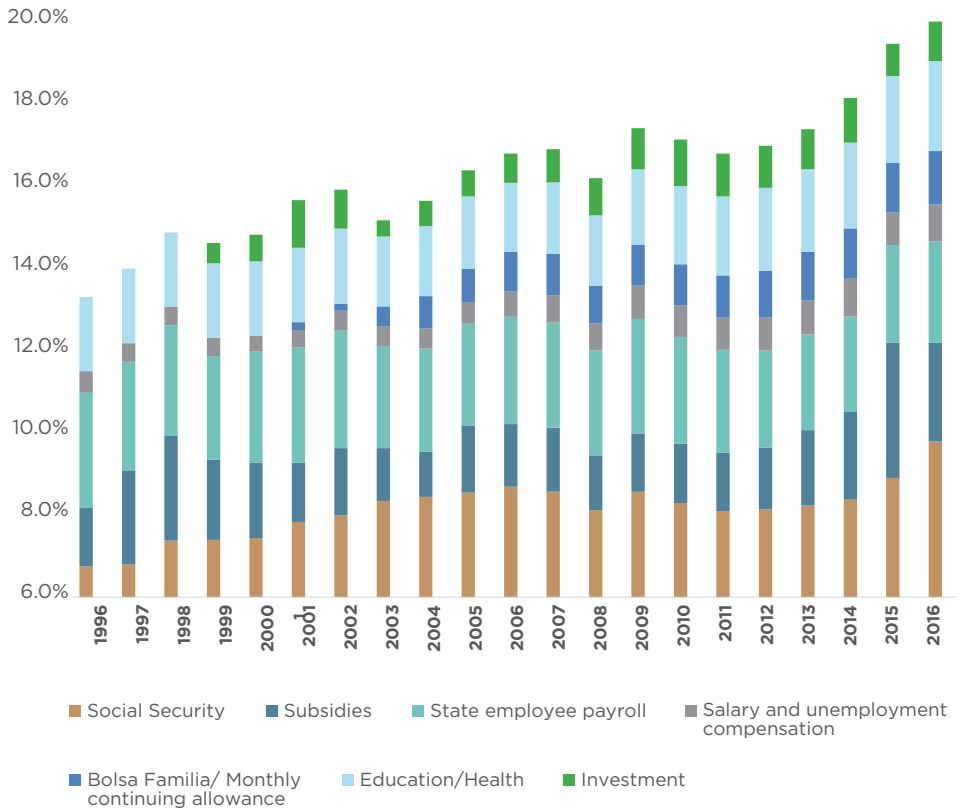
In this section, we aim to quantify the effect of a policy change in terms of GDP per capita in the Brazilian economy. We have available and required data for this estimation. We start by presenting tax evolution in Chart 2. There was an increase in tax burden between 1996 and 2004 and it has remained almost constant since then. In terms of composition, approximately 50% of current tax income is on consumption, which tends to create fewer distortions, but it also does not reduce inequality as much. As for the rest of tax income, about 35% corresponds to work taxes and 15% to capital taxes.⁷

7 The main taxes on consumption are indirect: State Tax on Goods Circulation, Federal Value-Added Tax on Industrialized Goods, Social Contribution on Gross Revenues, and Municipal tax on services. All these taxes are respectively known as ICMS, IPI, PIS/Cofins, ISS for their acronyms in Portuguese. The main taxes on work are income tax and social security contributions (INSS, for its acronym in Portuguese). As for capital taxes, there is the corporation tax, as well as the tax on property, vehicles and transactions.

CHART 2. Brazil: Tax Income by Type, as % of GDP.

Source: Authors' estimates with data about Brazilian taxes (Ministry of Finance).

Chart 3 shows the evolution of federal government spending as a share of GDP. It is worth mentioning that, during the period under analysis, total expenses increased from approximately 13% to 20% of GDP. When comparing Charts 2 and 3, we can clearly see a great difference between federal government spending and total income tax. This is because approximately one-third of income is transferred to states and municipalities, and there is no information available about how this money is spent. However, we know that states' and municipalities' primary surplus is very close to zero (Brazil's Tax Liability law limits their debt). We also have reliable information about federal primary surplus, which was around -0.8 % of GDP in 2018. This information allows us to adjust government spending so that it reflects an amount congruent with tax income. We assumed that states and municipalities follow the federal pattern to allocate their resources. After ensuring that income and total expenses were congruent, we could carry out the desired experiments to show the effects of tax changes and expense allocation.

CHART 3. Federal Government Spending (% of GDP)

Source: Authors' estimates with data about Brazilian expenses (Ministry of Finance).

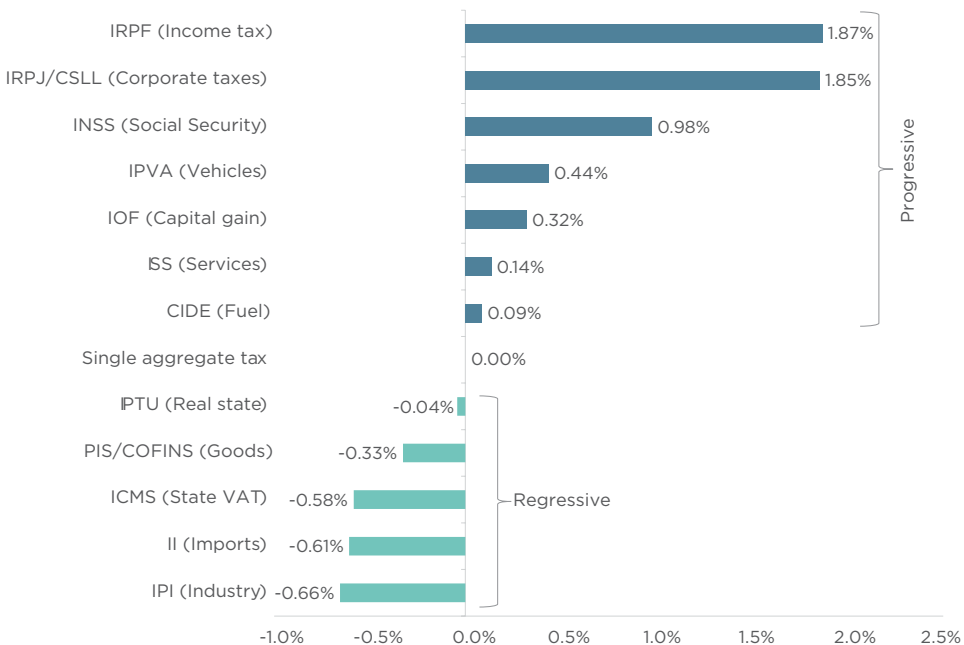
We had to estimate the impact of different taxes and subsidies on efficiency and equality before conducting any experiment. Table 8 shows the impact on efficiency of increasing one percentage point of GDP in every tax type. Data is obtained from a traditional macroeconomic model, such as the one included in Prescott (2004), calibrated for Brazil's case (see, for example, Da Silva, Paes, and Raydonal, 2014). The results obtained are the expected ones, and they are similar to the estimates from other countries. Capital tax is the most distorting, whereas tax on consumption is the least distorting.

TABLE 8. Brazil: Impact on Efficiency of Tax Increase of One Percentage Point of GDP (% of GDP)

| Tax | Impact |
|-------------|--------|
| Consumption | -0.64 |
| Work | -1.19 |
| Capital | -1.93 |

Source: Authors' estimates with data from Brazilian Ministry of Finance.

Chart 4 shows the impact of the main Brazilian taxes on equality. The level of equality was defined as $\log(1 - \text{Gini})$. These estimates were made in two steps. First, we defined which goods and services were affected by each tax. Second, using microdata about personal expenses (*Pesquisa de Orçamento Familiar*), we assigned taxes to consumers according to their level of income.⁸ We noted that impact on equality tends to be almost linear in relation to tax amounts. That is how we estimated the impact of a tax increase of one percentage point of GDP.

CHART 4. Impact on Equality of Brazilian Tax Increase of One Percentage Point of GDP % ($\log(1 - \text{Gini})$)

Source: Authors' estimates with data from *Pesquisa de Orçamento Familiar*, Brazil.

⁸ The analysis uses a model of representative agents who pay taxes to consumption, work and capital. See also Chari and Kehoe (1999).

The implicit and common assumption is that people consume the same basket of goods and services throughout their lives. This goes against the life-cycle hypothesis, according to which people consume all their wealth throughout their lives. In this case, poor people consume a larger proportion of income than rich people. Consequently, taxes on consumption tend to be more regressive than taxes on capital or work.

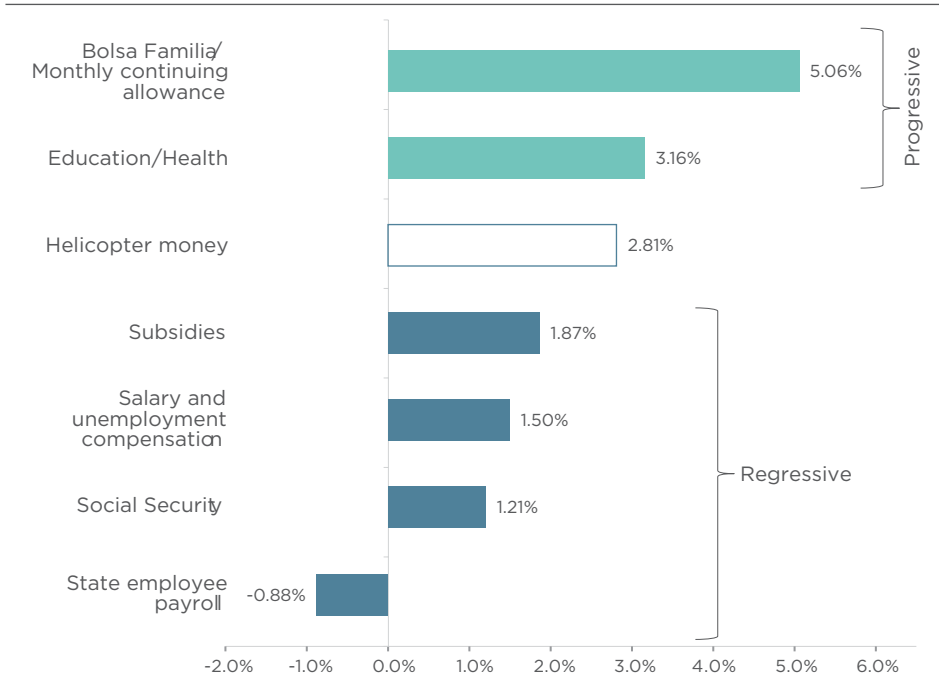
For comparative purposes only, in Chart 4, we included the impact on equality of introducing a *flat tax*, i.e., every individual would pay the same rate, in this case, 1% of GDP. As we can see, the impact is zero, even though Brazil does not actually have such a tax. Most of the results were as expected. Indirect taxes are usually much more regressive than direct taxes, due to what had been previously hypothesized. In addition, direct taxes tend to be more efficient than fixed taxes, since they ensure greater equality.

However, some results were surprising. For example, it can be observed that taxes on work are even more progressive than taxes on corporate profits.⁹ We believe this is related to the great salary and education inequality that characterizes the Brazilian labor market. It is also worth noting that taxes on property are regressive. This could be connected to the fact that such tax is based on the value of the properties declared by their owners. As a general takeaway, we could say there are many ways to create more equality and higher efficiency.

Chart 5 shows the impact of the main components of government spending in equality. The methodology applied is the same used with taxes. In some cases, we obtained data about products affected by expenses and, then, we assigned expenses according to individual data. In other cases, we had direct information about who received cash transfers. As in the case of taxes, we can see the impact of cash transfers on equality is almost linear in relation to the amount of those transfers, which is why we regularized it for a cash transfer of 1% of GDP.

⁹ In the model of representative agents, the corporation tax corresponds to the tax on capital. See Chari and Kehoe (1999), and Da Silva *et al.*, (2014).

CHART 5. Brazil: Impact on Inequality of Increasing Expense by One Percentage Point of GDP (% log(1-Gini)).



Source: Authors' estimates with data about Brazilian expenses (Ministry of Finance).

We also considered the impact on equality of the hypothetical case of “helicopter money.” This discredited policy measures the consequence of hypothetically transferring the same amount of resources to every person. As Brazil has a very unequal distribution of income, helicopter money would have a positive impact on equality.

It might be astonishing that even such a linear policy as is helicopter money might be better for redistributing income than the majority of policies currently implemented in Brazil. It is surprising that the social security system, which takes almost 10% of GDP, is considerably worse than distributing helicopter money. However, we also have the example of the program named “Bolsa Família,” which transfers resources and increases school attendance. This is an example of positive measures governments can adopt.

The proposed experiment implied changing the choice of taxes and expenses to improve efficiency without changing the impact on inequality of the current selection. Therefore, we made some adjustments in our set. First, we adjusted expenses to the magnitude of taxes so that the primary surplus equaled zero. Then, we removed expenses that were not strictly related to our redistribution and efficiency analysis, such as investment and education and health expenses. Then, we adjusted taxes so that the primary surplus equaled zero again. In doing so, we obtained an estimate of taxes and expense on redistribution, which equals 25% of GDP.

Afterwards, we estimated the total impact of expense and taxes on efficiency and equality. Our results indicate that the total effect on efficiency would imply reducing GDP by 26.7%, and the total impact on equality would mean increasing 27.2% the magnitude of $\log(1 - \text{Gini})$.

Then, we analyzed a case in which all taxes would be replaced by indirect taxes on consumption. We assumed the impact on equality of this new tax (VAT) would correspond to a weighted average of the effects of indirect taxes currently imposed. Hence, the hypothetical case became a case that could actually be implemented. In terms of expense, we proposed replacing all government spending (apart from the elements previously removed) with the “Bolsa Familia” program. Once again, this would be a relatively simple policy to implement, without any practical difficulties.

To determine the amount of taxes and expenses (which presumably are equivalent), we assumed the new system should have the same impact on equality as the current system, as previously stated. Results showed that we could have the same 26.7% impact on equality with government spending 5.9% of GDP, instead of the current 25% of GDP. The new system of taxes and expenses would reduce efficiency by 3.8%, instead of its current value of 26.7%. This means that, by reducing the efficiency loss from the current system of taxes and expenses, we would improve GDP per capita by 22.9%. In other words, in our framework, there would be a 22.9% increase in productivity.

Unfortunately, there is no available data to conduct the same experiment with other Latin American countries. Therefore, as an initial approach, we assumed that modifying the tax system by tax unit in other Latin American countries would have the same impact as in Brazil. That is to say, we assumed the impact in other countries would be proportional to the current tax burden in Brazil. In a country with lower tax burden than Brazil, we should expect tax optimization to generate a smaller improvement in efficiency.

Table 9 shows the tax burden in above-mentioned Latin American countries as per the macroeconomic data from Heritage Foundation (2015). Afterwards, we used the same data to estimate the impact of removing the disincentive related to taxes and expenses. The “Distortion” column shows all those impacts, and it reflects productivity improvements from the policies mentioned before. Needless to say, these policies should be adapted to each specific Latin American country.

TABLE 9. State Size and Productivity Improvement

| | Tax burden (% of GDP) | Distortion (%) |
|--------------------|--------------------------|----------------|
| Argentina | 25.0 | 19.0 |
| Brazil | 30.1 | 22.9 |
| Chile | 21.0 | 16.0 |
| Colombia | 16.1 | 12.2 |
| Costa Rica | 21.0 | 16.0 |
| Ecuador | 13.2 | 10.0 |
| El Salvador | 13.3 | 10.1 |
| Guatemala | 11.9 | 9.1 |
| Haiti | 9.4 | 7.2 |
| Honduras | 15.6 | 11.9 |
| Mexico | 23.7 | 18.0 |
| Nicaragua | 17.8 | 13.5 |
| Paraguay | 12.0 | 9.1 |
| Peru | 18.0 | 13.7 |
| Dominican Republic | 12.0 | 9.1 |
| Uruguay | 23.1 | 17.6 |
| South Korea | 33.6 | - |
| United States | 27.1 | - |

Source: Authors' estimates with data from Heritage Foundation (2015).

7. Opening of economy

The last policy we would like to analyze is the opening of economy to global markets. Many Latin American countries insist on imposing high tariffs and non-tariff measures, even though there is plenty of theoretical and empirical evidence to emphasize the advantages of global trade. It is worth asking why countries do not unilaterally remove trade barriers, since the benefits of such a simple policy would be considerable. Sometimes, the answer is related to the great pressure from local industries. In other cases, the reason has to do with an alternative of the game theory. Every country is open to negotiation under one condition: they are willing to lower their tariffs only if their partners also do it. However, these negotiations take time and progress is unclear.

In order to assess the advantages of opening the economy and its impact on productivity, we hypothesized what would happen if every Latin American country completely eliminated its tariffs. We also assumed that they would not adopt any measure regarding non-tariff barriers as we have not estimated such distortions. We also assumed that the countries that negotiate with every Latin American country did not react to that policy. In doing so, we also implicitly assumed that Latin American countries did not trade among them.

We estimated two alternative measures resulting from removing the source of inefficiency related to opening the economy. The first had to do with the welfare increase, equivalent to the area of the triangle below the imports' curve. We assumed supply (exports of trading partners of the country) was horizontal and that the imports' curve had constant elasticity. In line with the bibliography, we calibrate the elasticity to 4. Prices changed as a result of the (total) tariff change. Elasticity and the current number of imports as a share of GDP were used to estimate the new number of imports.

Welfare increase after removing tariffs was estimated with the tax distortions previously calculated. In the experiment suggested in the section about tax system and expenses, we proposed removing taxes on capital goods and focusing solely on taxing consumption. Following the same logic, when analyzing trade, we should remove taxes on imports of capital goods. Data from Brazil shows that 39.5% of imports are of capital goods.¹⁰ This is why we assumed it is only a portion of tariffs on capital goods. (Similarly, the remaining portion corresponds to taxes on imports of consumer goods.) To estimate any distortions, we propose eliminating tariffs on capital goods as an

¹⁰ Most of the other Latin American countries import the majority of their machinery and equipment (see Alfaro and Hammel, 2007). Leaving aside its effect on investments, imports of capital goods can have extra benefits for the economy through the spread of knowledge, since the advantages of technological progress go beyond borderlines. Technological progress, in the shape of global production of capital goods and global research and development, is primarily focused on a small number of countries. Its advantages can spread all over the world through exports of capital goods with new technology.

experiment. This would be easy if there were available data about the number of imports (as a share of GDP) and tariffs. However, due to lack of information, we assumed every Latin American country had the same percentage of imports of capital goods and the same distorting impact from taxes as Brazil.

Table 10 shows trade (imports plus exports as a percentage of GDP) and average tariffs (%) in Latin American countries. We also included South Korea, the United States, and Singapore, the country with the lowest tariff rates from our database (our sources are TRAINS-UNCTAD for data about tariffs, and the World Bank for data about trade). We used the most-recent data available for each country, and we assumed imports were equal to half of the total trade. In the same table, we presented two distortion estimates and welfare improvements as a consequence of trade and removing tax on capital.

It is worth mentioning that distortions associated with opening the economy are much less important than others previously estimated. Figures obtained are similar to the ones stated in the bibliography about trade, but they tend to disappoint both researchers and people responsible for shaping policies. It is possible that the bibliography has not explored some important channels for opening the economy yet. However, since there are no research works identified for these additional channels, we decided to focus on figures from our own estimates. As the experiment on tax distortion is closely related to productivity improvements, we would rather use its results as a distortion measurement that result in efficiency losses.

TABLE 10. Opening of Economy

| | Trade (% of GDP) | Tariff (%) | Welfare distortion (%) | Capital tax distortion (%) |
|-----------------------|---------------------|------------|---------------------------|-------------------------------|
| Argentina | 26.3 | 12.6 | 0.4 | 1.3 |
| Brazil | 24.6 | 13.7 | 0.5 | 1.3 |
| Chile | 56.1 | 1.0 | 0.0 | 0.2 |
| Colombia | 34.9 | 5.2 | 0.1 | 0.7 |
| Costa Rica | 63.5 | 4.3 | 0.1 | 1.0 |
| Dominican Republic | 54.1 | 8.8 | 0.4 | 1.8 |
| Ecuador | 38.8 | 7.6 | 0.2 | 1.1 |
| El Salvador | 64.2 | 4.0 | 0.1 | 1.0 |
| Guatemala | 46.8 | 3.5 | 0.1 | 0.6 |
| Haiti | 71.8 | 6.2 | 0.3 | 1.7 |
| Honduras | 100.7 | 8.2 | 0.7 | 3.1 |
| Mexico | 78.1 | 3.0 | 0.1 | 0.9 |
| Nicaragua | 95.9 | 3.9 | 0.1 | 1.4 |
| Paraguay | 81.3 | 8.1 | 0.5 | 2.5 |
| Peru | 44.8 | 2.8 | 0.0 | 0.5 |
| Uruguay | 41.5 | 9.8 | 0.4 | 1.6 |
| South Korea | 77.7 | 5.2 | 0.2 | 1.5 |
| United States | 26.6 | 2.9 | 0.0 | 0.3 |
| Singapore | 318.4 | 0.2 | 0.0 | 0.2 |

Notes: Authors' estimates with data from TRAINS-UNCTAD and World Bank.

8. Technology adoption

Before closing this chapter and summarizing the productivity improvements referred to in the previous sections, it is worth mentioning one major omission in our analysis. When looking into the productivity issue in Latin America, we assumed it relates to economic disincentives. After having identified all disincentives and estimating the impact of removing associated distortions, we would logically have to think we have fully resolved the productivity issue. In other words, distortions associated with economic disincentives could appear as the only reason why Latin America is different from the frontier. However, this is not the case.

Even though those countries seem to have the best production technology (the same used by the frontier), Latin American economies do not adopt it quickly. In fact, instead of considering it some sort of “blessing,” technology adoption should be seen as an endogenous process that requires adequate conditions in place. When we speak of technology in this context, we refer to production techniques, knowledge, and the efficiency of an organization. Without those elements, even if a country manages to remove all the economic disincentives, it will still be less productive than the frontier.

Bibliography identifies two main topics as the vital aspects for spreading and adopting technology. First, institutions in charge of recruitment should promote contracts among supplying and transformative companies (*upstream and downstream*), among companies and workers, and among companies and financial institutions (Acemoglu, Antràs, and Helpman, 2007). Those institutional agreements influence the quantity of investments, the selection of entrepreneurs and companies, and the efficiency with which different tasks are assigned to diverse companies and workers. There are considerable differences in the institutions responsible for recruitment from one country to the other. These dissimilarities appear to be important when adopting and spreading technology.

Second, we have international trade links. International trade provides the static benefits analyzed in Section 7, but it also has an impact on the process of innovation and growth (Grossman and Helpman, 1991). International division of labor and the product life cycle are two examples of how international trade links contribute to the process of spreading technology and promote production specialization.

We can conclude that facing the disincentives detected in this chapter is not only a matter of applying an integral set of policies to improve productivity. In addition to the previously mentioned issues, there are many others to be considered, including technology adoption and other obstacles.

9. Conclusion

Finally, we would like to examine productivity improvements that could arise from implementing all the policies suggested above. In short, we refer to the following policies:

- i. *Human capital*: To concentrate state investments in health and education, especially in children's early years, and alleviate loan restrictions on financing private human capital.
- ii. *Company size*: To adopt horizontal policies.
- iii. *Taxes and redistribution*: To introduce taxes on consumption and to redistribute income through efficient (clearly defined) social programs.
- iv. *Infrastructure*: To privatize and sanction adequate regulations.
- v. *Opening of economy*: To reduce tariffs, specially related to inputs and capital goods.

Table 11 shows the productivity improvements of each of those policies and the thorough impact of implementing all those reforms in every country. To estimate the total impact of many reforms, we would need to know, in theory, if those reforms complement each other or substitute one another, and if their impact is superadditive or subadditive. We do not know the theory or the evidence related to this issue, so we assume the impact of implementing many reforms is equal to the sum of the effects of implementing each reform separately.

TABLE 11. Impact of all Implemented Policies

| | Human capital | Company size | Taxes and expenses | Infrastructure | Opening of Economy | Total |
|--------------------|---------------|--------------|--------------------|----------------|--------------------|-------|
| Argentina | 44.3 | 23.1 | 19.0 | 8.5 | 1.3 | 132.1 |
| Brazil | 57.1 | 23.1 | 22.9 | 9.4 | 1.3 | 163.5 |
| Chile | 31.3 | 25.8 | 16.0 | 2.9 | 0.2 | 97.5 |
| Colombia | 49.2 | 24.3 | 12.2 | 5.3 | 0.7 | 120.5 |
| Costa Rica | 41.9 | 65.5 | 16.0 | 7.1 | 1.0 | 194.9 |
| Ecuador | 46.7 | 23.2 | 10.0 | 10.6 | 1.1 | 122.4 |
| El Salvador | 76.0 | 24.4 | 10.1 | 7.1 | 1.0 | 160.7 |
| Guatemala | 91.3 | 22.2 | 9.1 | 7.1 | 0.6 | 174.7 |
| Haiti | 95.6 | 84.8 | 7.2 | 7.1 | 1.7 | 321.9 |
| Honduras | 79.6 | 24.3 | 11.9 | 7.1 | 3.1 | 175.9 |
| Mexico | 44.3 | 22.5 | 18.0 | 8.0 | 0.9 | 127.3 |
| Nicaragua | 66.0 | 16.1 | 13.5 | 7.1 | 1.4 | 137.6 |
| Paraguay | 66.0 | 18.7 | 9.1 | 9.7 | 2.5 | 141.9 |
| Peru | 49.2 | 19.4 | 13.7 | 7.5 | 0.5 | 118.7 |
| Dominican Republic | 79.6 | 28.0 | 9.1 | 7.1 | 1.8 | 173.6 |
| Uruguay | 46.7 | 22.0 | 17.6 | 2.4 | 1.6 | 118.7 |
| South Korea | 4.8 | 10.2 | 0.0 | 0.3 | 1.5 | 17.6 |
| United States | 15.8 | 0.0 | 0.0 | 2.6 | 0.3 | 19.1 |

Source: Authors' estimate.

It is worth mentioning that the impact of the policies referred to above would increase productivity considerably. If measured as a simple average, any country in Latin America would increase its productivity by 154%. As expected, Haiti and Chile are the countries that would have the biggest and lowest impact, respectively. It is also worth mentioning that South Korea, and the United States could remove certain disincentives and improve their productivity as well. However, their margin for improvement would be significantly lower.

In Table 12, we used those productivity improvements to show the impact in terms of convergence toward the frontier. The table shows productivity in each country as a portion of the current productivity in the United States (i.e., as a portion of the current frontier). Once again, by working out a simple average of all Latin American countries, we found out that a typical Latin

American country with a current productivity of 22% of the productivity of the frontier would converge to 54% of such productivity if it implemented all the previously analyzed policies. Broadly speaking, current productivity is at 25% of its potential. With the suggested policies, it would double, and it would reach half of its potential. In other words, the impact of the policies proposed covers approximately half the desired area.

TABLE 12. Productivity Convergence

| | 1990 | 2018 | With reforms |
|--------------------|------|------|--------------|
| Argentina | 0.31 | 0.33 | 0.76 |
| Brazil | 0.28 | 0.26 | 0.68 |
| Chile | 0.19 | 0.40 | 0.80 |
| Colombia | 0.21 | 0.24 | 0.53 |
| Costa Rica | 0.21 | 0.28 | 0.83 |
| Ecuador | 0.20 | 0.19 | 0.42 |
| El Salvador | 0.12 | 0.13 | 0.35 |
| Guatemala | 0.14 | 0.13 | 0.37 |
| Haiti | 0.06 | 0.03 | 0.13 |
| Honduras | 0.09 | 0.08 | 0.23 |
| Mexico | 0.27 | 0.32 | 0.72 |
| Nicaragua | 0.08 | 0.09 | 0.21 |
| Paraguay | 0.22 | 0.22 | 0.52 |
| Peru | 0.14 | 0.23 | 0.50 |
| Dominican Republic | 0.15 | 0.28 | 0.78 |
| Uruguay | 0.27 | 0.38 | 0.82 |
| South Korea | 0.35 | 0.65 | 0.76 |
| United States | 1.00 | 1.00 | 1.19 |

Source: Authors' estimate.

Considering the glass is half-empty, we would say that the suggested policies are not enough to make Latin American countries fully converge toward the frontier. However, considering that the glass is half-full, we would say those policies seem to be enough to cover approximately half the distance that separates productivity in those countries from the frontier's productivity. In this sense, our challenge seems to be more related to difficulties in political economy than with lack of economic knowledge.

Bibliography

- Acemoglu, D., Antràs, P., and Helpman, E. (2007). "Contracts and technology adoption." *American Economic Review*, 97: 916-943.
- Alfaro, L., Charlton, A., and Kanczuk, F. (2009). "Plant-size distribution and cross-country income differences." J. A. Frankel and C. Pissarides (ed.), *NBER International seminar on macroeconomics 2008*. Cambridge (USA): National Bureau of Economic Research, 2009.
- Alfaro, L. and Hammel, E. (2007). "Capital flows and capital goods." *Journal of International Economics*, 72: 128-150.
- Atkinson, A. Hoff, K., and Stiglitz, J. E. (1976). "The design of tax structure: Direct versus indirect taxation." *Journal of Public Economics* 6 (1-2): 55-75.
- World Bank (2018). "Proyecto de capital humano". Retrieved from <https://www.bancomundial.org/es/publication/human-capital>
- Barro, R. J. (1990). "Government spending in a simple model of endogenous growth." *Journal of Political Economy*, 98(S5): 103-125.
- CAF (2018). *Institutions for productivity: Towards a better business environment*. Bogotá: CAF.
- Caselli, F. (2005). "Accounting for cross-country income differences." P. Aghion and S. Surlauf (ed.), *Handbook of economic growth*. Amsterdam: Elsevier North Holland.
- Chari, V. V. and Kehoe, P. J. (1999). "Optimal fiscal and monetary policy." J. B. Taylor and M. Woodford (ed.), *Handbook of Macroeconomics*. Elsevier.
- Global Infrastructure Hub. (2017). "Global infrastructure outlook." Retrieved from <https://outlook.gihub.org/>
- Grossman, G. M. and Helpman, E. (1991). *Innovation and growth in the global economy*. Cambridge (USA): MIT Press.
- Hall, R. E. and Jones, C. I. (1999). "Why do some countries produce so much more output per worker than others?" *Quarterly Journal of Economics*, 114(1): 85-116.
- Herrendorf, B., Rogerson, R., and Valentinyi, A. (2014). "Growth and structural transformation." P. Aghion and S. Surlauf (ed.), *Handbook of Economic Growth* (vol. 2). Amsterdam: Elsevier North Holland, pp. 855-941.
- Heckman, J. J., Lochner, L. J., and Todd, P. E. (2006). "Fifty years of mincer earnings regressions." Hanushek, E. and F. Welch (ed.), *Handbook of education economics*, Vol. 1. The Netherlands: Elsevier.
- Heritage Foundation (2015). *Economic freedom index*. Washington D.C.
- Hsieh, C.-T. and Klenow, P. J. (2009). "Misallocation and manufacturing TFP in China and India." *Quarterly Journal of Economics*, 124(4): 1403-1448.

- Murphy, K. M. and Topel, R. H. (2016). "Human capital investment, inequality, and economic growth." *Journal of Labor Economics*, 34(S2): S99-S127.
- Okun, A. M. (1975). *Equality and efficiency, the big tradeoff*. Washington D.C.: Brookings Institution.
- Prescott, E. C. (2004). "Why do americans work so much more than europeans?" *Federal Reserve Bank of Minneapolis Quarterly Review*, 28 (1), July: 2-13.
- Restuccia, D. and Rogerson, R. (2008). "Policy distortions and aggregate productivity with heterogeneous plants." *Review of Economic Dynamics*, 11: 707-720.
- Da Silva, W. B., Paes, N. L., and Raydonal, R. (2014). "A substituição da contribuição patronal para o faturamento: Efeitos macroeconômicos, sobre a progressividade e distribuição de renda no Brasil." *Revista Brasileira de Economia*, 68(4): 517-545.



Infrastructure and Development

04

Guillermo
Perry
*Universidad de
los Andes*

Carlos
Santiago
Guzmán
*Universidad de
los Andes
Innovations for
Poverty Action*

Juan
Benavides
Fedesarrollo

In memory of Guillermo Perry

The authors would like to thank Pablo Sanguinetti and the participants of the workshop “Latin America: The Development Challenge”, organized by CAF in Bogotá in August 2019, for their valuable contributions.

1. Introduction

The material welfare of a society relies on its ability to generate wealth and people's opportunities to enjoy it. The access, condition and quality of basic infrastructure services are critical factors that influence production development and determine the quality of people's daily lives (Bhattacharya, Romani, and Stern, 2012; Bhattacharya, Oppenheim, and Stern, 2015; CAF 2008). In that sense, the infrastructure, as a whole, constitutes one of the pillars on which society builds its economic activity and develops its productive life.

The relationship between a quality public infrastructure and economic growth and development has been widely studied. After Aschauer's work (1989), researchers have tried to quantify the public investment effect on these measurements and to identify its contribution to a country's economy, particularly, investment in infrastructure. In general, infrastructure is a factor that increases productivity and attracts business activity by lowering production costs and facilitating market access, but its effect is extremely variable (Egert, Kozluk, and Sutherland, 2009).

As Latin America is the region that most needs to invest in infrastructure, it is compelling to wonder about these factors. According to the Global Infrastructure Hub report (2017), the investment required in the region by 2040 will be 47% higher than the assumptions based on current trends' forecasts. This means a projected infrastructure investment gap of 47% by 2040, in comparison with 39% for Africa, 19% for Europe, and 10% for Asia. Moreover, when analyzing the investment levels for the 1992-2013 period, the infrastructure investment reached an average of 2.4%, while in other countries, such as Canada, South Korea and New Zealand, among others, it was 4% (Serebrisky, Suárez-Alemán, Margot, and Ramírez, 2015). Therefore, the evidence suggests that, despite the progress made in the region, infrastructure investment levels remain low and need to be further improved to reach the desired levels of growth and development.

The importance of the comments above lies with the relationship between the infrastructure and development of a country. First, Calderón and Servén (2004) studied the impact of infrastructure development on economic growth and inequality using a panel data set encompassing 121 countries during the 1960-2000 period. These authors find that a one standard deviation increase in the aggregate index of infrastructure (equivalent to an increase of 1.5% in the index, from 0.4% to 1.7%, comparable to the levels reported by South Korea and New Zealand in the period under analysis) would raise the growth rate of the economy by three percentage points. Regarding income distribution, this study shows that such an increase in the aggregate index of infrastructure

positively impacts inequality, i.e., it reduces the Gini coefficient by 0.06. In a more recent paper, Calderón and Servén (2014) review existing literature and conclude that considering measurement issues and the potential endogenous and heterogeneous effects, the evidence of infrastructure impact on growth is less robust. However, based on the above, we can conclude that—in general—there is a positive contribution of infrastructure development to growth (Straub, 2008; Calderón and Servén, 2014).

In the case of Latin America, this relationship is also positive, though a significant gap still remains. Particularly, when comparing the region's progress with other middle-income and East Asian countries, it is observed that the infrastructure development contributed to growth with an increase of 2.43 percentage points when contrasting the 2001-2005 period with the 1991-1995 period (Calderón and Servén, 2010). In line with this, Calderón, Moral-Benito, and Servén (2014) find that the elasticity of infrastructure contribution to output growth varies from 0.07 to 0.10. For example, increasing the infrastructure median supplied in lower-middle-income countries toward that offered in upper-middle-income countries would raise nearly 5.2% the output per worker. This shows the benefits obtained from a higher investment and infrastructure development. However, and despite the improvements shown, the region's investment levels remain low (Manuelito and Jiménez, 2015).

This review reveals the positive relationship between the infrastructure levels, the growth levels, and the development of a country. However, the mechanisms that characterize this behavior are diverse. Straub (2008) differentiates between direct and indirect effects. Direct effects of a better infrastructure are immediate, such as productivity increase, while indirect effects arise from the positive externalities of having a better infrastructure. As an example of direct effects, he mentions the supply of roads that ensure higher market access and development. According to the report of Garemo, Hjerpe, and Hallerman (2018) on the provision of road infrastructure, this component is essential to strengthen market connections and their productivity. As for indirect effects, Straub (2008) highlights adjustment costs, labor productivity due to reduced stress levels (e.g., less commuting time for workers and more efficient time management), the economies of scale and of scope, human development due to better health and education conditions (Botting *et al.*, 2010; Agénor, 2012).

Two additional mechanisms enrich the discussion about why it is important to study infrastructure development and investment, i.e. the complementary effect on private investment and the positive impact on the durability of private capital. Agénor and Moreno (2006) explained that the first mechanism refers to the rate of return, which will be higher if a country has invested in telecommunications, power, and transportation. Regarding the second mechanism, a good infrastructure (e.g., better roads) reduces the depreciation of capital goods (such as automobiles). Together, the mechanisms described above indicate how infrastructure positively affects the economic and social development of a country (Serebrisky *et al.*, 2015; Serebrisky *et al.*, 2018).

According to Kogan and Bondorevsky (2016), the infrastructure quality is another factor that has influenced the effect of infrastructure on growth and economic development. Specifically, despite the region's progress, the legal and contractual frameworks that favor infrastructure investment processes still need to be strengthened. Public-Private Partnership schemes have emerged and gradually consolidated and strengthened as the alternative mechanism to solve problems related to the provision and maintenance of quality infrastructure and promote efficiency gains (CAF, 2018; García-Kilroy and Rudolph, 2017). In general, studies on Latin America –which is considered as the developing region with the greatest progress in Public-Private Partnerships (Serebrisky *et al.*, 2015)– show that 17 out of 21 Latin American countries have a regulatory framework that qualifies as developed. This fact has favored investment processes despite frameworks still have to be improved (The Economist Intelligence Unit, 2019). Thus, continuing to deploy Public-Private Partnership strategies, as appropriate, will contribute to the consolidation of better infrastructure development.

This chapter aims to study the current state of infrastructure in Latin America, seeking to identify those crucial aspects to improve the region's development. Section 2 presents a brief diagnosis on infrastructure access and quality throughout the region. Section 3 describes the role of the private sector in infrastructure provision, i.e., Public-Private Partnership schemes and concessions. Finally, Section 4 analyzes the institutional and governance aspects of infrastructure, while Section 5 provides a set of conclusions resulting from that analysis.

2. Infrastructure access and quality in Latin America

The infrastructure in Latin America has evolved positively in terms of coverage and quality. Now, the major challenge is to improve everything related to quality. This section presents and analyzes the current status of infrastructure access and quality in the region by using available information from Infralatam¹ and the World Bank. For that purpose, we first study the evolution of access and coverage indicators to identify the existing gaps and their determinants. Then, we present the evolution of quality indicators, and finally, analyze the public and private investment levels that characterize Latin American countries in detail. This analysis comprises only Argentina, Brazil, Chile, Colombia, Mexico, and Peru due to limited available data. Likewise, we compare their evolution with six Asian countries that used to have similar conditions in the past. The selected countries to compare such evolution are: China, South Korea, Malaysia, Singapore, and Thailand.²

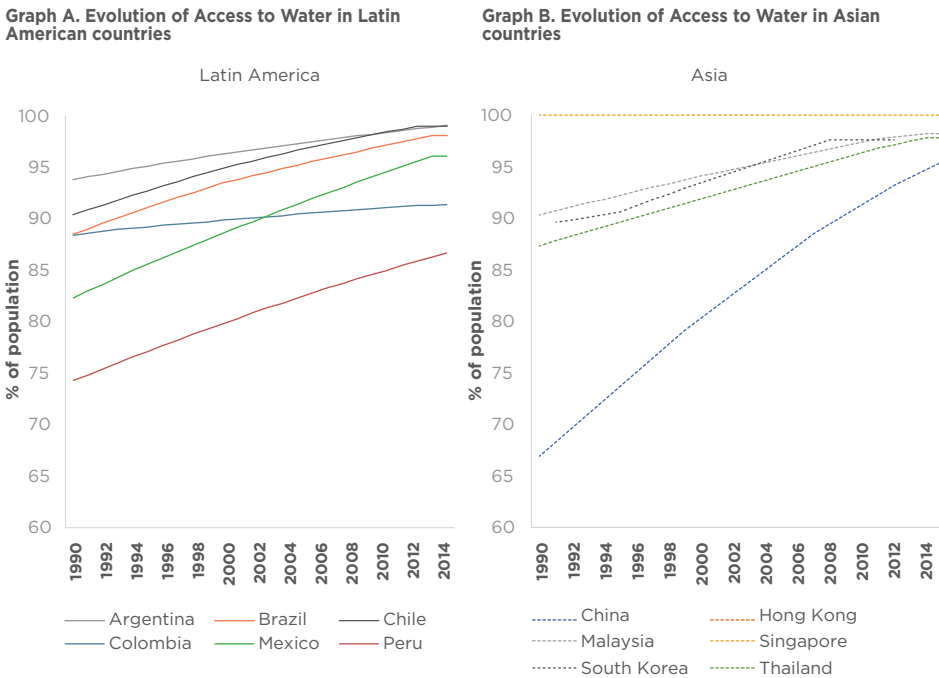
2.1. Access and coverage

In recent years, Latin America showed an increase in access and coverage of infrastructure services. By and large, access to drinking water³ has increased in the countries in the region under analysis, growing more in some than in others (UNICEF and WHO, 2017). Chart 1 displays this information. According to Graph A, Mexico and Peru were the best performers. Treated water coverage was the lowest in the early 1990s, with nearly 82% and 75%, respectively, and reached around 95% and 85% in 2015. On the other hand, Colombia stands out for its lack of progress in this area. Indeed, its change has been minimal, from approximately 88% to circa 91% over the same period. When comparing with Asian countries, in general, these countries have converged toward universal drinking water coverage faster. Among the analyzed countries, China lagged behind. The percentage of its population with access to treated water was below 70%. However, in 2015, the country had a coverage of around 94%, which means a great improvement.

1 Infralatam is an initiative of the Economic Commission for Latin America (ECLAC), the Inter-American Development Bank (IDB) and the Development Bank of Latin America (CAF) to gather information about public and private investment in infrastructure. For further information, please visit: <http://infralatam.info/>

2 Not all countries have information available for the indicators studied. Thus, the set of countries presented will vary in some cases.

3 The Joint Monitoring Programme (JMP) of the United Nations International Children's Emergency Fund (UNICEF) and the World Health Organization (WHO) define drinking water as the water used by households for drinking, cooking, personal hygiene, and other domestic uses. A person has access to drinking water if its source is less than one kilometer away from the place of use; each household member can obtain at least 20 liters in a reliable way. For further information, please visit: https://www.who.int/water_sanitation_health/mdgl/es/

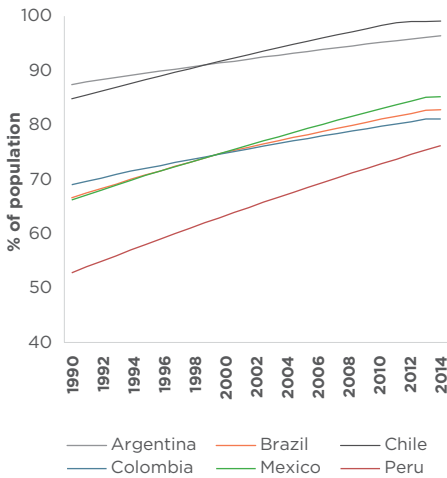
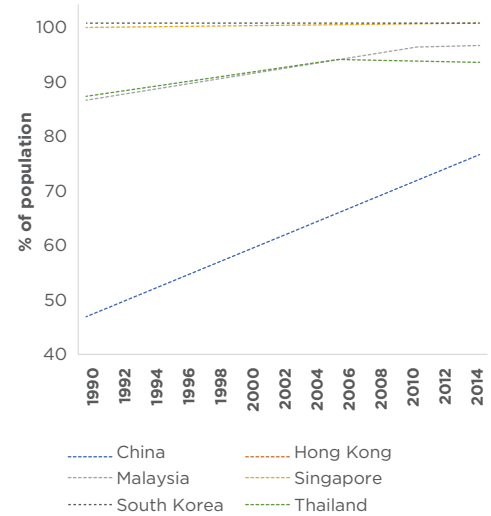
CHART 1. Access to Drinking Water in Selected Countries, 1990-2015

Source: Authors' elaboration based on World Bank data (2019).

Despite the evident progress, aggregate figures mask existing differences between urban and rural areas (CAF, 2018). At a global level, it is estimated that 55% of rural population has access to safely managed drinking water services compared to 85% of the urban population (UNICEF and WHO, 2017). This evidences that it is still necessary to close the existing gap in terms of access to this service, especially in these areas. Governance and efficient resource management issues at a local level partially explain the lack of development in the rural areas of Latin American countries (Castro, 2019). Consequently, the improvement of these processes must be a priority to achieve broader coverage.

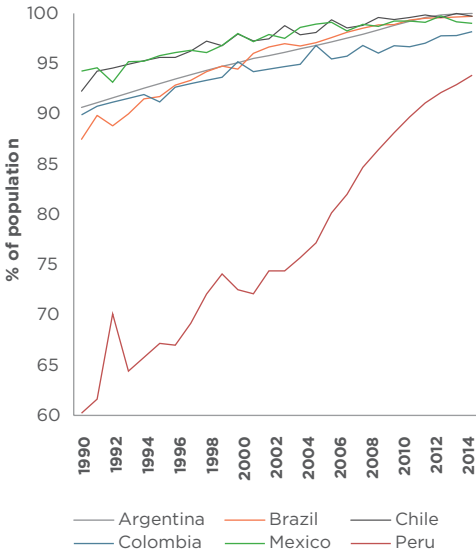
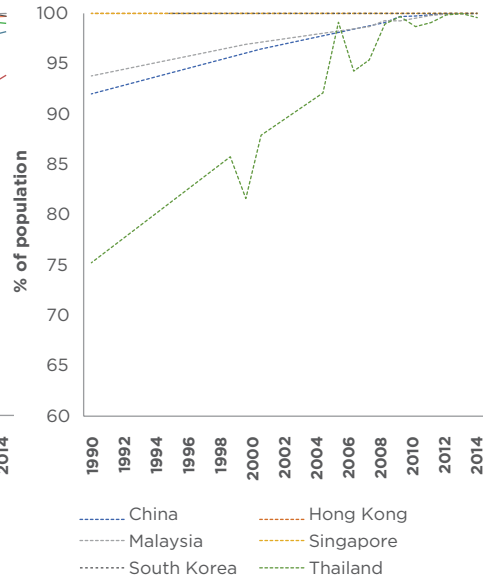
Access and coverage of sanitation⁴ services have also grown, but there is still much room for improvement (Chart 2). Particularly, figures show great differences between the countries under analysis. Argentina and Chile occupy the first place with the highest access rate above 90% of their populations. Brazil, Mexico, and Colombia come next with an average coverage of 80%. Despite a remarkable improvement, from circa 53% in 1990 to slightly over 71% in 2015, Peru still lags. In comparison, Asian countries show a higher level of coverage, except for China, whose evolution is similar to that of Peru.

⁴ The World Health Organization (WHO) defines sanitation as having access to facilities and services for the safe disposal of human waste (feces and urine), as well as having the ability to maintain hygienic conditions through services such as garbage collection and wastewater treatment and disposal (UNICEF and WHO, 2015).

CHART 2. Access to Sanitation in Selected Countries, 1990-2015**Graph A. Evolution of Access to Sanitation in Latin American countries****Graph B. Evolution of Access to Sanitation in Asian countries**

Source: Authors' elaboration based on World Bank data (2019).

After analyzing the access to electricity and Internet, some differences arise in the behaviors observed. According to Chart 3, the universal coverage in electricity is high, which suggests certain convergence in the percentage of population that manages to access this utility. In general, an adequate performance is observed for the 1990-2015 period, where Peru's evolution stands out. At the beginning of this period, Peru's access to electricity hardly reached 60%, while it was close to 93% by the end of the period. For the rest of Latin American countries, coverage varies from 97% to 100%, which shows how the development of infrastructure oriented to electricity supply in the region is one of the most advanced elements. However, when analyzing that indicator's evolution in Asian countries, a faster convergence is noted, with a curve close to 100%.

CHART 3. Access to Electricity in Selected Countries, 1990-2015**Graph A. Evolution of Access to Electricity in Latin American countries****Graph B. Evolution of Access to Electricity in Asian countries**

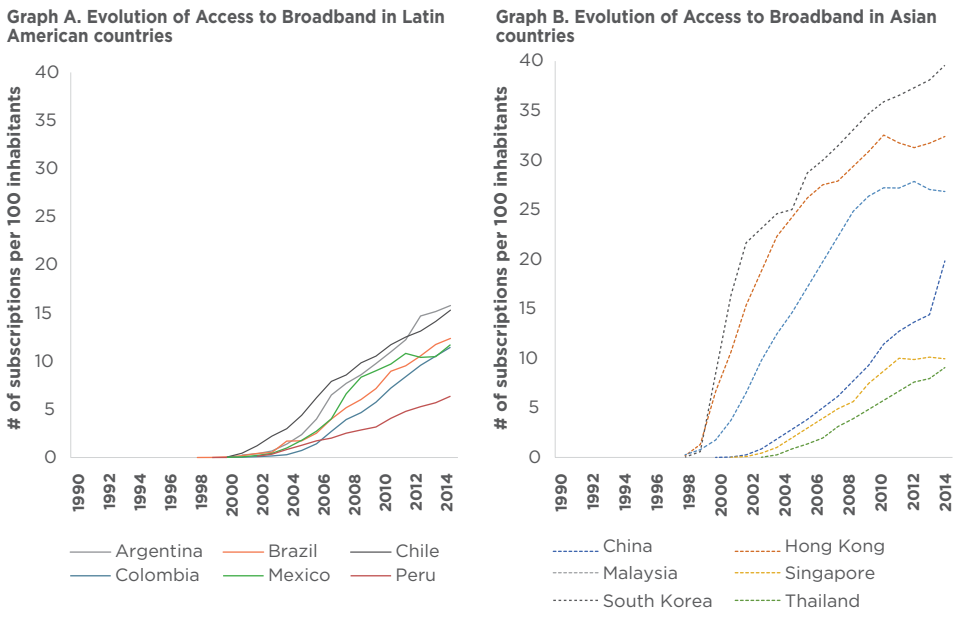
Source: Authors' elaboration based on World Bank data (2019).

Like access to drinking water, aggregate figures on the access to electricity conceal differences between rural and urban areas. According to Jiménez' study (2016), which analyzes the access to electricity⁵ of people in rural areas in 16 Latin American countries, this situation worsens for lower-income countries as electricity coverage in rural areas hardly reaches 55% of the lowest-income earners. The main access barrier is related to location and, to a lesser extent, income, which also partially explains such insufficient coverage. As an additional element to reach such universal coverage, private sector participation in the investment processes and in energy development should be encouraged, especially on renewable energies, due to the cost reduction they represent (Panos, Densing, and Volkart, 2016). In Asian countries, the emphasis on developing small-scale technology for renewable energy supply has helped the region improve its coverage indicator and reach a higher development (Sovacool and Drupady, 2016). In this sense, Latin America could also benefit from this type of technology based on renewable sources to increase electricity access in remote and rural areas.

5 The countries under study are: Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Peru, Paraguay, El Salvador, and Uruguay.

Broadband access is a bit different. Chart 4 shows the existing gaps between the Latin American and Asian countries under analysis. Specifically, in Latin America, 12 out of 100 people have a subscription to fixed broadband on average. While Argentina and Chile are the countries with the highest number of subscribers (nearly 15 out of 100 inhabitants), Peru is the country with the lowest number (8 out of 100). On the contrary, broadband use rose faster in Asian countries: the number of subscriptions per 100 inhabitants is approximately 39 and 28 in South Korea and Singapore, respectively, while Malaysia and Thailand resemble Latin American countries.

CHART 4. Subscription to Fixed Broadband per 100 Inhabitants in the Selected Countries, 1990-2015



Source: Authors' elaboration based on World Bank data (2019).

Despite the evident growth in broadband coverage, the region's levels remain low compared to some emerging Asian countries. There are several underlying reasons: i) low household income, device costs, and service fees; ii) a fragile infrastructure, the lack of digital education and distrust; and iii) policies, taxes, and operational barriers (West, 2015). Thus, ensuring competition in providing such services in the region is important to encourage other players to enter the market. Likewise, it is essential to increase Internet access in rural areas and promote greater interaction among countries.

In summary, the region has improved its coverage and access to water, sanitation, electricity, and Internet infrastructure. The advance has been remarkable, but it is still necessary to promote more investment and development processes that connect a higher part of the population to these

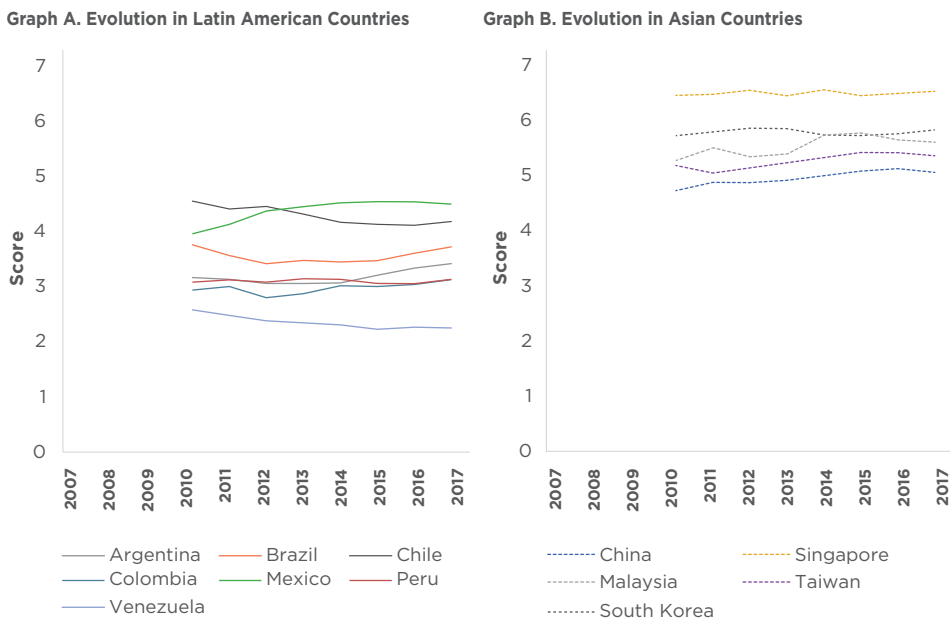
services. Therefore, it is vital to include rural populations while coordinating the development processes. These populations are the ones most affected by the issues related to the provision of infrastructure. We will discuss quality-related aspects of such services below. After this analysis, we will consider additional services, such as telecommunications, roads, and ports.

2.2. Quality

In terms of quality, the region poses the most significant challenges. Progress in coverage has been outstanding, and its quality has also improved; however, there is still a lot to be done, especially regarding quality. To study these behaviors, we used available data up to 2017 by the World Economic Forum. In particular, we used the quality indicators of roads (transportation), electricity, telecommunications, and ports. On this scale, 1 means extremely poor quality and 7, extremely good.

Chart 5 shows the road indicator's evolution, with little convergence and lower quality for the Latin American countries. Comparatively, this chart highlights the higher quality of roads in Asian countries: it reaches more than 5 in the countries under analysis, while it is under 4 in Latin American countries, except for Chile that gets between 4 and 4.5. Despite investment has leaned toward this sector (Lardé, 2016; Garemo *et al.*, 2018), data shows that it is necessary to encourage the provision and allocation of resources for road development and maintenance in Latin America.

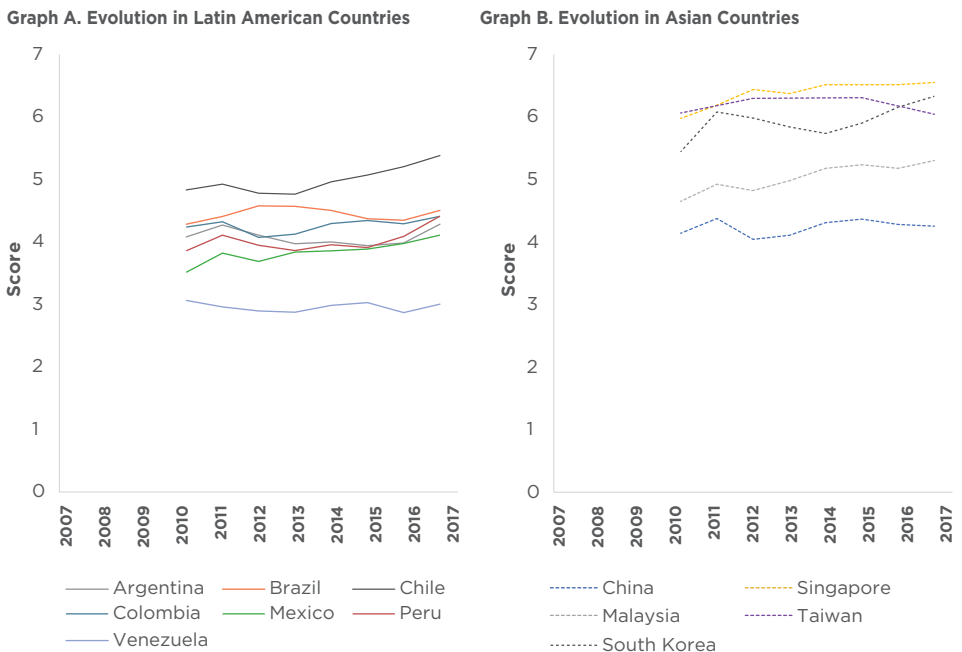
CHART 5. Road Quality in Selected Countries, 2007-2017



Source: Authors' elaboration based on World Economic Forum data (2019).

The quality of electricity and telephony services is hugely different from one country to another in Latin America. According to Chart 6, Chile is the country with the best quality in the region, with a rate of approximately 5.5. Argentina, Brazil, and Colombia share the same score of 4.4. Argentina and Brazil stand out for their reductions in the quality score obtained between 2012 and 2015, while Colombia has experienced an upward trend in the 2012-2017 period. Finally, within the countries under analysis, Venezuela has the poorest quality in the provision of electricity and telephony, with a score of 3. Even though some of these countries improved, their common feature is their low increase in quality. As it can be observed, the change between 2010 and 2017 has been minimal. This highlights the need to continue promoting development and the provision of infrastructure for electricity.

CHART 6. Electricity and Telephony Quality in the Selected Countries, 2007-2017



Source: Authors' elaboration based on World Economic Forum data (2019).

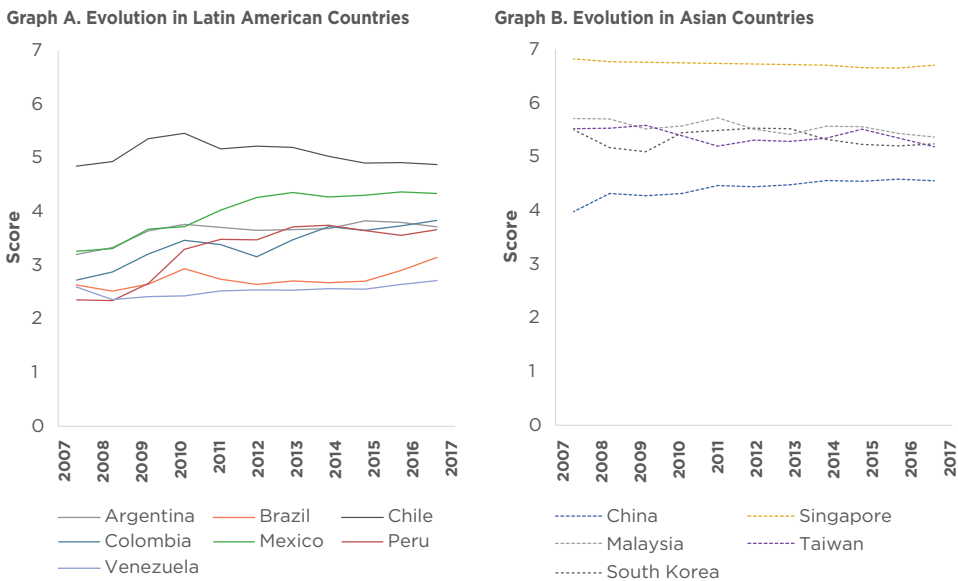
Regulation and governance of the electricity industry are the main reasons for the lack of notable improvements in this sector. De Halleux, Estache, and Serebrisky (2018) emphasize that the failure in developing regulatory capacity has prevented this industry's strengthening.

Ports are another essential infrastructure for economic activity. In Latin America, port efficiency has improved, with a positive relationship between port efficiency and private sector operators (Serebrisky *et al.*, 2016). However, despite the positive contribution of letting private players run port operations,

quality continues to be a vital aspect to be strengthened. As shown in Chart 7, the region is characterized by low quality. Indeed, Argentina, Colombia, Brazil, and Venezuela are below a score of 4, while Chile is the only country under analysis that surpasses that score. Colombia's behavior stands out; it has improved considerably since 2010 surpassing the rest of the countries. It went from a score of 2.9 in 2007 to 3.8 in 2017.

Comparatively, Asian countries show better quality in their port infrastructure, partially due to the investment processes they have implemented to reduce the transportation costs associated with low efficiency in ports (Abe and Wilson, 2009). Therefore, it is essential to consolidate integrated transportation structures that facilitate port traffic logistics to enhance the quality of port infrastructure in Latin American countries. This will help strengthen the relationship between the public and private sectors (Wilmsmeier and Monios, 2016).

CHART 7. Port Quality in Selected Countries, 2007-2017



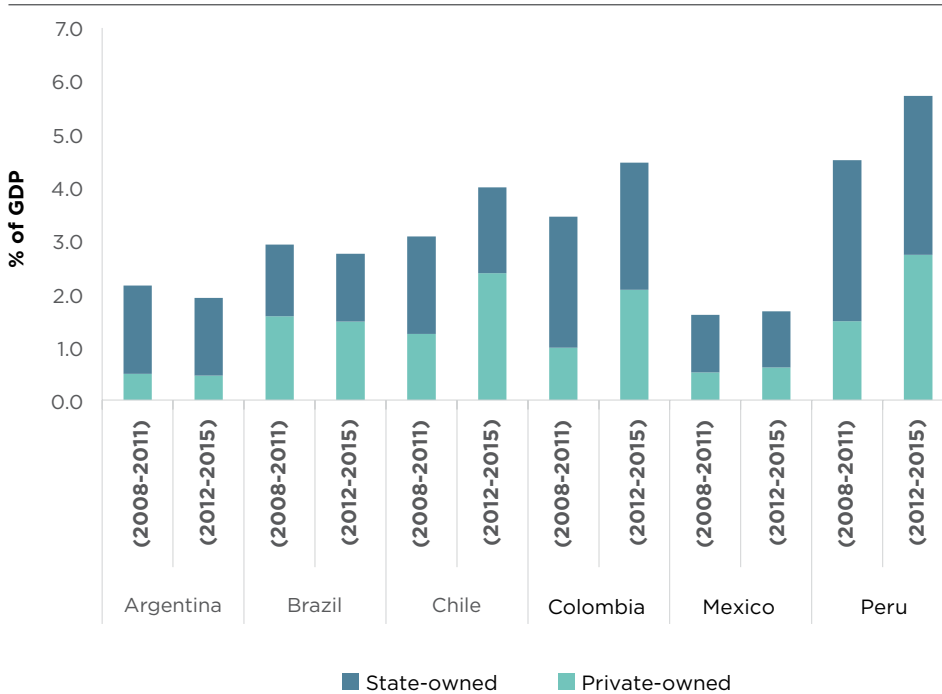
Source: Authors' elaboration based on World Economic Forum data (2019).

Thus, the evolution of the quality indicators for the infrastructure categories under analysis shows that little progress has been made and that it is important to continue strengthening their operation, and not just increasing coverage. The lack of convergence with the levels reached by Asian countries highlights the need to implement better investment processes to ensure further development. Better roads, electricity, communication networks, and ports, among other infrastructure categories, favor productive activity and progress in the region by reducing transaction costs and increasing efficiency.

2.3. Public and private investment

The prevailing need to increase investment in infrastructure has characterized Latin America. Despite the mentioned increases in coverage, underinvestment was recorded from 1992 to 2013; i.e., from 2.4% to 2.7% of GDP on average, compared with a 7.7% in East Asia and Pacific, 4% in Central Asia, and 6.9% in the Middle East and North Africa (Fay *et al.*, 2017). Additionally, the composition of infrastructure investment is mostly public, although there has been an increase in private participation in recent years (Serebrisky *et al.*, 2015; CAF, 2019; Fay *et al.*, 2017). Part of this increase is related to Public-Private Partnerships. This scheme has been consolidating in the region as one of the ways to improve infrastructure provision and development. Therefore, we discuss below the particularities of investment evolution in Argentina, Brazil, Chile, Colombia, Mexico, and Peru using the latest data reported by Infralatam.

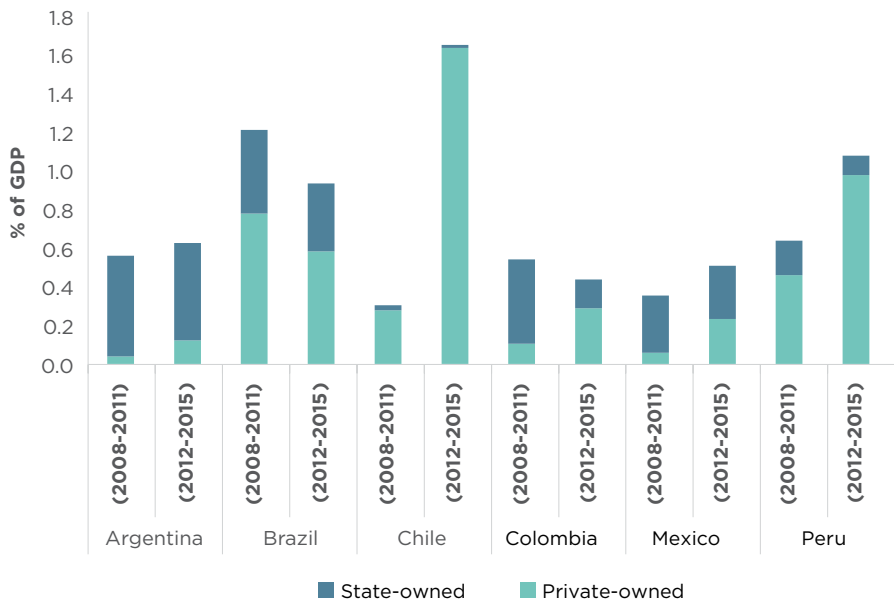
Chart 8 shows the average total investment in infrastructure for the periods 2008-2011 and 2012-2015. Private and public industries are segregated for each period to identify how investment has increased or decreased per funding source. It also shows that Chile, Colombia, Peru, and Mexico, to a lesser extent, have increased their investment in infrastructure as a share of GDP. The increase of one percentage point –on average– in the first three countries above is particularly noticeable. In figures, Chile grew from 3.07% to 4.01%. Colombia rose from 3.46% to 4.46%, and Peru from 4.51% to 5.73%, the latter being the country that grew the most. It is also clear that such an increase was partially due to the private sector's higher participation, which grew in proportion to total investment. This fact evidences the reconfiguration of the infrastructure development processes that have been occurring in the region. On the other hand, in Argentina and Brazil, the investment average decreased. We may infer this is due to the economic, political, and social situation that both countries have experienced in recent years.

CHART 8. Total Investment in Infrastructure

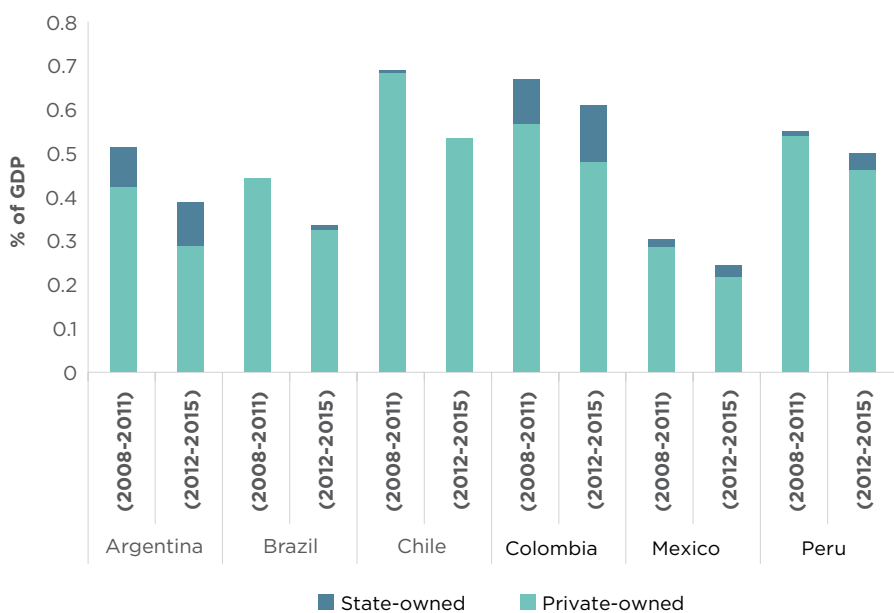
Source: Authors' elaboration based on Infralatom data (2019). Last access: September 2019.

The analysis of the evolution of total investment in infrastructure shows that the increase has been slow and, in some cases, minimum for each country's needs. When disaggregated by type of infrastructure, the behavior is similar; but public and private participation vary according to the sector under analysis. For instance, private participation in energy and telecommunications has always been higher than in other sectors.

Chart 9 shows that private participation in the energy sector has prevailed in all the countries, except for Argentina. The private participation growth in Chile, Colombia, Mexico, and Peru is also notable if compared to Brazil's reduced level of investments. Chart 10 shows the share of telecommunications investment, including fixed and mobile telephony, data, and Internet. In this case, given the nature of the sector, it is evident how private participation is the highest in every country, just with a low public investment share. Competition issues have influenced this sector's development because – despite the improvements observed – there are still monopolistic structures that have prevented further progress (Andrés, Schwartz, and Guasch, 2015).

CHART 9. Energy Investment in Latin American Countries

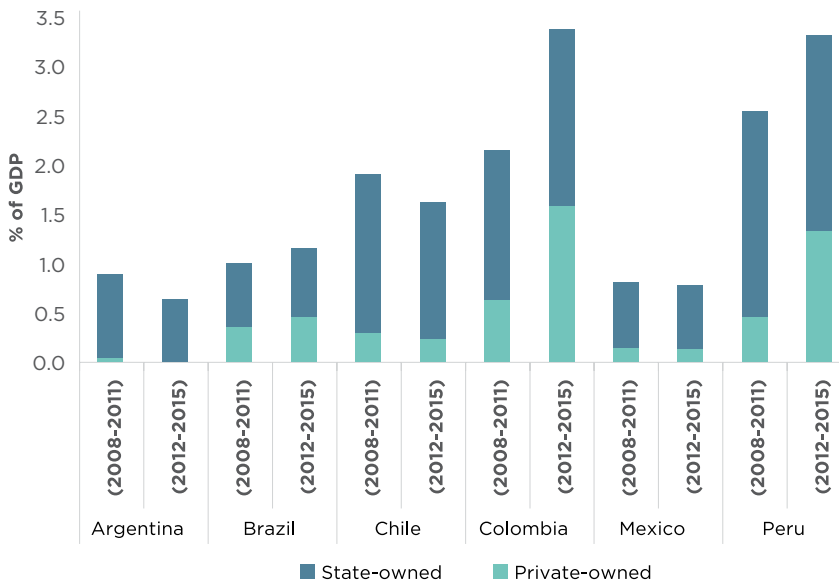
Source: Authors' elaboration based on Infralatam data (2019). Last access: September 2019.

CHART 10. Telecommunication Investment in Latin American Countries

Source: Authors' elaboration based on Infralatam data (2019). Last access: September 2019.

Transportation is the sector that accumulates the highest investment spending in comparison with other industries. Chart 11 shows its evolution. Colombia stands out with the highest investment in this area, growing from an average of 2.12% in 2008-2011 to 3.32% in 2012-2015. Similarly, Peru records a significant increase, from 2.5% to 3.26%. Instead, in Brazil, the change was minimal, i.e., from 0.99% to 1.13%. When analyzing the investment composition, private participation increased on average from 28% to 45% in total transportation investment in the three cases above. On the contrary, investment in transportation infrastructure shrank in Argentina, Chile, and Mexico.

CHART 11. Investment in Transportation



Note: It comprises land, air, river and maritime transportation.

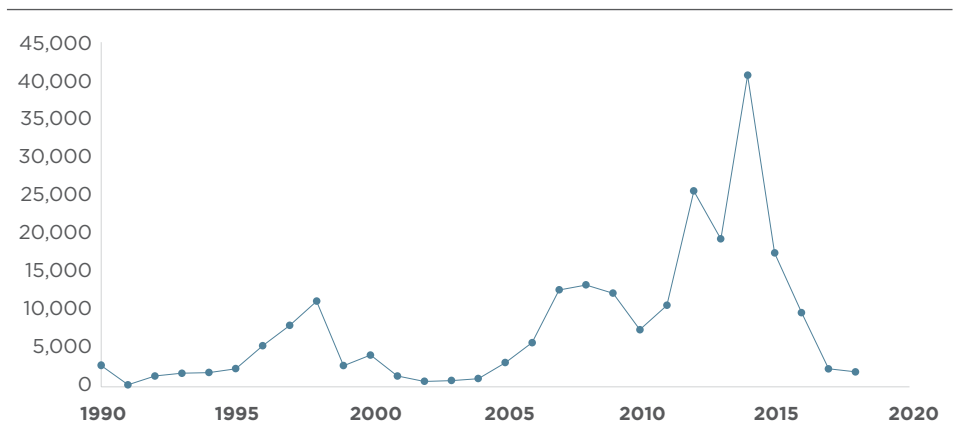
Source: Authors' elaboration based on Infralatom data (2019). Last access: September 2019.

Based on this diagnosis, it is possible to note how the region continues to pose significant challenges to improve infrastructure services' access and quality despite the progress made in recent years. Such challenges require increased investment and more efficient spending, e.g., through policies that ensure the maintenance and better use of the existing infrastructure. As Fay *et al.* (2017) state, concluding that each country must allocate between 4% and 5% of its GDP to infrastructure investment is insufficient. In fact, it is important to set clear goals so that policymakers know which are their countries' needs. (Fay *et al.*, 2017). Besides, it is essential to consolidate the State's regulatory capacity to ensure better infrastructure services that drive a higher economic and social development in the region. We will analyze to what degree the actions related to Public-Private Partnerships may help achieve the mentioned goal.

3. Public-Private Partnerships in Latin America: advantages and challenges⁶

Public-Private Partnerships –also known as PPPs or concessions– have been an alternative used by the countries in the region to tackle the transportation infrastructure deficit and the maintenance issue. Since their inception in the early 1990s, these schemes have succeeded and failed. Some countries, such as Colombia and Mexico, have learned from past mistakes and have developed new generations of Public-Private Partnerships that reduce or resolve their problems. However, the crisis that started in Brazil with the *Lava Jato*⁷ case and extended to several Latin American countries, such as the Odebrecht case⁸, led to a drastic reduction in the number and amount of projects (see Chart 12). This chart shows the value of these investments in the transportation sector and their variations during the last 30 years in Latin American and Caribbean countries recorded in the Public-Private Infrastructure Advisory Facility (PPIAF) database.⁹

CHART 12. Amount of Public-Private Partnerships' Investments in the Transportation Sector (in million USD)



Source: Authors' elaboration based on data processed by PPIAF. Accessed on June 2018.

6 Eduardo Engel (Department of Economics, University of Chile), Ronald Fischer (Department of Industrial Engineering, University of Chile, and the Complex Engineering Systems Institute), and Alexander Galetovic (School of Government, Universidad Adolfo Ibáñez, and Hoover Institution) have prepared this Section. R. Fischer thanks the financial support received from the Complex Engineering Systems Institute, the Chilean Commission for Scientific and Technological Research Institute - Research Associate Program-FB0816, and the Millennium Institute for Research in Market Imperfections and Public Policy - Complex Engineering Systems Institute 50002.

7 Name in Portuguese given to the money-laundering operation carried out in Brazil that resulted in the largest corruption investigation in the country's history.

8 Brazilian construction company investigated for bribing officials from various Latin American countries to win multimillionaire contracts for infrastructure works.

9 These data do not include Chile as it is not part of the group of middle-income Latin American countries considered by the database.

Under the Public-Private Partnership scheme, total investment in toll highways, airports, ports, and railways reached USD 228 billion between 1990 and June 2018. In addition, works related to drinking water, sewage, and wastewater treatment systems were also conducted for about USD 21 billion under this same method. Finally, if we also consider the investment in electrical projects, the figure is more than double, reaching USD 549 billion in that period.

3.1. Advantages of Public-Private Partnership schemes

The political economy turns investment in large infrastructure projects, especially in the transportation sector, into a tangible result of the different governments. This means that an effective policy of projects in infrastructure benefits the politicians in office. It is one of the incentives for the governments to allocate resources to these projects, especially when it is certain that they will be completed by the end of their mandates.

However, sometimes, it is difficult for Latin American countries to invest in infrastructure projects due to their tax restrictions. In this context, Public-Private Partnerships appear as a new business model where the private sector provides the desired infrastructure with a private company's efficiency. The efficiency argument to defend projects with the Public-Private Partnerships scheme may be tempting for governments. However, their real motivation is to expand their fiscal space.

According to Engel, Fischer, and Galetovic (2014), this strategy may favor the government in office but at the cost of future fiscal balances. Public-Private Partnerships do not release resources from the intertemporal fiscal budget, even when they charge for users' rights and do not involve direct payments from the State.¹⁰

This is evident in the case of Public-Private Partnerships that do not include charges to users but are financed by payments from the State, as this obligation is not different from a State loan, except for how tax accounting formally operates. For those projects that are financed with charges paid by users, a similar logic applies: the State could have developed the same project and collected the same revenue as the private sector. Any contribution made by the State when entering into a Public-Private Partnership contract could have been recovered from the charges collected. Another logic must support the arguments to defend a Public-Private Partnership other than expanding the budgetary fiscal space.

In some cases, the countries choose Public-Private Partnerships for ideological reasons, believing that private companies may be more efficient than State-owned companies in the construction, operation, and maintenance of works. The problem with this reasoning is that, even when the State builds huge infrastructure projects on its own, it hires private companies; thus, no advantages are present in this dimension. Furthermore, as we will see below, Public-Private Partnerships require a more sophisticated

¹⁰ Many of the arguments in this paper have been obtained from Engel *et al.* (2014) and, to avoid repetitions, they are included without reference to the authors.

institutional framework than public works, so the State's role is critical in this type of contract.

A valid argument for Public-Private Partnerships raised by Hart (2003) sustains that as the concessionaire is responsible for the work until contract expiration, it will try to minimize the total investment, maintenance, and operation costs (*bundling*). In State-built projects, the private contractor only has incentives for reducing construction costs. This means that the State project should have higher costs in a period equivalent to that of the Public-Private Partnership contract because the private contractor does not internalize other works' costs.

The advantage of the Public-Private Partnership scheme regarding infrastructure maintenance is certainly positive, especially in the transportation industry. Because the concessionaire is responsible for the total costs throughout the concession contract, maintenance will be regular and continuous. For this to happen, it is necessary to monitor the condition of the works because the concessionaire has incentives to lower costs by reducing services' quality. When users finance the project by paying tolls, works are kept in good condition to avoid users' claims for poor maintenance and consequential political effects.

Another advantage of Public-Private Partnership projects is that they are usually ready for operation earlier than State-built projects. The reason is that the concessionaire starts collecting payment only when the project becomes operative (particularly for projects financed by charges applied to users). For instance, Raisbeck, Dufeld, and Xu (2010) compare 21 transportation projects conducted through Public-Private Partnerships in 31 traditional projects in Australia, and conclude that 3.4% of these projects were completed before the agreed date, while traditional projects lasted 23.4% longer than stipulated.¹¹

Public-Private Partnerships offer three additional theoretical advantages. Two of them are only valid for projects financed by users' fees. First, they filter "white elephant" projects because if a project is not profitable for private investors, no one will be interested in executing it. Second, collecting money directly from users results in resource savings. In State-financed projects, there are costs related to the State's rigidity to use resources, and there may be corruption associated with such resources. The third advantage has to do with how Public-Private Partnerships afford the projects. In this case, the *project finance* method is applied whereby financial institutions are responsible for the direct monitoring of the construction progress. These institutions receive better incentives than those received under the State's surveillance.

It is obvious that the Public-Private Partnership scheme offers advantages over similar projects built under traditional methods. However, this method implies complex, rigid and long-term contracts. Such increased complexity translates into a higher potential for conflict. In some countries in the region, there have been several generations of Public-Private Partnerships due to the failure of previous programs. Each generation brings along modified laws, and procedures and this evolution shows better results each time.

11 In contrast, the National Audit Office (2009) that compares Public-Private Partnerships' and non-Public-Private Partnerships' projects in the United Kingdom does not find significant differences in projects' delivery dates.

3.2. About the types of contracts

Public-Private Partnerships may be divided into those fully or almost fully financed by State resources and those in which a significant part of the financing comes from users. In the former case, the uncertainty about the project's future demand reflects its dimensioning (size, number of users to be served, etc.). Still, such uncertainty does not affect the private party once the bidding process has been completed. The risks for private players are the investment, maintenance, and operation costs. In these cases, the appropriate Public-Private Partnership contract is the so-called availability contract. The concessionaire is compensated for its investment plus the project's operative and maintenance costs, subject to the demand. If the service quality does not meet the agreed standards, payment reductions apply as concessionaire punishment. This type of contract has been used in the United Kingdom to build hospitals and schools since the 1990s. Upon eliminating the demand risk, the concessionaire can reduce the costs of the contract life cycle, subject to meeting the quality levels established in said contract.

In the second type of contract, the project receives a significant part of its resources from the fees paid by users. Suppose the project demand may be affected by the concessionaire (i.e., it is endogenous). In that case, it is convenient to have a fixed-term contract and a fee that results from the competitive bid process. This usually occurs in port-related projects. Consequently, in this type of contract, the concessionaire has an incentive to endeavor to increase the project demand. However, if the demand is not affected by the concessionaire (i.e., it is exogenous), this type of contract is not adequate but is commonly used. Indeed, in this case, the contract price for the private investor depends on the actual demand, which poses a non-controllable risk because the demand fluctuates exogenously. A fixed-term contract introduces the risk of not generating enough revenue during the concession. This risk will fully reflect on the concessionaire's costs because it cannot do anything against this risk, unlike the endogenous demand. Thus, the return claimed by private bidders is higher than what it is strictly required. This fact increases the project costs and, hence, the fees that users will eventually pay. In these cases, it is appropriate to use the Present Value of Revenue, where bidders compete based on the lowest present value of revenue from the Public-Private Partnership. The concession contract ends when the revenue requested by the awarded bidder is collected. This limits or eliminates the risk faced by concessionaires when they cannot encumber road service demand. If the demand is endogenous, as in ports, the incentives to attract demand in a Present-Value-of-Revenue contract are lower than in a fixed-term contract because the contract term is reduced automatically until the requested amount is obtained.¹²

Present-Value-of-Revenue contracts are particularly suitable for roads

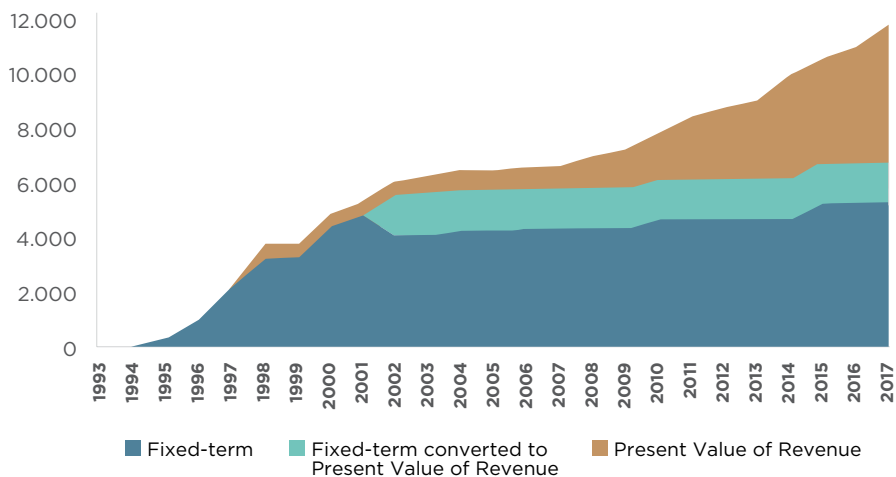
¹² A crucial issue is to determine the appropriate rate to discount contract revenue. A possibility is using the State fund cost plus a correction factor for the business risk. Another alternative is to use the same rate but at a floating or variable value similar to the State fund costs for each year plus the risk factor. If the contract rate is much higher than the one appropriate to the business, the concessionaire has incentives to extend the concession.

since quality can be easily checked and audited by users. Almost every road in Latin American countries face exogenous demand given the difficulties to execute new roads. This is also applicable to airports when they cannot compete to attract airlines.

An additional advantage of this Present-Value-of-Revenue mechanism, in the case of urban highways, is that it is possible to modify the toll collected, which allows to adapt it to the congestion levels. In a fixed-term Public-Private Partnership contract, raising the fee to face the concession benefits the concessionaire. This is complex from a political economy perspective. In the case of Present-Value-of-Revenue contracts, the effect of raising the fee upon higher congestion is just reducing the concession duration without altering its economic value.

Even though fixed-term Public-Private Partnership contracts prevailed in Chile, in the early 2000s, the Present-Value-of-Revenue contracts have become the standard for airport and road works since 2007.¹⁵ This is clear in Chart 12, where the aggregate investment in fixed-term and Present-Value-of-Revenue contracts are represented. The third type of concession that started as fixed-term and became Present-Value-of-Revenue after a renegotiation appears in turquoise between both types of contract.

CHART 13. Value of Present-Value-of- Revenue Contracts in Chile (in million USD)



Source: Engel, Fischer, and Galetovic (2020).

¹⁵ Concessions with a variable duration have also been used in Colombia, United Kingdom, and Portugal.

Although companies initially considered it difficult to finance projects with Present-Value-of-Revenue contracts because they do not have a fixed term for debt repayment, this has not been the case. In fact, they offer higher payment security than fixed-term contracts, and the payment in advance is not associated with reductions in the interest rates. Usually, this is a moral risk concern in standard contracts that allows for a prepayment (Engel, Fischer, Galetovic, and Soto, 2019). Present-Value-of-Revenue contracts are standard practice in Chile and do not find difficulties for project financing. This is shown in Chart 12, where half of the investment in concessions has been through Present-Value-of-Revenue contracts.

3.3. The renegotiation issue

Private-Public Partnerships should be awarded by competitive processes as they reduce the risk of corruption and society's costs. The economic theory assumes that the outcome of a competitive tender will be close to the one that would exist under competition. In the case of infrastructure Private-Public Partnerships, this means that the consideration requested by the awarded company is close to the cost of construction, operation, and maintenance, plus repayment of the capital involved, adjusted by the business risk.

However, certain events make it necessary to renegotiate the concessions in a long-term relationship. In the absence of an efficient institutional framework to resolve the differences that might arise, a bilateral negotiation between the parties offers the concessionaire a positive and higher return than the competitive option. This is what Williamson (1976) calls the fundamental transformation. Table 1 shows the number and amount of renegotiations in some Latin American countries. It shows that contract renegotiations have been significant in all three countries, but especially in Colombia, where they are almost ten times greater during the construction stage. This provides competitive advantages to companies that are particularly skilled in handling negotiations with the State than those with technical strengths.¹⁴

¹⁴ Besides, the potentially "easy" contract renegotiations eliminate the advantage of self-sustained Private-Public Partnerships as a filter for "white elephant" projects.

TABLE 1. Road Renegotiations under the Private-Public Partnership Scheme in Latin America

| | Chile | Colombia | Peru |
|---|-------|----------|-------|
| Number | 20 | 25 | 14 |
| Average initial investment (in million USD) | 255.8 | 263.2 | 166.3 |
| Initial contract duration (years) | 25.4 | 16.7 | 23.2 |
| Private-Public Partnerships - average years of existence | 12.7 | 9.0 | 3.8 |
| Number of renegotiations | 58 | 430 | 47 |
| Number of renegotiations during construction | 31 | 218 | 33 |
| Average construction renegotiation/Average initial investment | 7.5 | 41.3 | 9.0 |
| Average renegotiation/Average initial investment (%) | 16.5 | 85.1 | 13.7 |
| Weighted average renegotiation of initial investment yearly (%) | 1.1 | 14.9 | 5.8 |
| Duration increase (years) | 0.9 | 5.3 | 0.1 |

Source: Engel, Fischer, and Galetovic (2019) with data from Bitrán *et al.* (2013).

As regards the type of renegotiations, they may be divided into legitimate and illegitimate. The former occurs due to events that were not easy to predict upon contract drafting. For instance, when the demand grows more than projected, it is necessary to extend the road before the contract ends. As potential future events are too many, not all of them may be considered into a Private-Public Partnership contract. Therefore, modifying the contract under these circumstances is legitimate. However, it is essential to have an efficient and equitable resolution system in place that does not increase the project's profitability when these events occur.

Renegotiations may be called illegitimate when they relate to predictable events (e.g., construction aspects) or when one of the parties to the contract wishes to modify it in its favor. This is observed in Chile (Table 2), and also in Brazil. De Castro e Silva Neto, Oliveira Cruz, and Miranda Sarmiento (2018) show that in the 42 cases studied in Brazil, the first contract renegotiation occurred before the third year of the Private-Public Partnership contract, i.e., during the construction phase. Another example of illegitimate renegotiation is when the contract is modified to incorporate works that were not part of the original design, such as adding roads in Colombia or rainwater pipes in Chile. Another case of illegitimate renegotiations occurs when such renegotiations intend to rescue the concessionaire, as it happened with the first generation of concessions in Mexico during the 1990s.

Considering the relevance that renegotiations may have on companies' profitability, the bidding process is altered, and companies are ready to tender at a price lower than the costs, as long as they can assure the concession if

they know they can renegotiate it. As the outcomes of renegotiations benefit companies with a higher capacity to renegotiate contracts, these are the skills favored by the entities that participate in the Private-Public Partnership bidding processes. This has two effects: bid competition is reduced because companies that are not skilled in renegotiations prefer not to participate, and the contract integrity weakens (Guasch, Laffont, and Straub, 2002).

Apart from dispute resolution mechanisms, transparency is a way of limiting renegotiations. It would also be important to publish every contract detail and amendments on a project website to determine the renegotiations' responsible parties, the contract price for private investors, and other aspects that make it more difficult for State's negotiators to be lenient with private stakeholders. Otherwise, expropriation is the only alternative. Illegitimate renegotiations may also be limited by making them automatically less profitable, such as stipulating that extensions and new works should be tendered under conditions monitored by the regulatory authority. The reform of the Concession Act of 2010 in Chile included measures such as reducing the relevance of renegotiations. As shown in Table 2, extracted from Engel *et al.* (2020), the effect of the new law has been remarkable in reducing renegotiations.

TABLE 2. Renegotiations in Chile before and after the 2010 Reform

| | Roads | | Transportation | |
|------------------------|----------------|-------------------|----------------|-------------------|
| | Renegotiations | | Renegotiations | |
| | No. | (% of investment) | No. | (% of investment) |
| Before the 2010 reform | 29 | 26.1% | 44 | 27.6% |
| After the 2010 reform | 15 | 0.7% | 25 | 0.9% |

Source: Engel *et al.* (2020).

Projects to be bid should include sufficient design specifications to avoid disputes arising from the omissions of significant aspects when proceeding to the detail design phase. Projects should also exclude those risks that private investors can hardly afford. Environmental and expropriation issues pose the highest construction risks to projects. Thus, projects should be bid after having conducted environmental studies, and the State should be responsible for expropriating the lands where the project will be executed. These measures may mitigate a risk that may lead to contract renegotiations.

Again, two of the three contracting mechanisms suggested in the previous section offer an advantage in renegotiations: i.e., the availability and the Present-Value-of-Revenue contracts. Indeed, an alternative to renegotiation is the contract repurchase, which is easy in both cases. Under an availability contract, you should only pay for the discounted value necessary to setoff the investment costs. In the case of a present value contract, repurchase means paying what was left to be collected minus the operation and maintenance

cost during the remaining term of the contract, a value per vehicle that should be defined in the contract.¹⁵ On the other hand, with a fixed-term contract, future demand is unknown, so there will be disputes over the repurchase value and the saving amount in operation and maintenance costs upon early termination of the concession.

There is evidence on the reduction of renegotiation amounts in Present-Value-of-Revenue contracts, as shown by Table 3, obtained from Engel *et al.* (2020). Tables 2 and 3 suggest that the amendments that limit profits in renegotiations (Private-Public Partnership Act reform of 2010) coupled with the use of Present-Value-of-Revenue contracts, lead to a significant reduction in the number and amounts of renegotiated contracts. It is impossible to draw causal conclusions from this evidence on the effect of each of these factors as fixed-term and Present-Value-of-Revenue contracts have not been used concurrently. However, a significant reduction in the renegotiations as a result of both amendments, and their theoretical basis, suggest that this combination of policies should be considered in other countries.

TABLE 3. Renegotiations of Fixed-term and Present-Value-of-Revenue Contracts in Chile

| Period considered | Fixed-term | | Present Value of Revenue | |
|---|------------|-----------------------|--------------------------|-----------------------|
| | No. | % of average renegot. | No. | % of average renegot. |
| Construction | 20 | 32.0% | 15 | 3.6% |
| First 8 years of operation | 20 | 25.2% | 15 | 2.5% |
| Total (construction + 8 years of operation) | 20 | 57.2% | 15 | 6.1% |

Note: The table uses the first eight years of operation because Present-Value-of-Revenue contracts are more recent.

Source: Engel *et al.* (2020).

3.4. Rigidity of contracts

Renegotiation issues are partly due to the rigidity of Present-Value-of-Revenue contracts.¹⁶ As the private investor makes a large investment without an alternative value through a long-term contract, it demands conditions against expropriation, including regulatory expropriation. Consequently, extremely rigorous contracts are required, which is complex in the long run. Thus, one of the aspects that the regulatory authority should evaluate when deciding how to award a contract is the implied cost that represents the rigidity of Private-Public Partnership contracts. Under the traditional

¹⁵ Since the maintenance cost is almost entirely determined by the number and composition of vehicles, its value can be calculated in the repurchase amount because there is a linear relationship between what remains to be collected and those costs.

¹⁶ Please see the National Audit Office (2018), pp. 17.

construction scheme, the State is the owner and controls the infrastructure since it starts operating. Thus, it can adjust or change the operation based on the project needs. In the case of Private-Public Partnerships, flexibility does not exist. Contracts can only be modified with the consent of the private party. This aspect is often forgotten and projects in which flexibility is important may be carried out under an inadequate contract form.

As mentioned in the previous section, the Present-Value-of-Revenue method may reduce the difficulties that arise when modifying contracts and, therefore, it provides more flexibility. Indeed, when it is not possible to reach an agreement, there is the alternative to repurchase the contract at a value that does neither imply an expropriation from the concessionaire nor grants him excessive revenue. The advantage of a fair compensation is that if the concessionaire claims an excessive amount for contractual modifications, the contract may be repurchased at a fair price, which facilitates negotiations.

Finally, it is important to note that these recommendations for Private-Public Partnership contracts aim to maximize their efficiency and limit renegotiations to justified requirements (from the social point of view) call for a reasonably sophisticated state apparatus. This is necessary to avoid renegotiations and to monitor the concessionaire's fulfillment of his quality obligations or to punish him. The long term of concession contracts is one of the reasons why Private-Public Partnerships require a more developed institutional framework than traditional public works. Not only must there be an institutional framework that ensures –with a high degree of probability– that there will not be a regulatory expropriation, but also more efficient mechanisms for dispute resolution in Latin America than the civil law.

Conveniently, countries should have an institutional framework that eliminates illegitimate renegotiations and regulates legitimate ones to avoid granting extraordinary revenue to private investors. There are several alternatives, including permanent panels of experts (comprised by lawyers, economists, or engineers) responsible for determining the renegotiation legitimacy and its value, or temporary and permanent arbitration commissions. Finally, an option could combine panels of experts (lawyers, engineers and economists) that resolve any discrepancies in the sector and adhere to the law and the contracts to issue their verdicts, like in Chile.

If the institutional framework is deficient, it may be more convenient to use traditional mechanisms for an infrastructure provision, with the advantage of limiting initial contractual errors from lasting decades.

A solid institutional framework is also required to limit corruption episodes regarding the award of these contracts.¹⁷ The Odebrecht case, analyzed by Campos, Engel, Fischer, and Galetovic (2019), shows the degree of corruption that may exist in huge public works. However, there does not seem to be significant differences in corruption under Private-Public Partnerships vs. traditional construction contracts for public works.

17 Public capacities and corruption are further discussed in Chapter 6 of this book.

Many measures may limit corruption scope, though they do not eliminate the risk. Competitive project bids reduce corruption likelihood. Besides, from the risk-reduction perspective, it is convenient that the project is awarded with only one objective variable. i.e., fee, Present Value of Revenue or annual payment in availability contracts. In the Odebrecht case, it was confirmed that the evaluators of technical and financial aspects were bribed to increase the Company's score. This could have been overcome by establishing a minimum threshold instead of having a valuation influencing the award's final score. Therefore, if the purpose is to limit the room for corruption, the analysis of bidders' technical and financial scores should be an independent process by which minimum thresholds must be met.

Lastly, perhaps publicity is the most critical aspect involved throughout the awarding process and subsequent monitoring of Public-Private Partnerships. The bidding terms and conditions should be published on a public website upon the bid closing date. This should also apply to the minutes of technical assessment commissions of the proposals. Bidders' quoted price in the final stage should also be officially known. Later on, every contract modification, as well as private investors' revenue should be publicly disclosed.

4. Infrastructure governance and institutional aspects (particularly in the transportation industry)

Public investment in infrastructure, either through conventional public works arrangements or Private-Public Partnerships with state guarantees and payments, is undetached from the rest of the redistributive process to allocate the State's expenditures and taxes. If redistribution is not disclosed clearly to citizens, most influential politicians will allot infrastructure projects to their supporters. Therefore, they will inject monetary resources to the regions that receive the investment, will create jobs, and provide a tangible public service flow. Given this political encouragement for allocating funds to infrastructure, it is highly likely that these concentrated benefits may be lower than the project costs, negatively affecting the efficient use of public resources. That is why sectoral institutions' capacity to identify socially profitable projects through rigorous planning and assessment processes plays a critical role in the allocation of resources to infrastructure projects.

For instance, in the transportation industry, where it is not feasible to organize markets with decentralized prices standing for the best sequence of multimodal and heterogeneous infrastructure interventions in a country, it is crucial to organize a group of specialized institutions that resolve the issue of i) planning different transportation modes and levels consistently (national, subnational); ii) structuring projects integrally; iii) obtaining adequate financing; and iv) developing a series of types of contracts that maximize the monetary value of investments and are sustainable from the financial, social and environmental perspective. Finally, after making the investments, it is necessary to have regulatory and supervisory bodies that monitor service quality and price, and the fulfillment of the undertakings assumed by suppliers under the contracts. These topics are discussed below.

4.1. Planning

The transportation policy must serve the country's widest interests (i.e., export promotion, regional competitiveness encouragement, territorial integration). Infrastructure planning, particularly transportation, is subject to the transactional costs of public policy formation expressed by Dixit (1996): it is restricted by the country's history, social habits, collective memory, and partial leaderships with different goals. It is important to achieve the best feasible change in the correct direction, as expressed by Williamson (1996, pp. 195). This change consists of –at least– assuring the maintenance of existing assets.

Transportation planning is full of difficulties. A central planner will always be in an inferior position versus local agents with regard

to information about the project's relevance, certain costs, risks, and benefits. It does not mean that we should build a national transportation plan based on the identification of local projects because we must consider the general functionality of networks within a hierarchy of purposes. Local stakeholders should participate in the coordination of a national transportation plan. The regional projects that do not arise from regional legitimation and agreement may represent high-cost aspirations, few benefits, and much visibility.

Master transportation plans constitute the first module of an institutional consolidation process. They should be deemed as part of a high-level process to guide the decisions on the creation of a projects' portfolio. Planning must become a usual practice with increasingly in-depth studies aimed at defining measures that reduce general transportation costs and provide accessibility to regions that are disconnected or in disadvantageous conditions.

Unlike other networks (such as power transmission and distribution), it is more difficult to model and estimate the total benefits of a transportation project. Even though state-of-the-art transportation models are used, it is impossible to reduce the plan to a technocratic exercise of cost minimization in a transportation network. The diversity of interests demands incentives to align regional, private, and national objectives. The plan cannot be created as a combination of expectations and proposals discriminated by transportation mode. The project portfolio should use the cost-benefit analysis to prioritize the interventions.

The strengthening of sectoral institutions should focus on creating incentives and weights and counter-weights, spaces for understanding general expectations that facilitate the decision-making process of investments and improve transparency (CEI, 2019). Additionally, before undertaking legal reforms, a government must show that it has the political will to apply the correct solutions from an institutional perspective.

4.2. Project structuring

After establishing a prioritized list of projects within a master transportation plan, the best structuring action should be selected. In some countries, a structuring role has been assigned to a specialized institution or agency¹⁸ with broad technical skills in engineering design and project financing for concessions or Public-Private Partnerships. Sometimes, structuring capacities may also be delegated to local development banks.

As mentioned in the previous section, Latin America has made progress in implementing Public-Private Partnerships, particularly in road infrastructure. For instance, Colombia has recently reinforced in a tangible way the capacities to structure Public-Private Partnership contracts. These improvements resulted from a series of domestic institutional advances since the promulgation of Act 1506 in 2012 (CEI, 2019).

¹⁸ Examples: Proviav Nacional del Perú and the National Infrastructure Agency (*Agencia Nacional de Infraestructura, ANI*) in Colombia.

This legal instrument aligned public and private incentives to develop Public-Private Partnerships, based on the need to improve risk allocation and transfer, project structuring with a technical, legal, and financial analysis before starting the selection processes, the use of project financing, the payment for availability and the elimination of prepayments. In that sense, the new scheme implies that now the private sector is responsible for the construction, maintenance, and operation of the infrastructure, and for ensuring its performance during a 20-30 years' period. The scheme eliminates deficient practices, such as prepayments and payments subject to infrastructure availability. The Act generated an attractive environment to link investors with experience and financial background to develop large-scale projects and attract financiers with different risk profiles.

However, the Colombian scheme still has pending-improvement areas in i) land management –delays are due to a lack of regulation of community surveys and value setting–; ii) public weaknesses in environmental licensing; iii) reduction of future processing time at the Ministry of Finance; iv) the use of Public-Private Partnerships at a sub-national level supported by the national government; and v) the regulation of Public-Private Partnerships' private initiatives that may interfere with the development of the master transportation plan.

4.3. New sources of payment and financing

The sources of payment for infrastructure investment include public contributions from the State's budget (taxes), own resources, in the case of public agencies, the local transfers or taxes in territorial entities and direct charges to the infrastructure users and beneficiaries. In most countries in this region, such payment sources are not enough to finance the development of new infrastructure projects.

When the national markets for infrastructure financing are small, a concentration of concessions in a few investors may occur. That concentration increases the systemic risk of a concession program and may also lead to potential delays in the financial closing of projects.

Countries must ensure that users' charges (vehicles or fuels) are exclusively allocated to prioritized sectoral projects. They should also explore new payment sources, such as soil valuation taxes for national investments and the income from residual values of concessions (a mechanism already tested in Chile). The residual value of a concession is the current value of future cash flows that may be monetized or securitized from projects with free cash flows that are stable and generate a surplus.

In small markets, bank financing in local currency must be extended through institutional investors with a long-term profile (pension funds and insurance companies). In this regard, it is convenient to adjust the applicable financial regulation to these funds to develop the infrastructure as an *asset class*, setting the exposure limits, accounting records and valuation methodologies of such assets. Additionally, other critical aspects related to capital market

regulations should be considered to support infrastructure project financing, which includes among others: i) strengthening the regulatory framework to issue and offer securities as this would expand the supply and penetration of the fixed income market; ii) reviewing pension fund investment scheme to expand the universe of securities admitted and improve pension resource management; iii) offering reinsurance from the State that mitigates risks to promote the annuities' market. This would encourage an industry that requires investing in long-term assets; iv) reviewing the public fund management model, and v) fostering securitization processes for underlying assets.

4.4. Infrastructure regulatory aspects and governance scheme

In fact, the regulation of infrastructure services must be adapted to the characteristics of each industry. In some cases, such as electricity (e.g., generation) or telephony, regulations should seek to encourage competition *within* the market, while in others, such as some transportation industry segments with natural monopolies, competition between different markets should be stimulated, as well as consistency *among* modes. In the latter case, the existence of independent regulatory entities is vital to promote economic efficiency (e.g., monitor charges to users, provided services, quality, etc.)

In summary, the best practices in terms of task segregation and institutional scheme in infrastructure development, where the private sector may also cooperate through Public-Private Partnerships' agreements, could include: i) strategic planning and identification of projects by each industry's ministry; ii) filtering, prioritizing and coordinating initiatives by the Ministries of Finance and Planning (including the consequences about indebtedness levels); iii) a Public-Private Partnership agency that summons the private sector and designs contracts; iv) an independent regulatory agency that oversees contract fulfillment and generates information about service performance; and v) monitoring: following up of the impact in an *ex post* way (e.g., agreements between the same regulatory agency and universities).

Some countries in the region have institutional schemes in place or are proposing reforms that replicate these principles. However, we must understand that such institutional schemes are not immutable, and the countries must necessarily undergo a learning process, which perhaps must be expressly recognized since the onset of reforms, so that changes are not considered failures.

5. Conclusions

Improving the quality and dimension of the countries' infrastructure is crucial to the prosperity and well-being of society and poses a significant challenge for public policy. This challenge has been present in historical discussions about development, and it is still fully valid. Improving the current conditions of infrastructure in Latin America is a key objective. The region has made progress in the past twenty years, but there are still serious challenges to face. Although access to basic services, such as water, sanitation, electricity, telephony, and Internet connection, has improved considerably in cities, there is still a substantial gap between urban and rural areas. The transportation infrastructure, which is extremely relevant for family well-being and business productivity, is inferior to that of developed countries and even of other emerging economies. In terms of quality, deficiencies are even more noticeable. Many of these services have to deal with regular outages, acute bottlenecks, and congestion. In particular, the lack of maintenance is a serious problem that damages facilities and increases the cost of investment to repair them. In the context of tax consolidation processes, governments have set limits to investment in infrastructure, which has been partially replaced by private investment. In total, the region has invested just above 2.5% of GDP, when it should need to invest at least 3.5%-4%.

Apart from the issue of limits to public resources, the implementation of policies that promote a higher public and private investment in infrastructure face political (electoral cycle) and institutional restrictions (poor planning capacity, a public sector which is highly exposed to pressure groups) to the implementation of policies. There are a series of rules, procedures, and institutional mechanisms that help solve those problems. These cover, on the one hand, strengthening the capacity to plan and assess investment by the public sector. On the other hand, as previously mentioned, the Public-Private Partnership schemes are particularly useful to channel private resources, even though they do not fully replace public sector investment in certain critical areas that are less profitable for the private sector, but which have a high social return (e.g., water and sanitation, and tertiary roads in rural areas).

For maximum efficiency and impact of the Public-Private Partnerships, the private sector's pressure for renegotiations should be discouraged, particularly after unjustifiable commitments. This would require segregating the roles of Public-Private Partnerships' investment planning and design from contract fulfillment monitoring and follow-up. The improvements in the institutional framework (e.g., restrictions established by law or independent

councils that determine when a renegotiation is justified) may also help reduce this type of opportunistic behavior. Additionally, it could be relevant to extend the funding source options for these investments (e.g., charges for revaluations of real-estate assets or beneficial owners) and expand bank financing in local currency with institutional long-term investors, such as pension funds and insurance companies.

In the context of reduced commodity prices, which is expected to continue in the following years, the region must strengthen the national growth sources. In this context, an increased dynamism in productivity and efficiency is an essential requirement to grow at higher rates. Improvements in the dimension, quality and use of social and productive infrastructure may drive that engine of growth.

Bibliography

- Abe, K. and Wilson, J. S. (2009). *Weathering the storm: Investing in port infrastructure to lower trade costs in East Asia*. World Bank.
- Agénor, P. R. and Moreno-Dodson, B. (2006). *Public infrastructure and growth: New channels and policy implications*. World Bank.
- Agénor, P. R. (2012). “Infrastructure, public education and growth with congestion costs.” *Bulletin of Economic Research*, 64(4), 449-469.
- Andrés, L. A., Schwartz, J., and Guasch, J. L. (2013). *Uncovering the drivers of utility performance: Lessons from Latin America and the Caribbean on the role of the private sector, regulation, and governance in the power, water, and telecommunication sectors*. World Bank.
- Aschauer, D. A. (1989). “Is public expenditure productive?” *Journal of Monetary Economics*, 23(2), 177-200.
- Banal-Estañol, A., Calzada, J., and Jordana, J. (2017). “How to achieve full electrification: Lessons from Latin America.” *Energy Policy*, 108, 55-69.
- Barbero, J. A. (2019). *IDEAL 2017-2018: La infraestructura en el desarrollo de América Latina* (Executive summary). Caracas: CAF. Available at: <http://scioteca.caf.com/handle/123456789/1467>
- Bhattacharya, A., Oppenheim, J., and Stern, N. (2015). “Driving sustainable development through better infrastructure: Key elements of a transformation program.” Brookings Global Working Paper Series.
- Bhattacharya, A., Romani, M., and Stern, N. (2012). *Infrastructure for development: Meeting the challenge*. London: Centre for Climate Change Economics and Policy. Available at: www.ccecep.ac.uk/Publications/Policy/docs/PP-infraestructure-for-development-meeting-the-challenge.Pdf
- Botting, M. J., Porbeni, E. O., Joffres, M. R., Johnston, B. C., Black, R. E., and Mills, E. J. (2010). “Water and sanitation infrastructure for health: The impact of foreign aid.” *Globalization and Health*, 6(1), 12.
- CAF (2018). *IDEAL 2015-2016: La infraestructura en el desarrollo de América Latina* (Main document). Caracas: CAF. Available at: <http://scioteca.caf.com/handle/123456789/1353>
- Calderón, C. and Servén, L. (2004). *The effects of infrastructure development on growth and income distribution*. World Bank. Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/14136/WPS3400.pdf?sequence=1&isAllowed=y>
- Calderón, C. and Servén, L. (2010). *Infrastructure in Latin America*. World Bank.
- Calderón, C. and Servén, L. (2014). *Infrastructure, growth, and inequality: An overview*. World Bank.

- Calderón, C., Moral-Benito, E., and Servén, L. (2015). "Is infrastructure capital productive? A dynamic heterogeneous approach." *Journal of Applied Econometrics*, 30(2), 177-198.
- Campos, N., Engel, E., Fischer, R., and Galetovic, A. (2019). *Renegotiations and corruption in infrastructure: The Odebrecht case*.
- Castro, J. E. (2019). "Issues of governance and citizenship in water services: a reflection on Latin American experiences." *Water Services Management and Governance*, 133.
- CEI (2019). Commission Expert Group on Transportation Infrastructure, 2019 Report. Bogotá, Colombia. Available at: <https://www.eltiempo.com/uploads/files/2019/11/19/INFORME%20COMISION%20DE%20EXPERTOS%20DE%20INFRAESTRUCTURA.pdf>
- De Castro e Silva Neto, D., Oliveira Cruz, C., and Miranda Sarmento, J. (2018). "Understanding the patterns of PPP renegotiations for infrastructure projects in Latin America: The case of Brazil." *Competition and Regulation in Network Industries*, 18(3-4):271–296, August, 2018.
- De Halleux, M., Estache, A., and Serebrisky, T. (2018). *Institutional governance and performance in the electricity sector in Latin America and the Caribbean* (N° IDB-TN-01525). Inter-American Development Bank.
- Dixit (1996). *The making of economic policy. A transaction-cost politics perspective*. Cambridge, MA: The MIT Press.
- Egert, B., Kozluk, T., and Sutherland, D. (2009). "Infrastructure and growth: Empirical evidence" OECD Economics Department Working Papers, N° 685. Paris: OECD.
- Engel, E., Fischer, R., and Galetovic, A. (2014). *Public-private partnerships: A basic guide*. Cambridge University Press.
- Engel, E., Fischer, R., and Galetovic, A. (2019). "Soft budgets and endogenous renegotiations in transport PPPs: An equilibrium analysis." *Economics of Transportation*, 17:40–50.
- Engel, E., Fischer, R., and Galetovic, A. (2020). *When and how to use public-private partnerships in infrastructure: Lessons from the international experience*. University of Chicago Press.
- Engel, E., Fischer, R., Galetovic, A., and Soto, J. (2019). *Financing PPP projects with PVR contracts: Theory and evidence from the UK and Chile*.
- Fay, M., Andrés, L. A., Fox, C., Narloch, U., Straub, S., and Slawson, M. (2017). *Rethinking infrastructure in Latin America and the Caribbean: Spending better to achieve more*. World Bank.
- García-Kilroy, C. and Rudolph, H.P. (2017). *Private financing of public infrastructure through PPPs in Latin America and the Caribbean*. Washington, D.C.: World Bank.
- Garemo, N., Hjerpe, M., and Halleman, B. (2018). *A better road to the future. Improving the delivery of road infrastructure across the world*. McKinsey & Company, Interim report.
- Global Infrastructure Hub (GIH). (2017). "Global Infrastructure Needs to 2040." Global Infrastructure Hub and Oxford Economics. Available at: <https://outlook.gihub.org>

- Guasch, J. L., Laffont, J.-J., and Straub, S. (2002). *Renegotiation of concession contracts in Latin America*. World Bank.
- Hart, O. (2003). "Incomplete contracts and public ownership: Remarks and an application to public-private partnerships." *Economic Journal*, 113:C69–C76.
- Infratam (2019). Economic infrastructure investment data. Latin America and the Caribbean. Available at: <http://infratam.info>
- Ivanova, E. and Masarova, J. (2013). "Importance of road infrastructure in the economic development and competitiveness." *Economics and management*, 18(2), 263–274.
- Jiménez, R. (2016). *Rural electricity access penalty in Latin America: Income and location*. Policy Brief IDBPP253. Inter-American Development Bank.
- Kogan, J. and Bondorevsky, D. (2016). "La infraestructura en el desarrollo de América Latina." *Economía y Desarrollo*, 156(1), 168–186.
- Lakshmanan, T. R. (2011). "The broader economic consequences of transport infrastructure investments." *Journal of transport geography*, 19(1), 1–12.
- Lardé, J. (2016). "Latin America's infrastructure investment situation and challenges." FAL Bulletin. ECLAC. Available at: <https://repositorio.cepal.org/handle/11362/40849>
- Manuelito, S. and Jiménez, L. F. (2015). "Stylized features of the investment-growth connection in Latin America, 1980–2012." *ECLAC magazines*. Available at: <https://repositorio.cepal.org/handle/11362/38830>
- National Audit Office (2009). *Performance of PFI construction*. London. Available at: https://www.nao.org.uk/wp-content/uploads/2009/10/2009_performance_pfi_construction.pdf
- National Audit Office (2018). *PFI and PF2*. London. Available at: <https://www.nao.org.uk/wp-content/uploads/2018/01/PFI-and-PF2.pdf>
- Panos, E., Densing, M., and Volkart, K. (2016). "Access to electricity in the World Energy Council's global energy scenarios: An outlook for developing regions until 2030." *Energy Strategy Reviews*, 9, 28–49.
- Raisbeck, P., Dufeld, C., and Xu, M. (2010). *Comparative performance of PPPs and traditional procurement in Australia*, 28(4):345–359.
- Rojas, E. F., Poveda, L., and Grimblatt, N. (2016). *Estado de la banda ancha en América Latina y el Caribe 2016*. ECLAC. Available at: https://repositorio.cepal.org/bitstream/handle/11362/40528/S1601049_es.pdf?sequence=6&isAllowed=y
- Serebrisky, T., Sarriera, J. M., Suárez-Alemán, A., Araya, G., Briceño-Garmendia, C., and Schwartz, J. (2016). "Exploring the drivers of port efficiency in Latin America and the Caribbean." *Transport Policy*, 45, 31–45.
- Serebrisky, T., Suárez-Alemán, A., Margot, D., and Ramírez, M. C. (2015). *Financing infrastructure in Latin America and the Caribbean: How, how much and by whom?* IDB. Available at: <https://publications.iadb.org/en/financing-infrastructure-latin-america-and-caribbean-how-how-much-and-whom>
- Serebrisky, T., Suárez-Alemán, A., Pastor, C., and Wohlhueter, A. (2018). *Lifting the veil on infrastructure investment data in Latin America and the Caribbean* (N° IDB-TN-1366). Inter-American Development Bank.

- Sovacool, B. K. and Drupady, I. M. (2016). *Energy access, poverty, and development: The governance of small-scale renewable energy in developing Asia*. Routledge.
- Straub, S. (2008). *Infrastructure and growth in developing countries* (Vol. 4460). World Bank.
- The Economist Intelligence Unit (2019). Evaluación del entorno para las asociaciones público-privadas en América Latina y el Caribe: el Infrascopio 2019. New York: EIU.
- Unicef and WHO (2015). Progreso en materia de agua potable y saneamiento. Informe de actualización 2015 y evaluación del ODM. Unicef and the World Health Organization (WHO).
- Unicef and WHO (2017). Progress on drinking water and sanitation: 2017 Update. Unicef and the World Health Organization (WHO).
- WEF (2019). *The global competitiveness report*. World Economic Forum. Available at: <http://www.weforum.org/docs/WEFTheGlobalCompetitivenessReport2019.pdf>
- West, D. M. (2015). *Digital divide: Improving Internet access in the developing world through affordable services and diverse content*. Brookings Institution.
- Williamson, O. (1996). *The mechanisms of governance*. Oxford University Press.
- Williamson, O. (1976). "Franchise bidding for natural monopoly-in general and with respect to CATV." *Bell Journal of Economics*, 7:73-104, 1976. Spring.
- Wilmsmeier, G. and Monios, J. (2016). "Institutional structure and agency in the governance of spatial diversification of port system evolution in Latin America." *Journal of Transport Geography*, 51, 294-307.



Natural Resources, **Export Diversification and Growth**

05

Patricio Meller
*Corporación de Estudios
para Latinoamérica
(CIEPLAN) and
University of Chile*

The author thanks Pablo Sanguinetti, Juan Camilo Cárdenas, and Augusto de la Torre for their valuable comments. The opinions expressed in this article exclusively reflect the author's opinion.

1. Introduction

Are natural resources a curse? (Lederman and Maloney, 2007b). Can natural resources turn Latin America into a developed region? Natural resources are really a blessing. They have been the grounds for Latin America's development and integration into the global economy. Natural resources have been a critical factor in international trade during the 20th century and still play and will play an important role during the first part of this 21st century.

In Latin America, natural resources represent the main productive sector contributing to foreign exchange earnings. They are also deemed as an important financial source for domestic balance of payment. Foreign exchange earnings generated by natural resources are the main source of international reserves and sovereign funds. In the region, natural resource sectors take the lead in the use of state-of-the-art technologies and information technology. Based on their experience with natural resource abundance, several developed countries may create a solid knowledge-intensive platform and the basis for technological innovation. Furthermore, thanks to forward and backward production linkages, natural resources may give rise to productive activities that promote local development, therefore, contributing to a more homogeneous growth of Latin American countries.

How have the diversification and concentration of Latin American exports evolved in this 21st century? How can Latin American economies diversify their export baskets? Which policies are appropriate to achieve this goal within the context of the strong trade expansion with Asia? Which factors have been decisive for the creation of new export activities in Latin America? What roles have public policies played, for example?

The export baskets of Latin American countries concentrate more in certain goods as opposed to the export baskets of Asian countries that are more diversified, in general. However, it is worth mentioning that most Latin American countries showed an increasing trend to (relatively) diversify exports in a 10-year period during the 21st century.

Is it possible to step up and shift from the production of natural resources to the production of goods and services linked to the digital technological revolution? The use of technologies from the Fourth Industrial Revolution constitutes a profitable and essential element in the production process of natural resources.

Despite this positive standpoint on the role that natural resources have played as the engine of growth over the 20th century, a negative perspective regarding their role in the economic development of Latin America has prevailed. Different concepts have supported these visions including

Prebisch's hypothesis on the decline in the terms of trade, the Dependency theory, and the so-called "resource curse hypothesis." Later in this chapter, we will analyze in detail the arguments that rebut these concepts.

Meanwhile, we will shortly refute the idea that having natural resources could be a curse. Claiming why a country with abundant natural resources would tend to be poorer in the long-term is counterintuitive. These resources are an asset or wealth for the owner country. As far as we can tell, "wealth is wealth" and—in theory—there should be no difference between different types of assets or wealth. But the hypothesis of the "resource curse" states that the economic performance of an underdeveloped country that has copper or oil could be worse than that of an underdeveloped country without them. In short, if a country wants to grow faster, it would be better not to have natural resources.

The solution to the "resource curse" would be simple: Latin America could leave its oil and minerals underground (or under the sea), avoid cutting trees, dispense with the fish, and avoid harvesting fruits from trees. Would this have a positive effect on the economic growth trend in Latin America? Besides, can technological innovation booms spawn spontaneously? In short, it would be irrational for Latin America not to take advantage of its comparative advantages.

The question has changed from "Are natural resources a curse?" to "Why in some countries the presence of natural resources seems to be a curse and in others a blessing?" (Acemoglu, Johnson, and Robinson, 2003). In general, the literature states that the quality of the institutions determines which side will prevail as the final use of resources lies with them.

2. Latin America external sector

2.1. Evolution of the natural resource exports

Historically, Latin America has had comparative advantages in natural resources. It should not be surprising that natural resource exports constitute a big share of the export basket. The region has shown the following numbers (a median value for ten countries from 1962 to 2017 (55-year period) - Chart 1): i) in the 1960s, natural resources represented more than 95% of Latin American exports. This fact justifies the “export pessimism” of the region and argues that Latin America is only able to export natural resources; ii) from 1962 to the beginning of the 21st century, a systematic fall of natural resource exports was observed, reaching a 70% share; this fact was deemed positive as it evidenced Latin America’s export diversification; and c) nevertheless, based on the boom of raw material prices, natural resources’ share on the export basket bounced back to 80% in the 21st century.

CHART 1. Natural Resources Share in Latin American Exports, 1962-2017 (%)



Note: Median value of ten Latin American countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru, Uruguay, and Venezuela.

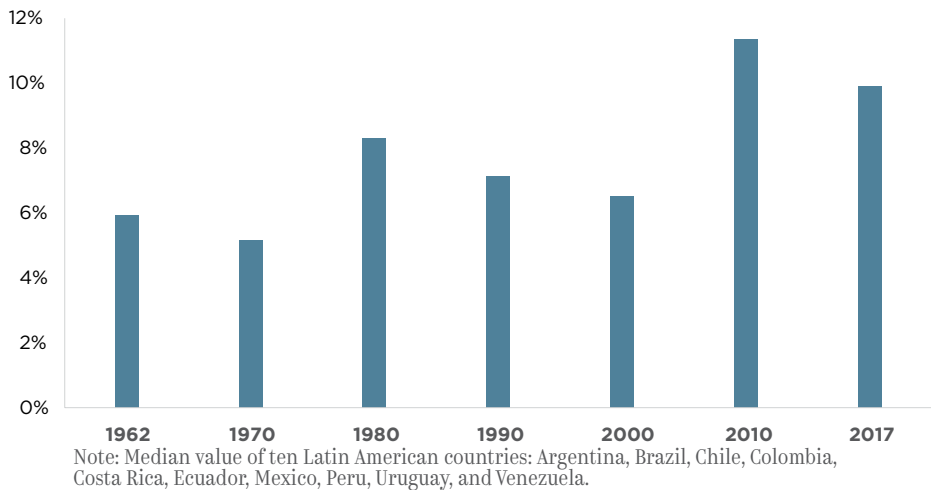
Source: UN COMTRADE and World Bank database.

This trend changed significantly in Mexico and Costa Rica when comparing the 21st century with the previous 100 years. Natural resources constituted less than 20% of the domestic total export basket in the first and a share below

50% in the latter). Argentina and Brazil also stand out since natural resources are 65% of their export basket. In most of South American countries, exports remain highly concentrated in natural resources: Venezuela (97%), Ecuador (93%), Chile and Peru (85%), and Colombia and Uruguay (80%).

Such evolution would suggest that, in most countries in the region, we have returned to the same situation we faced in the past. However, there has been an important change. From 1950 to 1980, there was a bias against the production of natural resources, while Latin America was going through the import-substitution industrialization of its development stage. This highly-protectionist trade policy toward the industrial sector gave rise to changes in the relative prices to foster the production of industrialized products.¹ Therefore, even when the share of natural resources in the total export basket was high, its share of GDP was below 6%. However, during the 21st century, natural resource exports in Latin America represent (on average) more than 10% of GDP. This is particularly true in Chile and Ecuador (18% of GDP), Venezuela (17%), Peru (15%), Uruguay (11%), and Costa Rica (10%).

CHART 2. Natural Resource Export Share of Latin American GDP, 1962-2017 (%)



Source: UN COMTRADE and World Bank database.

¹ The import-substitution industrialization strategy is implemented through a protectionist trade policy, including different barriers to discourage imports of industrialized products including high tariffs, lists of prohibited/permitted imports, privileged access to foreign currencies for industrial companies, subsidization of the industrial sector.

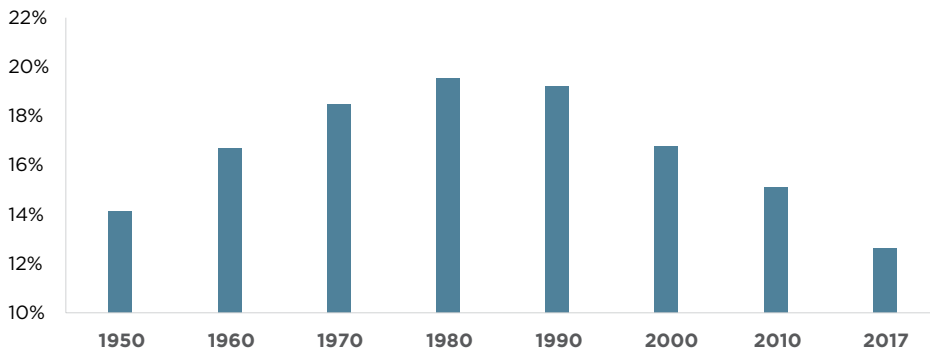
2.2. Evolution of the industrial sector

Industry was considered the growth engine of development based on import-substitution industrialization. This strategy preferred the internal over the external market. Since natural resource exports became the new engine of growth, there was a decline in the industry's importance. However, we observe that a sharp increase in industrial exports took place, evidencing big differences between the countries in the region.

Evolution of Latin America's industrial sector

The import-substitution industrialization strategy prevailed during a large portion of the second half of the 20th century (1950-1990). The average share of the industrial sector (median value of ten selected Latin American countries) in GDP grew from 14% in 1950 to 19% in the 1980s. Since 1990, this share fell steadily and reached 13% of GDP in 2017.

CHART 3. Evolution of Latin America's Industrial Sector, 1950-2017 (percentages of GDP)



Note: Median value of ten Latin American countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru, Uruguay, and Venezuela.

Source: UN COMTRADE and World Bank database.

After four decades of implementing the import-substitution industrialization strategy, the Latin American industry started a downtrend and reached its smallest significance (in percentage of GDP) compared to the year when the strategy was first implemented (1950).

Industrial production declines in terms of share of GDP compared to the peak of the period have been significant: i) share of GDP reductions reached -55%² in Brazil and Venezuela; ii) it dropped about -45% in Chile, Colombia, Costa Rica, and Uruguay; iii) Argentina and Mexico evidenced a drop of 31% and 13%, respectively.

² For example, Brazil's industrial sector constituted 45% of GDP in 1980 and shrank to 20% of GDP in 2017.

Evolution of Latin America's industrial exports

Despite the import-substitution industrialization strategy and the reduction of the industry's share of GDP, some Latin American countries register high levels of industrial exports. Mexico and Costa Rica are two interesting cases to analyze. In the 21st century, industrial exports in Mexico and Costa Rica represent 80% and over 50%, respectively, of their total export baskets. In Argentina and Brazil, industrial exports reach 30% of total exports while they are close to 20% in Colombia and Uruguay. In other Latin American countries, industrial exports are less than 13% of their total exports.

Let us analyze exports expressed in annual constant US dollars (Table 1). Mexico is a surprising case. Before 1980, Mexico exported less than USD 4 billion of industrialized products. During the 21st century, its industrial exports increased by USD 1.69 billion in 2000, USD 2.19 billion in 2010, and USD 2.96 billion in 2017. Industrial exports in Brazil surpassed Mexican exports between 1980 and 1990, but this trend changed dramatically later. Even when Brazil's industrial exports fluctuated around USD 60 billion (2010 and 2017), a high value compared to the rest of the Latin American countries, this amount stood for 20% of Mexico's industrial exports. Argentina's outcome stands out among the rest of Latin America, with industrial exports close to USD 15 billion. While the rest of Latin America totals industrial exports for less than USD 8 billion a year.

TABLE 1. Latin America's Industrial Exports, 1962-2017 (in million USD, 2010)

| Country | 1962 | 1970 | 1980 | 1990 | 2000 | 2010 | 2017 |
|------------|-------|-------|--------|--------|---------|---------|---------|
| Argentina | 251 | 942 | 3,552 | 3,861 | 9,517 | 21,320 | 14,450 |
| Brazil | 284 | 1,263 | 14,955 | 18,668 | 33,756 | 60,010 | 57,698 |
| Chile | 45 | 161 | 611 | 1,026 | 3,249 | 7,895 | 8,007 |
| Colombia | 103 | 273 | 1,743 | 2,277 | 4,770 | 7,244 | 6,247 |
| Costa Rica | N/A | 174 | 603 | 550 | 4,355 | 5,365 | 5,181 |
| Ecuador | 12 | 17 | 169 | 95 | 499 | 1,624 | 1,057 |
| Mexico | 3,996 | 1,438 | 3,546 | 15,166 | 168,834 | 218,612 | 295,561 |
| Peru | 25 | 54 | 1,153 | 863 | 1,329 | 3,412 | 3,314 |
| Uruguay | N/A | 203 | 868 | 486 | 1,194 | 1,681 | 1,354 |
| Venezuela | 103 | 73 | 251 | 1,484 | 1,555 | 1,010 | N/A |

Source: UN COMTRADE and World Bank.

The importance of industrial exports in respect to GDP reveals the following information: i) before 1990, industrial exports comprised less than 2% of GDP in most Latin American countries, except for Costa Rica (where it ranged from 3% to 5% of GDP), Mexico and Uruguay (where, during the 1980s, it exceeded 2%); and ii) in the 21st century, industrial exports in Mexico and

Costa Rica stand out since they range from 20% to 15% of GDP, respectively. Out of the remaining countries, Argentina and Uruguay are worth mentioning, with industrial exports representing about 3% to 5% of GDP, respectively. The percentages of the remaining countries stay below 3%.

In summary, most Latin American countries evidence a marginal increase in the relative importance of industrial exports (in respect to GDP and the total export basket) in the 21st century, compared to the 20th century. The big exceptions are Mexico and Costa Rica. In our opinion, the determining factors of these two countries' successful outcomes are associated with the North American Free Trade Agreement (NAFTA) –Mexico–, and the establishment of Intel and the free-trade agreement with the United States –Costa Rica–.⁵

2.3. Evolution of Latin America's main trading partners

Considering Latin America as a homogeneous region in respect to its trading partners, and based on the numbers of the (region's) pattern of trade, one could assume that the United States will be Latin America's leading trading partner in this century, both for exports and imports. Thus, it would return to the role it played over the last century (see Annex with information on five countries or regions during 1962–2017). However, this inference is not valid for South American countries. Therefore, it is important to analyze the pattern of trade breakdown by country. There is a big difference between, for example, Mexico and Costa Rica (a representative country of Central America) and South American countries. Let us look at this on a country-specific level.

When considering Mexico during the 21st century (2017), the United States is its primary export market, with an 80% share of total exports.

In the case of Costa Rica, this percentage fluctuates by around 40%. Ecuador and Colombia's exports to the United States represent around 30% of total exports. In contrast, the United States market represents less than 14% in the rest of the South American countries –Argentina, Brazil, Chile, Peru, and Uruguay– (Table 2).

China is currently the main destination for exports of Peru (31%), Chile (28%), and Brazil (22%). However, in the 1990s, China represented a one-digit share of the export basket of Argentina, Colombia, Costa Rica, Ecuador, and Mexico.

⁵ Even when Intel closed its microprocessors manufacturing company in 2014, its impact on the transformation of Costa Rica export basket has been notorious.

TABLE 2. Evolution of Latin American Region's Trading Partners based on their Destination Markets.

| Region | LAC | | United States | | China | | Europe | | Asia (without China) | |
|------------|------|------|---------------|------|-------|------|--------|------|----------------------|------|
| | 1990 | 2017 | 1990 | 2017 | 1990 | 2017 | 1990 | 2017 | 1990 | 2017 |
| Argentina | 28% | 33% | 14% | 8% | 2% | 8% | 37% | 17% | 15% | 22% |
| Brazil | 12% | 20% | 25% | 12% | 1% | 22% | 36% | 18% | 19% | 21% |
| Chile | 13% | 17% | 16% | 14% | 0% | 28% | 39% | 14% | 27% | 24% |
| Colombia | 17% | 37% | 44% | 28% | 0% | 6% | 30% | 16% | 5% | 11% |
| Costa Rica | 17% | 31% | 45% | 41% | 0% | 1% | 30% | 22% | 3% | 4% |
| Ecuador | 29% | 27% | 53% | 31% | 0% | 4% | 12% | 22% | 6% | 15% |
| Mexico | 7% | 5% | 70% | 80% | 0% | 2% | 13% | 6% | 7% | 4% |
| Peru | 15% | 18% | 23% | 14% | 2% | 31% | 38% | 17% | 19% | 16% |
| Uruguay | 41% | 32% | 9% | 6% | 4% | 19% | 33% | 13% | 9% | 9% |
| Venezuela | 15% | - | 52% | - | 0% | - | 14% | - | 4% | - |

Source: UN COMTRADE.

It should be pointed out that Latin America (and the Caribbean) is the first or second destination of exports from Colombia (37%), Argentina (33%), Uruguay (32%), Costa Rica (31%), Ecuador (27%), and Brazil (20%). Additionally, Mexico only exports 5% of its total exports.

Asia (without China) is an important destination for exports from Chile (24%), Argentina (22%), Brazil (21%), Peru, and Ecuador (almost 15%). Again, this region is not relevant for Mexican exports (4%).

Something similar happens with Europe. For most Latin American countries, the European market represents almost 18% of their total exports. Once more, Mexico is the exception to this rule, since Europe only has a share of 6%.

In respect to the origin of Latin American imports, the region is the leading supplier at country-level (Table 6), particularly Uruguay (39%), Argentina (37%), Venezuela (34%), Ecuador (32%), Peru (28%), Chile (25%), Costa Rica (22%), Colombia (20%), and Brazil (17%). Only 3% of Mexican imports come from the rest of Latin America.

The United States is the main source of Mexico (46%) and Costa Rica (38%) imports and stands for more than 20% of total imports of Colombia, Ecuador, Venezuela, and Peru. North American imports represent almost 18% in Chile and Brazil, and just 11% in Argentina and Uruguay.

Note that in 1990, there were almost no imports from China to Latin America. In 2017, the proportion of imports from China surpassed 20% of the total imports

in Chile (24%), Peru (22%), and Uruguay (20%), and was approximately 18% in Argentina, Brazil, Colombia, Ecuador, and Mexico (Table 3).

TABLE 3. Evolution of Latin America's Main Trading Partners according to their Imports, 1990-2017

| Region | LAC | | United States | | China | | Europe | | Asia (without China) | |
|------------|------|------|---------------|------|-------|------|--------|------|----------------------|------|
| | 1990 | 2017 | 1990 | 2017 | 1990 | 2017 | 1990 | 2017 | 1990 | 2017 |
| Argentina | 33% | 37% | 20% | 11% | 1% | 18% | 32% | 19% | 9% | 11% |
| Brazil | 18% | 17% | 20% | 17% | 1% | 18% | 26% | 25% | 29% | 18% |
| Chile | 25% | 25% | 20% | 18% | 1% | 24% | 29% | 16% | 13% | 13% |
| Colombia | 22% | 20% | 35% | 26% | 0% | 19% | 27% | 17% | 12% | 12% |
| Costa Rica | 24% | 22% | 47% | 38% | 0% | 13% | 14% | 11% | 12% | 10% |
| Ecuador | 23% | 32% | 33% | 20% | 0% | 19% | 28% | 15% | 13% | 13% |
| Mexico | 4% | 3% | 67% | 46% | 1% | 18% | 19% | 12% | 7% | 17% |
| Peru | 36% | 28% | 28% | 20% | 1% | 22% | 23% | 14% | 7% | 13% |
| Uruguay | 49% | 39% | 10% | 11% | 0% | 20% | 26% | 17% | 12% | 9% |
| Venezuela | 14% | - | 47% | - | 0% | - | 29% | - | 6% | - |

Source: UN COMTRADE.

About 25% of total imports in Brazil comes from Europe; this percentage ranges from 12% to 19% in most Latin American countries. Besides, imports coming from Asia (except China) have a smaller, variable portion that ranges 15%.

In summary, Latin America and the Caribbean, together with China, have become the two main trading partners of an important group of South American countries. The situation is quite different in Mexico and Costa Rica, where the United States is still their main trading partner.

2.4. The impact of China in Latin America

The fast-growing trend of China's economy and its huge impact on the demand of raw materials in the global market have been the main factors stimulating a boom in the prices of these materials. This has meant a significant economic growth for Latin American countries. In fact, the recent deep global financial crisis has had a relatively low impact in the region. There have been even optimistic expectations suggesting that we were living "the decade of Latin America" (2000-2010).

However, old fear linked to the so-called “resource curse” still persists in some market players. Given the comparative advantages between Latin America and Asia, to what extent will this trading business between the regions generate an enhanced productive specialization in Latin America?

Two different “opinions” clash regarding this topic. The first one states that the region will repeat the same historical determination of productive specialization focused on natural resources, and that trading with China will drive Latin America in this direction. Furthermore, China’s imports pattern in the region will reinforce this dynamic; export diversification will be an empty shell. Based on the hypothesis of the “resource curse,” Latin America will eventually experience a low economic growth.

On the other end, others consider that natural resources are a blessing for the region. This is what we have called the “resource blessing” (Meller, Poniachik, and Zenteno, 2013) and is supported by the empirical evidence described above. The increasing generation of “extra-normal profits” should lead to Latin America investing in expanding and diversifying its productive capacity. In fact, as we will discuss below, Latin American exports have diversified. The region has also attracted foreign direct investment in different sectors (manufacturing, services and natural resources). Based on this reasoning, the large Chinese market is perceived as a source of new business opportunities. Latin American entrepreneurs should be considering selling their products to China’s increasing middle-class population. This segment size is estimated in 10% to 20% of the country’s total population and comprises 130-260 million consumers.

Asian countries have become the “global engine of growth.” Estimates for 2000-2030 state that 66% of global growth will be linked to emerging economies, mainly Asian, China and India.⁴ It has also been repeatedly affirmed that China is the new global engine of growth. Consequently, Asia has turned into the “engine of global exports”; and this role has been reinforced after the recent financial crisis of the developed countries. Asian economies have played a particularly important role for Latin America as it has managed to keep an increasing growing pace mainly based on exports to such growing market.

Again, China has become a luring market for Latin America, and it is already one of the most common destinations for the exports of Argentina, Brazil, Chile, Peru, and Uruguay. China and the rest of the Asian emerging countries are also one of the main import’s suppliers in the region. Therefore, there is a big variety of products that these numerous middle-class consumers will demand soon.

2.5. The effect of the raw material boom (in the 2000s) in Latin America

The significant increase in the demand of natural resources worldwide (raw material boom), boosted by Asian economies’ growth (mainly China’s) has led to a deep change in the role that natural resource exports play in Latin American economies. There are different indicators evidencing the increasing trend of the relative importance of raw material exports in the

4 These predictions are previous to Trump and the trade war.

region's economies in the 2000s.⁵ In most cases, exports of main raw materials have increased as a percentage of total exports and as a percentage of GDP. This fact is mainly linked to the boom of the prices of these products during that decade.

The quantitative increase of the value of Latin American natural resource exports has benefited the region's economies in different ways, which we will discuss below.

Natural resources growing contribution to economic incomes. The impact of the raw material *boom* first manifested on prices; i.e., through a significant increase in the Ricardian value of natural resources in Latin American countries. Table 4 shows natural resource total economic incomes for selected Latin American countries during 2000–2010. This is the sum of oil rents, natural gas rents, coal rents, mineral rents, and forest rents based on the data obtained from the World Bank's *World Development Indicators*.⁶

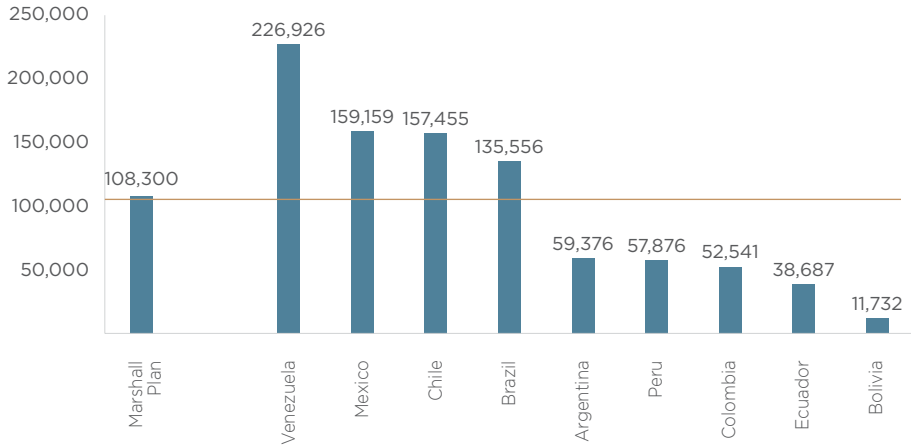
In most Latin American countries, the total of natural resource rents increased dramatically during the decade under review. When comparing years 2000 and 2010, Peru reveals a 1,000% change, while most of the other countries evidence 3-digit percent changes. The *boom* effect became more notorious as from 2004–2005, when Latin America started accumulating “extra-normal profits” based on natural resources on an annual basis. In order to quantify these rents, we will consider the average of total rents for 2000–2003 as reference.

In order to illustrate the size of resources that Latin America has gained thanks to said “extra-normal profits” derived from natural resources, the “parameter” to be considered as a reference will be the resources allocated to meet the Marshall Plan goal for the reconstruction of Europe after the World War II. The Marshall Plan for 1949–1952 involved resources amounting to USD 108,500 million (USD in 2006) (OECD, 2008.) Chart 4 shows that many Latin American countries have benefited from the “extra-normal profits” with figures exceeding the whole Marshall Plan: Venezuela more than twice; Mexico, Chile and Brazil, approximately 1.5 times, and Argentina, Peru and Colombia, almost 50%.

⁵ Full series for 1962–2011 are available in Meller et al. (2015).

⁶ Estimates are based on sources and methodologies described in “The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium”, World Bank (2011). As a base for normal rates of return, average estimates for 2000–2003 (prices and quantities) are used.

CHART 4. Natural Resources' Extra-normal Profits (2004-2010) compared to the Marshall Plan Resources (1949-1952) (in million constant USD, 2006)



Note: Amounts reported by the World Bank for natural resource rents of Latin American countries are higher than the ones shown in this chart.

Source: Authors' elaboration based on OECD (2008) (Marshall Plan), World Bank and UN COM-TRADE Databases.

Considering this huge amount of extra-normal profits gained by Latin America thanks to the boom of raw material prices, can anyone still believe there may be a resource curse? In fact, the underlying problem is not related to having these resources or not, but how to manage revenues arising therefrom. The management of extra-normal profits arising from said boom is still a pending topic.

Significant increase in international reserves. It is worth noting the significant increase in international reserves as a consequence of the boom of raw material prices. In 2003, Brazil, Mexico, and Argentina had USD 43,565 million, USD 54,896 million, and USD 12,325 million of international reserves, respectively. In 2011, Brazil accumulated forex reserves for USD 520,292 million (seven times its amount in 2003); Mexico accumulated USD 134,896 million (a 250% increase), and Argentina accumulated USD 49,237 million (four times its amount in 2003). Uruguay, Peru, and Venezuela increased their international reserves 6.3, 4.7, and 3.8 times, respectively, while the rest of the countries: Colombia, Costa Rica, Ecuador, and Chile, exceeded twice their value.

Different relative indicators of the importance of international reserves show that (Table 4): i) reserves are more than 20% of GDP in Peru and Uruguay; from 10% to 15% in Argentina, Brazil, Chile, Colombia, Costa Rica, and Mexico, and less than 10% in Venezuela and Ecuador; ii) reserves as a percentage of total external debt are more than 100% in Peru, more than 50% in Brazil, Uruguay, Mexico, and Costa Rica, and more than 40%

in Venezuela, Argentina, and Colombia; iii) in months of imports, reserves are more than 10 months in Brazil and Peru, and from 5 to 8 months in Uruguay, Argentina, Venezuela, and Chile.

TABLE 4. Raw Material Price Boom Effects* on Latin America's International Reserves, 2003-2011

| Country | Total Reserves | | | | |
|------------|----------------|---------|-----------|-----------------------|-------------------|
| | (million USD) | | Year 2011 | | |
| | 2003 | 2011 | % GDP | % Total External Debt | Months of Imports |
| Argentina | 12,325 | 49,237 | 12% | 44% | 6.6 |
| Brazil | 43,565 | 320,292 | 14% | 84 % | 11.8 |
| Chile | 15,593 | 34,886 | 15% | 39% | 3.8 |
| Colombia | 10,882 | 29,986 | 10% | 43% | 5.2 |
| Costa Rica | 1,671 | 4,694 | 12% | 50% | 3.3 |
| Ecuador | 1,085 | 2,790 | 5% | 18% | 1.3 |
| Mexico | 54,849 | 134,896 | 12% | 51% | 4.3 |
| Peru | 9,982 | 46,564 | 28% | 107% | 10.7 |
| Uruguay | 1,429 | 8,979 | 21% | 63% | 8 |
| Venezuela | 16,464 | 28,800 | 8% | 45% | 5.6 |

Note: Values for 2003 and 2011 were averaged with their respective previous years' values to mitigate temporary fluctuations. (*) Total external debt is the amount owed to non-residents, which is reimbursed in foreign currency, goods or services, and results from the sum of long-term sovereign debt, sovereign guaranteed debt, and corporate, non-guaranteed debt, the use of IMF credit, and short-term debt securities. It also includes gold.

Source: World Bank.

To sum up, the *boom* of raw material prices benefited the region's overall situation in respect to international reserves. The contrast with what happened during the ("lost") decade in 1980s is striking. This has also influenced the significant capital inflows and foreign direct investments experienced by Latin America during this century.

Effect on tax revenues. Higher natural resource rents have generated higher tax revenues for Latin American countries. Tax revenues from natural resources, as a share of total tax revenues, increased –on average– from 18% in 1998 to 32% in 2008 (Sinnot, Nash, and de la Torre, 2010); countries such as Chile, Ecuador, Peru, and Venezuela show significant increases in respect to this indicator (Table 5).

TABLE 5. Tax Revenues from Natural Resources, 1998 and 2008 (% of Total Tax Revenues)

| Country | 1998 | 2008 |
|-----------|------|------|
| Argentina | N/A | 14% |
| Bolivia | 27% | 33% |
| Chile | 3% | 22% |
| Colombia | N/A | 11% |
| Ecuador | 23% | 47% |
| Mexico | 48% | 40% |
| Peru | 7% | 18% |
| Venezuela | 30% | 50% |

Note: Argentina's data only includes export taxes. Colombia's data shows the average income on hydrocarbon during 2000-2005.

Source: Sinnott, Nash, and de la Torre (2010).

Natural resources' growing importance in tax collection is not only based upon the increase of the raw material prices, but also responds to changes in tax regimes.⁷

⁷ All Latin American countries with natural resources (except for Mexico) have amended their legislation during the first decade of this century in order to increase the State's participation in related profits (natural resources "extra-normal profits") through additional royalties, taxes and tariffs applied to the extractive industries. See Sinnott, Nash and de la Torre (2010), and CAF (2012).

3. Export diversification or concentration in Latin America⁸

How have Latin American exports' diversification and concentration evolved in this 21st century? How can Latin American economies diversify their export baskets? Which policies are appropriate to achieve this goal within the context of the strong trade expansion with Asia? Which factors have been decisive for the creation of new export activities in Latin America? What roles have public policies and foreign investment played, for example?

Recent economy-related literature on export diversification has focused on measuring the concentration of export baskets. This analysis is usually the basis for examining the impact that an export basket with a higher or lower degree of concentration may have on economic growth. Export diversification is commonly considered a key element of development strategies. The literature generally identifies two main mechanisms through which diversification stimulates economic growth:⁹ i) the effect of risk diversification in the case of external *shocks* of the demand, and ii) the dynamic effect on productive technologies (technological externalities).

3.1. The evolution of the Herfindahl-Hirschman index

The literature commonly uses the normalized Herfindahl-Hirschman index (HHI) to measure the concentration of each country's export basket, and to assess it against economic growth parameters, although some other methods have also been used, as the Gini coefficient applied to export baskets or the Theil index. Imbs and Wacziarg (2005), Hesse (2008), Agosin, Álvarez, and Bravo-Ortega (2008), Cadot, Carrière, and Strauss-Kahn (2009) are some of the experts who use these indicators.

HHI indicators of different Latin American and Asian economies for 2000, 2006 and 2011 are shown below.¹⁰ Nine Latin American countries representing more than 94% of the total exports of the region and the six Asian countries with the highest level of exports were selected.¹¹ Data from the 2000s was considered for this selection.¹²

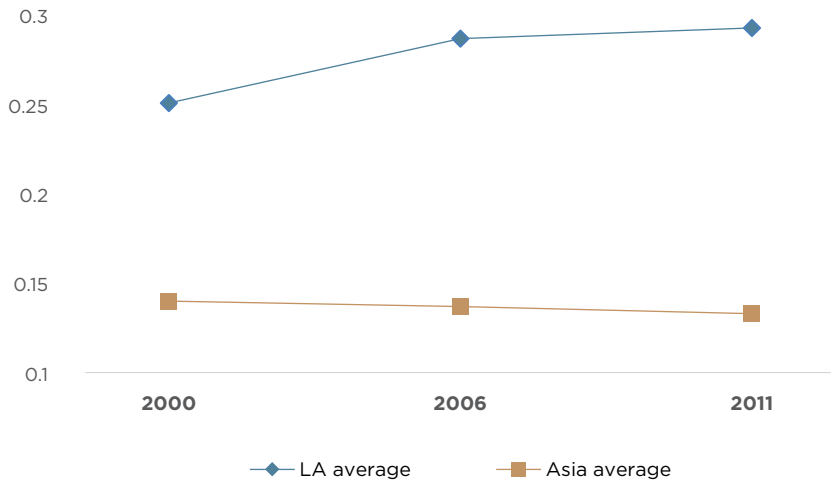
8 This section is mainly based on Meller and Zenteno (2015).

9 See Agosin (2007), Dutt, Mihov and Van Zandt (2008), and Hesse (2008).

10 Indices were calculated applying the methodology suggested by the UNCTAD Handbook of Statistics (2010).

11 The nine Latin American countries are Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, Uruguay, and Venezuela.

12 The six Asian countries are China, India, Japan, Malaysia, South Korea, and Thailand.

CHART 5. Export Concentration HHI for Selected Countries in Asia and Latin America.

Note: Regional numbers are non-weighted averages, i.e., each country is given equal weight.

Source: Authors' calculations based on UN COMTRADE 3-digit SITC level, Rev. 5.

In general, HHI indicators are higher for Latin American countries than for Asian countries, though Latin America has a significant heterogeneity. This shows general regional differences in respect to each export structure. According to these indices, the export basket of Latin American economies are more concentrated in certain goods, compared to Asian economies. If these indices' performance is observed, they suggest that Asian countries have tended –on average– to decrease the concentration levels of their export baskets, while Latin American countries have tended to increase the concentration thereof. The HHI grew by 17.13% in Latin America between 2000 and 2011, while the same index in Asia decreased by 7.64% during that period (Chart 5).

3.2. Alternative methods to calculate export diversification

Upon calculating the concentration levels of Latin American export baskets through HHI, a process of higher concentration levels is observed during the last decade. The implicit outcome traditionally interpreted out of this trade pattern is that more exports of the same commodity are being made in higher proportions. In other words, there is no export diversification but an increasing concentration.

However, this outcome contrasts to the fact that Latin America has developed new export activities in the last decade. The breakdown by export

category exceeding USD 100 million for selected economies in Latin America and in Asia is shown below, for 2000, 2006, and 2011 (Table 6).¹⁵

TABLE 6. Main Export Categories (3-digit) for Latin American and Asian Export Baskets (selected countries)

| X > USD 100 million on an annual basis (3-digit) | | | |
|--|------|------|------|
| Country | 2000 | 2006 | 2011 |
| Argentina | 51 | 72 | 92 |
| Brazil | 100 | 137 | 155 |
| Chile | 25 | 42 | 57 |
| Colombia | 18 | 36 | 41 |
| Costa Rica | 9 | 9 | 18 |
| Mexico | 142 | 154 | 172 |
| Peru | 14 | 26 | 41 |
| Uruguay | 4 | 9 | 17 |
| Venezuela | 13 | 13 | 9 |
| China | 179 | 207 | 218 |
| India | 75 | 140 | 180 |
| Japan | 157 | 165 | 171 |
| Malaysia | 92 | 130 | 164 |
| South Korea | 135 | 155 | 171 |
| Thailand | 108 | 144 | 169 |
| United States | 238 | 251 | 270 |
| LA average | 42 | 55 | 67 |
| Asia average | 124 | 157 | 179 |
| LA median value | 18 | 36 | 41 |
| Asia median value | 122 | 150 | 171 |

Note: Regional numbers are non-weighted averages, i.e., each country is given the same weight.

Source: Authors' calculations based on UN COMTRADE 3-digit SITC level, Rev. 3.

Except for Venezuela, Latin America evidenced a sharp increase in the number of exported products over the first decade of this century. The annual value (3-digit) of exports exceeded USD 100 million. The literature commonly refers to the emergence of new leading export categories as an extensive margin

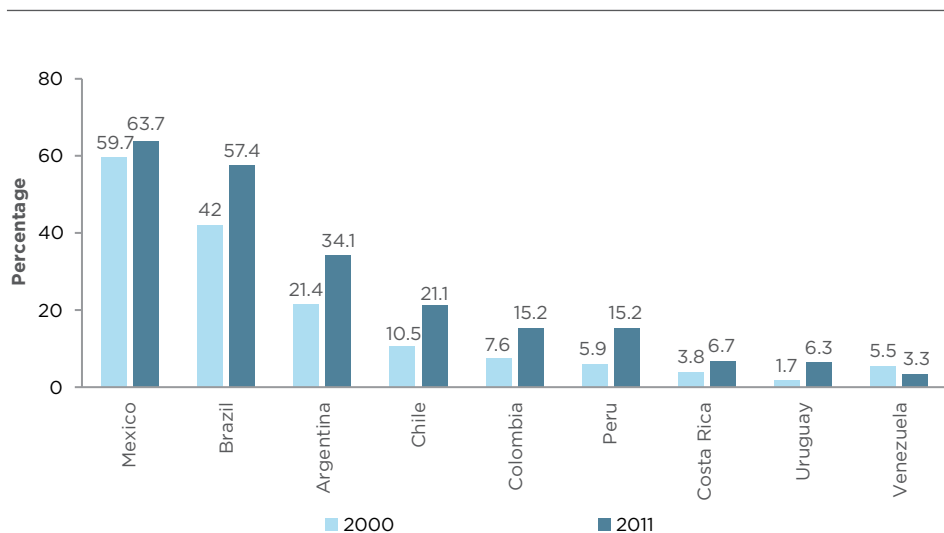
¹⁵ The United States has been added for benchmarking purposes.

diversification. Therefore, it is clear that there is a limitation in traditional methods to measure the diversification of export baskets: the HHI does not show the diversification related to the emergence of new export categories.

Here, we provide an alternative indicator that intends to fill this gap in traditional methods. We will measure export baskets' product diversification, considering the United States as *benchmark*.¹⁴ The Export Diversification Index (EDI) is the number of product categories covered by a country's exports (which exceed USD 100 million or other agreed value) in respect to the number of categories exported by the United States.¹⁵

Charts 6 and 7 show the evolution of the Export Diversification Index between 2000 and 2011 for a group of selected economies in Latin America and Asia. The index has increased in most of them, evidencing an increase on the number of the leading product categories exported in respect to the number of categories covered by the most diversified economy in the world.

CHART 6. Export Diversification Index for Selected Countries in Latin America, 2000 and 2011 (United States=100, 3-digit)



Source: Author's calculations based on UN COMTRADE.

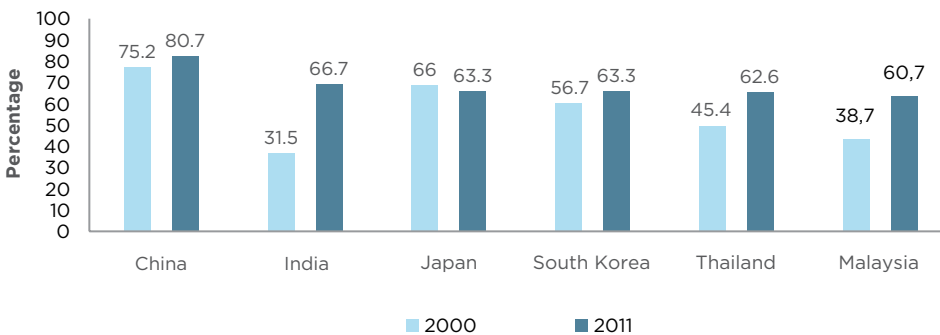
Comparing both regions (in 2011), we find that all Asian countries have an export diversification index above 60%, with China's index reaching 81% (Chart 7). However, in Latin America, only Mexico and Brazil have export diversification indices similar to the Asian ones. These indices are lower in the rest of the countries in the region: Argentina, 34%; Chile, 21%, and Colombia and Peru, 15% (Chart 6). Consequently, once again, in general, Asian countries

¹⁴ United States was chosen because it was the largest exporter in the world in 2000, with annual exports amounting to current USD 1,095,200 million (Source: World Bank).

¹⁵ To obtain a 100-based index, the ratio is multiplied by this number.

have more diversified export baskets than Latin American countries. However, there is a notorious significant increasing trend in the diversification (product diversification) of exports in most Latin American countries over this century (2000-2011); i.e., there has been a reduction of the gap in respect to diversification in Latin American and the United States' exports.

CHART 7. Export Diversification Index for Selected Countries in Asia, 2000 and 2011 (United States=100, 3-digit)



Source: Author's calculations based on UN COMTRADE.

In summary, the HHI offers a distorted view of Latin America's export pattern, and it suggests a higher concentration in the export basket over the last decade. However, the HHI does not reflect the introduction of new economic activities significant for Latin American export baskets. We recommend the use of a more accurate index to measure new-product categories' diversification over a pre-determined value (for example, USD 100 million). This index also allows for the analysis of the evolution of export diversification by country compared to a "reference export country" (the United States).

3.3. New successful Latin American exports

It is also interesting to review different cases of new successful exports in the region. Recent successful cases in Latin America involve the exports of different types of products. Both the expansion of activities with a pre-set comparative advantage linked to the abundance of natural resources (natural resource-intensive traditional exports) and the introduction of new comparative advantages are notorious. Within the new comparative advantages, we find, on one side, non-traditional exports of natural resource-intensive products with higher added value, and on the other side, non-traditional exports not linked to natural resource-intensive products. The introduction of these two last categories challenges the Latin American productive development vision which states that export volumes are the same

today than 50 (or 50) years ago. In fact, there are many examples evidencing the possibility of generating new comparative advantages in the region, i.e., comparative advantages are not static, but dynamic (Table 7).

TABLE 7. Successful Export Cases in Latin America, 1990–2012 (in million USD, 2012 constant)

| Type of Export/ Country | 1990 | 1995 | 2000 | 2005 | 2010 | 2011 | 2012 | Variation 1990–2011 (%) |
|----------------------------|-------|-------|-------|-------|--------|--------|--------|-------------------------------|
| Soybean/Brazil | 1,582 | 1,249 | 3,334 | 6,866 | 12,089 | 16,425 | 17,248 | 938% |
| Forestry/Chile | 474 | 764 | 777 | 1,292 | 817 | 907 | 958 | 92% |
| Flowers/Colombia | 398 | 774 | 892 | 1,166 | 1,363 | 1,264 | N/A | 218% |
| Fruits/Chile | 1,566 | 2,231 | 2,343 | 3,742 | 5,321 | 5,770 | 5,799 | 268% |
| Pork/Brazil | 38 | 136 | 248 | 1,443 | 1,343 | 1,294 | 1,348 | 3,263% |
| Wine/Chile | 90 | 296 | 891 | 1,136 | 1,706 | 1,715 | 1,806 | 1,811% |
| Aircrafts/Brazil | 963 | 449 | 5,447 | 4,244 | 4,775 | 4,366 | 5,218 | 353% |
| Software/Uruguay | 0 | N/A | 121 | 134 | 247 | N/A | N/A | - |

Source: UN COMTRADE, SITC Rev. 1, 2, and 5. Uruguayan Chamber of Computer Technologies (CUTI - Cámara Uruguaya de Tecnologías de la Información)

Different factors have given rise to the introduction of these new economic activities, and they may be subject to export diversification-related policies. The concept of public goods is identified, including the control of phytosanitary conditions in production processes, quality control of exports, the promotion of the country's image, and the negotiation of free trade agreements. All these policies imply an important role for the public sector within the frame of export diversification.

The gathering, generation and disclosure of knowledge related to productive and export activities are also main factors for export diversification and require the coordination of different players. Foreign direct investment is also essential (as well as *joint-ventures*) to foster productivity-enhancing technologies, to gain access to international markets and distribution channels, and to be aware of global demand. Knowledge on productive and export activities may also be enhanced by connecting producers and research centers, by incorporating specific human resources to certain strategic sectors or by promoting producers-exporters' associations.

4. Natural resources and growth

4.1. The role of natural resources

Over the 19th century and the beginning of the 20th century, the abundance of natural resources was Latin America's main asset. It was an incentive for foreign investors to come and exploit those resources. Given the low local development level, there were no entrepreneurs, no capital flows, and no skilled labor to organize enterprises to take advantage of the natural resources available. In this sense, natural resources established the first connection between Latin America and the global economy.

During the Great Depression, there was an extreme decline in the world price and export activities of raw materials. This caused long and severe balance-of-payments problems in the region and introduced the debate on which development strategy should be applied to reach a standard of living similar to that of developed countries. Underdeveloped countries usually aim at "reaching the level of developed countries." Over the 1930s to 1950s, there was great correspondence between "developed country and industrialized country." And industrialization was considered a mechanism of modernization of lagged countries. Later on, the main goal of the first development strategy was the creation of a national industry. This is how the import-substitution industrialization strategy emerged and prevailed until the 1980s, approximately.

The import-substitution industrialization strategy prioritized the domestic market and, consequently, demoted to a secondary place the integration with the global economy. This strategy posed an anti-natural resource's position, which was also justified by several conceptual approaches reinforcing this negative point of view in respect to those resources. We will consider these approaches below.

The *Prebisch hypothesis* states that countries' specialization in the production of natural resources is related to the problem of "secular deterioration of the terms of trade" and the demand for each (quantitative) unit of natural resources will increase less rapidly than the demand for industrialized products. This will maintain the underdevelopment condition of Latin American countries, while income per capita increases in developed countries.

Income per capita differential between developed countries and Latin America is determined by their productive structure and their relationship to international trade. During the first half of the 20th century, the world experienced a kind of "global division in terms of production" in which Latin America produced natural resources, and the developed countries produced manufactured goods. This productive specialization of the whole region based

on (static) comparative advantages of a specific natural resource, eventually excluded Latin American countries from the benefits of technical progress, which has mainly related to the industrialized world.

This statement is mainly based on the following empirical assumptions: i) Latin America is highly specialized in the production and export of natural resources; ii) consumer demand of those resources is falling; in contrast, consumer demand of manufactures is on the rise; iii) technical progress occurs in the industrial sector; and iv) the relative price of natural resources in terms of manufactures falls steadily. Together, these facts suggest the secular deterioration of the terms of trade of countries that export natural resources.

Consequently, Latin America has obtained little benefit from technical progress and international trade.

The **dependency theory** divides the world into a center/periphery dichotomy. The most important global decisions are made in developed countries (at the center), while Latin America remains in the periphery and has a subservient role. The role of this region is to produce resources for the developed countries. In summary, the “dependency theory” was developed in the 1960s and represented an updated version—at the time—of colonialism approaches.

An extension to this theory is the “enclave theory.” According to this theory, the natural resource productive sector is only an annex to the core or center and would be totally isolated from domestic economy. In other words, natural resource exports to developed countries would have no production-related impact on domestic economies. So, how will Latin America benefit from as a producer of natural resources? Evidently, the enclave theory underestimates different effects on domestic economies arising from natural resource exports (such as being the source of foreign exchange earnings and tax collection) which used to be managed by foreign owners.

The theories stated above generate the so-called “export pessimism” which prevailed before the 1980s throughout Latin America: this region can only export natural resources.

China stirs up some trouble in this dependency theory. Where should China be placed? In the center or the periphery? Countries in the periphery, such as South Korea, China, etc., may shift into the category of countries in the center; this means that the periphery is not a permanent location for the countries.

The **“resource curse”** is a hypothesis stating that countries with abundance of natural resources tend to have lower rates of economic growth.

Different empirical findings state that, on average, relative natural resource-intensive countries have had lower economic growth than countries with less natural resource endowment; in addition, countries with a higher economic growth have (in general) less natural resource endowment. Additionally, first discoveries revealed that there was a negative relationship between economic growth rates and the participation of natural resource exports on a country’s total exports, compared to their GDP, in a group of 80 developed countries (Sachs and Warner, 1995). All these

case studies have taken place over the 1970s, 1980s and the beginning of the 1990s (Auty and Mikesell, 1998).

The reasons for a country's lower economic growth might be (Sachs and Warner, 1995; Auty and Mikesell, 1998): i) productive specialization in natural resources, which leads to fewer possibilities of incorporating technological innovation and acquiring related knowledge in respect to the production of manufactures, and ii) the production of natural resources in underdeveloped countries with weak political institutions may lead to political instability arising from decisions to be made in respect to income generated by natural resource productive sectors (Robinson, Torkiv, and Verdier, 2006).

Lederman and Maloney (2007) have examined the empirical relationship between natural resource exports and economic growth through various structural aspects and different econometric techniques for a group of countries and have concluded that "there is no resource curse," and in case there is an incidence thereof, it has a positive rather than a negative effect. Manzano and Rigobón (2007) and Meller *et al.* (2013) have come to a similar conclusion.

In respect to **the deterioration of the terms of trade of natural resources**, and since we are facing the new technological revolution based on information technology, it seems convenient to study the evolution of the terms of trade in Latin American countries by observing the relative price performance of computers and natural resources. The *United States* Bureau of Labor Statistics¹⁶ index on computer prices has been used for this purpose. Prices of the main commodities exported by the 18 Latin American countries have been included. The *Global Economic Monitor Commodities* (World Bank) has been used as reference. This way, a trade indicator for the period 1981-2011 was released. It is noted that all raw materials included in the findings' evidence a clear uptrend throughout the period under analysis (see Annex). A closer look at the period before the *boom* (1981-2000) confirms that all products (except for coffee) experienced a clear uptrend. It should be noted that the use of the computer price underestimates the level of decline as substantial quality upgrades are disregarded.

Table 8 shows the equivalence between the number of computers and units of raw materials over decades. According to Table 1, the value of a ton of copper was equivalent to the value of 0.45 computers in 1981, while a ton of copper was equivalent to 20 computers in 2011. Similarly, a thousand barrels of oil was equivalent to the value of 10 computers in 1981, and it turned to be equivalent to 240 computers in 2011. The value of a ton of coffee was not enough to buy one computer in 1981, while it is worth 14 computers in 2011. Both for soybean and beef, one computer could be bought with 15 times less units of these commodities in 1981-2011. Similar estimates might be calculated for each commodity, and positive outcomes in terms of trade may be observed over the last 30 years for Latin America. This contradicts the hypothesis of the deterioration of the terms of trade in the region.

16 The computer price in the year 1997 was considered as a basis. Then, this is combined with the index available in 1981-2011.

TABLE 8. Raw Materials Units' Equivalence with a Number of Computers

| Year | Copper (1) | Iron (2) | Coffee (3) | Oil (4) | Soybean (5) | Coal (6) | Beef (7) |
|------|------------|----------|------------|---------|-------------|----------|----------|
| 1981 | 0.45 | 70 | 0.7 | 10 | 70 | 10 | 0.6 |
| 1991 | 0.77 | 100 | 0.6 | 10 | 60 | 10 | 0.9 |
| 2001 | 1.43 | 300 | 1.3 | 20 | 170 | 30 | 2 |
| 2011 | 20.00 | 4,000 | 14 | 240 | 910 | 290 | 9 |

(1) Metric tons (t); (2) millions of dry metric tons.; (5) tons; (4) thousand barrels; (5) thousands of metric tones; (6) thousands of metric tones; (7) t.
The table shows that the value of one ton of copper was similar to 0.45 computers in 1981, while a ton of copper was worth 20 computers in 2011.

Source: Author's elaboration.

By the end of the 20th century, the globalization process accelerated. In this context, commercial interaction expanded; partners to these commercial activities would enjoy tariff benefits, providing for a competitive advantage. Free Trade Agreements (FTA) have two different purposes: they link domestic economies with trading partners, and they also provide for the execution of FTA with developed countries, which is a significant step toward Latin America's modernization. Free Trade Agreements attract foreign investment. Additionally, export expansion stimulates Latin American entrepreneurs to invest abroad.

In summary, trade flows of goods (exports and imports) and investment flows (domestic and foreign), together with the significant expansion of these flows turn Latin America into a region connected to the global economy.

Topics related to this worldwide economic integration over the 21st century focus on increasing local economies' competitiveness and diversifying the export basket. Entrepreneurship, innovation and creative capacities are key to achieve all these goals. How can Latin America take advantage from and anticipate to the future expansion of the demand of Chinese and Indian consumers? The region will need to overcome some of the challenges below.

4.2. Natural-resource related technologies and innovation

Since the times of Adam Smith, the idea that natural resources generate low technical progress has prevailed. Adam Smith's consideration is justified by the fact that early inventions of the "industrial revolution" dazzled him and he compares them to the prolonged agriculture stagnation.

This concept has influenced the theoretical models developed by the economics literature. There are different economic growth and trade models involving the industrial and the natural resource sectors that demonstrate that a country specializing in the production of natural resources in the present will be "tied" to this same production in the future and will have lower

growth rates (Krugman, 1987; Grossman and Helpman, 1991). Nevertheless, these models also state in advance that technological innovation only takes place in the industrial sector, and, consequently, this leads to the conclusions mentioned above. This assumption is not empirically valid, since the natural resource productive sector actively applies modern technologies and may be the base for new technological innovation processes.

A problem arising from the resource curse hypothesis is to assume that these goods are neither linked to nor generate any technological innovation. Thus, it is advisable to imitate Costa Rica to foster technological innovation capacity and provide franchises and subsidies to attract foreign companies, such as Intel. In other words, according to this approach, Latin America should leave aside its comparative advantages and move forward into the generation of new comparative advantages linked to technology production.

A new approach based on the resource curse theory is the so-called “second stage of the export process,” which states that the first stage of Latin American export’s activity has been the easy one (oil, mining and natural resources exports). This stage only included “collecting the existing natural resources in the country, loading them into a *container* and sending them abroad.” But is exporting natural resources such an easy task? The cartoon may suggest this; then the inference seems logical. “Exporting more is not enough. We must export better quality products.” Therefore, the region must enter the second stage of the export process and “incorporate intelligence or added value to natural resources being exported.”

There is a core element discouraging the production of manufactures from natural resources for export purposes: the requirements related to high-cost distribution and commercialization channels abroad. Notwithstanding the above, there is a related concept that should be discussed: the suggested strategy of processing natural resources implicitly assumes that a country with comparative advantages in these products would automatically have comparative advantages in their processing activities. If processing natural resources has positive benefits, why do most of emerging economies export raw materials instead of processed products? Does the availability of natural resources provide for comparative advantages for the production of processed products?

Export strategy of manufactures arising from natural resources implicitly has the same bias as import-substitution industrialization strategy. Allegedly, exports of manufactured goods are “better” than natural resource exports; and industrial production is “better” than the production of raw material. Why is this true? USD 100 million exports of raw materials are equivalent to USD 100 million computers exports. What is the difference? The answer seems to be that industry is what really matters. Why does industry matter so much? Because industrial production is believed to be the main mechanism for the incorporation and spreading of modern technology. This may have been valid for the first half of the 20th century, but in the second half, imports have been deemed the main means of acquisition of modern technology. Furthermore, natural resource productive sectors have had a relative higher importance in the industry in respect to the use of modern technology.

In fact, in the region, natural resource sectors are the ones really leading the use of modern technologies and information technology (IT). The use of advanced technologies in the sector includes satellite communication, robotics, nuclear sensors, computational modeling of different processes, the use of a wide range of software for more efficient production and administrative processes, the development of global platforms for purchasing inputs, etc. In conclusion, from a technological point of view, the productive method of the natural resource productive sector is one of the most sophisticated, both at national and international levels.

In this global and modern world of the 21st century, what really matters is not the type of goods under production, but “how those goods are produced” (World Bank, 2001). This production process is what generates a learning process (*learning by doing*), which is the basis of innovation and accelerated modern growth. An ideal scenario would involve attracting young people who master information and communication technologies to become involved in the technological challenges of producing natural resources in Latin America.

4.3. The clustered-based development strategy¹⁷

Fostering the creation of clusters linked to natural resources may be the basis for an adequate and promissory development strategy for Latin America. Developing new clusters of this type would provide a long-term vision of Latin America’s permanent evolution. It would be a sort of roadmap that would allow for an enhanced current and future coordination of activities held by private, public, and academic sectors.

Before creating a cluster, it is essential to clarify whether forward or backward linkages *will be fostered*. There is no apparent general principle for all types of natural-resource clusters. Two indicators of a cluster’s success and development performance should be: on one side, exports expansion of the main natural resource, and on the other side, the generation of new products associated to the core natural resource. In other words, the formation of clusters linked to natural resources may be a tool providing simultaneously for export diversification and for triggering technology innovation.

Clusters also offer intersectoral interaction (vertical and lateral) and intra-sectoral interaction (horizontal) among different and complementary companies that specialize in a specific component (or knowledge) of the value chain. This means that there are incentives within a cluster, and that cooperation and competition co-exist among cluster participants. Technological innovations (and different types of policies) are focused on

¹⁷ This section is based on Porter (1990; 1998). A cluster is a geographic concentration of interconnected businesses and associated institutions in a particular field. These businesses include producers of consumer goods, any type of suppliers (machinery, special services, general services, inputs, etc.) and associated institutions (technological institutions, universities, sales companies, government-owned agencies). An economic cluster emerges in a context with a critical mass of companies that take advantage of economies of scale and economies of clusters. These companies also internalize different types of externalities (monetary, accumulation, or technological ones) and provide for and encourage technical innovation and new business activities.

empowering mutual independence and interaction among the different economic players or organizations of the value chain.

Clusters make externalization easier, i.e., clusters substitute vertical integration within a company. Within an environment of rapid changes and unexpected *shocks*, companies with a high degree of vertical integration are prone to reacting quickly; while external companies and consultants are relatively more efficient and effective in implementing changes in the short term. On the other hand, clusters allow each of its participants or economy players to operate as if it had a big economy of scale, without losing the advantages of flexibility.

The Australian mining model is an example of a cluster based on backward linkages. The quite big producers of natural resources in Latin America constitute a significant internal market that could be the basis for developing a sector supplying inputs and professional services (engineering) to companies producing natural resources. Technological problems of production processes may be outsourced, and consultant companies (local) may also provide support in the solution of these problems. This win-win situation lets the company creating natural resources increase productivity levels while the supplier gains the knowledge it needs to generate technological innovation. The World Class Supplier Program in Chile, which tries to replicate the Australian model has been built following the mentioned logic.

We will briefly describe the core elements of the World Class Supplier Program (WCSP) implemented in Chile (Fundación Chile, 2008-2017). The program comprises more than 4,000 input suppliers in the mining industry, with annual revenues amounting to USD 20 billion and with labor forces close to 600,000 people. The objective of this program is to provide for the emergence of companies that solve mining companies' technological problems. The two biggest mining companies, BHP and CODELCO, have implemented this program and almost 80 suppliers have already been participating.

This program evidences a down-to-earth way to **articulate the mining cluster**. One of the objectives is to turn suppliers into exporters, something similar to what has been observed in Australia. Australian mining industry's suppliers export more than USD 10 billion on an annual basis in inputs, *software* and professional services. Can Latin America replicate this model?¹⁸

In other words, the same copper would help to diversify Chile's export basket. This is a great idea! No doubt. But what are the bottlenecks? Meller and Parodi (2017) state that "For mining companies, the World Class Supplier Program was not important. Most of the people working in mining companies were not aware of the program. It was under the scope of the Corporate Social Responsibility (CSR) area. The type of technological challenge addressed by the World Class Supplier Program was quite marginal, i.e. "definitely, not so important." Besides, Chilean professionals and supervisors of mining companies have an "anti-Chilean bias"; they do not believe in the existence of Chilean innovators, and they are not willing to take risks using technological solutions developed by

18 See Meller and Gana (2015).

domestic companies. If those solutions failed, they would be blamed for having chosen a ‘precarious’ company; on the other hand, if a solution from a large foreign supplier failed, the fault would lie with the foreign company.”

4.4. Lessons from developed countries with abundance of natural resources¹⁹

The main lesson from the experience of developed countries is that natural resource-based activities can be relatively knowledge-intensive; even an enclave sector such as oil or mining could become a “collective learning phenomenon” (World Bank, 2001).

The United States’ experience is interesting since by the late 19th century and early 20th century, the American economy was relatively natural resource intensive. The broad lesson is that what matters for resource-based development is not the inherent character of resources, but the nature of the learning process through which their economic potential is achieved.

The role of mining education constitutes a key factor underlying the success of the expansion of natural resources in the United States. Academic institutions used to draft detailed roadmaps, including the location of all mining sites, which was really useful for enterprises and scientific research. Research and Development (R&D) of specific technologies provided for the expansion of natural resources in that country, which became the world leader in mining and metallurgical engineering. The development of mining and oil extraction was the basis for the emergence of the industry of technological knowledge. By the end of the 19th century, American geologists were being hired as consultants all over the world for the exploration of oil and mining sites. In fact, “it is not geology (nor funds), but investment in geological knowledge what accounts for the United States’ dominance of oil production worldwide” (Wright, 2001, pp. 16).

The main dilemma for a country with abundance in natural resources is not trying to reinvent itself and become a different country. The underlying problem is focused on whether it should encourage exploration, investment and R&D for developing their natural resource potential to its maximum. Consequently, and for this purpose, investments needed are not exclusively the ones related to physical capital (machineries) and infrastructure (roads, ports, energy, etc.) but also to the “acquisition of knowledge in respect to the natural resources’ endowment of the country and the development of technologies leading to the increase of said endowment.”

In summary, “one of the biggest historical mistakes often made by Latin American countries is to have turned their backs on their natural resources-based comparative advantages” (World Bank, 2001). Historical evidence and rationality suggest benefiting from comparative advantages by exploiting the most of existing natural resources; and since natural resource stock is endogenous, it is essential to apply new knowledge and technologies to discover and explore new sites (Maloney, 2002). In this

¹⁹ This section is based on the outstanding article written by Wright and Czelusta (2007).

way, the optimal use of these resources may position a country among the leaders in technological knowledge.

In today's world, what really matters is not the type of goods under production, but "how those goods are produced" (World Bank, 2001; CAF, 2018), and this is what generates a process of practical learning, which is the basis for accelerated modern growth. In Latin American economies, the production method of natural resources' productive sectors is the most sophisticated in terms of technology applied, both at the national and international level. Consequently, it is time for the Latin American society to start associating natural resources with modern technology. Besides, other sectors should also start applying the "learning by doing" process of this sector. If the rest of the productive sectors used a technological level similar to the natural resource sector, "Latin America would be a developed region by now."

Is it possible to step up and shift from the production of natural resources to the production of Information Technology? As we have mentioned above, the fact of having natural resources should not be an obstacle for the incorporation of Information Technology. Using this type of technology is not only possible but also profitable and essential for the production process of natural resources. Three-dimensional seismology combined with high-speed computer programs allows the processing of large amounts of information generated by waves that penetrate geological formations, as well as considerable time and cost savings.²⁰

IT is now incorporated in all the stages of oil, gas and mining production processes. It is also used in the product's exploration, exploitation and extraction, the processing and physical separation of different substances, the design of different processes and control mechanisms, time saving in respect to each process, and waste and contaminating particle's reduction, among others. Additionally, Information Technology has been incorporated into different stages of the executive and the human resources management process. Different findings evidence that productivity profits derived from better integration of management processes grounded on the extensive use of Information Technology are comparable to those obtained from incorporating modern technology (and IT) in the production process.

The experience of the Scandinavian countries illustrates how these countries develop specific know-how from natural resources linked to their own endowment of natural resources, and then become global producers of machinery, technology, and consultancy providers in respect to the different stages of production of those goods. To this end, Scandinavian countries have managed to establish links between the private sector, universities, and government-owned agencies to create a "knowledge cluster" (World Bank, 2001; Blomstrom and Kokko, 2007). Generating a similar interactive network in Latin America would be highly beneficial. However, it is important to highlight that this has different difficulties. On one side, it would be necessary to overcome mutual distrust between the private sector and universities, and

²⁰ In 1985, the computational complexity required to process one square kilometer of geographical data was 800 minutes, and this time was reduced to just 10 minutes in 1995. In 1980, the cost of analyzing 50 square miles of geological data was USD 8 million; and this cost decreased to 1.1% in 2001 (USD 90,000).

between the private sector and government-owned agencies. On the other side, it would be necessary to coordinate, finance and provide appropriate incentives to achieve the formation of these clusters of knowledge.

A recent example is Australia, one of the most important mining producers in the world.²¹ Australia is also the main producer of *software* used by mining companies worldwide. Latin American oil and mining sectors are the ones having comparative advantages to induce the generation of *software* with worldwide projection, in an analogous way, compared to Australia.

4.5. Institutions and natural resources

The emergence of resource-rich countries that have achieved significant long-term economic growth has generated a large body of literature that seriously challenges the empirical and conceptual validity of the resource curse hypothesis.²² Norway and Botswana were the key countries leading this change in the literature. The first one is a country with abundance of oil resources, but it used to be the poorest European country by the beginning of the 20th century. However, it is currently one of the richest countries in the world. Many people have considered that proper management of oil derivatives has been one of the main bases for success. Botswana has been the most successful country in respect to economic growth in Africa. According to Acemoglu *et al.* (2003), Botswana was one of the poorest countries in the world. However, between 1965 and 2000, it was one of the countries with the highest growth in the global economy, reaching an annual rate of 7.7%. Taking into account that the low pace of growth of African countries was mainly based on the resource curse theory, it looks at least contradictory that Botswana has had such a wonderful performance, since most of its income derived from diamond's exploitation activities. Acemoglu *et al.* (2003) also suggest that people may wonder the reason why some natural resources seem to be a curse for the rest of African countries, may be such a blessing in the case of Botswana.

In fact, the question has changed from "Are natural resources a curse?" to "Why in some countries the presence of natural resources seems to be a curse and in others a blessing?" In general, the literature states that the quality of the institutions determines which side will prevail as the final use of resources lies with them. Acemoglu *et al.* (2003) state that the difference between Botswana and the rest of the African countries is that Botswana had an adequate institutional system in place in respect to "private property";²⁵ which allowed for the positive use and savings of the income arising from diamond's extraction.

Robinson *et al.* (2006), in the same line, drafted a model to relate political institutions with the resource curse. According to the authors, countries with institutions allowing the arbitrary management of resources, where

21 Iron, coal, diamonds, bauxite, gold, nickel, copper, zinc, silver, and manganese are the mining products representing more than 40% of total exports in Australia.

22 For more extensive and detailed information on the hypothesis of the "curse," see World Bank (2002), Lederman and Maloney (2007), and Meller *et al.* (2013)

23 Mainly linked to the existence of obstacles to opportunistic behavior.

there is no “accountability” or transparency would be more likely a misuse of its natural resources and therefore, a raw material *boom* would impact its economic efficiency negatively, providing for further incentives for corruption. For example, Mehlum, Moene, and Torvik (2006) initially estimate the impact of natural resources on GDP growth, finding that a higher endowment of resources would lead to lower growth rates. However, they also add the quality of institutions and their interaction with the abundance of natural resources as independent variables. In that case, their findings were that the impact of abundance of natural resources is still negative in respect to growth, but the variable related to the interaction between institutions and resources shows a positive outcome. This means that, with low quality institutions, natural resources would effectively be a curse, but with high-quality institutions, natural resources would have a positive impact and would increase growth rates, therefore, becoming a blessing.

4.6. Differences between the natural resource export pattern of the 19th and the 20th centuries

What is «new» about a growth strategy in which exports of natural resources are a key element? This strategy is the one adopted by different Latin American countries since the 19th century and over the 20th century and did not turn them into developed countries. If it was unsuccessful in the past, why would it work now?

It was suggested above that the core question was whether natural resources might turn Latin America into a developed region or not? But, in fact, the underlying issue is how Latin America can become a developed region. That is to say, it is not important to discuss what happens with natural resources; since the core issue is not sectorial. What is important is the transformation of a Latin American country into a developed country. In our opinion, natural resources may still play a main role in this sense, though it would be less significant than in the past.

The economic context in which Latin America operates has changed dramatically. The bias against exports in the set of policies is gone and the export-related pessimism has been left behind. Exports have expanded, both in value and variety, and in the diversification of exported products; additionally, Latin American products now reach almost all the countries around the world. In this sense, the dominant myth among developed countries stating that “you need to be Asian to export” has been refuted. We can now observe that “Latin American companies can also export and some exported products are of high quality.” This also reveals that aggressive entrepreneurs have emerged with innovative solutions in the region; likewise, there is a relatively higher level of human resources compared to the past.

The internal macroeconomic context of most countries in the region does not evidence the imbalance levels experienced in the past; inflation rates and fiscal deficit levels have been dramatically reduced. Efforts may be focused on long-term policies as the control over the macroeconomic situation is

greater today. In this regard, there is a broader discussion over policies on investment and savings' incentives, on human resources training and on the incorporation of modern technology.

Asian countries have a big capacity to imitate successful experiences of leading countries of the region. Lagging countries in the region should act likewise, imitating the wide range of strategies and new products that have emerged in the export baskets of different Latin American countries.

5. Conclusions

Natural resources may play a key role in facilitating the transformation of a Latin American country into a developed country, though it might be a less significant role compared to the past. In other words, the growth strategy of the region should not exclude the export of raw materials. In this respect, there is a wide range of possibilities, which are not exclusive to each other:

i. A big expansion on the production of traditional natural resources. The increasing growing trend of countries with large populations, such as China and India, is generating a huge increase in demand for all types of raw materials, and it seems that this trend will continue for several years. Also, trying to incorporate to the global economy of all Eastern Europe countries and new countries emerging as a result of the Soviet Union break-up, has increased the number of economies with comparative advantages in natural resources. The increase in the production of natural resources traditionally exported by Latin America discourages investment in other regions for the exploitation of these products; this is a *crowding out* phenomenon that contributes to maintain the region's comparative advantages.

ii. The incorporation of new natural resources within the same industry, for example, by incorporating new products to mining, gas, fishing, forestry and fruit sectors' export baskets, different from other traditionally exported resources. The know-how acquired in the production of a raw material can be applied to other resources in the same sector. This sequence of natural resource exports (and the maintenance of exports of traditional natural resources) corresponds to a strategy suggested by the theory of economic growth that emphasizes the role of commodities (*Staple Theory*) applied in Canada.

iii. The production and export of intensive goods in traditionally exported natural resources. This means adding value to exports arising from traditional natural resources; for example, by fostering *forward linkages* of the productive chain. This way, the enclave condition of the mining or hydrocarbon product would diminish.

iv. A different alternative is the local production of goods and services emphasizing backward linkages of the productive sector of natural resource exports, for example, goods and services used as inputs in traditionally exported natural resources. Given the estimated sharp increase to be faced by the raw materials' productive sector, there could be a multiplying effect on local providers of intermediate inputs and professional services. Companies exporting natural resources require high-quality inputs and services. Therefore, local suppliers are forced to gain competitive experience and know-how in respect to the global market; and for this reason, these suppliers may

also turn to be exporters. In other words, the current local huge productive sector of natural resource exports constitutes a significant local market that might be the basis for developing an export sector to meet the demand of said inputs and professional services. However, efficient production would be a fundamental condition to displace external competitors (transportation costs would initially constitute a competitive advantage for local producers; and this advantage obviously disappears if the company starts to export).

v. Finally, in line with the idea that institutions might be more important than policies, there are some approaches aimed at creating “high-quality institutions.” Institutions are the “rules of the game in the long-term.” Among them, we can find: i) the creation of sovereign funds, which serve to transform natural resource physical wealth into financial wealth; therefore, it is important to discuss how natural resources may be “seeded” to enhance technological innovation and local productivity; and ii) it is necessary to provide for public-private partnerships promoting innovative activities, as some countries did by establishing productivity and competitiveness boards or executive commissions. The mission implies to provide for a definition on which the long-term purposes are and how to achieve them. This is a challenge that involves both the public and the private sectors.

Bibliography

- Acemoglu, D., Johnson, S., and Robinson, J. (2003). "An African success story: Bostwana." D. Rodrik (ed.), *In search of prosperity: Analytical narrative on economic growth*. Princeton University Press.
- Agosin, M. (2007). "Export diversification and growth in emerging economies," Working Paper 233. Department of Economics, University of Chile. Santiago.
- Agosin, M., Álvarez, R., and Bravo-Ortega, C. (2008). "Determinants of export diversification around the world: 1962-2000." Working Paper. Department of Economics, University of Chile. Santiago.
- Auty, R. M. and Mikesell, R. F. (1998). *Sustainable development in mineral economies*. Oxford: Clarendon Press.
- World Bank (2002). *From natural resources to the knowledge economy*. Studies by the World Bank on Latin America and the Caribbean Washington D.C.
- World Bank (2011). *The changing wealth of nations: Measuring sustainable development in the new millennium*. Washington D.C.
- Blomström, M. and Kokko, A. (2007). "From natural resources to high-tech production: The evolution of industrial competitiveness in Sweden and Finland." D. Lederman and W. F. Maloney (ed.), *Natural resources, neither curse nor destiny*. Washington D.C.: World Bank.
- Cadot, O., Carrère, C., and Strauss-Khan, V. (2009). "Export diversification: What's behind the hump?" Working Paper 2009.54, CERDI.
- CAF (2012). *Finanzas públicas para el desarrollo: Fortaleciendo la conexión entre ingresos y gastos*. CAF.
- CAF (2018). *Instituciones para la productividad*. Reporte de Economía y Desarrollo (RED). CAF.
- Dutt, P., Mihov, I., and Van Zandt, T. (2008). *Trade diversification and economic development*. INSEAD.
- Grossman, G. and Helpman, E. (1991). *Innovation and growth in the global economy*. Cambridge: MIT Press.
- Hesse, H. (2008). "Export diversification and economic growth." Working Paper 21. The Commission on Growth and Development. World Bank.
- Imbs, J. and Wacziarg, R. (2003). "Stages of diversification." *American Economic Review*, 93 (1).
- Krugman, P. (1987). "The narrow moving band, the Dutch disease, and the competitive consequences of Mrs. Thatcher: Notes on trade in the presence of dynamic scale economies." *Journal of Development Economics*, 27(1-2), 41-55.
- Lederman, D. and Maloney, W. F. (ed.) (2007b). *Natural resources: Neither curse nor destiny*. World Bank. Washington D.C.: Stanford University Press.

- Lederman, D. and Maloney, W. F. (2007a). "Trade structure and growth." D. Lederman and W. F. Maloney (ed.), *Natural Resources, Neither Curse nor Destiny*. Washington D.C.: World Bank.
- Maloney, W. (2002). "Mixed opportunities: Innovation, natural resources and growth in Latin America." *Economía*, 3 (1), 111-169.
- Manzano, O. and Rigobón, R. (2007). "Trade structure and growth." D. Lederman and W. F. Maloney (ed.), *Natural resources: Neither curse nor destiny*. Washington D.C.: World Bank.
- Mehlum, H., Moene, K., and Torvik, R. (2006). "Institutions and the resource curse." D. Lederman and W. F. Maloney (ed.), *Natural resources: Neither curse nor destiny*. Washington D.C.: World Bank.
- Meller, P. (2013). *Recursos naturales y diversificación exportadora: Una mirada de futuro para América Latina*. Santiago: Cieplan-CAF.
- Meller, P. and Gana, J. (2015). "El desarrollo de proveedores mineros en Australia: Implicancias para Chile." Santiago: CIEPLAN.
- Meller, P. and Parodi, P. (2017). *Del programa de proveedores a la innovación abierta en minería*. Santiago de Chile: CAF; CIEPLAN. Retrieved from <http://scioteca.caf.com/handle/123456789/1074>
- Meller, P., Poniachik, D., and Zenteno, I. (2013), "América Latina y la bendición de los recursos naturales." P. Meller (ed.), *Recursos naturales y diversificación exportadora: Una mirada de futuro para América Latina* (pp. (15-72). Santiago: Cieplan-CAF.
- Meller, P. and Zenteno, I. (2013). "Diversificación de exportaciones en América Latina: experiencias y lecciones para políticas públicas." P. Meller (ed.), *Recursos naturales y diversificación exportadora: Una mirada de futuro para América Latina*, (pp. (15-72). Santiago: Cieplan-CAF.
- OECD (2008). "The Marshall Plan: Lessons learned for the 21st Century." Paris: OECD
- Porter, M. E. (1990). *The competitive advantage of nations*. New York: Free Press.
- Porter, M. E. (1998). "Clusters and the new economy." *Harvard Business Review* 76, N.º 6 (November-December 1998).
- Robinson, J., Torvik, R., and Verdier, T. (2006). "The political foundations of the resource curse." *Journal of Political Development*, 79, 447-468.
- Sachs, J. and Warner, A. (1995). "Natural resource abundance and economic growth." NBER Working Paper 5398.
- Sanguinetti, P. (2018). *Productividad e innovación para el desarrollo*. CAF - Banco de Desarrollo de América Latina.
- Sinnott, E., Nash J., and de la Torre, A. (2010). "Natural resources in Latin America and the Caribbean. Beyond boom and busts?" Studies by the World Bank on Latin America and the Caribbean
- Wright, G. (2001). "Resource-based growth then and now." California: Mimeo, Stanford University. June.
- Wright, G. and Celusta, J. (2007). "Resource-based growth past and present." Lederman and Maloney (ed.), *Natural resource: Neither curse nor destiny*. Washington D.C.: World Bank.

Annex

TABLE A1. Equivalence of Units of Raw Materials and A Computer

| Year | Copper (1) | Iron (2) | Coffee (3) | Oil (4) | Soybean (5) | Coal (6) | Beef (7) |
|------|------------|----------|------------|---------|-------------|----------|----------|
| 1981 | 2.2 | 13,550.8 | 1,326.9 | 107.3 | 15.1 | 71.0 | 1,538.3 |
| 1991 | 1.3 | 5,953.3 | 1,661.2 | 160.7 | 15.8 | 78.5 | 1,168.5 |
| 2001 | 0.7 | 3,527.7 | 771.5 | 43.5 | 5.9 | 32.8 | 497.5 |
| 2011 | 0.1 | 252.74 | 70.94 | 4.1 | 1.1 | 3.5 | 104.9 |

(1) Metric tons; (2) dry metric tons.; (3) kilograms; (4) barrels; (5) metric tones; (6) metric tons; (7) kilograms.

Note: The table shows that: the value of one computer was similar to 2.2 tons of copper in 1981 while a computer was worth 0.1 tons of copper in 2011.

As shown on Table A1, 2.2 metric tons of copper were needed to buy 1 computer in 1981, while 0.67 metric tons were required in 2001 and just 0.05 in 2011. In 1981, 135.5 dry metric tons of iron were needed, while 35.3 were required in 2001 and just 2.5 in 2011.

TABLE A2. Destiny Breakdown of Latin American Exports by Region in the World 1962-2017 (%)

| | 1962 | 1970 | 1980 | 1990 | 2000 | 2010 | 2017 |
|----------------|------|------|------|------|------|------|------|
| USA | 37% | 30% | 30% | 40% | 60% | 37% | 46% |
| China | 0% | 0% | 1% | 1% | 1% | 8% | 11% |
| EU | 18% | 19% | 23% | 14% | 17% | 18% | 15% |
| Asia (- China) | 4% | 7% | 9% | 13% | 6% | 11% | 12% |
| LAC | 37% | 39% | 31% | 27% | 12% | 14% | 12% |
| Other | 5% | 5% | 6% | 6% | 4% | 12% | 5% |

Source: UN COMTRADE.

TABLE A3. Origin Breakdown of Latin American Imports by Region in the World, 1962-2017 (%)

| | 1962 | 1970 | 1980 | 1990 | 2000 | 2010 | 2017 |
|----------------|------|------|------|------|------|------|------|
| USA | 43% | 41% | 37% | 41% | 51% | 31% | 32% |
| China | 0% | 0% | 1% | 1% | 2% | 14% | 19% |
| EU | 10% | 13% | 14% | 16% | 14% | 18% | 14% |
| LAC | | | | | | | |
| Asia (- China) | 6% | 8% | 19% | 14% | 11% | 16% | 16% |
| LAC | 37% | 34% | 23% | 24% | 16% | 16% | 16% |
| Other | 3% | 4% | 6% | 5% | 5% | 6% | 4% |

Source: UN COMTRADE.



State Capacities, **Governance and Corruption Prevention**

06

Eduardo Engel
*Espacio Público and
University of Chile*

The author appreciates the comments of Manuel Aris, Nicolás Campos, Gustavo Fajardo, Leopoldo Ferguson, María Jaraquemada, Daniel Kaufmann, Ernesto Muñoz, and Pablo Sanguinetti, as well as Tomás Cortés' assistance in the preparation of charts.

1. Introduction

Corruption has become one of the issues that concerns Latin American citizens the most after major scandals, either at country or regional level. The larger and more educated middle class that emerged after the boom of commodity prices demands that their taxes be devoted to quality services.¹ Citizens resent both the petty corruption expressed by the need to pay bribes to obtain better services and the grand corruption resulting in exorbitant surcharges in huge public infrastructure projects. They do not tolerate the conflicts of interest, the influence peddling or the corruption that –in their opinion– reflect the existence of privileged groups not governed by the same rules as the rest of the citizens.

The fact that citizens are more outraged by corruption today than in the past is also due to the new technologies and the presence of media that conduct first-class investigative journalism. New technologies have reduced the coordination costs for those who wish to protest, resolving the collective action issue faced by previous generations. Social media facilitate the rapid dissemination of information, while mobile phone cameras have provided each demonstrator with a robust deterrent tool against police repression attempts.

A better journalistic work also explains why more corruption cases are known now than in the past. Several of the biggest corruption cases in countries in the region became known as a result of high-quality investigative journalism, including videos and recordings that evidence the irregularities.² An audio or a video that shows an illicit transaction is generally more widely spread than a newspaper article, so indignation grows. In addition, investigative journalism has benefited from the advances in the access to information and social media, while the new technologies have reduced the influence of traditional media that are reluctant to report corruption cases.³

Corruption cases, about which there is now more awareness and knowledge, have caused a growing discontent with governments and dominant political parties (e.g., Jair Bolsonaro in Brazil, and Andrés López Obrador in Mexico),⁴ and an important drop in the support of representative democracy in the region.⁵ Corruption and the State capture that corruption

1 See, for example, IPSOS Public Affairs (2019).

2 In fact, several scandals have resulted in series by Netflix, the content producer company.

3 See, for example, Mungiu-Pippidi (2015) and Margetts, John, Hale, and Yasseri (2015).

4 "From Mexico to Brazil, the Odebrecht scandal brought corruption to the center of public debate. It also bolstered a widespread revolt against political and business elites –a decisive element in most of the elections held in Latin America over the past two years" (Simon, 2019).

5 According to *Latinobarómetro*, the support to democracy has fallen from 44% in 1998 to 24% in 2018. See further details at: <http://www.latinobarometro.org/lat.jsp>

usually entails have also reduced the effectiveness of public policies and limited the development of countries.⁶

In recent years, the international scenario has not been favorable for fighting corruption in the region either. Under the Donald Trump administration, the leadership of the United States in the fight against corruption has weakened,⁷ facilitating decisions from the governments of Guatemala and Honduras to put an end to successful institutional initiatives that fought against corruption crimes, which had been developed with the support of the United Nations and the Organization of American States (OAS). The United States' reduced interest in governance issues has also affected the role of the World Bank in this area in the last decades, which was partially replaced by the International Monetary Fund (IMF). Today, the IMF contemplates the macroeconomic effects of corruption in their assistance programs. The growing participation of China in areas with high-corruption risk, such as the infrastructure and the extractive industries, constitutes another external adverse factor.⁸

There is a general agreement as to what are the challenges to be faced in order to establish an anti-corruption agenda that would address its most overt manifestations as well as its deeper root causes. The first challenge is to bring transparency and to regulate political funding, both in campaigns and within political parties themselves. The deficiencies in this area are probably the main underlying cause for most corruption scandals in the region. A second significant challenge is the effective regulation of conflicts of interest. Nepotism, the practice of revolving doors and inefficient regulation of incapacities and incompatibilities in public office are some of the topics that worry citizens the most. A third important issue is how to spend public funds, including public procurement in general and, in particular, public infrastructure, as well as public sector employment, all of which are areas prone to corruption. In addition, there are sectors that provide the State with high income, such as the extractive industries.

Regarding the main measures to advance in each of the issues mentioned above, it seems fair to say that there are more agreements than disagreements. However, most reform initiatives have either failed or have not achieved any progress at all. Either because they are never approved due to opposition from the decision-makers in charge of adopting the measures, because what is approved is far from meeting the initial objectives of the regulation, or because the implementation is poor and fails. Not many initiatives could be qualified as "successful", and there is not enough information to design reform strategies with a high chance of success. Different solutions have been put forward: to import an institutional framework, to create anti-corruption commissions, and to build political leadership around the fight against corruption. Many times, the starting point for these strategies is to

6 See Mauro (1995) and Kaufmann and Kraay (2002) for early references, and IMF (2016), CAF (2019) and the papers cited therein for recent references.

7 A clear example of leadership is the pioneer legislation to punish the payment of bribes abroad: the Foreign Corrupt Practices Act passed in 1977.

8 See, for example, Gransow (2015).

benefit from the window of opportunity to introduce anti-corruption reforms after big corruption scandals come to light. Although there have been a few successful cases for each of those strategies, most of the times, the result has been disappointing.

One possible conclusion on the difficulties to advance anti-corruption reforms is the need of a critical juncture (Acemoglu and Robinson, 2012), hoping that power relations are redistributed to enable a more virtuous equilibrium in governance. Another more proactive strategy is studying success and failure cases to facilitate the design of successful strategies in future crisis scenarios. The latter approach –which is adopted here– generally has more chances of success due to specific reforms approved before a crisis precipitates, as a result of the persistence of political players and the civil society (e.g., the access to information laws).

In this chapter, we first review the status of the fight against corruption in Latin America. The following section evaluates the region's status in governance and corruption. Section 3 reviews the evidence of the impact of corruption on economic development and growth while section 4 discusses the main reforms to be considered in the anti-corruption agenda. Section 5 reviews the policy of anti-corruption reforms, analyzing various experiences of these agendas that provide valuable lessons learned, some of them successful. Finally, section 6 includes some final comments.

2. How we are: evolution of indicators in Latin America

Before 1995, multilateral organisms and development banks omitted the word “corruption” in their official documents. Criticizing a country for its high levels of corruption and how this phenomenon impaired development policies was considered an intrusion on their internal affairs. Corruption was also seen as a cultural issue where developed countries had no right to impose their rules and values on developing countries. The intellectual grounds for “non-foreign involvement” in corruption issues come from a tradition that adopted the “efficient corruption” concept (Leff, 1964; Huntington, 1968). Applying the *second-best* theory, it sustained that corruption improved resource allocation in developing countries where bureaucracy and regulations suffocated private initiatives. In other words, corruption served to grease the wheels of state bureaucracies facilitating the completion of socially profitable projects.

Tired of not being able to tackle the payment of bribes in projects under their supervision, a group of officers from the World Bank left the institution and founded Transparency International (TI) in May 1993.⁹ One of the major contributions of Transparency International was the creation of the Global Corruption Perceptions Index (GCPI) in 1995. As its name indicates, this index has the purpose of measuring corruption at a national level, based on surveys about perceptions and experiences of different citizens, businessmen, investors, and experts. TI initially defined corruption as “the misuse of public office for private gain,” and then this definition evolved toward “the misuse of entrusted power for private gain.”

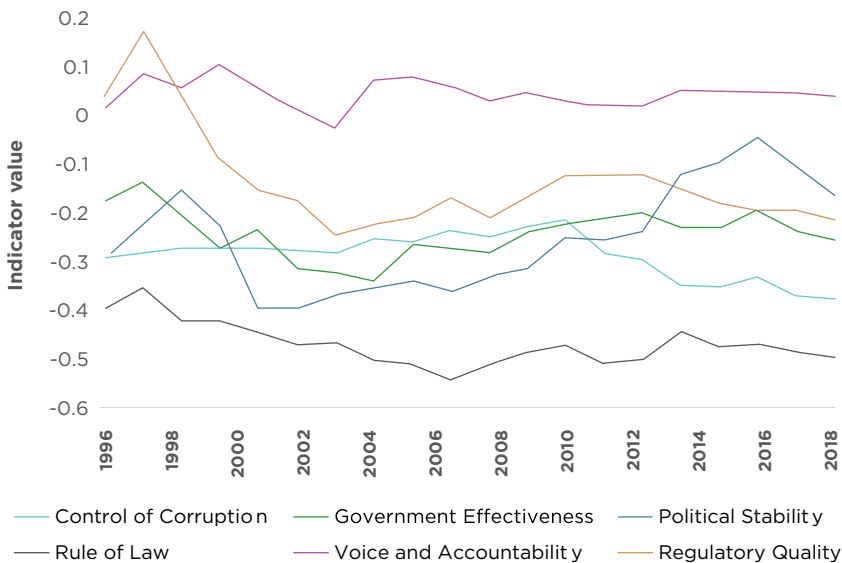
On the other hand, when the president of the World Bank took office in 1995, he announced that fighting the “cancer of corruption” would be one of the main objectives of his mandate. This radical change in the Bank’s approach to the sensitive issue of corruption led to the creation of the World Governance Indicators (WGI) a year later. There are six indicators: Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption and Voice and Accountability.¹⁰ Just like the GCPI, WGIs are determined from surveys and assessments carried out by more than a dozen specialized international institutions. Although they use similar information sources, WGIs offer the advantage of a methodology that allows assigning a precision measurement to the value of each indicator (standard deviation). This facilitates the detection of significant differences among countries. WGIs define governance as “the traditions and institutions through which authority is exercised in a country.”

⁹ See Eigen (2017).

¹⁰ The term “accountability” is used in the sense of willingness to accept responsibility for our own actions.

Chart 1 shows the average evolution of the six governance indicators for the 19 Latin American countries during the last two decades.¹¹ Higher values are associated with a better performance. Each indicator's values are normalized in a given year, so the average and standard deviation of the complete sample of countries is zero and one, respectively. Thus, a positive value shows that the country or region is above the average (and below if that value is negative), while a value over 1 means that it is within the 16% of top performers, and a value under -1 ranks the country or region within the 16% of worst performers.

CHART 1. Evolution of Global Governance Indicators in Latin America (average)



Source: Authors' elaboration from global governance indicators (World Bank).

On average, in Latin America, we see that only the Voice and Accountability indicator has values over zero. This reflects not only the enactment of access to information laws in the last two decades, but also the rise of a much more active, incisive and influential investigative journalism than in the past. The remaining indicators have values below the world average (as mentioned above, it was standardized to zero).

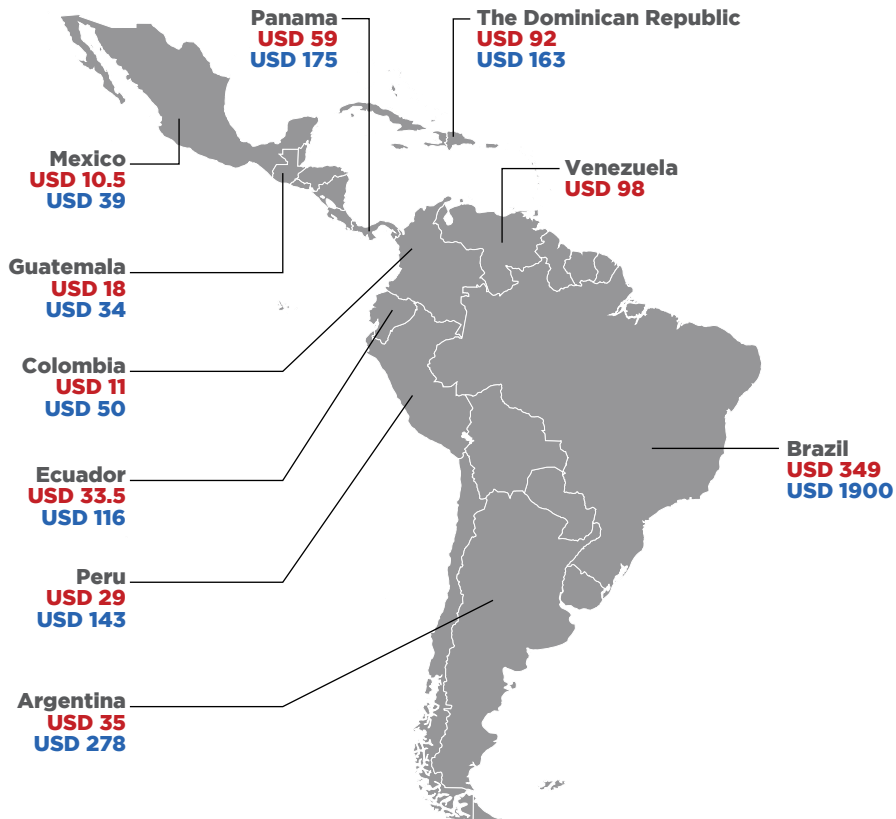
As for the trends, only the Political Stability indicator shows a positive evolution during the period; the rest appears to be stagnant (Voice and Accountability) or with a downward trend (Rule of Law, Control of Corruption, Government Effectiveness, and Regulatory Quality). In particular, a significant deterioration is observed in the Control of Corruption indicator since 2011, i.e., from an average of -0.21 to -0.38.

¹¹ The countries considered are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Dominican Republic, Uruguay, and Venezuela.

This deterioration is due to a combination of factors. First, a series of corruption scandals at a national level and a major scandal shared by several countries in the region, which we will discuss below. Second, as mentioned in the introduction, a larger and more educated middle class emerged after the decade of the commodity boom, which is less tolerant toward corruption. New technologies, social media, and investigative journalism have also contributed to unveil more corruption cases and facilitated massive manifestations when such cases are brought to light. This, in turn, has given more visibility and raised awareness regarding the scandals, which has deteriorated the Control of Corruption index.

Corruptions scandals, such as Operation Car Wash (*Lava Jato*) in Brazil, The line (*La Línea*) in Guatemala, the Corruption Notebooks (*Cuadernos de las Coimas*) in Argentina, Penta, SQM and Caval in Chile and the White House (*Casa Blanca*) in Mexico, among others, harmed public authorities' legitimacy and citizens' confidence in institutions. Apart from the scandals mentioned above, specific to each country, there is the Odebrecht case, which involved bribes for almost USD 800 million in ten countries in the region (see Figure 1). This case put several former presidents in jail, some were declared offenders and fugitives from justice, and it led to a suicide event. It also forced the resignation of a president in office. The Odebrecht case, the largest ever prosecuted under the United States anti-corruption legislation (*Foreign Corrupt Practices Act*),¹² had a significant political impact and froze the construction of major infrastructure projects. This led to the bankruptcy of many contractors and delayed the beginning of population-important infrastructure works for several years.

¹² See Campos, Engel, Fischer, and Galetovic (2020).

FIGURE 1. Bribes and Benefits from Odebrecht (in million USD)

Note: Bribes, amounts in red; benefits, amounts in blue.

Source: US Department of Justice (2016).

The second column in Table 1 shows the average assessment for the Control of Corruption indicator during the last two decades for each country. Countries may be grouped into four major groups based on this average. Chile and Uruguay are in the first group with 1.39 and 1.19 indicators, respectively. These amounts are similar to the average value in industrialized countries. Then, there is a second group made up of Costa Rica and Cuba with average values of 0.62 and 0.24. These four countries have better Control of Corruption practices than the world average, and as we will see below, better than expected, given their development level. The rest of the countries have negative values below the world average and may be divided into two groups. The first group composed of Argentina, Brazil, Colombia, El Salvador, Mexico, Panama, and Peru with values between -0.5 and 0 . The second group, integrated by Bolivia, Ecuador, Guatemala, Honduras, Nicaragua, Paraguay, the Dominican Republic, and Venezuela, shows average values below -0.5 .

TABLE 1. Control of Corruption (averages)

| Country | Control of Corruption 1996-2018 | Ranking per average | Trend (average differences between 2018-17 and 1996-98) | Ranking per trend |
|------------------------|---------------------------------|---------------------|---|-------------------|
| Argentina | -0.35 | 10 | -0.06 | 9 |
| Bolivia | -0.63 | 12 | -0.05 | 8 |
| Brazil | -0.10 | 5 | -0.50 | 18 |
| Chile | 1.39 | 1 | 0.39 | 15 |
| Colombia | -0.30 | 6 | 0.17 | 6 |
| Costa Rica | 0.65 | 3 | -0.29 | 14 |
| Cuba | 0.25 | 4 | -0.11 | 10 |
| Ecuador | -0.72 | 14 | 0.18 | 4 |
| El Salvador | -0.45 | 9 | 0.27 | 3 |
| Guatemala | -0.70 | 13 | 0.08 | 7 |
| Honduras | -0.085 | 17 | 0.34 | 2 |
| Mexico | -0.45 | 11 | -0.41 | 17 |
| Nicaragua | -0.75 | 15 | -0.24 | 13 |
| Panama | -0.33 | 8 | -0.41 | 16 |
| Paraguay | -1.05 | 18 | 0.46 | 1 |
| Peru | -0.34 | 7 | -0.14 | 11 |
| The Dominican Republic | -0.73 | 16 | -0.18 | 12 |
| Uruguay | 1.19 | 2 | 0.18 | 5 |
| Venezuela | -1.15 | 19 | -0.52 | 19 |

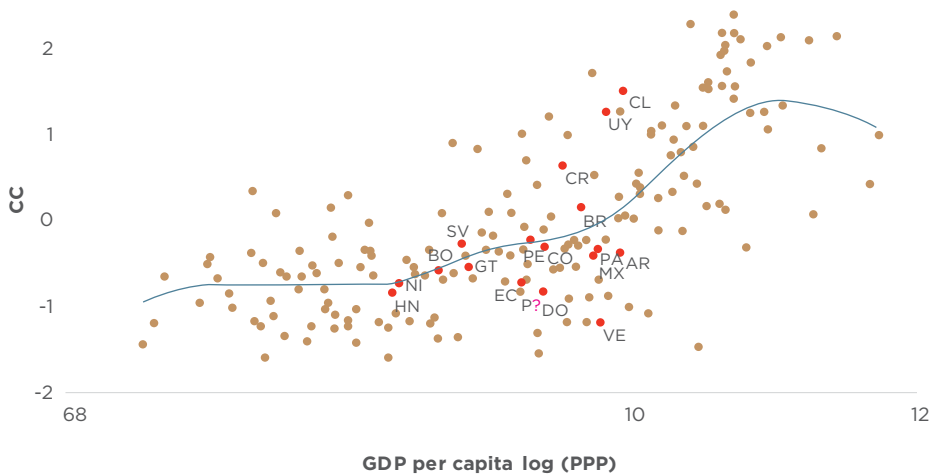
Source: Authors' elaboration based on global governance indicators (World Bank).

The fourth column in Table 1 shows the trend in the Control of Corruption index for each country under analysis. This column reports the difference between the averages available for the last two years (2017 and 2018) and the first two years (1996 and 1998) of the indicator. Paraguay is the country with the greatest improvement in the Control of Corruption index, i.e., 0.46. Only two other countries, Honduras and El Salvador, show improvements above 0.20. In turn, seven countries suffered a deterioration of the Control of Corruption index higher than 0.20. The highest deterioration occurred in Venezuela with a negative trend of 0.52, followed by Brazil with a decline of 0.50, and Mexico and Panama, both with a drop of 0.41.

The blue curve in Chart 2 shows the estimated relationship between the Control of Corruption and the income per capita (logarithm). These data are from 2011, the golden time of the Control of Corruption in the region. The red points in the chart indicate Latin American countries, and the yellow

points, the remaining countries.¹⁵ Placing the Control of Corruption on the vertical axis and the income on the horizontal axis should not be interpreted as if the latter were a consequence of the former. On the contrary, several studies suggest that the predominant causal effect goes from corruption toward growth (and other variables related to development).¹⁴

CHART 2. Control of Corruption vs. Income per Capita (logarithm), 2011



Source: Authors' elaboration based on global governance indicators (World Bank).

As shown by Chart 2, on average, countries with the highest income per capita have less corruption. However, evidently, this relationship is not linear.¹⁵ Besides, we may see significant differences in the Control of Corruption even for the same level of income per capita (e.g., Uruguay and Chile versus Venezuela and Argentina).

Finally, we conclude that the corruption in Latin American countries corresponds, on average, to their level of income. Chart 2 shows that five countries in the region have better Control of Corruption values than suggested by their income, i.e., above the blue line, in comparison with eight countries with worse values. However, on average, top-performing countries are farther away from the curve than worst-performing countries. Indeed, the aggregate distance to the curve for both groups of countries is practically identical. Thus, if we choose one Latin American country at random, the best location projection of its Control of Corruption based on its income per capita is above the blue curve. This curve represents the relationship between corruption

¹⁵ We considered the 19 countries included in the previous figures and tables, except for Cuba, because there was no data available on income per capita.

¹⁴ See, for example, Kaufmann and Kraay (2002), Rodrik, Subramanian and Trebbi (2004), and Acemoglu and Robinson (2012).

¹⁵ The estimation model is a Gaussian kernel smoother, where bandwidth is chosen based on cross-checking.

and income at a global level. We may also infer from Chart 2 that the Control of Corruption indicator, at least for countries with the highest income per capita, is particularly widespread throughout Latin America. Several countries have indicators that are far lower than expected for their income levels, except for Chile and Uruguay, whose indicators exceed the expected values for countries with twice that income or more.

3. Why it matters: corruption costs and magnitude

What percentage of the world GDP is spent on the payment of bribes? What is the estimated social cost of these bribes and of corruption as a whole? The questions above are important, and at the same time, difficult to answer because these are illegal activities. It is therefore not surprising that answers vary widely from one estimate to another. Certain literature finds positive correlations between the Control of Corruption indicator (and governance quality) we saw in the previous section and the variables related to economic growth and inclusive development. However, correlations are not causality, and it is not easy to find causal evidence that improvements in the Control of Corruption lead to further development.

The most cited value of bribes reported in the world comes from the IMF studies (2016, p. 5) and is around 2% of the world GDP. Such an estimate constitutes an update of the value cited by Kaufmann (2005), who extrapolates the values obtained in household and business surveys. The author assigns a margin of error that could be as high as 50% of the estimated value, a precaution that is ignored by those who cite these amounts.

The estimates of bribes in the infrastructure sector also vary widely. For instance, Kenny (2009) concludes that such value is between 5% and 20% of the construction costs, while Campos, Engel, Fischer, and Galetovic (2019) report that the bribes paid by Odebrecht in eight Latin American countries amount to only 0.4% of the investments made.¹⁶

The IMF (2016) details a series of mechanisms by which corruption damages growth, and recognizes the difficulty of establishing causal relationships between corruption and growth. According to this study, the relevance of said mechanisms is confirmed by “wide empirical evidence and the experience” of this institution’s teams. Corruption breeds mistrust in the government, weakening state capacities to fulfill its role. For instance, when corruption erodes the government’s capacity to enforce the laws, rules and regulations impartially, this deteriorates the positive impact of competitive markets over resource allocation, growth, and productivity.

Depending on how widespread corruption is, it can affect the main determinants of growth, either potential or inclusive, such as macro-financial stability, public and private investment, human capital accumulation, and total factor productivity.¹⁷ Also, it is worth noting that low rates of inclusive growth may feed corruption, creating a causality where the lower the growth, the higher the corruption, accentuating the negative impact of corruption on growth.¹⁸

16 This amount was obtained from the plea agreement entered into by the Brazilian group and the U.S. Department of Justice (2016). That information is more reliable and accurate than the range reported by Kenny, though its scope is more restricted.

17 In a pioneer study, Mauro (1995) shows that most corrupt countries grew less during the 1960-1990 period compared to countries with similar initial levels of prosperity.

18 Kaufmann and Kraay (2002) offer evidence consistent with this phenomenon.

4. What to do: a menu of reforms

Often the academic world requires more evidence and analysis than policymakers to make political recommendations. In fact, sometimes, the economic theory shows interest in the public policy issue only after a reform is conducted without a rationale. For example, Roland (2008) asserts that “the conventional economic theory, as it was in the early 1980s, did not have much to say about the privatizations” that have become popular since that decade.

The gap between scholars and policymakers is particularly vast as far as proposing anti-corruption policies are concerned. A possible explanation is that it is difficult to measure the impact of anti-corruption policies because, among other reasons, the Control of Corruption indicators at a national level are not sufficiently refined to capture the impact of specific reforms. Policymakers must then act based on the scarce available evidence, supplementing it with case studies, plausibility analysis, and political considerations.

Fisman and Golden’s (2017) work illustrates the extreme caution with which the academic world proposes anti-corruption policies. In this book, these scholars masterfully summarize the current status of what is known about corruption. However, in the prologue (p. xiii), they make it clear that policy recommendations will not be at the core of the book:

“We are two scholars who have studied corruption for many years. [...] We are both committed to the detailed and careful review of the best evidence available and are interested in how new research techniques – especially experimental research – can be brought to bear on the questions that concern us. Finally, we are both cautious about drawing overly strong conclusions that go beyond what the data and evidence support [...]”

Thus, it is likely that the enthusiasm generated after reading the first chapters of the book will lead to frustration when reaching the final ones on policies’ recommendations. The following paragraph from one of the last chapters of the book (p. 238) illustrates the typical academic recommendations:

“There is a bigger lesson to the preceding discussion: we should resist the notion that there is a silver bullet that will end corruption, or even that a given intervention, such as raising salaries, will have the same effect when applied under different circumstances. Transparency, enforcement, cultural change, higher wages –they are all potentially important tools in fighting corruption, but they interact with one another in complex ways, and their effects depend on pre-existing circumstances.”

At the opposite pole of academics are the recommendations made by policymakers, development banks, and non-governmental organizations

devoted to anti-corruption policies. For a concrete policy to be incorporated into the array of policies they recommend, a successful experience, correlations that suggest efficacy or a plausibility analysis suffice. Sometimes more than one of those factors is present, but this is not always the case.

The difference between the academic and public policymaking environments is also reflected in the willingness to promote specific reforms. The academic approach often emphasizes that corruption is a matter of balance, where nobody may improve his or her personal situation by acting in a different way given the decisions made by others. For instance, Fisman and Golden (p. 261) claim that “corruption constitutes an equilibrium, a set of shared expectations about how to behave. Reducing corruption requires changing those expectations. Consequently, specific reforms that do not consider the factors that distort incentives incorporate control mechanisms and recalibrate the rules will not have much effect and could even be counterproductive.”

The policymakers that create public policies recognize the importance of systemic reforms to tackle corruption, but this does not prevent them from proposing specific policies without further analyzing how they impact the existing equilibrium. Next, we review this array of specific policies, gathering the main recommendations made by Engel *et al.* (2018) in various cases. It is a varied menu in constant evolution, with longstanding and more recent recipes, where sometimes there is suggestive evidence, and other times, there is not so much. Based on Engel *et al.* (2018), we organized the programmatic answers to corruption under three pillars: i) regional and global initiatives, ii) national initiatives, and iii) the role of civil society in anti-corruption reforms.¹⁹

4.1. Regional and global initiatives

Money laundering, final beneficiaries, virtual currencies, and extradition are —among others— critical issues that require transnational cooperation mechanisms to be addressed successfully. Most countries in the region participate in a series of international agreements and commitment networks on corruption-related matters. They include mainly the Inter-American Convention against Corruption, created in 1996, the United Nations Convention against Corruption, the Convention on Combating Bribery of Foreign Public Officials in International Business Transactions of the Organization for Economic Co-operation and Development (OECD), and the International Standards on Combating Money Laundering and Terrorist Financing of the Financial Action Task Force (FATF).

Significant progress has been achieved to comply with the formal aspects of the above-mentioned agreements. However, their implementation encounters significant limitations. The lack of political will and the inefficiency of the judicial power explain why corruption cases often remain unpunished. Hence, it is crucial to strengthen the independence, the resources (technical, human, and economic), and the legal tools available to prosecutors' offices to

¹⁹ Engel *et al.* (2018) also consider a fourth pillar: the role of the private sector and development banks.

perform their tasks. Leniency programs and well-designed systems to protect informants are the primary legal tools to combat corruption, but they are not available in most countries in the region.²⁰

Among the concrete measures included in the first pillar, two stand out.²¹ First, that every country rich in natural resources adheres to the Extractive Industries Transparency Initiative, known by its initials, EITI. This initiative promotes transparency over payments and revenues in the extractive sector (oil and minerals), an area with a high risk of corruption (and some widely known cases). As of September 2019, several industrialized countries (Germany, Norway, and the United Kingdom) participated in this initiative together with the following countries in the region: Argentina, Colombia, Guatemala, Honduras, Mexico, Peru, and the Dominican Republic. It is noteworthy that Bolivia, Brazil, Chile, and Venezuela have not adhered yet. Obviously, the governance of natural resources also encourages anti-corruption policies at a national level, which are described in the following section.

A second action to support multinational coordination is the creation of final beneficiary registries, i.e., a registry of the natural persons that are behind a legal entity. Such registries assist in the fight against corruption, tax evasion, and money laundering because they make it difficult to conceal illicit funds. Registries of final beneficiaries also prevent collusion in public procurement. They allow detecting when several companies participating in a bid are owned by the same person. They are also useful to identify conflicts of interest, e.g., a public official who must make decisions that affect companies where he or she has an interest. It is important that these registries are public and contemplate effective sanctions when erroneous information is entered. The countries have made commitments to the FATF to meet certain standards in this area.

The final beneficiary registration in the countries in the region has been uneven, and in most cases, the deficiencies are severe. For instance, 45 out of the 99 countries assessed by FATF have achieved a good fulfillment level (i.e., rated as “Compliant” or “Largely compliant”) under Recommendation 24 about transparency and beneficial ownership of legal entities. The remaining alternatives are “Partially compliant” and “Non-compliant.” In Latin America, five out of the twelve assessed countries were rated as “Largely compliant,” other five as “Partially compliant” and two as “Non-compliant.”²² Also, coordinated efforts at a global level are required for this policy to fight against corruption effectively. Otherwise, corrupt individuals may conceal ill-gotten money in jurisdictions where registrations are not carried out.

20 The leniency program was essential in the successful investigations of the Lava Jato case in Brazil. It was a fortuitous event since it had been approved by the Brazilian Congress shortly before this case erupted in response to massive protests against corruption. See Watts (2017).

21 See Engel et al. (2018) for further measures.

22 The amounts above are from FATF as of February 20, 2020. For a more detailed analysis, but older data, see Knobel (2017).

4.2. National initiatives

There are specific measures available to combat the corruption associated with natural resource governance within a national scope. We will mention the three most relevant. First, reformulating the governance of state-owned companies in the extractive sector. Even though relevant improvements have been achieved in several countries, the reform of major companies in Brazil, Ecuador, Mexico, and Venezuela, among others, is still pending. Second, taking action and building an institutional framework to strengthen environmental standards and mitigate social conflicts. Third, improving the transparency of sovereign funds that are used to soften the macroeconomic impact of natural resource price fluctuations and reach a better intergenerational distribution of renewable resources.

At a national level, it is advisable to take action in other critical areas. They include expanding financial and governmental transparency; strengthening public resource management, acquisitions and contracts; radically transforming the political financing system; using technology to prevent and address corruption; and finally, becoming aware of how far the State capture and minor corruption go. Next, we will mention the most important actions to face some of the issues mentioned above.

Public infrastructure²⁵

In general, public infrastructure spending and government procurement are the main components of tax expenditure and involve a high risk of corruption. The governance improvements in these areas may result in significant productivity profits, releasing substantial tax revenue.²⁴

As to the big infrastructure projects that we will analyze below, the high risks of corruption result from a combination of factors. First, each project has its own characteristics. Thus, comparing them with “similar projects” is complicated. Second, it is not easy for users to evaluate if the government paid a fair price or if the design was the most suitable. The sources of uncertainty are so many that there will always be unforeseen events to be accountable for the surcharges and delays. Third, public officials in charge of supervising the development of a project need to act with significant discretion because unexpected events may occur, so the institutional framework created to manage those situations will be crucial.

To improve governance and reduce the space for corruption in major public infrastructure projects, it is useful to consider separately three stages in a project lifecycle, i.e., pre-award, award, and post-award.

During the pre-award stage, the main issue is often the lack of long-term planning and the absence of a serious and independent social assessment of the projects. Few are the countries in the region that make such assessments. In general, the national systems of public investment do not have the autonomy or the necessary powers to filter projects of high political but

²⁵ For further details about the subjects discussed in this section, see Campos *et al.* (2019).

²⁴ For example, Dobbs *et al.* (2013) estimate that should governments adopt the best practices in infrastructure provision, the productivity profits would amount to 60%.

low social profitability. Therefore, the institutional designs of the ministries responsible for public works should protect decision-making officers from the pressures that may be exerted by stakeholders, either in the business or political sectors. The selection of works to be executed should be based on technical criteria intended to finance projects with high social benefits and good cost-benefit ratios. Therefore, it is desirable to separate as much as possible the government unit in charge of social planning and assessment from that one responsible for contract surveillance. This avoids the conflicts of interest that exist in every sector ministry between promoting its sector and overseeing contracts, where political considerations often lead to support the former objective to the detriment of the latter.

In the award stage, it is important to avoid bidding processes intended to favor a specific company. Consequently, the bidding terms and conditions should be outlined by specialized bodies that use standardized formats. In addition, it is recommended to have anonymous whistleblowing channels and a protection system for informants. It is also advisable to avoid subjective elements in the award criteria.²⁵

The post-award stage offers the highest room for reforms that reduce corruption and improve the efficiency of major public infrastructure projects (Campos *et al.*, 2019). During the construction stage, many times, the original contracts are modified, either because situations not contemplated in the original contract arise, because of deficiencies in the project design that are detected during the construction, or because the authority is captured and favors the contractor. Contract renegotiations occur either for public works or Public-Private Partnership (PPP) schemes. In the case of public works, in most countries in the region, the dispute-resolution systems, if any, are deficient. They must grant incentives for a careful design of projects and contracts to counterbalance the rush of political authorities to launch projects.

In Public-Private Partnership schemes, the companies' possibilities to renegotiate the original contract to their favor are high. This is due to the long-term nature of contracts (several decades), and Public-Private Partnerships may be used to conduct additional projects launched by the current administration and financed by future administrations, circumventing budgetary controls.²⁶

Perhaps because the studies that quantify the relevance of renegotiations have been mainly made for Public-Private Partnerships, the recommendations to avoid opportunistic renegotiations are focused on this type of contracts. For instance, the reform of the Concession Act of 2010 in Chile establishes that additional works (above a certain amount of money) must be awarded by a bidding process where the concessionaire is not allowed to participate. It also creates a technical commission that must certify the renegotiations. After that reform, renegotiations of Public-Private Partnerships during the construction phase decreased over 80%.²⁷

25 See Decarolis, Fisman, Pinotti, and Vannutelli (2020) for evidence of contracts with subjective elements in their awarding criteria that are associated with a higher level of corruption.

26 See Engel *et al.* (2020) for further details.

27 See Engel *et al.* (2020).

There are some legal traditions that hinder a good allocation of risks in the infrastructure sector, which is fertile soil for corruption. Companies claim the “doctrine of unforeseeability” for public works, and the “financial break-even point” for Public-Private Partnerships to obtain tax offsets in scenarios where governmental decisions reduce their earnings. However, the State does not receive part of the extraordinary benefits in the opposite scenario. The principles above somewhat contradict a reasonable risk allocation in infrastructure contracts, as a substantial part of the risks that the company should assume are related to the State’s general decisions (e.g., devaluations and changes in financing costs). Therefore, the social price of these principles is high. Some countries of the region have managed to remove them from their legislation; others tried but were not successful.

It is also worth noting that the application of the foregoing principles implies significant degrees of discretion by the State, which encourages companies to pay bribes and finance election campaigns. As previously mentioned, the reform of the Concession Act of 2010 in Chile was successful in this area, but it seems to be an exception in the region. In fact, for public works in Chile, companies still invoke the “doctrine of unforeseeability” to elude paying for the costs resulting from adverse scenarios.²⁸

Finally, it should be noted that several measures of active transparency serve to prevent corruption from occurring in the infrastructure sector. Such measures include publishing every original contract and any contract changes in a timely fashion and at the same place. This last measure is not usual either in Latin American or in developed countries.

Political financing

Most major corruption scandals in Latin America include at least one illegal (or irregular) political financing element. The most notorious case in recent times is *Lava Jato* and Petrobras in Brazil.²⁹

Illegal political funding has a high direct welfare cost. Those who finance political parties or candidates often expect retributions if they are elected. Such “return” of their “investments” may be highly distorted, resulting in lax regulations or surveillance applied to the financing companies, with a welfare cost that may have an order of magnitude higher than the amounts assigned to election financing.

For instance, in 2012, the Congress of Chile enacted a law that wasted the opportunity of taking bids for industrial fishing quotas and redistributing the fishing revenue among all the Chilean citizens instead of among a few families. As it became known three years later, Corpesca fishing company illegally financed the campaigns of several members of Congress to support the opposition to bids in Congress.³⁰ It is worth adding that Congress members in question received regular payments from the company after being elected.

28 The Chacao bridge is a recent example.

29 This also includes the “Corruption Notebooks” in Argentina, SQM and Penta cases in Chile, and the ramifications of the Odebrecht case in several countries in the region.

30 The exchange of emails between a Congress member and a manager from Corpesca illustrates what happened in a very concrete way. We include an extract of the messages they exchanged over a few months. “At the Committee, I will once again be giving the big fight for fishery. God will guide us. I’m sure. He never abandons us.” “I am very happy with the ‘no to bidding’ goal we scored. In the end, my work paid off!”

Apart from the direct costs above, other already mentioned indirect costs are considered. These indirect costs are connected with the political discredit and the confidence crisis in representative democracy and its institutions. The second source of democracy weakening results from the fact that political funding increasingly comes from organized-crime groups who have focused on influencing local governments in some countries in the region.⁵¹

The main reforms to improve political funding rules include:

i. To regulate and bring transparency to private funding,⁵² including the prohibition of anonymous contributions and foreign funding, and setting limits for legal entities' contributions.⁵³

ii. To establish a public subsidy system for political campaigns and political party funding. This system must avoid an excessive number of political parties and their related governance issues. Likewise, it should promote the rise of candidates and parties that challenge the incumbent ones. Finding the right balance between these two objectives is not an easy task. A funding floor for every political party and additional funds in proportion to the election results is often the most widely used mechanism.

iii. To consider an important component of political party public funding in exchange for transparency requirements and internal democracy. Otherwise, it is easy for political parties to be captured by stakeholders that finance them, which also weakens internal democracy because the parties closer to the lenders' interests have greater access to resources.

iv. To establish limits on campaign spending and an institutional framework capable of supervising it. Citizens' support in the surveillance task, hand in hand with new technologies, may be very valuable.

v. To bring transparency to political activity contributions in all their manifestations, including candidates, companies, foundations, non-governmental organizations, and other players. This information should be disclosed during the campaign.

vi. To reinforce the capacity and independence of national bodies, judges, and prosecuting attorneys on electoral matters. This must include additional punishments other than fines, such as prohibiting the participation in public bids to the companies that illegally finance politics and removing from office those candidates who commit serious illegal acts after they are elected.

vii. To set election campaigns within the banking system, i.e., oblige every candidate to have a banking account to receive the funds that finance their campaign and pay all expenditures with it. This action facilitates the monitoring of campaign spending.

Conflicts of interest

Every individual has interests. For democracy to represent its citizens, it is necessary to establish mechanisms that bring transparency and regulate those interests, segregating them by their private or public nature.

51 See Casas-Zamora (2015).

52 The legislation enacted in Chile in 2016 allows small donations from individuals to protect employees from eventual retaliation from their employers.

53 The countries with broader surveillance capacities should debar political financing by legal entities.

Conflicts of interest occur when an individual is in a position to derive personal benefits from the actions or decisions he or she adopts in a role in which he or she represents the interests of an organization or institution, or in the case of elected authorities, the interests of their voters and the common good. It means an individual serves two causes in situations where it is difficult to determine, from his or her actions, which of them he or she served.

Nowadays, citizens vehemently disapprove of situations where conflicts of interest are not managed appropriately. They associate such situations with corrupt behaviors, even when no illegal acts have been committed. A deficient regulation of conflicts of interest also facilitates the State capture by the interests created.

Compared experiences suggest that conflicts of interest should be regulated by combining prohibitions, regulations, and transparency. In the most relevant cases of conflicts of interest, the legislation prohibits individuals with such conflicts from occupying certain positions. In other cases, they may make the positions but should refrain from making decisions where conflicts exist. In the third type of situation, the authorities may take decisions where they have conflicts of interest but must disclose them so that the social control acts as a counterbalance.

The main tools used to regulate conflicts of interest include asset and interest declarations, regulating the “revolving door” practice, i.e., a transfer of personnel from roles in the private sector to the public sector (and vice versa); regulations to prevent nepotism; and the rules that oblige the authorities with valuable assets to refrain from managing their assets.⁵⁴

4.3. The role of civil society

Latin American civil society has played a significant role in promoting transparency and public integrity, particularly through the encouragement and defense of access to information laws and the creation of platforms to bring transparency to and monitor public procurement, budget execution, and the source of political campaigns’ financing.

As mentioned in the introduction, investigative journalism has also played a vital role in encouraging the agenda of reforms to improve governance. Several corruption scandals became known due to first-class investigative journalism reports.

Finally, education is vital to ensure that the legal and regulatory changes that improve a country’s governance endure over time. Education in civic values, ethical principles, and democratic culture are essential to strengthen democracies. Integrity and civic education should extend throughout the educational stages, from primary to tertiary education. As indicated by the OECD (2018), “Building a culture of integrity in society necessarily begins with the education of young people. The knowledge, skills, and behaviors they acquire now will shape their country’s future and will help them uphold public integrity, which is essential for preventing corruption.”

⁵⁴ For a discussion on these topics, see Engel *et al.* (2018) and Presidential Advisory Council for Conflicts of Interest, Influence Peddling and Corruption (2015).

5. How to achieve it: the political economy of anti-corruption reforms

Acemoglu and Robinson (2012) discuss the *critical junctures* that determine the countries' institutional evolution and explain the differences in capabilities and governance among them. Significant advances in the Control of Corruption will be the consequence of major changes in the countries' political-institutional equilibrium, which occur rarely and unpredictably. According to this approach, from a public policy perspective, little can be done to achieve substantial advances in a country's governance. The evaluation made by Mungi-Pipidi (2015, p. 207) about attempts of anti-corruption reforms is consistent with the vision above, proving that most of these initiatives fail. In this section, we will further analyze the policy of anti-corruption reforms,⁵⁵ with a somewhat more optimistic vision than the previous one. We identified several scenarios where reforms could be implemented successfully, though we recognize they were the exception to the rule. These scenarios include outstanding leaders, an imported institutional framework, presidential committees, and partial reforms that end up being much more effective than expected.

In general, anti-corruption reforms mean that key players of the political and economic system lose power. The *status quo* favors them, and the reforms mean a new *status quo* where their power will be reduced. In normal times, these players have sufficient power to veto any reform or to weaken it and protect their interests, as applicable. However, after big corruption scandals, they lose their power to veto, at least temporarily, and reforms become a possibility. For instance, let us consider reforms that shed light on electoral campaign financing, which, as we have seen in the previous section, is one of the critical topics in the anti-corruption agenda. In general, these reforms must be approved by Congress, whose members were elected under the opaque financing rules that are intended to be changed. Later on, the reform will be detrimental to many Congress members that must enact it. Hence, it is usually tough to build a majority that supports significant reforms in this field. However, after a major scandal of illegal political financing, especially when Congress members see a threat to their reelection possibilities if they oppose, a window of opportunity is opened to make deeper reforms.⁵⁶ This last argument explains why most of the anti-corruption reforms we analyze below have in common a far-reaching corruption scandal as a catalyzer.⁵⁷

⁵⁵ Engel (2018) and CAF (2019) developed some of the ideas expressed in this section.

⁵⁶ The preceding argument is consistent with the Acemoglu-Robinson paradigm if reforms that are approved lead to a virtuous and long-lasting redistribution of power, something that is very difficult to predict and not always occurs.

⁵⁷ This does not mean that every scandal results in reforms: they just open windows of opportunity for coalitions that support reforms to be successful.

Not all the significant cases of advances in the fight against corruption originated in a big scandal. Joining multilateral instances, such as the OECD, demands strengthening State capacities in general, and most of the times, it serves to solve collective action issues that face the reforms in these areas. There are also specific reforms that were approved before scandals, all thanks to the long and persistent work of political leaders and the civil society, that contribute in a decisive way to know the details of corruption cases, bring the responsible parties to justice and create a scenario where significant reforms are possible. For example, the enactment of the leniency scheme in Brazil in 2013, after massive manifestations against corruption, was vital for the Brazilian legal system's effectiveness in bringing those responsible for the *Lava Jato* and Odebrecht cases to justice.

5.1. Outstanding leaders

Although as a prescription for promoting anti-corruption reforms it is of little use, some countries achieved impressive progress in this field thanks to outstanding leaderships. These presidents knew how to harness the citizens' discontent against corruption to transform it into their main emblem of the fight and achieve effective advances in this area. Below, we will review probably the best example of this type.

Georgia and Mikheil Saakashvili⁵⁸

In 2002, Georgia was one of the most corrupt countries in the world, with a Control of Corruption indicator that ranked 208 among 219 countries. Twelve years later, in 2014, the Control of Corruption value had grown a little over two percentage points (i.e., to 0.79) and Georgia reached the 50th position in the ranking. The explanation for such a remarkable improvement in the Control of Corruption has a name and surname: Mikheil Saakashvili.

After its independence from the Soviet Union, in 1991, Georgia became an operations center for organized crime—in the view of many—coordinated by the police and law enforcement agencies, with a manifestly corrupt and inefficient government. Social unrest was growing, and the protests known as the Rose Revolution triggered the election of Saakashvili in 2003, whose main campaign promise was to fight corruption.

To fulfill his commitment, Saakashvili embarked on a thorough police reform. Sixty percent of the police force in the country was dismissed and substituted by new police officers that went through a rigorous recruitment process. Police salaries increased, and so did the demands and assessments they were subjected to satisfy. Corrupt officials in other areas of the administration were brought to justice, and the government was restructured to keep police officers under strict civil control. Other reforms, not so drastic as the police restructuring, also contributed to transforming Georgia into an icon of anti-corruption reforms in the extinct Soviet Union.

⁵⁸ The Georgia case is based on Fisman and Golden (2018), even when the final evaluation we reached differs from that of these authors.

In his second term, 2008–2012, Georgia’s economy grew an annual 10% on average, and the improvements in the Control of Corruption continued to reflect in the indicators. Saakashvili has always been a controversial character, on the verge of legality in his battle to eradicate corruption with authoritative behaviors. This probably explains his electoral defeat in 2012 and why he later went into exile to avoid lawsuits that, in the former president’s opinion, had political motives. However, the latest data available show that Georgia’s progress around the Control of Corruption has been maintained: the last value available for Control of Corruption (2018) was practically the same as when Saakashvili left office five years earlier.

5.2. Importing capacities

The second way to fight corruption is to rely on the capacities and institutions of more developed countries. This may occur in several ways that we will explore below with concrete examples.

Hong Kong and the Goldber scandal⁵⁹

Hong Kong went from being an extremely corrupt place to one with low corruption levels after a scandal made the United Kingdom create a sophisticated and successful anti-corruption institutional framework. Everything began when Peter Goldber, a British citizen who held a high-ranking position in the Hong Kong police department, escaped to London in June 1973 while he was being investigated for receiving huge bribes. Corruption in that British colony was somewhat generalized. Residents paid bribes for practically every public service. Prostitution networks and the illegal betting business —protected by the police— had expanded on the island.

Goldber’s escape was a famous case in the British media and raised such anger that it forced the British government to create the Independent Commission Against Corruption in Hong Kong, known as the ICAC, in 1974. The ICAC was endowed with special powers to conduct its task, such as the possibility of arresting officials suspected of corruption with no need for a judicial order. ICAC’s autonomy and seriousness, resulting from the British government’s support, allowed citizens from Hong Kong to denounce corrupt officials to this commission with no fear of retaliation. Hundreds of police officers were prosecuted between 1974 and 1977. This resulted in a significant and long-lasting reduction of corruption. Now, Hong Kong is rated among the least corrupt countries, occupying the 16th position out of 180 in the GCPI of Transparency International.⁴⁰

Guatemala and the CICIG⁴¹

The creation of the International Commission Against Impunity in Guatemala (Comisión Internacional Contra la Impunidad en Guatemala [CICIG]) originated from the Peace Agreements of 1996, which ended the

⁵⁹ Based on Fisman and Golden (2018).

⁴⁰ The governance indicators from the World Bank do not include Hong Kong since it became part of China in 1997.

⁴¹ Based on information from the website of the International Commission Against Impunity in Guatemala (CICIG) and various press information sources.

internal armed conflict that lasted 36 years. As part of these agreements, the Guatemalan government undertook to “combat any manifestation” of “illegal security forces” and “clandestine security apparatus.”

A wave of attacks against human rights defenders in 2002 revealed that the government did not have the capacity to fulfill this commitment. This forced the government to ask for assistance to the United Nations in January 2004. The government of Guatemala and the United Nations signed an agreement to create the Commission for the Investigation of Illegal Organizations and Clandestine Security Apparatuses. Three years went by (and a series of violent events resulting in public alarm) before the amended version was enacted on August 1, 2007 for the creation of CICIG.

Its governance furnished the entity with considerable autonomy. The United Nations Secretary-General chose the Commissioner in charge. Once appointed, he or she had full autonomy to organize the Commission and decide which cases to investigate. As for its funding, the Commission was responsible for obtaining its funds, which came from Norway, the United States, Sweden, and the European Union.

CICIG’s autonomy explains why it could expand the scope of the concept of illegal organizations and clandestine security apparatuses to include corruption networks in 2014 when Commissioner Iván Velásquez took charge. That change and a joint work with the Public Ministry of Guatemala, led by Attorney General Thelma Aldana, resulted in a period of successful prosecutions in corruption cases that lasted five years. The most prominent case that the CICIG and the Public Ministry brought to justice was called “The line” (*La Línea*) and involved corrupt customs officials. That case arose in early 2015 when the arrest of about twenty people involved was ordered. The investigations found that the network was led by President Otto Pérez Molina and Vice-president Roxana Baldetti. By the end of August, Baldetti was arrested and sent to prison, and Pérez Molina was forced to resign on September 2, and as of the following day was held in custody.

Afterward, the CICIG and the Public Ministry investigated other corruption cases. One of them involved Pérez Molina’s successor, Jimmy Morales. Another case focused on the financing of Jimmy Morales’ presidential campaign, and it involved several of the most powerful families in Guatemala. Morales’ opinion on the CICIG changed radically after these cases, becoming very critical of the Commission. In September 2018, the government of Guatemala prohibited the entrance of Commissioner Velásquez (Colombian). That prohibition was revoked by the Constitutionality Court.

CICIG’s governance required that the President of Guatemala renew the Commission’s mandate every two years. After the renewal in 2017, President Morales announced in January 2019 that he would not renew the mandate, and on September 5th, the Commission was forced to conclude its duties.⁴² In its last report, published a few days before its closure, the CICIG pointed out that it had dismantled 70 criminal structures, brought 600 people to justice

⁴² Some analysts think that the decision made by the Morales’ administration was driven by the United States government’s abandonment of the fight against corruption as a priority in the bilateral relations between both countries.

and obtained 400 sentences. “I think that my main achievements have to do with raising public awareness [...] that indeed it is possible to proceed with serious and profound investigations no matter who the person investigated is”, pointed out Velásquez in an interview published by the United Nations. Former Attorney General Aldana, who was debarred from running for president –what several analysts defined as political persecution– acknowledge the CICIG’s work on Twitter: “Thank you CICIG for the legacy of justice and public awareness. We did it together.” The last CICIG’s report not only summarizes the Commission’s achievements, but also indirectly mentions the reasons that explain its closure when it refers to corruption entrenched in the system and to the “State capture and co-optation” by power groups that seek to perpetuate the *status quo* and the “impunity” in the Central American country.

Jimmy Morales’ successor, Alejandro Giammattei, refused to contradict his predecessor’s decision about the CICIG. Instead, in February 2020, he created an anti-corruption commission supported by the government. This Commission would investigate only public officials, and would refer to the Guatemalan justice any case involving private players.

Honduras and the MACCIH

In 2015, a huge corruption scandal burst in the Honduran Institute of Social Security. Several former vice-ministers were involved in embezzlement estimated at USD 250 million. Besides, they were benefiting at the expense of the health of the poorest, which caused indignation in society. The scandal was followed by massive protests demanding the resignation of President Juan Orlando Hernández, who proposed to create a system to combat corruption. Citizens and social organizations rejected that proposal and suggested a commission similar to Guatemala’s CICIG. Then, in early 2016, and with the support of the OAS, the Mission to Support the Fight against Corruption and Impunity in Honduras (Misión de Apoyo contra la Corrupción y la Impunidad en Honduras [MACCIH]) was created.

MACCIH’s governance and *modus operandi* were similar to those of the CICIG, successfully handling a series of corruption cases. Like the CICIG, the MACCIH also initiated cases that involved authorities, particularly many Congress members. Shortly after, in December 2019, Congress voted by a majority not to renew the Mission’s mandate.

One would wonder why the governments of Guatemala and Honduras consented to establish instances that, in practice, reduced their sovereignty, and facilitated the prosecution of their leaders and people close to them for illegal acts. In Guatemala, a key element was the Commissioner’s decision to extend the scope of cases to be investigated, and the contribution made by the attorney general. Instead, in Honduras, the creation of the MACCIH was an option adopted by the president in an effort to rescue his government, extremely debilitated in the midst of a major crisis. It is worth adding that, in both cases, according to press information, a relevant factor might have been that the Barack Obama administration conditioned its external assistance to the governments’ acceptance of the Commissions. If that is the case, it would

also be no coincidence that both governments put an end to the Commissions when the United States abandoned its leadership in the fight against corruption under the Donald Trump administration.

5.3. Anti-corruption commissions⁴³

Governments often react to huge corruption scandals by appointing an anti-corruption commission. Such a commission may have two different goals. First, contributing to bringing to justice those involved in the scandal. Second, proposing an agenda of reforms on that matter. Here, we will focus on the second goal. Sometimes, the objective governments have when appointing these commissions is to gain time, waiting for the citizens' indignation to pass. However, occasionally, these commissions end up contributing to the approval of significant reforms to strengthen the country's governance and capacities.

Below, we will analyze the experience of the anti-corruption commission in Chile, summoned by President Michelle Bachelet in March 2015, and chaired by the author of this chapter. We will also compare this experience to similar instances in Peru and Ecuador.

The Presidential Advisory Council against Conflicts of Interest, Influence Peddling and Corruption was summoned after three high-impact corruption scandals, two of them related to illegal political financing (Penta and SQM cases), while the third one involved the president's son in influence peddling (Caval case).

The Council was integrated by sixteen members from different professions and political preferences. Its members did not include political or business leaders, which allowed to address issues that would have otherwise been probably vetoed by some members. The Presidential Advisory Council was financed by public funds managed by its president. It created a technical secretariat formed by ten professionals who reported to the Commission's president. In 45 days, the Presidential Advisory Council prepared a report with 236 concrete proposals that covered 21 subject areas grouped in five chapters: corruption prevention, conflict of interest regulation, political financing, market regulation and integrity, and citizens' rights. Specialized national and international entities, and the above-mentioned technical secretariat supported the intense work carried out by the Commission's members. The proposals developed also benefited from the work of previous commissions.

After the report was delivered, there followed an ambitious agenda of reforms that led to the approval of a dozen bills and a significant number of administrative measures of the subjects raised by the report, most of them well assessed. The reforms included bills to bring transparency and regulate the electoral campaign financing, as well as to promote internal democracy and transparency in political parties. This is something to which public financing was assigned for the first time. Additionally, legislation was enacted that required sufficient details in the statements of assets and interests, so as to detect conflicts, apart from empowering the Comptroller's Office to monitor

⁴³ For further details, particularly on the Chilean experience, see Aris, Engel and Jaraquemada (2019), and Muñoz (2019).

them. Likewise, new powers and constitutional autonomy were granted to the regulator of elections and political parties. A reform that introduced types of crimes for collusion offenses was enacted, as well as another reform that strengthened the financial sector regulatory entity. The authorities with high-value assets were now obliged to create a trust to manage their assets, and the Public Senior Management System was strengthened by appointing senior positions in the public sector. A project was also approved to prevent corruption in territorial planning, while civic and ethical education was resumed at the primary and secondary school levels. All the reforms above were approved during the second Bachelet administration, which ended in March 2018. The subsequent government of Sebastián Piñera passed a bill from that agenda, increasing the types of crimes for corruption and introducing the legal principle of bribery as a conduct crime, where it is not necessary to prove the existence of *quid pro quo* to establish bribery.

In brief, there were substantial advances in 13 out of the 21 subject areas considered in the Presidential Advisory Council's report. The main areas with little or no progress include: i) proposals to reduce the space for corruption at a municipal level, ii) reforms to the public procurement system and to the institutional framework for spending in Defense, and iii) the creation of an integrity system for the public and private sectors.

Several factors can explain the relative success of this Commission. First, its working methodology allowed to approve most measures (217 out of 236) unanimously. Second, they were corrective measures, not generic ones. Thus, their inclusion in bills was effectively a sign that the legislator was taking up Presidential Advisory Council's proposals. Third, during the forty-five days of Council sessions, a political-communicational strategy was developed that allowed gathering political capital and then using it to support the resulting legislative agenda. This strategy included eight public hearings in Santiago and the regions, as well as meetings with representatives from the main State's institutions and civil society, political parties, the business sector, and union leaders, and active work in social media.

The perfect complement to the work carried out by the Presidential Advisory Council was the Anti-corruption Observatory created by the foundations Ciudadano Inteligente (Smart Citizen) and Espacio Público (Public Space) shortly after the report was delivered. This observatory assessed, on a weekly basis, the degree of progress of the ongoing legislative process in order to collect each of the measures proposed by the Presidential Advisory Council. These evaluations were incorporated to create notes on progress and quality in the twenty-one subject areas and the five main chapters. The Observatory allowed citizens and opinion leaders to follow the reform agenda in Congress. Besides, it warned in due time about significant setbacks in the legislative process, which allowed Presidential Advisory Council's members and other opinion leaders to react quickly, mobilizing public opinion to reverse the situation.

The Presidential Advisory Council served to validate reforms, as the citizenship did not trust the Congress nor the Executive Power. The fact that

three Commission members were on the board of one of the foundations that created the Observatory was crucial because they transferred the political capital of the Council to the Observatory.

Just as important as the Commission's role, if not more so, was the support of ministers, the president herself, and congress leaders, including the president of the Senate, as well as the often enthusiastic support of the media from diverse editorial lines and civil-society organizations.

It is interesting to compare the anti-corruption Commission of Chile with similar entities created by the governments of Peru and Ecuador.

In the case of Peru, the Commission was summoned after a scandal known as the "*Morenazo*", which started with the disclosure of recorded conversations between Carlos Moreno –President Pablo Kuczynski's main advisor on health issues and personal physician– and the owner of a private healthcare center. In these conversations, Moreno sought to benefit illegally from agreements between the public health system and private healthcare centers that had entered into agreements with the Archdiocese of Lima. To top citizenship indignation, one of the audios ended with Moreno asking the director of a healthcare center with whom he was conducting illicit negotiations to hire his own daughter, who had just got her degree, to manage the dental division.

The government reacted by creating the Presidential Integrity Commission, which had the same forty-five-day term as its Chilean counterpart to prepare a report with proposals. Such proposals focused on strengthening the civil service, preventing the entry or re-entry to public service of persons convicted of corruption, drug trafficking, and money laundering, bringing transparency to the State recruitment system, fighting money laundering and strengthening the powers of the Financial Intelligence Unit, establishing limits to parliamentary immunity, and promoting the private sector integrity.

A year after the report was delivered, Eduardo Vega, who chaired the Commission and formed part of the observatory created to monitor the subsequent legislative agenda, evaluated the progress of reforms as "devastating." Of the one hundred proposals made by the Presidential Integrity Commission, thirteen were fully completed, seventeen were completed partially, and seventy made no significant progress.

The Peruvian commission lacked resources of its own and did not have a technical secretariat that reported to its chairman. The reduced technical advice it received came from a few government officials assigned to support the Presidential Integrity Commission. Eventually, they reported to the government and not to the Commission's chairman.

The lack of resources and autonomy probably explains why the Presidential Integrity Commission did not develop a political-communicational strategy that would place it, in the eyes of society, as a model in the fight against corruption. In fact, it was not even present in social media. Besides, the Peruvian observatory did not create a system for assessing the progress of the legislative agenda.

In Ecuador, the origin of the presidential anti-corruption commission, known as *Frente de Transparencia y Lucha Contra la Corrupción* (Transparency

and Fight Against Corruption Front), was a campaign promise made by President Lenin Moreno after local reverberations of the Odebrecht case (see Figure 1). This instance was composed of members from the civil society and authorities, something that reduced its autonomy.

The Ecuadorian commission addressed the creation of reform proposals and received corruption complaints filed by citizens to have a clear picture of how the corruption phenomenon developed in Ecuadorian society. After five months of work, the Commission delivered its report with legal and public policy recommendations to President Moreno in October 2017.

There are two important differences between the anti-corruption commissions of Ecuador and Chile. First, Ecuador's report was not made public, so it was impossible for the civil society to encourage or monitor the proposed actions, as it was the case in Chile.

Second, the Ecuadorian government prioritized the prosecution of corruption cases instead of the institutional reform implementation. The simultaneous approach of these two challenges (i.e., corruption case prosecution and reform encouragement) weakened the execution of the latter. In fact, the Commission was under pressure to bring to justice those responsible for corruption scandals. Therefore, it did not have the necessary autonomy or credibility to promote the institutional reforms it had proposed.

In short, many presidential anti-corruption commissions have had little impact, and few achieved a substantial contribution. The contrast between the experience of recent commissions in Chile and its counterparts in Peru and Ecuador provides several important lessons. Firstly, the Commission must have its own resources, which will enable it to design a political-communicational strategy and finance a technical secretariat that reports to the Commission's chairman only. Secondly, the Commission must promote reforms with a State vision and avoid meddling in the legal processes related to the corruption cases that gave rise to it. Finally, creating an observatory that monitors the legislative process resulting from the report delivered is a key element. This observatory evaluates the quality of the resulting legislation, makes it easier for civil society to monitor the legislative process, strives for this process to reflect the Commission's proposals, and validates the legislative achievements before the public.

6. Conclusion

Like soldiers, who spend a lifetime preparing for a war that seldom occurs, the future of the policymakers devoted to anti-corruption reforms is also full of frustration. Progress is slow, setbacks are frequent, and most initiatives fail. This also applies to the wider reforms that strengthen the state institutions and capacities.

However, in this chapter, significant advances have been documented. Now, and unlike 25 years ago, there exist sophisticated methodologies to measure various dimensions of the countries' governance, such as the Control of Corruption. These indicators allow detecting trends and relevant changes in this area, and their relationship with major reforms. They also show that the access to information laws enacted in recent decades and the investigative journalism that benefited from them, together with social media and the new technologies, have played a relevant role, discovering and reporting major corruption cases, improving the voice and the accountability of the authorities.

This chapter further reviewed the main actions that reforms of key areas should consider to fighting corruption –particularly, bringing transparency and regulating policy financing, actions to improve the governance of the infrastructure sector, and reforms to handle conflicts of interests. Although silver bullets are still far from being available to combat corruption, the study of several relatively successful experiences may serve to design strategies that make better use of the windows of opportunity opened by major corruption scandals in order to undertake reforms.

Bibliography

- Acemoglu, D. and Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity, and poverty*. New York: Crown.
- Aris, M., Engel, E., and Jaraquemada, M. (2019). *Reformas anticorrupción en Chile 2015-2017: Cómo se hizo para mejorar la democracia*. Available at: <https://www.espaciopublico.cl/wp-content/uploads/2019/08/LIBROS-KAS-ok.pdf>
- World Bank. Global Governance Indicators. Available at: <https://info.worldbank.org/governance/wgi/>
- CAF (2019). *RED 2019. Integridad en las políticas públicas: Claves para prevenir la corrupción*. Available at: <http://scioteca.caf.com/handle/123456789/1503>
- Campos, N., Engel, E., Fischer, R. D., and Galetovic, A. (2019). *Renegotiations and corruption in infrastructure: The Odebrecht case*. Marco Fanno Working Papers 0230, Dipartimento di Scienze Economiche. Available at: <https://economia.unipd.it/sites/decon.unipd.it/files/20190230.pdf>.
- Campos, N., Engel, E., Fischer, R. D., and Galetovic, A. (2020). “Recomendaciones para reformar el sector de infraestructura pública”. Reference Document 47. Espacio Público.
- Casas-Zamora, K. (ed.) (2013). *Dangerous liaisons: Organized crime and political finance in Latin America and beyond*. Washington, D.C.: Brookings Institution Press. Available at: www.jstor.org/stable/10.7864/j.ctt4cg80v
- Presidential Advisory Council for Conflicts of Interest, Influence Peddling and Corruption (2015). Final Report. Santiago de Chile. Available at: <http://consejoanticorrupcion.cl/informe/>
- Decarolis, F., Fisman, R., Pinotti, P., and Vannutelli, S. (2020). Rules, discretion, and corruption in procurement: Evidence from Italian government contracting. Available at: SSRN: <https://ssrn.com/abstract=3553368> or <http://dx.doi.org/10.2139/ssrn.3553368>
- U. S. Department of Justice (2016). *Plea agreement (between the Department of Justice and Odebrecht)*. December 21, 2016. Available at: <https://www.justice.gov/opa/press-release/file/919916/download>
- Dobbs, R., Pohl, H., Lin, D. Y., Mischke, J., Garemo, N., Hexter, J., Matzinger, S., Palter, R., and Nanavatty, R. (2013). *Infrastructure productivity: How to save \$1 trillion a year*. McKinsey Global Institute.
- Eigen, P. (2017). Presentation at the “Transparencia en la industria extractiva ¿Nos estamos quedando atrás?” Forum. May 16, 2017. Santiago: Espacio Público.

- Engel, E. (2018). "Sociedad civil y reformas anticorrupción: Chile y el mundo, pasado y presente." I. Arcos (ed.), *Hacia una nueva agenda de probidad*. Santiago: Center of International Studies from the Pontifical Catholic University of Chile, General Secretariat of the Presidency (Chile) and Inter-American Development Bank
- Engel, E., Fischer, R., and Galetovic, A. (2020). "When and how to use public-private partnerships in infrastructure: Lessons from the international experience." NBER Working Paper 26766.
- Engel, E., Noveck, B. S., Ferreira Rubio, D., Kaufmann, D., Lara, A., Londoño, J., Mark Peith, M., and Rose-Ackerman, S. (2018). *Report of the Expert Advisory Group on AntiCorruption, Transparency, and Integrity in Latin America and the Caribbean*. Washington, D.C.: Inter-American Development Bank.
- Fisman, R. and Golden, M. A. (2017). *Corruption: What everyone needs to know*. Oxford University Press.
- IMF (2016). *Corruption: Costs and mitigating strategies*. SDM16/05. Washington, D.C.
- Gransow, B. (2015). "Chinese infrastructure investment in Latin America—An assessment of strategies, actors and risks." *Journal of Chinese Political Science*, 20(3), 267-287.
- Huntington, S. (1968). *Political order in changing societies*. Yale University.
- IPSOS Public Affairs (2019). "What worries the world." IPSOS Public Affairs. November, 2019. Available at: https://www.ipsos.com/sites/default/files/ct/news/documents/2019-12/wwwgreat_britain_002.pdf
- Kaufmann, D. (2005). "Myths and realities of governance and corruption." MPRA Paper 8089. Munich.
- Kaufmann, D. and Kraay, A. (2002). "Growth without governance." *Economia Journal*. Vol. 3, N.º 1, issue fall, 169-230.
- Kaufmann, D., Kraay, A., and Zoido, P. (1999). "Governance matters." Policy Research Working Paper 2196. World Bank.
- Kenny (2009). "Transport construction, corruption and developing countries." *Transport Reviews*, 29(1), 21-41.
- Knobel, A. (2017). Regulación sobre beneficiarios finales en América Latina y el Caribe. IDB Technical Note 1341.
- Leff, N. H. (1964). "Economic development through bureaucratic corruption." *American Behavioral Scientist*, 8(3), 8-14.
- Margetts, H., John, P., Hale, S., and Yasseri, T. (2015). *Political turbulence: How social media shape collective action*. Princeton University Press.
- Mauro, P. (1995). "Corruption and growth." *The Quarterly Journal of Economics*, 110(3), 681-712.
- Mungiu-Pippidi, A. (2013). "Controlling corruption through collective action." *Journal of Democracy*, 24(1), 101-115.
- Muñoz, E. (2019). *¿Pueden funcionar las comisiones asesoras anticorrupción? The case of the Engel Commission in Chile*. Caracas: CAF. Available at: <https://scioteca.caf.com/handle/123456789/1486>

- OECD (2018). *Education for integrity: Teaching on anti-Corruption, values and the rule of law*. Available at: <http://www.oecd.org/governance/ethics/education-for-integrity-web.pdf>.
- Rodrik, D., Subramanian, A., and Trebbi, F. (2004). "Institutions rule: the primacy of institutions over geography and integration in economic development." *Journal of Economic Growth*, 9(2), 131-165.
- Roland, G. (Ed.). (2008). *Privatization: Successes and failures*. New York: Columbia University Press.
- Simon, R. (2019). "Odebrecht: LatAm's biggest stories of the 2010s." *America's Quarterly*. December 18, 2019.
- Watts, J. (2017). "Operation car wash: Is this the biggest corruption case in history?." *The Guardian*. June 1.



Inequality and **Social Policies**

07

Nora Lustig
University of Tulane

The author thanks Lucila Berniell, Christian Daude, and Pablo Sanguinetti for their useful comments on the previous version of this chapter, as well as Patricio Larroulet for his outstanding support with sections 1 and 2, and Samantha Greenspun for her support with section 3.

1. Introduction

Over the last thirty years, income distribution in Latin America, the most unequal region in the world, has shown clear trends. During the 1990s and the early 2000s, inequality increased in most countries for which comparable data was available. Between 2002 and 2013 (approximately), inequality decreased in almost all countries. Since 2013, this trend showed clear signals of being over: in some countries, inequality started to grow, while in others, the declining trend slowed down. In the first section of this chapter, we will discuss the evolution and determinants of inequality for the whole period, but mainly focusing on the subperiod when inequality is reduced. With respect to social policies, two elements contributed to the decrease mentioned above: the expansion of access to education, especially for those at the lower tail of income distribution, and the expansion and progressivity of cash transfers.

It is noticeable that despite the reduction of income concentration, various countries in the region have been shaken by different levels of intensity protests against inequality. Section 2 of this chapter will explore some opinions on which the underlying factors to this apparent paradox might be. In particular, three factors are considered: i) the fact that in the most recent period, inequality has reverted its declining trend in various countries; ii) the limitation of traditional inequality indicators (such as the Gini coefficient) to detect recent income gaps between the wealthy and the poor, in absolute terms; and iii) the biases that might be introduced, both in terms of inequality level and trends, when we measure inequality based on households survey data, considering that said data actually gathers poor information with respect to capital income (and the wealthiest sectors of the population).

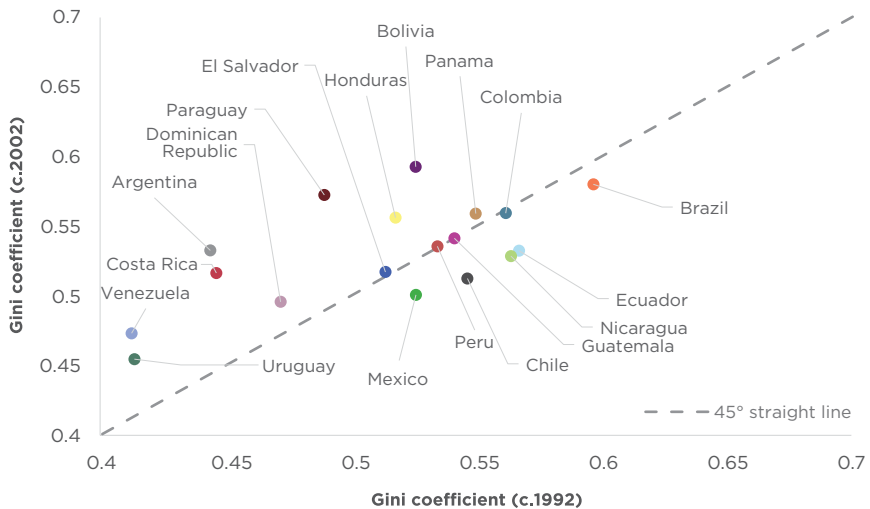
Finally, in section 3, we will discuss the fiscal redistribution model in the 18 countries included in the Latin American region. The first remarkable outcome is that it is a heterogeneous model. Revenue and social spending vary considerably, and so does the way Government manages concentration coefficients through fiscal instruments. A second finding to be considered is that, even though in all the countries, the combinations of taxes, social spending, and consumer subsidies are progressive (i.e., it reduces inequality), this is not the case for poverty. Considering the burden of indirect tax on consumption, national tax authorities make the poor usually poorer in some countries.

2. Inequality in Latin America: evolution and determinants

Between 1990 and 2017, inequality in Latin America has diminished. However, the trend was not steady throughout the period. During the 1990s and the early 2000s, inequality increased in most countries for which comparable data was available (Chart 1, Graph A). Between 2002 and 2013 (approximately), inequality decreased in all the countries shown in Graph B, Chart 1. Since 2013, this trend showed clear signals of being over: in some countries, inequality started to grow, while in others, the declining trend slowed down (Chart 1, Graph C).¹

CHART 1. Inequality Changes by Country and Subperiod, *circa* 1990-2017 (Gini coefficient)

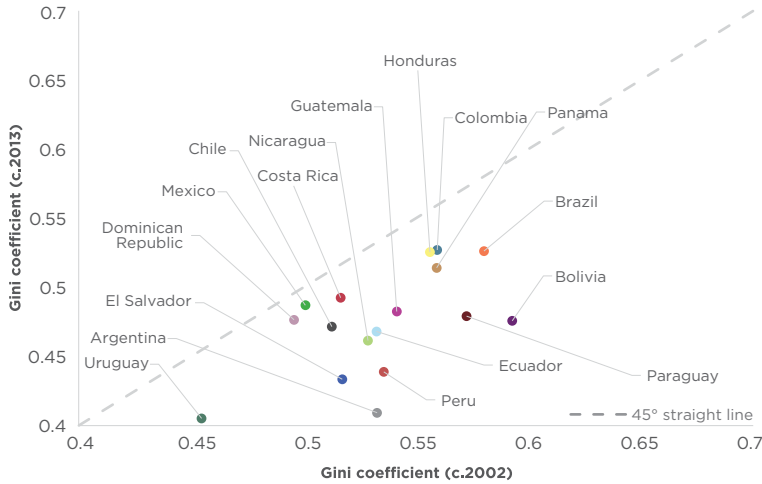
Graph A: circa 1992-2002



Note: The dotted line represents the 45-degree diagonal. Years considered: Argentina: 1992-2002 (urban population); Bolivia: 1997-2002; Brazil: 1995-2002; Chile: 1992-2003; Colombia: 2001-2002; Costa Rica: 1992-2002; Dominican Republic: 1996-2002; Ecuador: 1995-2003; El Salvador: 2000-2002; Guatemala: 2000-2000; Honduras: 1992-2002; Mexico: 1992-2002; Nicaragua: 1995-2001; Panama: 1995-2002; Paraguay: 1995-2002; Peru: 1997-2002; Uruguay: 1992-2002; Venezuela: 1992-2002.

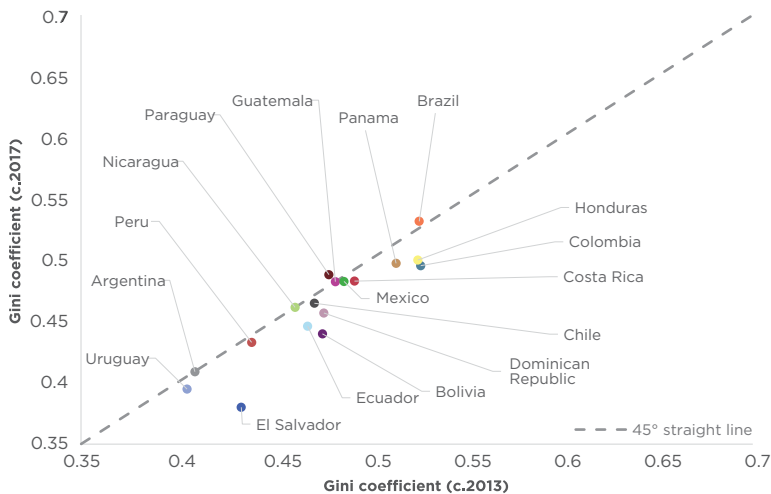
¹ The concept of income used is "disposable income." This concept includes wages, salaries or income arising from a person's main activity and any other non-labor income, which may correspond to allowances or pensions, payments or profits received, and cash transfers. The Socio-Economic Database for Latin America and the Caribbean (SEDLAC) gathers all this information from household surveys in each of the 24 countries in the region. For more information, see: <http://www.cedlas.econo.unlp.edu.ar/wp/en/estadisticas/sedlac/metodologia-sedlac/#1496251194841-0db46f2f-cc48>

Graph B: circa 2002-2013



Note: The dotted line represents the 45-degree diagonal. Years considered: Argentina: 2002-2013 (urban population); Bolivia: 2002-2013; Brazil: 2002-2015; Chile: 2003-2013; Colombia: 2002-2015; Costa Rica: 2002-2013; Dominican Republic: 2002-2013; Ecuador: 2003-2013; El Salvador: 2002-2013; Guatemala: 2000-2014; Honduras: 2002-2013; Mexico: 2002-2014; Nicaragua: 2001-2014; Panama: 2002-2013; Paraguay: 2002-2013; Peru: 2002-2013; Uruguay: 2002-2013.

Graph C: circa 2013-2017

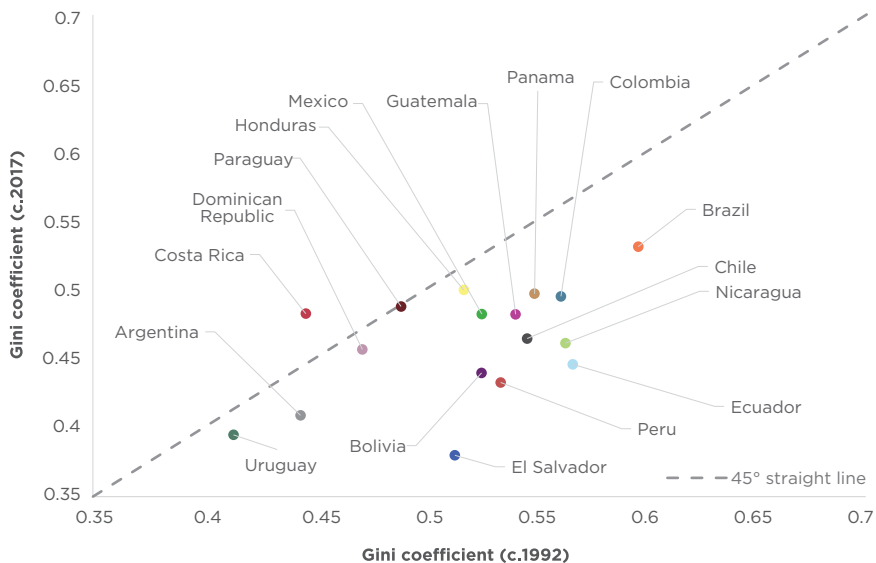


Note: The dotted line represents the 45-degree diagonal. Years considered: Argentina: 2013-2017 (urban population); Bolivia: 2013-2017; Brazil: 2013-2017; Chile: 2013-2017; Colombia: 2013-2017; Costa Rica: 2013-2017; Dominican Republic: 2013-2016; Ecuador: 2013-2017; El Salvador: 2013-2017; Guatemala: 2014-2014; Honduras: 2013-2016; Mexico: 2014-2016; Nicaragua: 2014-2014; Panama: 2013-2017; Paraguay: 2013-2017; Peru: 2013-2017; Uruguay: 2013-2017.

The observed outcome for the whole period (1990-2017) is a significantly lower degree of inequality in Latin America (Chart 2, Graph A). These are sound results, regardless of the inequality indicator used. For example, the reduction is both evidenced if calculated by the Gini coefficient and the ratio income received by the wealthiest decile of the population, compared to the poorest decile (Chart 2, Graph B). However, despite the sharp drop during the first decade of the century, Latin America is still the most unequal region (Chart 3).

CHART 2. Changes in Inequality by Country and for the Whole Period, *circa* 1990-2017 (Various Indicators)

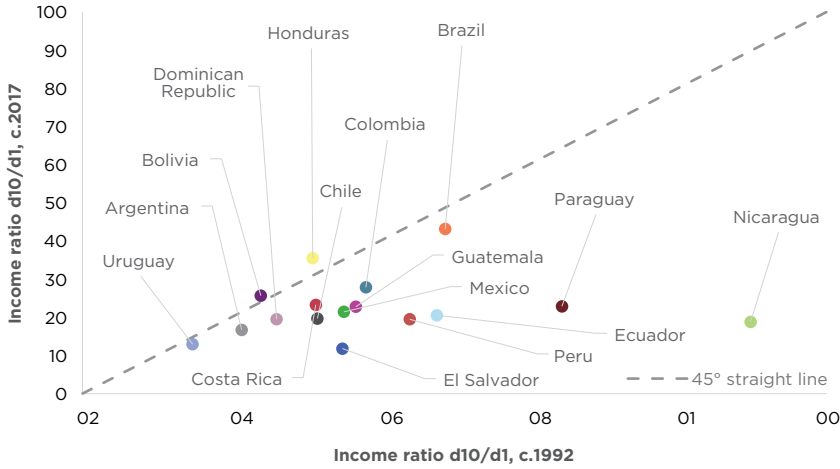
Graph A: Gini coefficient



Note: The dotted line represents the 45-degree diagonal. Years considered: Argentina: 1992-2017 (urban population); Bolivia: 1997-2017; Brazil: 1993-2017; Chile: 1992-2017; Colombia: 2001-2017; Costa Rica: 1992-2017; Dominican Republic: 1996-2016; Ecuador: 1995-2017; El Salvador: 2000-2017; Guatemala: 2000-2014; Honduras: 1992-2016; Mexico: 1992-2016; Nicaragua: 1993-2014; Panama: 1995-2017; Paraguay: 1995-2017; Peru: 1997-2017; Uruguay: 1992-2017.

Source: SEDLAC (CEDLAS and World Bank). Updated as of November 2019, accessed on February 20, 2020.

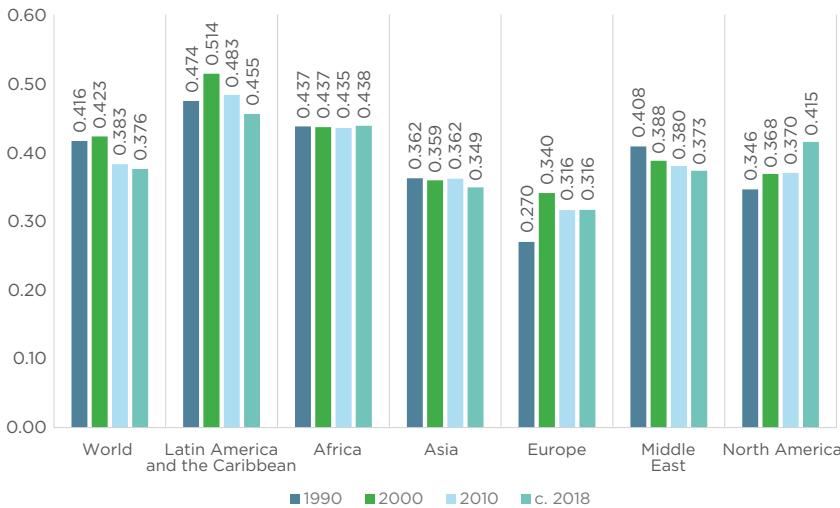
Graph B: Income Decile from the Wealthiest to the Poorest



Note: The dotted line represents the 45-degree diagonal. Income used to calculate the income decile ratio between the wealthiest and the poorest are expressed in USD considering 2011 Purchasing Power Parity (PPP). Years considered: Argentina: 1992-2017 (urban population); Bolivia: 1992-2017; Brazil: 1992-2017; Chile: 1992-2017; Colombia: 1992-2017; Costa Rica: 1992-2017; Dominican Republic: 1992-2016; Ecuador: 1994-2017; El Salvador: 1995-2017; Guatemala: 2000-2014; Honduras: 1992-2017; Mexico: 1992-2016; Nicaragua: 1993-2014; Panama: 1995-2017; Paraguay: 1995-2017; Peru: 1997-2017; Uruguay: 1992-2017; Venezuela: 1992-1999.

Source: POVCAL, World Bank. Accessed on January 7, 2020.

CHART 3. Inequality by Region: Gini Coefficient

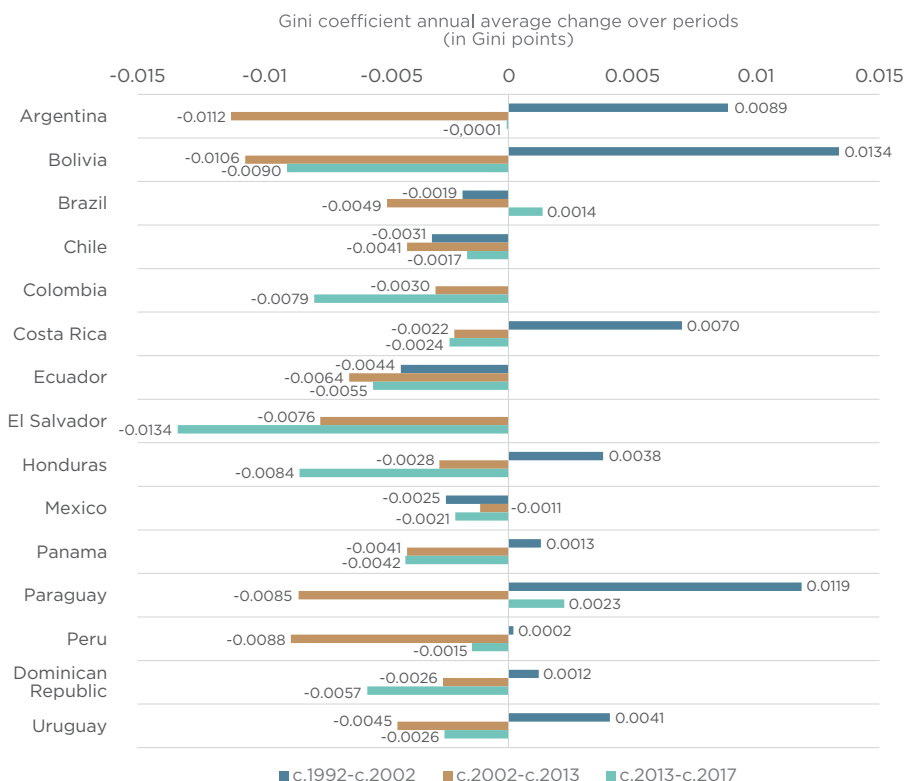


Note: Years included for Latin America and the Caribbean: 1992, 2000, 2010, and 2017. The group of countries used vary each year.

Source: World Bank. SEDLAC and World Development Indicators. Accessed on January 7, 2020.

Chart 4 shows a summary of the trends observed by country during the three periods mentioned. They evidence the change in the trend (from decrease to increase, between the second and the third period) in Brazil and Paraguay, and a still not analyzed remarkable decline in inequality over the third period in El Salvador and Honduras.

CHART 4. Inequality Trends by Country and Subperiod



Note: The average change is calculated as the Gini coefficient total change in the years included in each period, divided by the number of years within said period. Years considered for each country are: Argentina: 1992-2002, 2002-2013, 2013-2017 (urban population); Bolivia: 1997-2002, 2002-2013, 2013-2017; Brazil: 1993-2002, 2002-2013, 2013-2017; Chile: 1992-2002, 2002-2013, 2013-2017; Colombia: 2002-2013, 2013-2017; Costa Rica: 2002-2013, 2013-2017; Dominican Republic: 1996-2007, 2007-2013, 2013-2016; Ecuador: 1995-2002, 2002-2013, 2013-2017; El Salvador: 2002-2013, 2013-2017; Honduras: 1992-2002, 2002-2013, 2013-2016; Mexico: 1992-2002, 2002-2014, 2014-2016; Panama: 1995-2002, 2002-2013, 2013-2017; Paraguay: 1995-2002, 2002-2013, 2013-2017; Peru: 1997-2002, 2002-2013, 2013-2017; Uruguay: 1992-2002, 2002-2013, 2013-2017. Guatemala, Nicaragua and Venezuela have not been considered as the number of years with available information is limited. Information on Venezuela is available only until 2006.

First, it is important to mention that the –as explained– these trends are based on household survey data. This data poses a shared problem: income understatement, mainly with respect to capital income, which represents a higher share of the income of wealthiest individuals than in other social groups. The following section will provide details on the fact that inequality levels may be significantly higher and trends may change whenever information is gathered from administrative sources based on tax returns and national accounts. In particular, the 2002–2012 drop was not present or had a lower impact in those countries that had made corrections thereof. In summary, the analysis based on household survey data does not fully cover the whole performance of capital income.

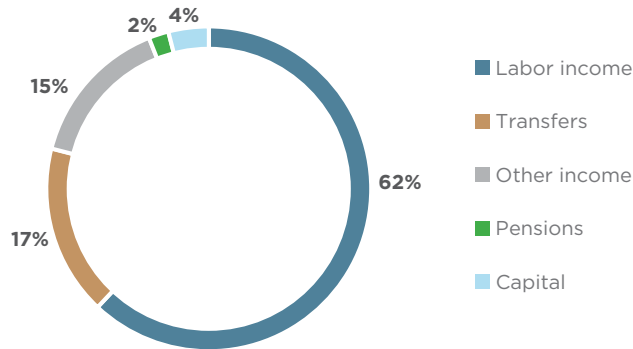
Therefore, the analysis included in this section refers mainly to labor income inequality and income derived from private transfers (for example, remittances) or from public transfers, but not to capital income. In particular, the role played by returns to education and government transfers on the dynamics of inequality will be analyzed.

Which are the underlying factors of the trend reversal of inequality over the period 2002–2012? First, observed trends have not evidenced a relationship between economic growth and inequality. Inequality has diminished both in countries with a quick economic recovery, for example, Chile, Panama, and Peru, and in countries experiencing a lower performance, such as Brazil, or quite a low rate of growth, such as Mexico. Inequality dropped both in countries categorized as commodity exporters (for example, Argentina, Bolivia, Brazil, and Chile) and in countries categorized as importers (for example, El Salvador and Guatemala). Likewise, the Gini coefficient has decreased in countries ruled by left-leaning governments (such as Argentina, Bolivia, Brazil, Chile, and Venezuela) and in countries governed by center or center-right parties (such as Mexico and Peru).

Available studies reveal two plausible factors that contribute to the decrease of inequality: a lower inequality on hourly earning and a higher volume and progressivity of public transfers.² Based on a nonparametric decomposition method, Azevedo *et al.* (2013) analyze the determinants related to trend reversals of inequality in fourteen countries in the region. On average, a bit more than 60% of the Gini coefficient reduction might be based on the decrease of inequality of hourly earning; 17% might be based on government transfers impact on equality, and 15% on the equalizing effect of other sources of income, including private transfers, and in particular, remittances³ (Chart 5).

2 Azevedo, Inchauste and Sanfelice (2013), and Cornia (2015); De la Torre, Levy Yeyati and Pienknagura (2015); López-Calva, and Lustig (2010); Lustig, López Calva, and Ortiz-Juárez (2015); Messina and Silva (2018).

3 However, it is worth mentioning that Azevedo *et al.* (2015) show a significant heterogeneity among the countries (see Chart 7).

CHART 5. Contribution to Inequality Change by Income Source

Source: The nonparametric decomposition method is based on Azevedo *et al.* (2015) and the parametric results were provided by CEDLAS, based on SEDLAC available data (CEDLAS and World Bank).

The analysis conducted by Cornia (2015) for Chile, Ecuador, El Salvador, Honduras, Mexico, and Uruguay confirms most of the data provided as evidence. In particular, results suggest that changes in labor income distribution partially explain the inequality drop.

Rodríguez-Castelán, López-Calva, Lustig and Valderrama (2016) state that the trend reversal in labor income inequality took place—in general—within a context of hourly earning growth together with a significant raise in the lower tail of income distribution. Between 2002 and 2013, the labor income of the poorest decile grew—on average—50% in real terms, while the average rate of growth was 15% for the wealthiest decile (and 32% for the median income distribution). This contrasts with what happened during the period of inequality growth in the 1990s, when the poorest decile experienced an income decrease, while income for the rest of the deciles was stagnant or experienced a slight growing rate.

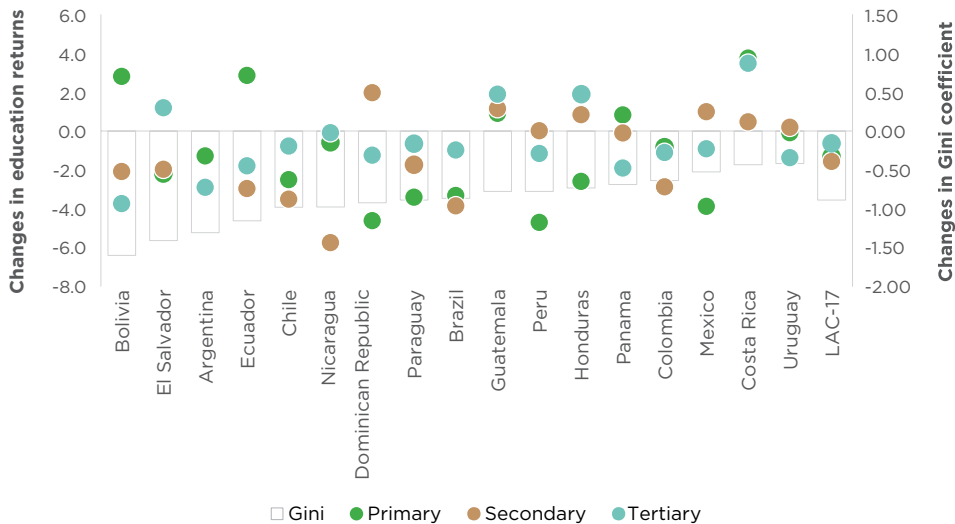
What was the cause of the reduction of inequality in hourly earning? In line with the opinions of López-Calva and Lustig (2010), Gasparini and Lustig (2011), Rodríguez-Castelán *et al.* (2016), and Messina and Silva (2018), available evidence suggests that both the increase and the decrease of inequality in labor income have been linked to the increase or decrease, respectively, of education wage gaps based on the hourly rate depending on the educational level; or, in other words, the increase or decrease in returns to education.⁴ In particular, in most countries where total inequality decreased over the 2000s, returns to education in primary, secondary and tertiary levels have also decreased, compared to no formal education or incomplete primary education.⁵ Chart 6 shows that in Brazil, Chile, Colombia, and Paraguay,

⁴ Also see Barros, De Carvalho, Franco and Mendonca (2010); Campos, Esquivel and Lustig (2012); De la Torre *et al.* (2015), and Gasparini and Cruces (2010).

⁵ Messina and Silva (2018) also state that the education premium decreased among workers with tertiary education and workers with secondary education levels, but—as expected—to a lesser extent than when workers with tertiary education are compared with workers with complete primary education levels or lower.

the decrease was evidenced by all educational levels, while the rest of the countries showed more heterogeneous outcomes.

CHART 6. Gini Coefficient Changes and Returns to Education, 2001-2015



Notes: The average change in the Gini coefficient of each country is calculated as the difference between the Gini coefficient of the last year minus the initial one, divided by the total number of years. The returns for different schooling levels are calculated for no formal education or incomplete primary education. Qualification levels are determined by the level of formal education. Schooling levels are categorized as complete primary, secondary and tertiary education. In the case of Argentina, the analysis only covers urban areas.

Source: Author's elaboration based on SEDLAC (CEDLAS and World Bank).

During the period of inequality reduction, the decrease in returns to education has also been partially associated with broader access to education, achieved in previous years. In relative terms, of course, the number of workers with no formal education or with incomplete primary educational attainments dropped (and in almost all countries, workers with secondary education also became relatively scarce compared to workers with post-secondary educational attainments). According to Battiston, García-Doménch, and Gasparini (2014), the number of years of formal education achieved by the population that is part of the labor force increased –on average– 1.5 years between 1990 and 2009 (the minimum increase was 0.7 years in Panamá and the maximum one reached 2.9 in Brazil). However, these authors also state they have found two different periods to be considered. From 1990 to 2002, the gap on average years of education for the region between the top and bottom quintiles of labor income distribution increased. However, from 2002 to 2009, this gap narrowed. This differentiation between the two periods

is most likely associated with what happened to access to education by earning categories in the previous decade: an unfavorable educational expansion in the population of the lowest quintile during the crisis of the 1980s and the opposite effect during the 1990s, when governments throughout the region made an effort to provide for open access to primary school education.

It is worth mentioning that, though the distribution of the years of education has become more uniform, there is evidence that the effect of this change has been unequalizing (Campos *et al.*, 2012; Gasparini, Galiani, Cruces, and Acosta, 2011). This means that, if case returns were to remain unchanged for a specific period, educational improvement effects would be unequalizing. This result, which apparently contradicts intuition, has been called in the literature “the paradox of progress” and is a consequence of the convexity of returns. When returns to education are convex, there is an inverse relationship between educational inequality and income inequality. That is to say, as educational inequality decreases, for example, income inequality first increases and then begins to fall (See Bourguignon, Ferreira, and Lustig [2005] for a more detailed explanation thereof). Over time, as the dispersion of years of school is reduced, the “paradoxical” outcome will disappear. Additionally, Battiston *et al.* (2014) suggest that the unequalizing effect over the 2000s was quite lower than over the 1990s. This seems to indicate that the paradox effect would disappear.

Added to the reduction in the so-called education premium, Rodríguez-Castelán *et al.* (2016) have found that the so-called experience premium is another factor contributing to the trend reversal of labor income inequality. That is to say, the gap between more-experienced and less-experienced workers decreased by almost 50% on average, based on other observable factors.⁶ However, it is worth mentioning that these authors state that the reduction in salary gaps between workers with different levels of education, experience or geographical location, explain quite a small share of the trend reversal of labor income inequality. Almost half of this trend reversal is based on the reduction of the variance of workers’ earnings who share similar observable characteristics (i.e., residual labor inequality). This topic should be further explained to identify which other underlying factors, as compositional changes in the labor force, exist with respect to the observed phenomenon.

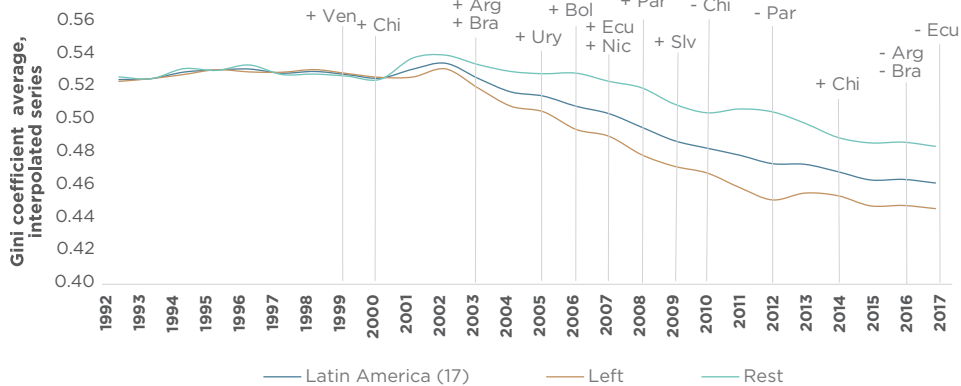
The determinants of inequality reduction of non-labor income include: capital gains (interest, benefits and premiums), private transfers (for example, remittances), and public transfers (for example, conditional cash transfers and non-contributory pensions). As stated above, household surveys fail to gather income from capital. With respect to private transfers, a study conducted about Mexico (Esquivel, Lustig and Scott, 2010) shows that remittances have had an equalizing effect, especially over the last decade, based on the reduction of the gap between rural and urban household per capita income. Cornia (2013) also states that the increase of remittances in total household income has an equalizing effect in El Salvador and Mexico but not in Honduras, where the effect was the opposite.

6 The categories of the years included: 0 to 5, 6 to 10, 11 to 20, 21 to 30, and 31 and more; the category of reference is from 0 to 5 years. Also see Messina and Silva (2019).

With respect to public transfers, as mentioned above, Azevedo *et al.* (2013) consider that these sources were the grounds for, on average, almost 17% share of regional inequality reduction. The role of non-contributory pensions cannot be measured since authors have included them together with contributory pensions of the social security system, and— as a whole— pensions contributed to 2% share of inequality reduction. Based on the profile of the people receiving non-contributory pensions in Latin American countries, this type of pensions is likely to represent quite a significant share of the trend reversal of inequality with respect to all the rest of the pensions granted. For example, Lustig and Pessino (2013) show that the big expansion of non-contributory pensions in Argentina mainly resulted in the reduction of inequality over the period 2006–2009. In Brazil, Barros *et al.* (2010) show that changes in the volume, scope and distribution of public transfers contributed with 49% share to the reduction of inequality over the period 2001–2007; and in Mexico, Esquivel *et al.* (2010) show that these same factors contributed with a share of almost 18% over the period 1996–2006.

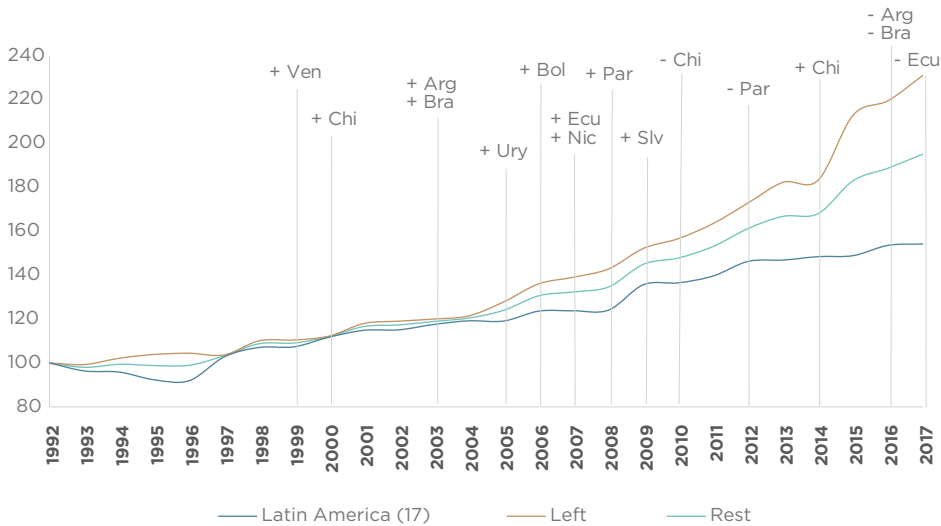
Though it is true that inequality reduction was present both in countries governed by left-leaning and center-left parties and in countries governed by other political regimes, it is also worth considering whether the first group of countries evidenced a deeper inequality reduction. As shown in Chart 7, the answer seems to be affirmative. The analysis of differences in the differences pointed out by Long, Lustig and Quan (to be published soon) reassures this outcome for a sub-group of countries. Which might have been the main mechanism influencing the deepest reduction of inequality in countries governed by left-leaning parties? First, increases in education and health spending have no immediate effect. Second, the expansion of cash transfers was present both in countries governed by left-leaning parties, and in countries governed by other regimes. Countries governed by left-leaning parties don't seem to systematically expand more public labor or introduce progressive tax reforms. The only variable of public policies that seemed to be different according to the political regime was the treatment of minimum wages, as shown in Chart 8, which increased at higher rates in countries under left-leaning governments.

CHART 7. Evolution of Inequality Evolution by Political Regime, 1992-2017



Note: Left-leaning governments include Argentina, Bolivia, Brazil, Chile, Ecuador, El Salvador, Nicaragua, Paraguay, Uruguay, and Venezuela; (+) refers to the first year with left-leaning regimes; (-) refers to the first year with no left-leaning regimes. Years without household surveys: Bolivia 1992-1996, 1998, 2005-2004, 2010; Brazil 1992, 1994, 2000, 2010; Chile 1995, 1995, 1997, 1999, 2001-2002, 2004-2005, 2007-2008, 2010, 2012, 2014, 2016; Colombia 1992-2000, 2006-2007; Ecuador 1992-1994, 1996-1997, 2001-2002; El Salvador 1992-1999, 2003; Guatemala 1992-1999, 2001-2005, 2007-2010, 2012-2015, 2015-2017; Honduras 2000; Mexico 1993, 1995, 1997, 1999, 2001, 2005, 2007, 2009, 2013, 2015, 2017; Nicaragua 1992, 1994-1997, 1999-2000, 2002-2004, 2006-2008, 2010-2013, 2015-2017; Panama 1992-1994, 1996; Paraguay 1992-1994, 1996, 1998, 2000; Peru 1992-1996; Uruguay 1993-1994, 1999; Venezuela 1993-1994, 1996, 2007-2017, inclusively. In the case of Argentina, the household survey only covers the urban population; it is nation-wide in the other countries.

Source: Author's elaboration based on series interpolations. Gini coefficients from SEDLAC (CEDLAS and World Bank).

CHART 8. Real Minimum Wage Evolution by Political Regime, 1992-2017

Note: Left-leaning governments include Bolivia, Brazil, Chile, Ecuador, El Salvador, Paraguay, Uruguay, and Venezuela; (+) refers to the first year with left-leaning regimes; (-) refers to the first year with no left-leaning regimes.

Source: Author's elaboration based on CEPALSTATS. Accessed on December 20, 2019.

In summary, over the period 2000–2012, Government activity contributed to the inequality reduction through three main mechanisms. First, broader access to basic formal education and higher educational levels has been the result of governments' explicit efforts to guarantee open access to education since the last decade. This means that governments have made efforts to provide equal opportunities concerning basic formal education, and these efforts had a real impact on wage inequality reduction in the following period. During this time, returns to education decreased partially due to the huge increase in the availability of workers with a higher educational level, but also due to other demand-related factors.⁷ Second, (net) government transfers turned to be more generous and progressive. Big scale conditioned cash transfer programs, such as *Bolsa Família* (Brazil) and *Progres-a-Oportunidades-Prospera* (Mexico), reduced inequality in household per capita income by 10% and 20%. Finally, in countries governed by left-leaning parties, Government activity has been evidenced by active policies in the labor market. For example, the increase on minimum wages provided for wage distribution compression. Government activity was mainly possible based on the increase of tax income linked to commodity boom.

⁷ Another factor that influenced this same direction was that, in some countries, based on the commodity boom, demand changed. Therefore, the productive structure also changed, benefiting workers with lower educational level attainments. Within a sub-group of countries, the rise of minimum wages in real terms also contributed (see Messina and Silva, 2018).

The commodity super cycle ended by 2012 and, since then, inequality reduction slowed down its pace in a huge number of countries (Chile, Peru, and Uruguay), made a pause (Argentina) and even reverted its declining trend (Brazil and Paraguay) (Chart 4). In South American countries, governments were not able to maintain the trend of raising minimum wages or transfers due to the declining of growth, and a heavy tax burden. However, an opposite phenomenon has also come up: inequality reduction accelerated in El Salvador and Honduras in the last period. Studies have not yet been conducted to determine the factors contributing to these new outcomes, both in countries where inequality reduction was paused and in the ones in which it appeared even more notorious than before.

3. Inequality reduction and protest increase?

Based on the increasing trend of protests in Chile, Colombia and Ecuador, during the last months of 2019, Latin America's high concentration of income turned to be in the headlines again. There is an apparent incongruence between the trends detected in the evolution of inequality in the last thirty years and the manifest social unrest. As mentioned in the previous section, over this century, the inequality trend in Latin America was reversed at a scale rarely seen in history (since data became available, of course). By the year 2000, the Gini coefficient was 0.514, 12% higher than the most-recent value of 0.455. Such a trend reversal means, for example, that in Brazil, the most unequal country in the region, income collected by the wealthiest 10% turned to be from sixty times the value of income collected by the poorest 10% to less than forty times. Inequality was reduced in each country in the region, including the three countries where the largest protests took place. During this century, in Chile, the Gini coefficient decreased from 0.481 (2006) to 0.465 (2017), in Colombia from 0.562 (2001) to 0.496 (2017), and in Ecuador from 0.532 (2003) to 0.446 (2017).⁸

If inequality has experienced a remarkable reduction in the recent period, then how is social unrest and its virulence explained? This section will reveal, in particular, three reasons: First, the negative impact on living conditions at the end of the commodity boom period; second, the limitation of indicators or indices used to measure (for example, the Gini coefficient), and third, the limitation of data used to measure inequality in a meaningful way.⁹

In South American countries, the end of the commodity boom period meant a decrease in the rate of growth of income per capita; some countries also entered in periods of recession. Protests are not the only evidence of social unrest. The popular vote in recent presidential elections has been characterized by going against the party holding office, regardless of its ideology (in countries governed by left-leaning parties; more right-leaning candidates were chosen and vice versa). This is a vote of protest against the loss of purchasing power, rates of unemployment, and less benefits derived from the fiscal system. Added to this, in many countries, the inequality trend was reverted with respect to the previous decade and started rising. This happened, for example, in Argentina and Brazil, and in Paraguay, to a lesser extent. Though there has been a decrease

⁸ Chile's data previous to 2006 was estimated using the old methodology applied by its government authorities, so they are not comparable.

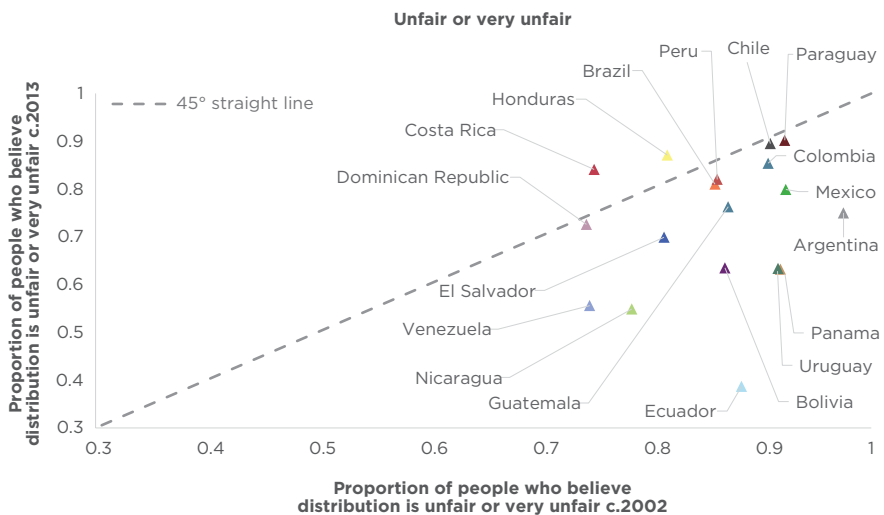
⁹ As these phenomena are so recent, there are many additional hypotheses. For example, greater aspirations of the new middle class in terms of goods and services at affordable prices and of satisfactory quality, the erosion of traditional political parties and institutions, the role of the media, and –above all– social media. See, for example, the guidelines included in the following document issued by the World Bank: <https://www.worldbank.org/en/events/2020/06/22/annual-bank-conference-on-development-economics-2020-global-unrest#2>. Also see Ferreira and Schoch's blog (2020)

in inequality, when numbers of the beginning of the century are compared to most-recent ones, over the last years, many countries experienced a stagnation of said trend reversal or even an increase of inequality levels (Chart 4).

The lower economic dynamism combined with growing rates of inequality increased incidence of poverty, just when the fiscal system capacity to offer compensation methods has slowed down. These types of combinations fuel social unrest since the population experiences an immense sense of frustration. Progress evidenced over the first decade of this century could not be sustained. If protests have emerged based on a trend reversal in social progress, is this fact shown in surveys on people's perceptions? Chart 9, Graph A shows that the share of individuals who considered income distribution as unfair or very unfair between 2002 and 2013 was reduced in almost all countries where inequality was reduced. According to end-to-end data, inequality was reduced in all the countries shown.¹⁰ During a most recent period, however, some countries have evidenced an inequality reduction but the perception of an existing unfair or very unfair income distribution, increased. This happened in Argentina, Bolivia, Colombia, Guatemala, Ecuador, El Salvador, Panama, and Uruguay (Chart 9, Graph B).

CHART 9. Inequality Perceptions

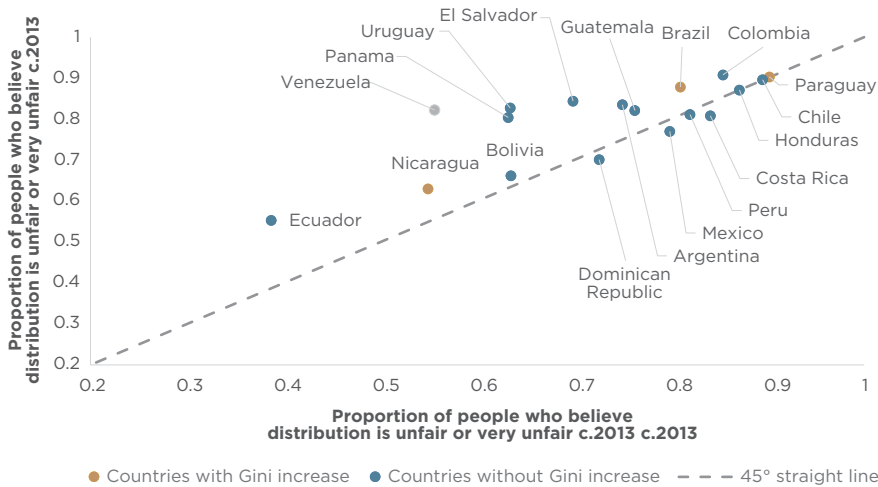
Graph A: Perception During the Period when Inequality was Reduced in Almost all Countries



Note: The survey question was: How fair do you think income distribution is in (country)? In addition, the answers "Don't know" and "No answer" were not considered to estimate the percentages. Years considered for each country are: Argentina: 2002, 2013, 2017; Bolivia: 2002, 2015, 2017; Brazil: 2002, 2015, 2016; Chile: 2002, 2013, 2017; Colombia: 2002, 2013, 2017; Costa Rica: 2002, 2013, 2017; Dominican Republic: 2007, 2013, 2016; Ecuador: 2002, 2013, 2017; El Salvador: 2002, 2013, 2017; Guatemala: 2002, 2013, 2017; Honduras: 2002, 2013, 2015; Mexico: 2002, 2013, 2016; Nicaragua: 2001, 2013, 2016; Panama: 2002, 2013, 2016; Paraguay: 2002, 2013, 2017; Peru: 2002, 2015, 2016; Uruguay: 2002, 2013, 2017; Venezuela: 2002, 2013, 2017.

¹⁰ Latinobarómetro 2002, 2013, and 2017.

Graph B: Perception During the Period when Inequality was Reduced at a Lower Pace, Stopped Declining or Started Rising in quite a Big Number of Countries



Note: Yellow dots represent countries where the Gini coefficient increased; blue dots represent countries where the Gini coefficient was stable or decreased; and the grey dot represents Venezuela, since no data was available with respect to the Gini coefficient for that period. The survey question was: How fair do you think income distribution is in (country)? In addition, the answers “Don’t know” and “No answer” were not considered to estimate the percentages. Years considered for each country are: Argentina: 2002, 2013, 2017; Bolivia: 2002, 2013, 2017; Brazil: 2002, 2013, 2016; Chile: 2002, 2013, 2017; Colombia: 2002, 2013, 2017; Costa Rica: 2002, 2013, 2017; Dominican Republic: 2007, 2013, 2016; Ecuador: 2007, 2013, 2017; El Salvador: 2002, 2013, 2017; Guatemala: 2002, 2013, 2017; Honduras: 2002, 2013, 2015; Mexico: 2002, 2013, 2016; Nicaragua: 2001, 2013, 2016; Panama: 2002, 2013, 2016; Paraguay: 2002, 2013, 2017; Peru: 2002, 2013, 2016; Uruguay: 2002, 2013, 2017; Venezuela: 2002, 2013, 2017.

Source: Author’s elaboration based on *Latinobarómetro*.

It is possible that the indicators used to measure inequality were not the most suitable ones to evidence the relationship between inequality and social unrest. The Gini coefficient (and all other indicators and indices commonly used to measure concentration levels) measure relative differences in individuals or household’s income levels. However, the gap increase in absolute terms might be fueling social unrest. If all earnings were increased in the same proportion in a country, the Gini coefficient of that country would be the same before and after said increase. However, in terms of purchasing power, the person with a higher-income level will benefit more from said uniform increase in absolute terms than someone with a lower-income level. What has happened with the differences in income level in absolute terms? Let us take, for example, the case of Chile, which has captured our attention based on the protests taking place in October 2019 and their unexpected

virulence.¹¹ Although, according to the information gathered by household surveys in Chile, the income earned by the wealthiest 10% decreased from thirty times the income of the poorest 10% in 2000, to twenty times said income in 2017, differences in absolute terms grew significantly. Over the same period, the difference in income between the wealthiest 10% and the poorest 10% surprisingly grew by 50% (45% if compared to the difference between the wealthiest 10% and the middle-income individual).¹²

This means that the poorest sector improved its situation, the wealthiest sector could also increase its trend of consumption of luxury goods, at the same time that poor and middle-class households kept on facing difficulties arising from a social contract by means of which the Government skimmed in services and benefits to be provided, mainly, to vulnerable and middle-class groups. In his excellent article on this topic, Uthoff (2016) describes how the pension and health systems established during the military dictatorship in Chile have profoundly failed in terms of providing insurance, smoothing consumption throughout the life cycle, and alleviating poverty for elders (pension system), and in terms of providing insurance and preventing disease (health system). Even after the reforms introduced since 2006 to enhance the pension system with respect to the difficulties mentioned above, 70% of citizens consider that benefits are below expectations. In fact, more than 40% of the beneficiaries in Chile have income below the poverty line and 79% below the minimum wage. Replacement rates are not sufficient since almost 50% of the beneficiaries receive a pension lower than 38% of the average amount of their earnings in the last ten years (and in the case of women, this amount is worse, since it drops to 24.5%).

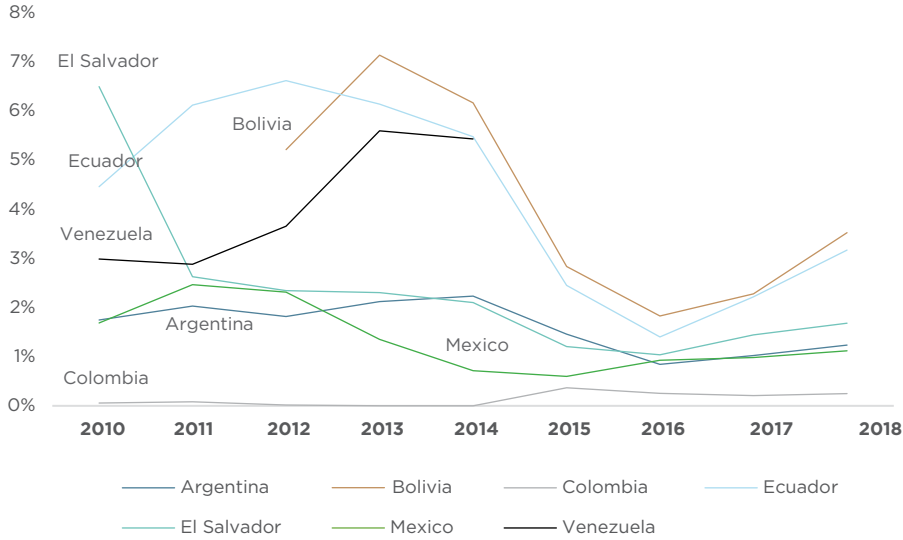
Likewise, some variables with significant impact on individual's purchasing power are not incorporated into inequality and poverty conventional indices or indicators, for example, indirect taxes (VAT, specific taxes, etc.) and consumer subsidies. Inequality and poverty indicators are based on disposable income (or the closest to this concept) to measure welfare. However, as explained in full in the following section, purchase power is preferably measured by the concept of consumable income, resulting from disposable income minus what households pay for taxes on consumption and adding what they earn as subsidies. There are no series of inequality or poverty indicators measured with consumable income so as to determine the degree of losses that the population might have experienced during the commodity post-boom period, based on the reduction of some subsidies (or the increase on indirect taxes on consumption). However, as shown in Chart 10, Graph B, fiscal resources allocated to subsidies on fossil fuels have significantly declined in El Salvador, Argentina, Bolivia, Venezuela, and to a lesser extent, in Mexico, which has resulted in price increases, mainly with respect to electricity, fuel and other energy-based products.

11 Different media reported these protests. See, for example: https://elpais.com/cultura/2019/11/21/actualidad/1574349151_671947.html

12 Measured in USD, in purchase power parity as of 2011, the poorest decile average income and the wealthiest one in 2000 was USD 56 and USD 1,819, respectively. In 2017, said values amounted to USD 140 and USD 2,754, respectively (author's calculations based on POVCAL, World Bank).

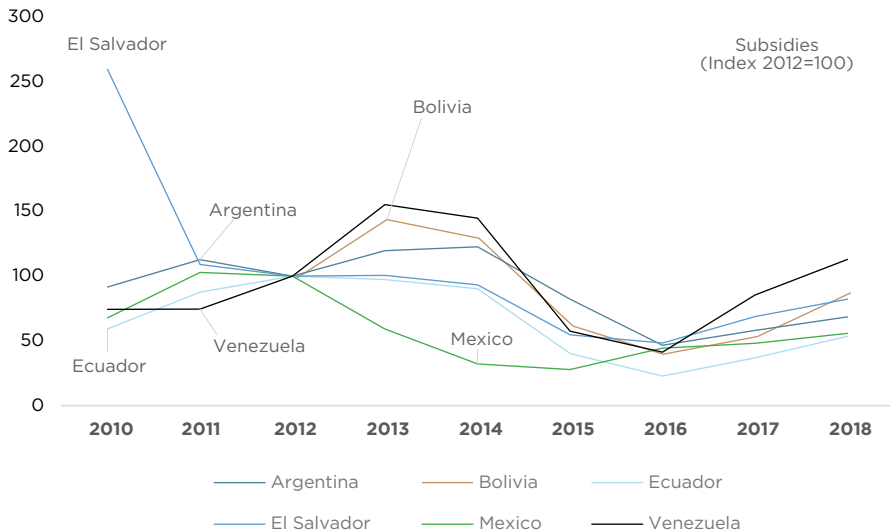
CHART 10. Evolution of Subsidies

Graph A: Total Expenses on Subsidies to Fossil Fuels in Percentages of GDP



Note: Ratios are calculated based on constant 2018 US dollars.

Graph B: Total Expenses on Subsidies to Fossil Fuels as an Index of the Real Value 2018 US dollars.



Note: Indices are calculated based on constant 2018 US dollars. The year 2012 was chosen as the base year since all the countries had information available.

Source: IEA (2018).

The fact that subsidies have decreased in real terms or proportionally to GDP does not necessarily mean that consumers are paying more for electricity, gas or gasoline, since this depends on the market prices' trends of said products (if market prices fall, a lower subsidy is needed to maintain the subsidized price constant). According to available data, gas prices increased in El Salvador, and electricity prices increased in Argentina.

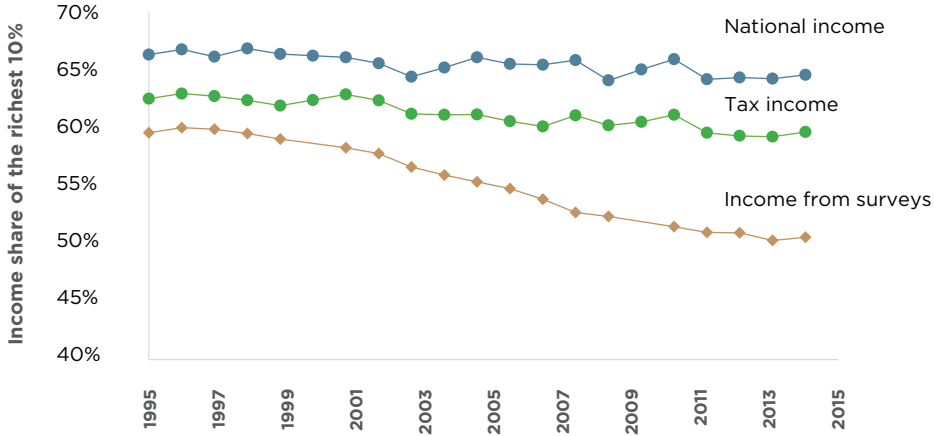
The third reason that may explain the intensity of protests and the vote against the political party in office or the governing political party might be the fact that data used to measure inequality is not adequate to quantify concentration levels of income among the wealthiest, and to assess changes in trends with respect to this concentration.

Traditional sources of information for inequality indicators are, as we have already mentioned, household surveys. A well-known limitation of these surveys is that, for many reasons, they do not often record the upper tail of income distribution, i.e., the income of the wealthiest. In particular, households tend to inform income below the ones they really earn, mainly the ones derived from capital income. Consequently, both inequality levels and trends might be miscalculated. When surveys are corrected and this issue is solved, results might be very different. For example, three relatively recent jobs are examined for Brazil, Chile, and Uruguay¹⁵ (Charts 11, 12, and 13). Using corrected data, the Gini coefficient in Brazil is not only much higher than the one calculated with the original survey data, but also inequality reduction since 2000, as reported in section 1, can be hardly observed. Furthermore, as shown in Chart 12, the weight of redistribution to lower-income sectors was placed on the population included in the eighth and ninth deciles (i.e., on middle-classes and in particular on the middle-upper class), while the wealthiest group kept on experiencing an increase on its income. In the case of Chile, the income share received by the wealthiest 1% is systematically higher when applying the corrected data (to include the information submitted by under-declaration of income) and does not show the declining trend observed in the household survey (Chart 13). In the case of Uruguay, the income share received by the 1% is higher when applying the corrected data, instead of evidencing a declining trend as observed in the household data (Chart 15).

From these exercises, it is clear that access to fiscal data and other administrative sources providing for more accurate calculations is essential to measure inequality, mainly with respect to the upper tails of income distribution. While this is not possible, we will have a partial and biased overview of inequality levels and time trends. This will lead us to misdiagnose the causes and consequences of inequality and to incomplete and misguided recommendations on public policies.

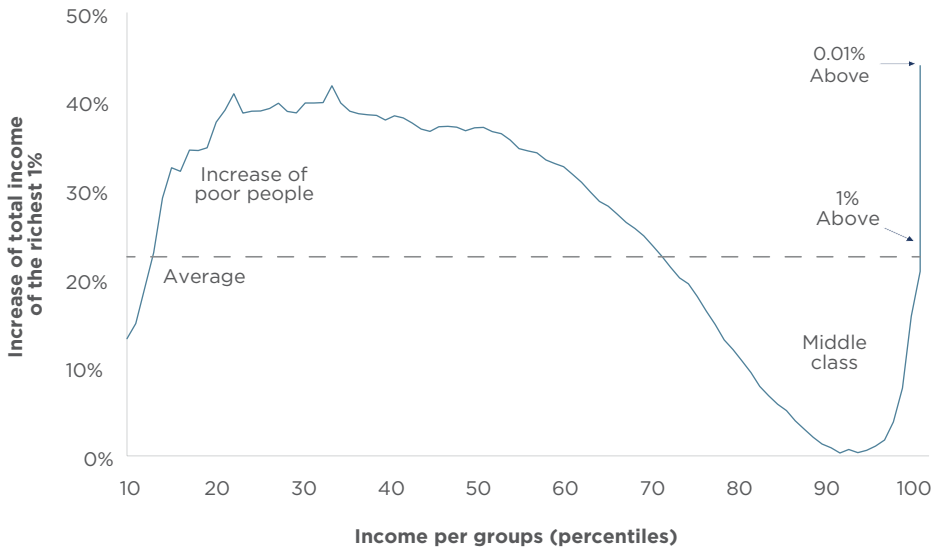
¹⁵ Brazil: Morgan (2018); Chile: Flores, Sanhueza, Atria, and Mayer (2019); Uruguay: Burdín, De Rosa, and Vígorigo (2019).

CHART 11. Evolution of the Gini Coefficient in Brazil with a Household Survey with no Corrections and with Corrected Data Using Administrative Sources, 1995-2016



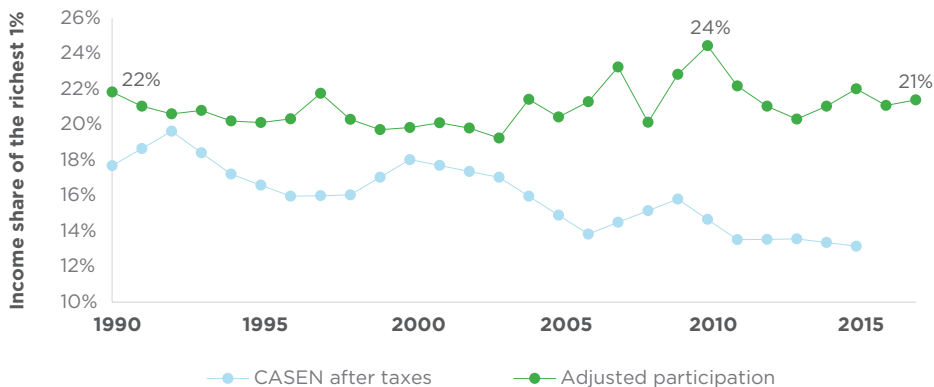
Source: Morgan (2018).

CHART 12. Income Growth Incidence Curves per Person per Percentile, 2002-2013



Source: Morgan (2018).

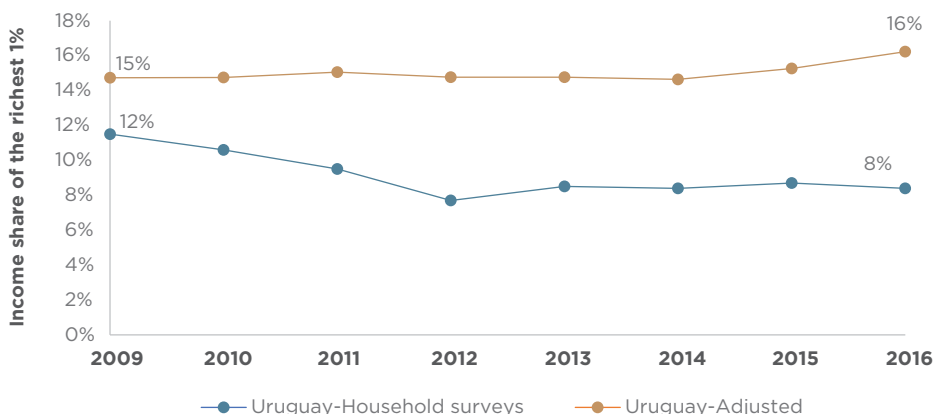
CHART 13. Evolution of Total Income Share Received by the Wealthiest 1% in Chile, 1990-2015



Note: *National Socio-economic Survey (CASEN) after taxes* corresponds to the income share of the wealthiest 1% after taxes in household surveys. *Series adjusted* corresponds to the income share of the wealthiest 1% according to fiscal data and after correcting the information submitted by under-declarations of income and including retained earnings.

Source: Flores *et al.* (2019).

CHART 14. Evolution of Total Income Share Received by the Wealthiest 1% in Uruguay, 2008-2016



Note: *Adjusted* refers to the share calculated using the concept of fiscal income, which mainly adjusts, in general terms, income reported under the household surveys to the information submitted under tax returns and other administrative sources.

Source: Chile: Flores *et al.* (2019); Uruguay: Burdín *et al.* (2019).

4. Redistributive effects of the fiscal policy¹⁴

This section analyses the possible combined impact of taxes and social spending on inequality and poverty in the 18 countries in the region. The period to be included is 2009 to 2016, depending on the country, and for the purposes of this analysis, it will be referred to as “2010s data.” Although information is available for only one point in time, this is possibly the first time that results are shown for all Latin American countries (also calculated using a common fiscal incidence method).¹⁵

Among the specific items to be considered under the categories of taxes and government spending—added to direct taxes and cash transfers included in the sections above—, indirect taxes and subsidies, as well as the effect of social spending on education and health will also be taken into account in this section. As mentioned above, the analyses of the close determinants of the evolution of inequality are based on the disposable income or a similar concept as a variable to be explained. Disposable income is market income (labor income and non-labor income including private transfers) net of direct taxes, to which government transfers are added. However, consumption per capita with a specific disposable income depends on indirect taxes and subsidies. In Latin America, indirect taxes are, in general, the main source of revenue. As we will explain in this section, in some countries, low-income household consumption is lower after taxes as a result of indirect taxes. On the other hand, the monetary value (measured at budgetary cost) of transfers received by households through education and health benefits are very significant, mainly in the case of lower-income household sectors.

The most frequent method to determine tax burden distribution and expenditure benefits among households is the fiscal incidence analysis. This method consists of allocating a portion of taxes (in particular, personal income tax, social security contributions and taxes on consumption), social spending, and consumer subsidies to households or individuals so as to compare income to income distribution before and after taxes. This fiscal incidence method of analysis uses the “accounting approach” because it ignores agents’ behavioral responses, the incidence throughout the life cycle and general equilibrium

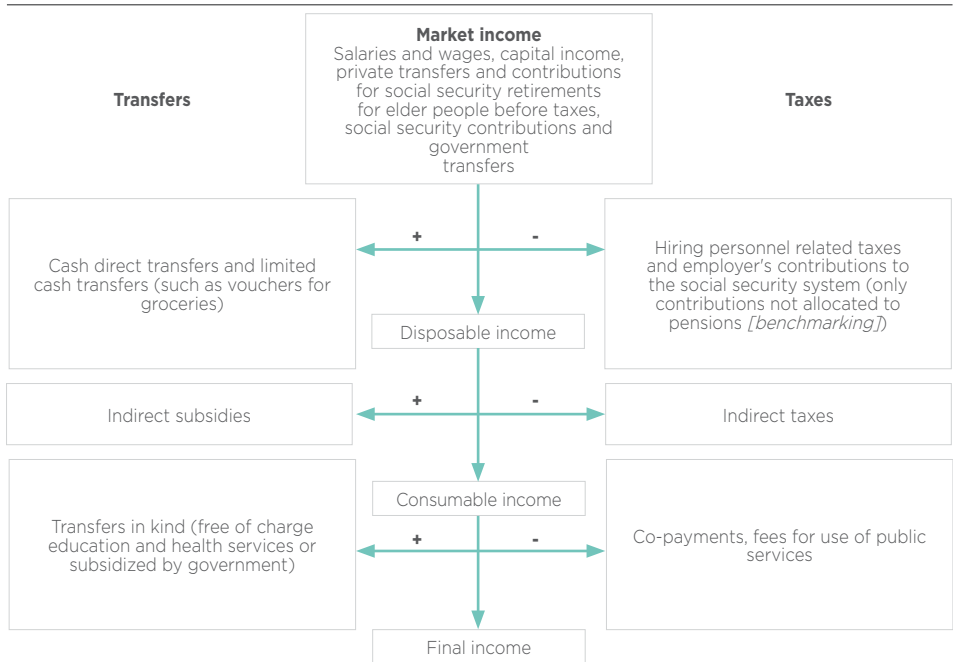
¹⁴ This section is based on a Lustig's (2017) update and adaptation.

¹⁵ That methodology is described in Lustig (2018). The analysis is based on the following fiscal incidence studies issued by the Commitment to Equity Institute, University of Tulane: Argentina (Rossignolo, 2018a); Bolivia (Paz Arauco, Gray Molina, Jiménez and Yáñez, 2014a); Brazil (Higgins and Pereira, 2014); Chile (Martínez-Aguilar *et al.*, 2018); Colombia (Meléndez and Martínez, 2019); Costa Rica (Sauma and Trejos, 2014a); Ecuador (Llerena Paul, Llerena Pinto, Saá Daza and Llerena Pinto, 2015); El Salvador (Beneke, Lustig and Oliva, 2018); Guatemala (Cabrera, Lustig and Morán, 2015); Honduras (ICEFI, 2017a); Mexico (Scott, Martínez-Aguilar, De la Rosa and Aranda, 2018); Nicaragua (ICEFI, 2017b); Panama (Martínez-Aguilar, 2018); Paraguay (Giménez *et al.*, 2017); Peru (Jaramillo, 2014); Dominican Republic (Aristy-Escuder, Cabrera, Moreno-Dodson and Sánchez-Martín, 2018); Uruguay (Bucheli, Lustig, Rossi and Amabile, 2014); and Venezuela (Molina, 2018).

effects induced by the fiscal system. For this reason, results should not be interpreted as those prevailing in case of lack of the fiscal system. Despite such considerations, these 18 studies are among the most detailed, comprehensive, and comparable studies currently available for Latin America.¹⁶

The information to conduct the fiscal incidence analysis comes from combining microdata from household surveys with administrative information on the amounts and characteristics of the tax system, transfer programs, education, social security and health systems, and consumption subsidy schemes. The incidence analysis commonly begins by defining the concepts of income used. In this case, we use four concepts of income: market income, disposable income, consumable income and final income, as described in diagram 1. The welfare indicator is always the income per capita.

DIAGRAM 1. Concepts of Income in the Fiscal Incidence Analysis



Source: Lustig (2018).

In fiscal incidence literature, some authors consider that social security pensions are deferred income (Breceda, Rigolini and Saavedra, 2008; Immervoll, Kleven, Kreiner and Verdellin, 2009) while other authors consider they are government transfers (Goñi, López and Servén, 2011; Immervoll, Levy,

¹⁶ In contrast to some current publications, these incidence analyses also stand out for minimizing the use of secondary sources. For example, Breceda, Rigolini and Saavedra (2008) and, specially, Goñi, López and Servén (2011) rely substantially on secondary sources for their incidence analysis.

Nogueira, O'Donoghue, and Bezerra de Siqueira, 2009; Lindert, Skoufias and Shapiro, 2006; Silveira, Ferreira, Mostafa and Ribeiro, 2011). In the first case, the assumption is that contributory pensions are part of a social security system within which individuals receive, during their retirement, amounts equivalent to their contributions plus the corresponding yield. In the second case, the assumption is that pensions received by these people are not linked to previous contributions (even whether the contributive system is actuarially fair or not).

Due to the difficulty of accurately separating the component of deferred income from the component of transfers in income based on pensions of the government contributive system, the results shown in this article are based on two extreme scenarios: contributory pensions are considered as any other direct transfer, or they are added to market income as if they were other pre-fiscal income. When pensions are considered as government transfer, social security contributions for the pension system are subtracted from market income, as any other direct tax. In contrast, when contributory pensions are considered as deferred income, social security contributions for retirements are recorded as forced savings and are subtracted to generate pre-fiscal income (they are left out from the calculations).

Finally, the incidence of government spending on education and health is calculated by allocating the average government spending to said service users. In the case of education, government spending is allocated by educational level. In the case of health, and based on available data, a distinction can be made between different levels of health care. This approach is similar to assessing how much household income should increase if the person had to pay for the total cost of a free public service. It is important to remember that the cost of providing the service may be different from the value that the service represents to the customer. Since monetization of services based on their average cost is controversial, final income values should be considered carefully.

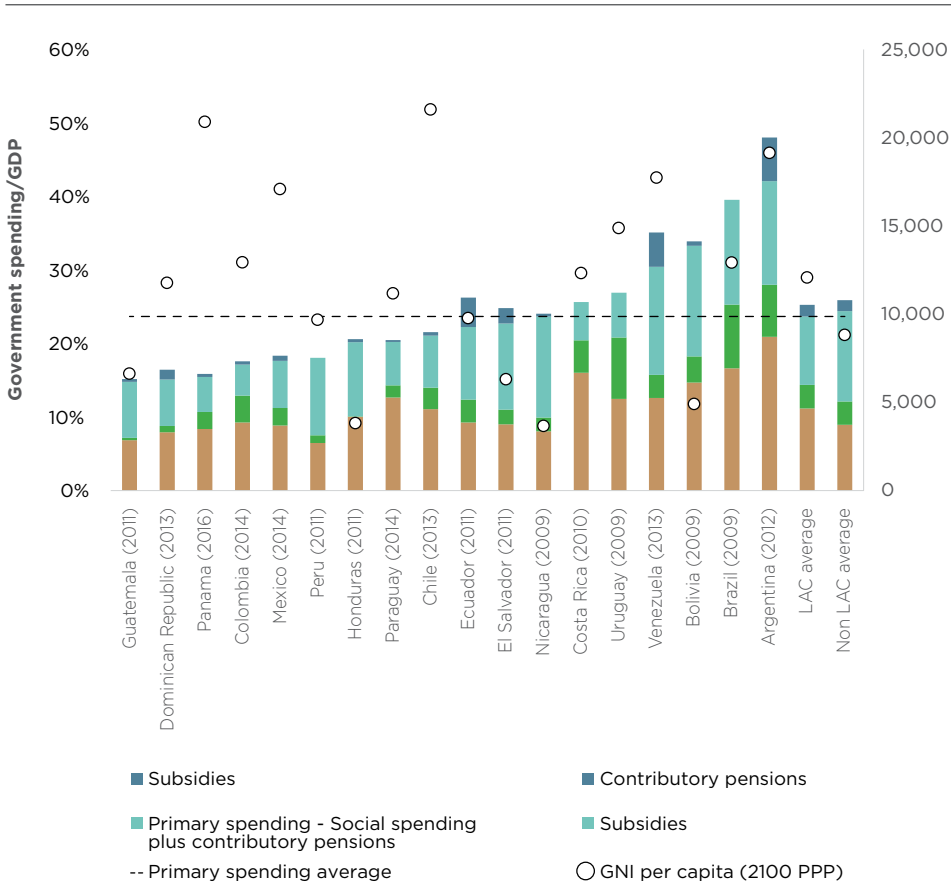
4.1. Size and composition of government spending and revenues

One of the main determinants of the potential distributive characteristics of fiscal policies is the size and composition of government spending, especially social spending and how said spending is financed. Primary spending as a share of GDP on average for the region is similar to 23.7% (Chart 15). Social spending as a share of GDP is, on average, similar to 14.4% if contributory pensions are included, and 11.2% without them. For comparative purposes, social spending as a share of GDP in developed countries, OECD members, is 26.7% on average, i.e., almost double. However, this same proportion for middle-income or low-income non Latin American countries for which information is available is similar to 11.7%. The 18 countries are considerably different from each other in terms of Government size and government spending composition. Primary spending as a share of GDP ranges from 42.1% in Argentina (percentage similar to the developed countries, OECD members) to 14.8% in Guatemala. Social spending

plus contributory pensions as a share of GDP is also heterogeneous and ranges from 28% in Argentina (average percentage in the OECD) to 7.2% in Guatemala. The countries allocating a higher share of their budgets (primary spending) to social spending plus contributory pensions are Colombia, Costa Rica, Paraguay, and Uruguay (70% or more) and the ones allocating proportional lowest shares thereof are Nicaragua and Peru (42%). This information is revealed in Chart 16.

On average, the 18 countries allocate 1.5% of GDP to direct transfers in terms of social spending composition, such as conditional and unconditional cash transfers, income through employment programs, unemployment benefits, non-contributory pensions, food, breakfasts and school uniforms (it does not include contributory pensions). In contrast, the average for the OECD is 4.4%. The country that spends the most on direct transfers is Argentina: 5.8% of GDP, close to the OECD average. Nicaragua is the country that spends the least in direct transfers: only 0.1% of GDP. With respect to contributory pensions, the average spending for the 18 countries is 3.2% of GDP, while for the OECD, it amounts to 7.9% (though this percentage includes both contributory and non-contributory pensions). The most notorious difference is observed between Brazil (which spends 8.7% of GDP) and Honduras (which only spends 0.1% of GDP in contributory pensions). Spending on education represents, on average, 4.5% of GDP, while the OECD average is 5.3%, that is, quite a lower difference compared to the previous items. The country devoting more resources to public education is Bolivia (8.3% of GDP) and the one devoting less resources is Peru (2.6% of GDP). With respect to spending on health, the average for the 18 countries is 3.9% of GDP, and 6.2% for the OECD. Costa Rica is the country devoting more resources to health (6.2% of GDP) and the Dominican Republic is the one devoting the least (1.8% of GDP). This information is revealed in Chart 16.

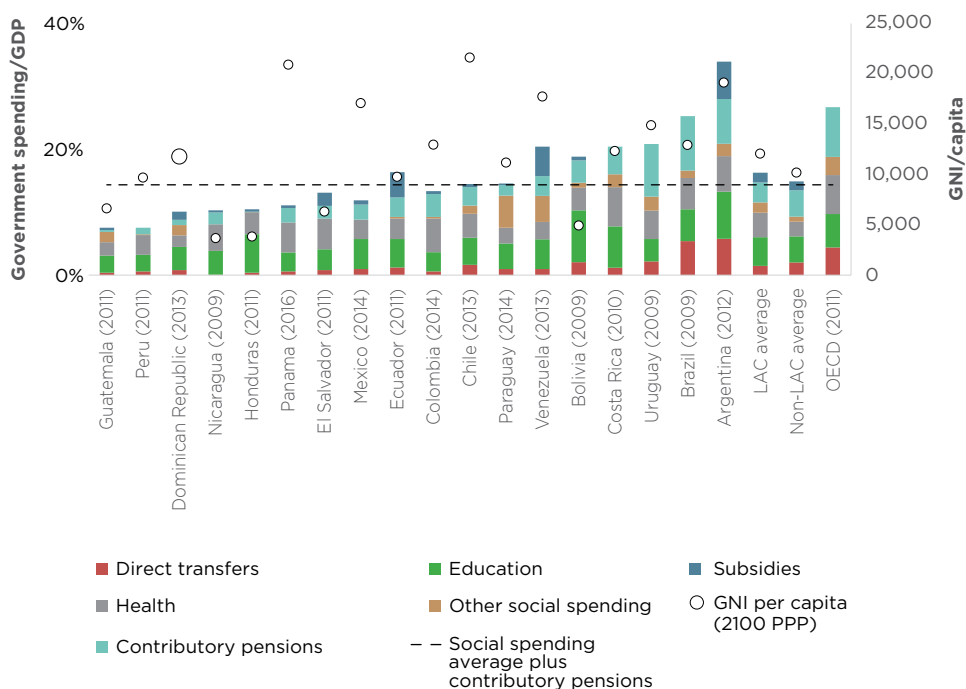
CHART 15. Primary Spending and Social Spending as a Share of GDP (2010s)



Note: Countries included as part of Non-LAC are: Armenia (Younger, Osei-Assibey and Oppong, 2019); Ethiopia (Hill, Eyasu and Woldehanna, 2014); Georgia (Cancho and Bondarenko, 2015); Ghana (Younger *et al.*, 2018); Indonesia (Afkhar, Jellema and Wai-Poi, 2015); Iran (Enami, Lustig and Aranda, 2017); Jordania (Abdel-Halim, Alam, Mansur and Serajuddin, 2016); Russia (Popova, 2019); Sri Lanka (Arunatilake, Gómez, Perera and Attygalle, 2019); South Africa (Inchauste *et al.*, 2016); Tanzania (Younger *et al.*, 2019); Tunisia (Jouini, Lustig, Moumimi and Shimeles, 2015); Uganda (Jellema, Haas, Lustig and Wolf, 2016).

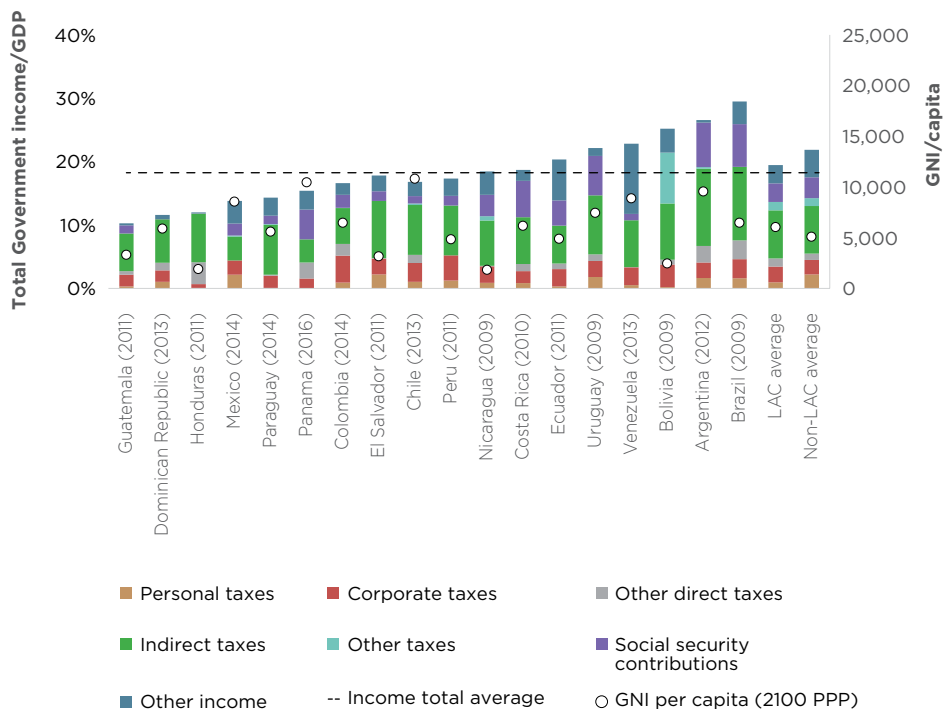
Source: CEQ Institute Data Center based on the following Master Workbooks Results: Argentina (Rossignolo, 2018b); Bolivia (Paz Arauco *et al.*, 2014b); Brazil (Higgins *et al.*, 2019); Chile (Martínez-Aguilar *et al.*, 2016); Colombia (Meléndez and Martínez, 2019); Costa Rica (Sauma and Trejos, 2014b); Ecuador (Llerena *et al.*, 2017); El Salvador (Beneke, Lustig and Oliva, 2019); Guatemala (Cabrera and Morán, 2015); Honduras (Castaneda and Espino, 2015); Mexico (Scott *et al.*, 2018); Nicaragua (Cabrera and Morán, 2015); Panama (Martínez-Aguilar, 2018); Paraguay (Giménez *et al.*, 2017); Peru (Jaramillo, 2019); Uruguay (Bucheli, 2019), and Venezuela (Molina, 2018).

CHART 16. Social Spending Composition as a Share of GDP (2010s)



Source and Notes: See Chart 15.

In terms of how government spending is financed, on average, direct taxes, social security contributions, indirect taxes, and non-tax revenue represent 22.8% of GDP. Total direct taxes represent 5.9% of GDP (out of which 1.2% are personal income taxes and the rest are business income taxes, property taxes and other direct taxes). Indirect taxes represent 9.5% (out of which 6.4% correspond to VAT and 1.3% to specific taxes). In most countries, direct taxes and social security contributions represent approximately from 30% to 50% of total revenues. Except for Ecuador, Mexico and Venezuela, where non-tax revenues represent a significant share of total revenues, indirect taxes are the biggest income source (almost 40% or more of total revenues). The information is shown in Chart 17.

CHART 17. Government Revenues Composition as a Share of GDP (2010s)

Source and Notes: See Chart 15.

4.2. Fiscal policy effects on inequality

The redistributive effect of direct taxes (on individuals) and direct transfers is calculated comparing the Gini coefficient for the disposable income with the Gini coefficient for the market income (scenario in which contributory pensions are considered as transfers) or the market income plus pensions (scenario in which contributory pensions are considered as deferred income). We will start by showing the results for the scenario in which pensions are considered as any other government transfer.

The average redistributive effect is similar to a decrease on the Gini coefficient of 2.8 percentage points. As observed in Chart 18, the scenario in which pensions are considered as transfers, the countries showing the highest redistributive effect are Argentina, Uruguay and Brazil.¹⁷ Honduras, Peru and Guatemala are the countries showing the lowest redistributive effect. Although Brazil is in the group of countries with the highest distribution levels, it still has a high level of inequality, even after the equalizing effect of direct taxes

¹⁷ In the case of Paraguay, for example, the scenario where contributory pensions were considered as a transfer was not estimated.

and transfers. It is worth mentioning that, even when Brazil, Colombia and Honduras emerge from similar inequality levels, Brazil's redistribution of resources is much higher than the other two countries. Likewise, Argentina, Bolivia and Chile emerge from similar inequality levels, but taxes and direct transfers are much more redistributive in Argentina and Chile. How are the results different within a scenario in which contributory pensions are considered as deferred income? The average redistributive effect is, as expected, a bit lower: 2.1 percentage points.

Whenever the redistributive effect of the 18 Latin American countries is compared to the European Union countries or the United States, the findings are as follows (Chart 18, Graph A). The redistributive effect of taxes and direct transfers is considerably higher in European Union countries, and to a lesser extent in the United States. In Latin American countries, the redistributive effect is 2.7 percentage points (simple average) when contributory pensions are considered as transfers, and 2.1 percentage points when pensions are considered as deferred income. For the European Union countries, the difference between both scenarios is huge: 19.1 and 7.7 percentage points, respectively. In the United States, the difference is less significant. 10.9 and 7 percentage points, respectively. These results evidence the importance of the assumption on the treatment of contributory pensions when comparing redistributive effects. If contributory pensions are considered as deferred income, the redistributive effect is 5.7 percentage points higher in the European Union. However, the redistributive effect is 16.4 percentage points higher when contributory pensions are considered as a transfer.¹⁸ Note that the redistributive effect within the scenario that considers contributory pensions as a transfer in the European Union, mainly, is over-valued based on the presence of many retirees or "false poor" (they appear with zero or near zero pre-fiscal income). Strictly speaking, this fact does not reflect their economic condition, for if they had not been granted social security pensions, they would have had positive income (whether from the labor market, by using their savings or by the receipt of private transfers).

Whenever indirect taxes and subsidies effects are considered, inequality reduction slows down in Argentina, Bolivia, Guatemala, and Uruguay. That is to say, in these four countries, the effect of these fiscal system components has been unequalizing. In the case of Bolivia, the effect of indirect taxes (net of subsidies) almost "erases" the equalizing effect of taxes and direct transfers. However, indirect taxes and subsidies have a net equalizing effect in the rest of the countries. Part of this effect, which may be surprising, is partially based on the assumption included in different analyses, which states that rural households and those purchasing goods and services in informal markets (such as street markets, local fairs, etc). usually don't pay indirect taxes, for example, VAT.

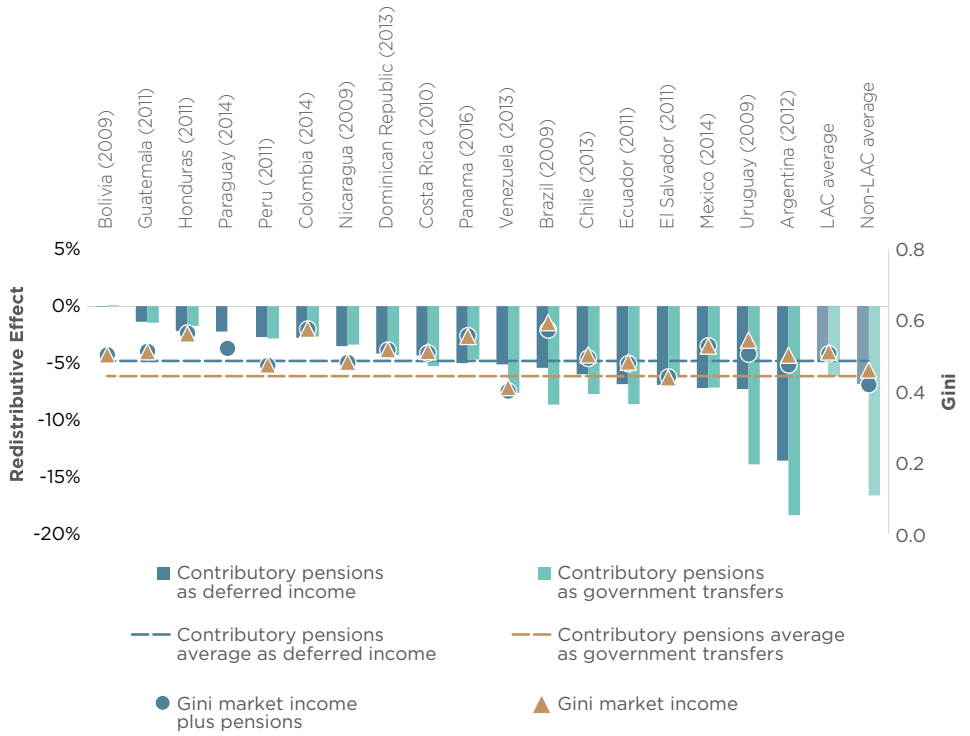
18 It should be noted, however, that for some European Union countries, it is impossible to distinguish which portion of the income from pensions comes from the contributive system and which portion comes from the social security system, so the order of magnitude may be an overestimate of the difference between the two scenarios.

CHART 18. Redistributive Effect

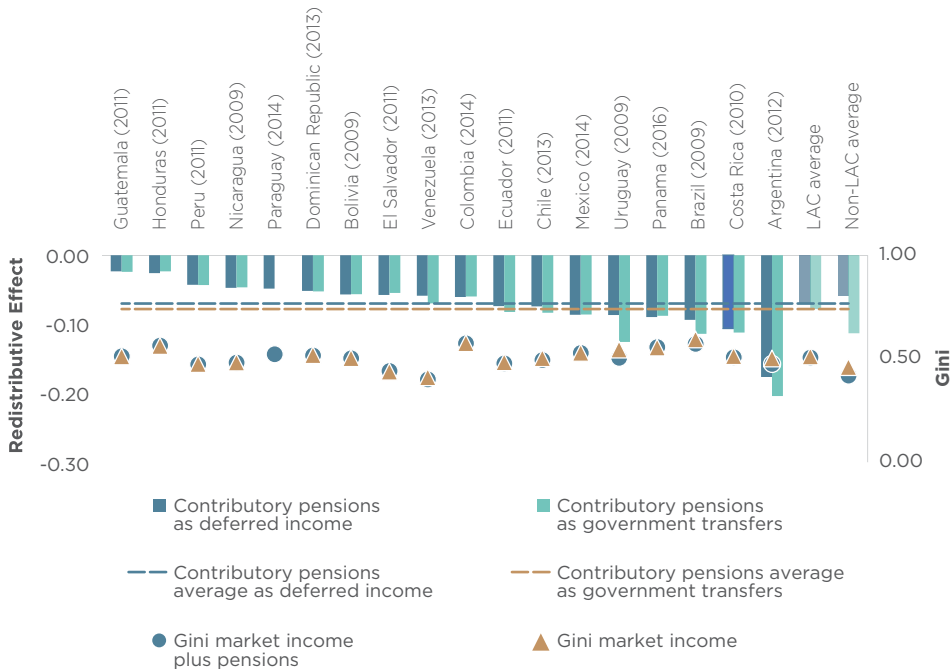
Graph A: Change on Gini Points: Market Income and Market Income plus Pensions to Disposable Income (2010s)



Graph B: Change on Percentage: Market Income and Market Income plus Pensions to Consumable Income (2010s)



Graph C: Change on Gini Points: Market Income and Market Income plus Pensions to Final Income (2010s)



Source and Notes: See Chart 15.

When the fiscal system is considered as a whole, i.e., the effect of direct and indirect taxes, direct transfers, indirect subsidies and the monetary value of spending in health and education, inequality reduction, as expected, is the highest in order of magnitude. The information is shown in Chart 18, Graph C. For the scenario in which contributory pensions are considered as transfers, the simple average of the decrease in the Gini coefficient of the market income to the final income is 7.8 percentage points. The countries with higher distribution levels are Argentina, Costa Rica and Brazil, and the ones with lower distribution levels are Honduras, Guatemala, and El Salvador. The marginal contribution of spending in education and health to the total redistributive effect is, on average, 4.7 percentage points. When contributory pensions are considered a deferred income, the simple average of the decrease on the Gini coefficient is 7 percentage points; i.e., a bit lower than the scenario in which pensions are considered a government transfer.

What is the effect of contributory pensions in themselves? On average, they have an equalizing effect. Contributory pensions have a significant equalizing effect in Uruguay, Argentina and Brazil. In Bolivia, Colombia, El Salvador, Guatemala, Honduras, Mexico, and Panama, contributory pensions have an unequalizing effect, but in general, a small one. These results are important

since they reveal it cannot be generally stated that contributory pensions in Latin America are regressive and have unequalizing effects.

As stated in Lustig (2018), marginal contribution of a fiscal policy component should be analyzed to determine whether it has an equalizing, unequalizing or neutral effect. Marginal contribution is defined as the difference between the Gini income, including the prefiscal income and all the components of the fiscal system, except for the component we want to assess and the Gini income, including that component. Marginal contribution of direct taxes and direct transfers is always equalizing (positive sign), except in Colombia, where direct taxes are almost neutral. In all the countries, except for Mexico and Peru, the marginal contribution of transfers is higher than the marginal contribution of direct taxes. Also, indirect subsidies and spending on education and health are always equalizing. Education and health marginal contributions exceed contributions of other components with positive signs, except for Ecuador, where marginal contribution of direct transfers is higher than the one derived from health. Contrary to what is commonly stated, indirect taxes not always increase inequality. The effect of indirect taxes is unequalizing in Bolivia, Brazil, Colombia, El Salvador, and Uruguay; however, it is equalizing in Chile, Costa Rica, Ecuador, Mexico, and Peru. Furthermore, when the monetary value of education and health is added to households' income, indirect taxes diminish inequality in all cases, except for Colombia.

4.3 Fiscal policy effects on poverty

It is important to emphasize that the impact of the fiscal system on inequality may be different from its impact on poverty. In general, poverty (and inequality) indicators are calculated using disposable income as the welfare variable. However, this type of income does not include the impact of indirect taxes and subsidies on consumption with respect to the purchasing power. In order to include this effect, it is necessary to measure poverty by applying the concept of consumable income. The importance of this fact is observed in the example below. Let us suppose that disposable income of a household is identical in one country as in the other; but in the first country, food is taxed with a 10% VAT while, in the second, it is exempted. Obviously, in the second case, less food can be consumed with the same disposable income.

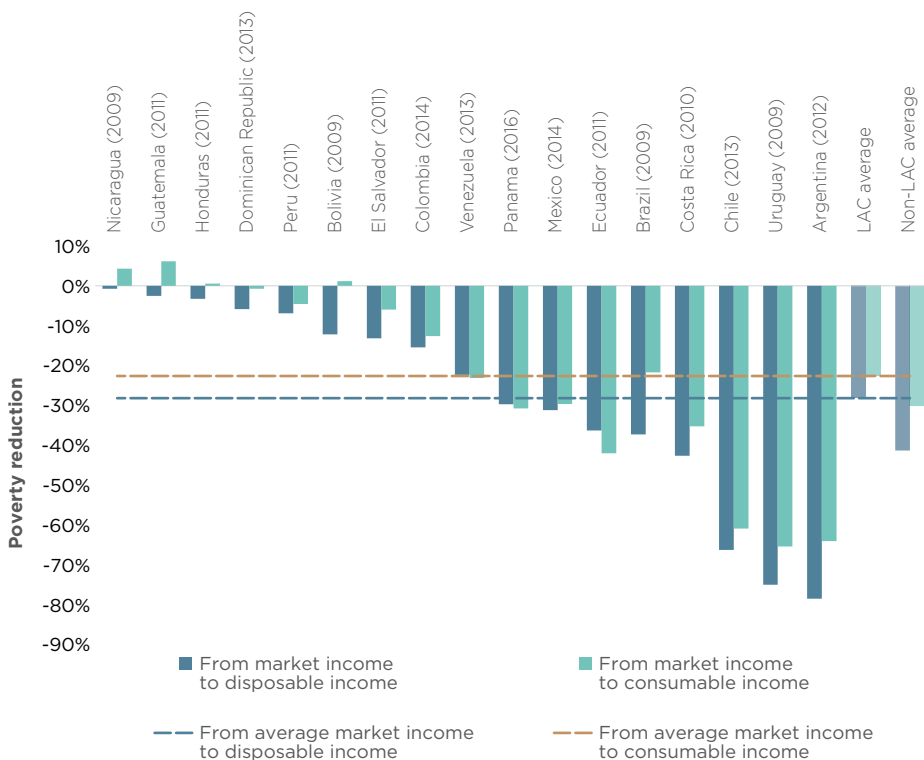
Thus, as shown in Inchauste and Lustig (2017) and Lustig (2018), even when all tax systems analyzed with the concept of consumable income are equalizing, in some countries, fiscal policies increase poverty. In other words, in terms of purchasing power, the system impoverished the poor. This is primarily based on the effect of indirect taxes on consumption which, even in case they are not regressive (i.e., the income share that households allocate to these taxes increases with income), they reduce the purchasing power of poor households. When this reduction exceeds the amount that the poor receive in direct transfers and indirect subsidies, the fiscal system impoverishes the poor.

Chart 19, Graph A (contributory pensions considered as transfers) shows,

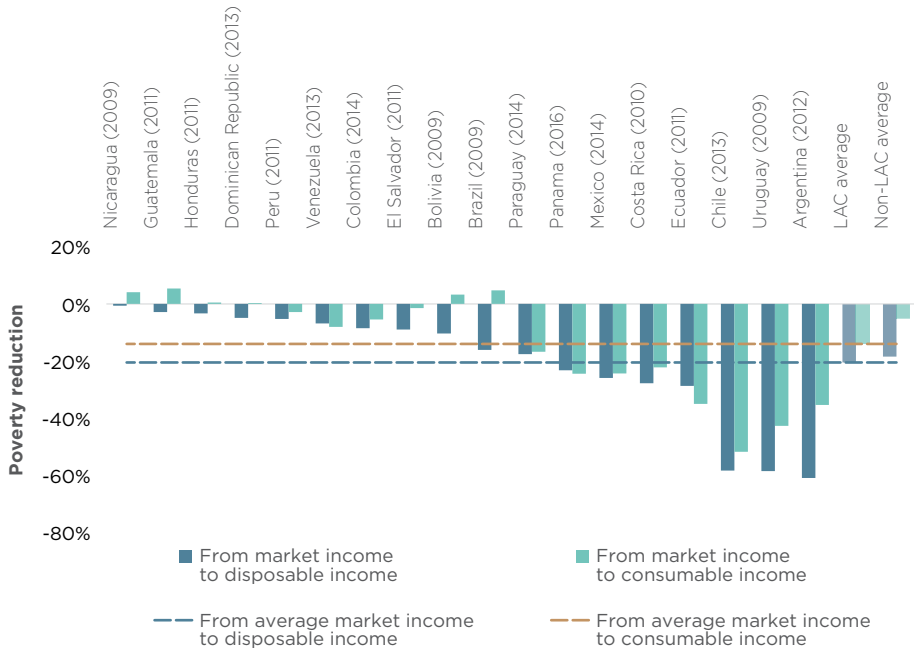
fiscal policies reduce extreme poverty (measured with consumable income and the USD 2.5 daily line in 2005 PPP) in 12 out of the 17 countries:¹⁹ Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Panama, Peru, Uruguay, and Venezuela. However, a concerning outcome is that the incidence of poverty for consumable income is higher than the incidence of market income in Bolivia, Guatemala and Nicaragua. In these countries, consumption taxes are higher than the benefits derived from transfers and subsidies, which end up with poor people being net payers to the fiscal system.²⁰ Note that this outcome takes place even when the combination of direct and indirect taxes, direct transfers and indirect subsidies, as shown above, reduce inequality.

CHART 19. Fiscal Policy and Poverty Reduction (2010s)

Graph A: Contributory Pensions as Government Transfers



19 Remember that in the case of Paraguay, the scenario in which pensions are considered as transfers was not estimated.
20 In Honduras and the Dominican Republic, the change is so small that it is considered as no change.

Graph B: Contributory Pensions as Deferred Income

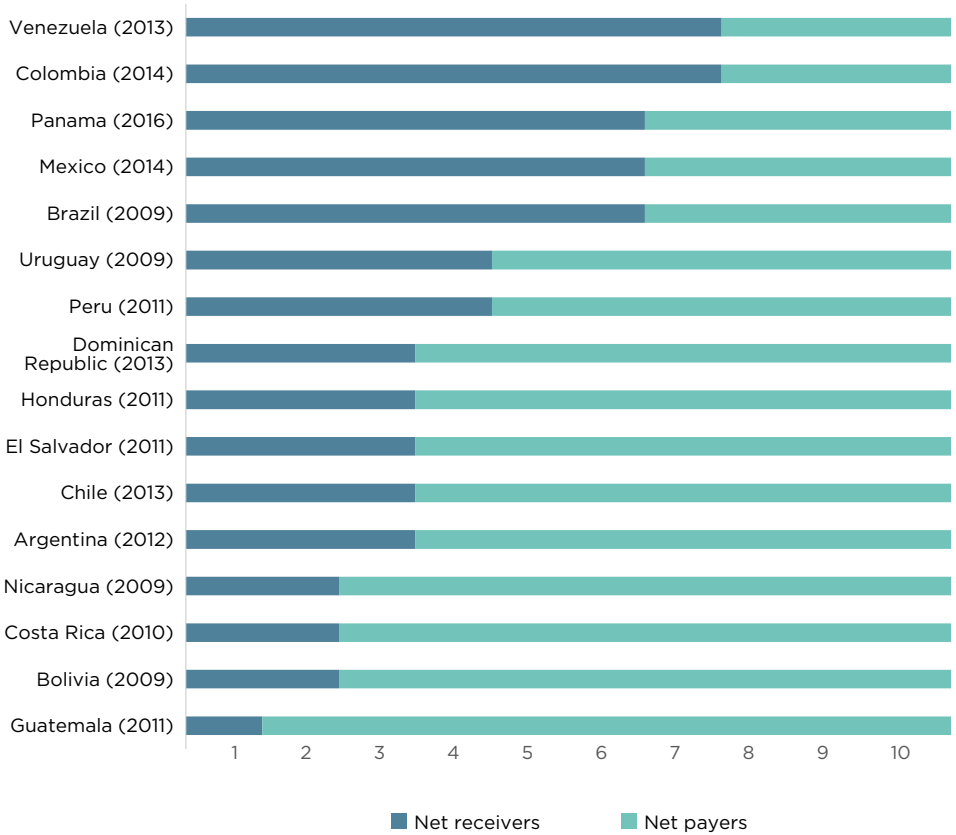
Note: Poverty line of USD 2.5 PPP/day in 2005; change in the incidence of poverty of market income and market income plus pensions to disposable income and consumable income (in %).

Source: See Chart 15.

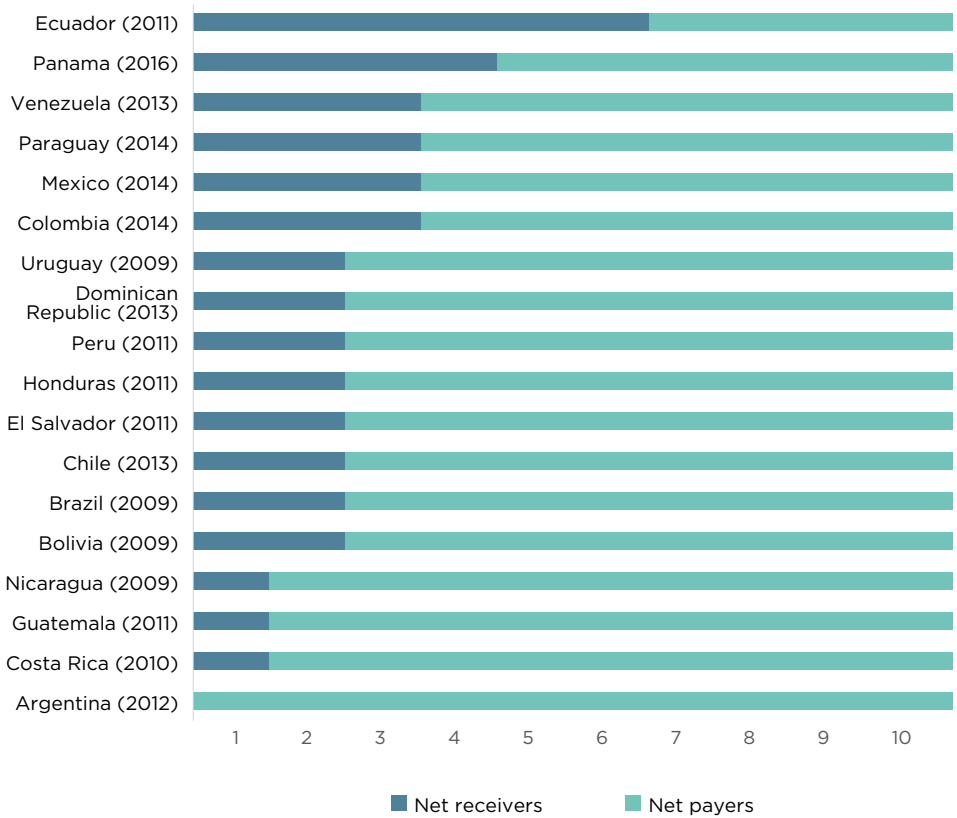
Besides poverty indicators, it is also important to consider from which decile onward, individuals become –on average– net payers to the fiscal system. Net payers are those paying more for direct and indirect taxes than what they receive in direct transfers and indirect subsidies. That is to say, education and health expenditure benefits are not considered in this analysis for they are benefits in kind, and for they are calculated at the average cost to the government. Outcomes are shown in Chart 20, Graphs A and B. If contributory pensions are considered as any other government transfer (Graph A), individuals become net payers, from the second decile in Guatemala and from the eighth decile in Venezuela. In contrast, when pensions are considered as deferred income, individuals under the prefiscal income median become net payers in all cases, except for Ecuador (Graph B).

CHART 20. Fiscal System Net Payers and Net Beneficiaries by Decile of Prefiscal Income (2010s)

Graph A: Contributory Pensions as Government Transfers



Graph B: Contributory Pensions as Deferred Income



Source: See Chart 15.

4.4. Fiscal policy effects on the use of public services

We use the approach described in Lustig (2018) to classify education and health spending. If the spending per capita decreases with income, said spending is considered pro-poor. If the spending per capita is the same for all, it is considered as neutral in absolute terms. If spending per capita in relative terms to prefiscal income decreases with income, it is by definition progressive. If, however, it increases with income, it is by definition regressive. In the first three cases, the pertinent spending will be progressive, i.e., it will have an equalizing effect, and in the last case, it will be regressive, i.e., it will have an equalizing effect.

The results for the countries analyzed are shown in Table 1. Total education spending is pro-poor in all countries, except for Argentina, Bolivia, Guatemala, Honduras, and Nicaragua, in which spending per capita is almost the same for all the population. Spending on preschool and primary school education is pro-poor in all the countries for which information is available. Spending on secondary education is equalizing in all the countries, but is not always pro-poor. Spending on tertiary education, as expected, is never pro-poor, but the only case in which tertiary education spending is regressive is in Guatemala. Health spending is equalizing in all countries and pro-poor in Argentina, Brazil, Chile, Ecuador, Panama, Dominican Republic, Uruguay, and Venezuela. In any of the cases, health spending is regressive.

TABLE 1. Spending Progressivity and Education and Health Pro-Poor Spending**Graph A: Contributory Pensions as Government Transfers**

| | Total in education | Preschool | Primary | Secondary | Lower secondary | Upper secondary | Tertiary | Health |
|---------------------------|--------------------|-----------|---------|-----------|-----------------|-----------------|----------|--------|
| Argentina (2012) | B | | | | | | C | A |
| Bolivia (2009) | B | A | A | A | | | C | B |
| Brazil (2009) | A | A | A | A | | | C | A |
| Chile (2013) | A | A | A | A | | | C | A |
| Colombia (2014) | A | A | A | | A | A | C | C |
| Costa Rica (2010) | | A | A | A | | | C | |
| Ecuador (2011) | A | | A | A | | | | A |
| El Salvador (2011) | A | A | A | | | B | C | C |
| Guatemala (2011) | B | A | A | B | | | D | C |
| Honduras (2011) | C | A | A | B | | | C | B |
| Mexico (2014) | A | A | A | A | | | C | C |
| Nicaragua (2009) | B | A | A | B | | | C | B |
| Panama (2016) | A | A | A | A | | | C | A |
| Peru (2011) | A | A | A | A | | | C | B |
| Dominican Republic (2013) | A | A | A | | A | A | C | A |
| Uruguay (2009) | A | A | A | | A | B | C | A |
| Venezuela (2013) | A | A | A | A | | | B | A |

- A Pro-poor, negative concentration coefficient
- B Same per capita value for everybody, concentration coefficient equals zero
- C Progressive, positive concentration coefficient but lower than the Gini prefiscal income
- D Regressive, positive concentration coefficient and higher than the Gini prefiscal income

Graph B: Contributory Pensions as Deferred Income

| | Total in education | Preschool | Primary | Secondary | Lower secondary | Upper secondary | Tertiary | Health |
|---------------------------|--------------------|-----------|---------|-----------|-----------------|-----------------|----------|--------|
| Argentina (2012) | A | | | | | | C | A |
| Bolivia (2009) | B | A | A | A | | | C | B |
| Brazil (2009) | A | A | A | A | | | C | A |
| Chile (2013) | A | A | A | A | | | C | A |
| Colombia (2014) | A | A | A | | A | A | C | C |
| Costa Rica (2010) | | A | A | A | | | C | |
| Ecuador (2011) | A | | A | A | | | | A |
| El Salvador (2011) | A | A | A | | | B | D | C |
| Guatemala (2011) | B | A | A | B | | | D | C |
| Honduras (2011) | B | A | A | B | | | C | B |
| Mexico (2014) | A | A | A | A | | | C | C |
| Nicaragua (2009) | B | A | A | B | | | C | B |
| Panama (2016) | A | A | A | A | | | C | A |
| Paraguay (2014) | A | A | A | A | | | C | A |
| Peru (2011) | A | A | A | A | | | C | C |
| Dominican Republic (2013) | A | A | A | | A | A | C | A |
| Uruguay (2009) | A | A | A | | A | B | C | A |
| Venezuela (2013) | A | A | A | A | | | B | A |

| | |
|----------|--|
| A | Pro-poor, negative concentration coefficient |
| B | Same per capita value for everybody, concentration coefficient equals zero |
| C | Progressive, positive concentration coefficient but lower than the Gini prefiscal income |
| D | Regressive, positive concentration coefficient and higher than the Gini prefiscal income |

Source: See Chart 15.

5. Conclusions

The first conclusion to this analysis is good news. Recent history of inequality in Latin America indicates that public policies may change it. More specifically, inequality reduction during the first decade of the 21st century can be traced back to two components of social policies: education expenditure, which resulted in higher levels of schooling of poor sectors of society, and the expansion of cash transfer programs focused mainly on populations that live in poverty. The increase in the number of years of schooling for poor populations is one of the factors that can bridge the education wage gap; this is, in turn, one of the factors that could reduce labor income inequality due to the decrease of the education relative return (the so-called “education premium”).

The second conclusion, however, is not encouraging. As evidenced by the analysis made on the period following 2012 (a year that roughly marks the ending of the commodity boom), inequality reduction has not been stable in several countries in the region. Having to face these lower or even negative growth rates, the conditions in the job market actually turned against poorer sectors of society, while tax restrictions hindered the creation of mechanisms of compensation.

Furthermore, as observed in section 2, it is probable that we still do not have the information we need to assess its inequality level and evolution in detail. The fact that the source used to measure inequality, household surveys, does not fully reflect the income of the wealthiest sector of the population, puts us at a disadvantage, both with respect to understanding political economy dynamics and in determining how fair or unfair the current social contract is. In particular, if we have no accurate information on the revenues of the wealthiest sectors of the population, we can neither have accurate data on the contribution made by this sector with respect to direct taxes, which are the most progressive way of funding social spending.

Third, fiscal systems in Latin America include particularly generous Governments in respect to distribution (for example, Guatemala) and Governments in which the amounts of redistributive spending are (or were) unsustainable (as evidenced, for example, in Argentina and Brazil). Additionally, one of the most alarming findings of the analysis in section 3 is that despite all the fiscal systems reduce inequality, in a group of countries, their net effect is the opposite because the poorest sector of the population (or at least part of it) pays more in indirect taxes than it receives in transfers and subsidies.

Bibliography

- Abdel-Halim, M., Alam, S. A., Mansur, Y., Serajuddin, U., and Verme, P. (2016). "CEQ Master Workbook: Jordan." Version: March 8, 2016. Commitment to Equity Data Center. CEQ Institute, Tulane University, and the World Bank.
- Afkar, R., Jellema, J., and Wai-Poi, M. (2015). "CEQ Master Workbook: Indonesia." Version: February 26, 2015. Commitment to Equity Data Center on Fiscal Redistribution. Tulane University, New Orleans.
- Ali, E., Lustig, N., and Taqdiri, A. (2017). "CEQ Master Workbook: Iran (2011-2012)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University and the Economic Research Forum. May 5, 2017.
- Aristy-Escuder, J., Cabrera, M., Moreno-Dodson, B., and Sánchez-Martín, M. E. (2018). *The Dominican Republic: Fiscal policy, income redistribution and poverty reduction in the Dominican Republic*.
- Arunatilake, N., Gómez, C., Perera, N., and Attygalle, K. (2019). "CEQ Master Workbook: Sri Lanka (2009-2010)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the World Bank.
- Azevedo, J. P., Inchauste, G., and Sanfelice, V. (2013), "Decomposing the recent inequality decline in Latin America." Policy Research Working Paper 6715. World Bank.
- Barros, R., De Carvalho, M., Franco, S., and Mendonca, R. (2010). "Markets, the state and the dynamics of inequality in Brazil." L. F. López-Calva and N. Lustig (ed.), *Declining inequality in Latin America: A decade of progress?* Washington, D.C.: Brookings Institution-UNDP.
- Barros, R., Foguel, M. N., and Ulyssea, G. (2006). *Desigualdade de renda no Brasil: Uma análise da queda recente* (vol. 1). Brasília: IPEA.
- Battiston, D., García-Doménch, C., and Gasparini, L. (2014). "Could an increase in education raise income inequality? Evidence for Latin America." *Latin American Journal of Economics*. Vol. 51, N.º 1.
- Beneke, M., Lustig, N., and Oliva, J. A. (2018). "El Salvador: The impact of taxes and social spending on inequality and poverty." N. Lustig (ed.), *Commitment to equity handbook. Estimating the impact of fiscal policy on inequality and poverty*, chap. 15. Brookings Institution Press and CEQ Institute, Tulane University.
- Beneke, M., Lustig, N., and Oliva, J. A. (2019). "CEQ Master Workbook: El Salvador (2011)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the Inter-American Development Bank.
- Bourguignon, F., Ferreira, F. H. G., and Lustig, N. (ed). (2005). *The microeconomics of income distribution dynamics in East Asia and Latin America*. Washington, D.C.: The World Bank-Oxford University Press.

- Breceda, K., Rigolini, J., and Saavedra, J. (2008). "Latin America and the social contract: Patterns of social spending and taxation." World Bank's Political Research Working Document 4604. Available at <http://go.worldbank.org/BWBRP9IA50>
- Bucheli, M. (2019). "CEQ Master Workbook: Uruguay (2009)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. March 22, 2019.
- Bucheli, M., Lustig, N., Rossi, M., and Amabile, F. (2014). "Social spending, taxes and income redistribution in Uruguay." N. Lustig, C. Pessino and J. Scott (ed.), Analyzing the redistributive impact of taxes and transfers in Latin America, Special Issue, *Public Finance Review* 42, N.º 3, pp. 413-433. DOI: 10.1177/1091142113493493
- Burdín, G., De Rosa, M., Vigorito, A., and Vilá, J. (2019). *Top income shares and mobility patterns in Uruguay 2009-2016*. Working Paper 30/19. Institute of Economics. FCEA. University of the Republic (Uruguay).
- Cabrera, M. and Morán, H. E. (2015). "CEQ Master Workbook: Guatemala (2011)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, Instituto Centroamericano de Estudios Fiscales (ICEFI) and the International Fund for Agricultural Development (IFAD). October 4, 2016.
- Cabrera, M. and Morán, H. E. (2015). "CEQ Master Workbook: Nicaragua (2009)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, Instituto Centroamericano de Estudios Fiscales (ICEFI) and the International Fund for Agricultural Development (IFAD). October 14, 2015.
- Cabrera, M., Lustig, N., and Morán, H. E. (2015). "Fiscal policy, inequality and the ethnic divide in Guatemala." *World Development*. Vol. 76, N.º C, pp. 263-279.
- Campos, R., Esquivel, G., and Lustig, N. (2012). "The rise and fall of income inequality in Mexico, 1989-2010." UNU-WIDER, Working Paper 2012/10.
- Cancho, C. and Bondarenko, E. (2015). "CEQ Master Workbook: Georgia (2013)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the World Bank. December 31, 2015.
- Castaneda, R. and Espino, I. (2015). "CEQ Master Workbook: Honduras (2011)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, Instituto Centroamericano de Estudios Fiscales (ICEFI) and the International Fund for Agricultural Development (IFAD). July 27, 2015.
- Cornia, A. (2013), "Inequality trends and their determinants: Latin America over 1990-2010." A. Cornia (ed.), *Falling inequality in Latin America: Policy changes and lessons*. Oxford University Press.
- De la Torre, A., Levy Yeyati, E., and Pienknagura, S. (2013). "Latin America and the Caribbean as tailwinds recede: In search of higher growth." Semi-annual report. Office of the Chief Economist, Latin America and the Caribbean World Bank.
- Enami, A., Lustig, N., and Aranda, R. (2016). "Analytical foundations: Measuring the redistributive impact of taxes and transfers." CEQ Working Paper 25. CEQ Institute, Tulane University. November. Available at: http://www.commitmentoequity.org/publications_files/CEQ_WP25_Enami%20Lustig%20Aranda_2016_XR_Edited%20by%20Ali%20on%20Nov%2019%202016.pdf

- Esquivel, G., Lustig, N., and Scott, J. (2010). "A decade of falling inequality in Mexico: Market forces or state action?" L. F. López Calva, and N. Lustig (ed.), *Declining inequality in Latin America: A decade of progress?* Washington, D.C.: Brookings Institution-UNDP.
- Ferreira, F. H. G. and Schoch, M. (2020). "Inequality and social unrest in Latin America: The Tocqueville paradox revisited." World Bank's blog, February 24. Available at: <https://blogs.worldbank.org/developmenttalk/inequality-and-social-unrest-latin-america-tocqueville-paradox-revisited>.
- Flores, I., Sanhueza, C., Atria, J., and Mayer, R. (2019). "Top incomes in Chile: A historical perspective on income inequality, 1964–2017." *Review of Income and Wealth*.
- Gasparini, L. and Cruces, G. (2010). "A distribution in motion: The case of Argentina." L. F. López-Calva and N. Lustig (ed.), *Declining inequality in Latin America: A decade of progress?* Washington, D.C.: Brookings Institution-UNDP.
- Gasparini, L. and Lustig, N. (2011). "The rise and fall of income inequality in Latin America." Working Paper 1110, Tulane University.
- Gasparini, L., Galiani, S., Cruces, G., and Acosta, P. (2011). "Educational upgrading and returns to skills in Latin America: Evidence from a supply-demand framework, 1990–2010." Policy Research Working Paper 5921, World Bank.
- Giménez, L., Lugo, M. A., Martínez-Aguilar, S., Colman, H., Galeano, J. J., and Farfan, G. (2017). "Paraguay: Análisis del sistema fiscal y su impacto en la pobreza y la equidad." Working Paper 74. Ministry of Finance (Paraguay), the World Bank and the CEQ Institute, Tulane University.
- Goñi, E., Humberto López, J., and Servén, L. (2011). "Fiscal redistribution and income inequality in Latin America." *World Development*. Vol. 39, N.º 9, pp. 1 558-1 569.
- Higgins, S. and Pereira, C. (2014). "The effects of Brazil's taxation and social spending on the distribution of household income." *Public Finance Review*. Vol. 42, N.º 3, pp. 346-367.
- Higgins, S., Pereira, C., and Cabrera, M. (2019). "CEQ Master Workbook: Brazil (2008–2009)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. May 3, 2019.
- Hill, R., Eyasu, T., and Woldehanna, T. (2014). "CEQ Master Workbook: Ethiopia (2010–2011)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the World Bank. September 28, 2014.
- ICEFI (2017a). "Incidencia de la política fiscal en la desigualdad y la pobreza en Honduras." CEQ Working Paper 51. CEQ Institute, Tulane University, IFAD and the Instituto Centroamericano de Estudios Fiscales. April.
- ICEFI (2017b). "Incidencia de la política fiscal en el ámbito rural de Centroamérica: El caso de Nicaragua." CEQ Working Paper 52. CEQ Institute, Tulane University, IFAD, and ICEFI. Washington D. C., Rome, Guatemala.
- IEA (2018). IEA Fossil Fuels Database. International Energy Agency (IEA).
- Inchauste, G., Lustig, N., Mashekwa, M., Purfield, C., Woolard, I., and Zikhali, P. (2016). "CEQ Master Workbook: South Africa (2010–2011)." CEQ Data

- Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the World Bank. March 6, 2016.
- Inchauste, G. and Lustig, N. (2017). "Overview." G. Inchauste and N. Lustig (ed.), *The distributional impact of taxes and transfers: evidence from eight low- and middle-income countries*. Washington, D.C.: World Bank.
- Immervoll, H., Kleven, H. J., Kreiner, C. T., and Verdelin, N. (2009). An evaluation of the tax-transfer treatment of married couples in European countries. IZA Discussion Paper 3965.
- Immervoll, H., Levy, H. I., Nogueira, J. R., O'Donoghue, C., and Bezerra de Siqueira, R. (2009). "The impact of Brazil's tax-benefit system on inequality and poverty." S. Klasen and F. Nowak-Lehmann (eds), *Poverty, inequality, and policy in Latin America*. Cambridge, Massachusetts: MIT Press. Pp. 271-302.
- Jaramillo, M. (2014). "The incidence of social spending and taxes in Peru." N. Lustig, C. Pessino and J. Scott (ed.), "Analyzing the redistributive impact of taxes and transfers in Latin America." Special Issue. *Public Finance Review* 42, N.º 3, pp. 391-412. DOI: 10.1177/1091142113496134
- Jaramillo, M. (2019). "CEQ Master Workbook: Peru (2011)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. February 11, 2019.
- Jellema, J., Haas, A., Lustig, N., and Wolf, S. (2016). "CEQ Master Workbook: Uganda (2012-2015)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University and the International Growth Center. July 28, 2016.
- Jouini, N., Lustig, N., Moumni, A., and Shimeles, A. (2015). "CEQ Master Workbook: Tunisia (2010)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the African Development Bank. May 5, 2017.
- Lindert, P. (2004). *Growing public. Social spending and economic growth since the eighteenth century*. Vol. 1 and 2. Cambridge, Massachusetts: Cambridge University Press.
- Lindert, K., Skoufias, E., and Shapiro, J. (2006). "Redistributing income to the poor and rich: Public transfers in Latin America and the Caribbean." Social Protection Discussion Paper 0605, Washington D. C.: World Bank.
- Llerena Pinto, M. C, Paul, F., Saá Daza, R. C., and Llerena Pinto, M. A. (2017). "CEQ Master Workbook: Ecuador (2011-2012)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. June 9, 2016.
- Llerena, P., Paul, F., Llerena Pinto, M. C., Saá Daza, R. C., and Llerena Pinto, M. A. (2015). "Social spending, taxes and income redistribution in Ecuador." CEQ Working Paper 28. Center for Inter-American Policy and Research and Department of Economics, Tulane University/The Dialogue. New Orleans and Washington D.C.
- López-Calva, L. F., and Lustig, N. (2010). *Declining inequality in Latin America: A decade of progress?* Washington, D.C.: Brookings Institution-UNDP.
- Long, W., Lustig, N., and Quan, S. (next publication). "The pink tide and inequality dynamics in Latin America." Tulane Economics Working Paper in progress (available on demand).
- Lustig, N. (1994). *Medición de la pobreza y de la desigualdad en la América Latina. El emperador no tiene ropa.*

- Lustig, N. (2017). "El impacto del sistema tributario y el gasto social en la distribución del ingreso y la pobreza en América Latina: Argentina, Bolivia, Brasil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, México, Nicaragua, Perú, República Dominicana, Uruguay y Venezuela. Una aplicación del marco metodológico del proyecto Compromiso con la Equidad (CEQ)." *El Trimestre Económico*, 84 (335), 493-568.
- Lustig, N. (ed). (2018). *Commitment to equity handbook: Estimating the impact of fiscal policy on inequality and poverty*. Brookings Institution Press and CEQ Institute, Tulane University.
- Lustig, N, López Calva, L. F., and Ortiz-Juárez, E. (2013). "Declining inequality in Latin America in the 2000s: The cases of Argentina, Brazil, and Mexico." *World Development*, 44, 129-141.
- Lustig, N. and Pessino, C. (2013). "Social spending and income redistribution in Argentina in the 2000s: The rising role of noncontributory pensions." Working Paper 5. CEQ.
- Martínez-Aguilar, S., Fuchs, A., Ortiz-Juárez, E., and del Carmen, G. (2018). "Chile: The impact of fiscal policy on inequality and poverty." N. Lustig (ed), *Commitment to equity handbook. Estimating the impact of fiscal policy on inequality and poverty*, chapter 13. Brookings Institution Press and CEQ Institute, Tulane University.
- Martínez-Aguilar, S. (2018). "CEQ Master Workbook: Panama (2016)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University and the Economic Co-operation and Development. November 2, 2018.
- Martínez-Aguilar, S. and Ortiz-Juárez, E. (2016). "CEQ Master Workbook: Chile (2013)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the World Bank. October 7, 2016.
- Meléndez, M. and Martínez, V. (2019). "CEQ Master Workbook: Colombia (2014)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the Inter-American Development Bank. February 28, 2019.
- Messina, J. and Silva, J. (2017). *Wage inequality in Latin America: Understanding the past to prepare for the future*. World Bank.
- Molina, E. (2018). "CEQ Master Workbook: Venezuela (2012)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. April 5, 2018.
- Moncada, G. and Lee, H. (2005). *MECOVI: Improving the survey and measurement of living conditions in Latin America and the Caribbean*.
- Morgan, M. (2018). "Essays on income distribution: Methodological, historical and institutional perspectives with applications to the case of Brazil (1926-2016)." PhD Dissertation. Paris School of Economics (PSE) y L'École des Hautes Études en Sciences Sociales (EHESS).
- Paz Arauco, V., Gray Molina, G., Jiménez, W., and Yáñez, E. (2014b). "CEQ Master Workbook: Bolivia (2009)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. September 22, 2014.
- Paz Arauco, V., Gray Molina, G., Jiménez, W., and Yáñez, E. (2014a), «Explaining low redistributive impact in Bolivia.» *Public Finance Review*, vol. 42, N.º 3, pp. 326-345.

- Popova, D. (2019). "CEQ Master Workbook: Russia (2010)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the World Bank. March 21, 2019.
- Rodríguez-Castelán, C., López-Calva, L. F., Lustig, N., and Valderrama, D. (2016). "Understanding the dynamics of labor income inequality in Latin America." Policy Research Working Paper 7795. World Bank. August.
- Rossignolo, D. (2018a). "Argentina: Taxes, expenditures, poverty, and income distribution." N. Lustig (ed.), *Commitment to equity handbook. Estimating the impact of fiscal policy on inequality and poverty*, chapter 11. Brookings Institution Press and CEQ Institute, Tulane University.
- Rossignolo, D. (2018b). "CEQ Master Workbook: Argentina (2012-2013)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. June 8, 2018.
- Sauma, P. and Trejos, J. D. (2014b). "CEQ Master Workbook: Costa Rica (2010)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. February 14, 2014.
- Sauma, P. and Trejos, J. D. (2014a). "Social public spending, taxes, redistribution of income, and poverty in Costa Rica." CEQ Working Paper 18. CEQ Institute, Tulane University/IFAD/ICEFI, Washington D.C., Rome, Guatemala.
- Scott, J., Martínez-Aguilar, S., De la Rosa, E., and Aranda, R. (2018). "CEQ Master Workbook: Mexico (2014)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. November 9, 2018.
- Silveira, F. G., Ferreira, J., Mostafa, J., and Ribeiro, J. A. C (2011). "Qual o impacto da tributação e dos gastos públicos sociais na distribuição de renda do Brasil? Observando os dois lados da moeda." J. Aparecido Carlos Ribeiro, A. Luchiezi Jr., and S. E. Arbulu Mendonça (ed.), *Progressividade da tributação e desoneração da folha de pagamentos elementos para reflexão*. Brasília: IPEA, pp. 25-63.
- Uthoff, A. (2018). "Do competitive markets of individual savings accounts and health insurance work as part of the welfare state?" J. A. Ocampo and J. Stiglitz (ed.). *Welfare and Inequality*. New York: Columbia University Press. Available at: <https://cup.columbia.edu/book/the-welfare-state-revisited/9780231185448>
- Younger, S., Myamba, F., and Mdadila, K. (2019). "CEQ Master Workbook: Tanzania (2011-2012)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. June 21, 2019.
- Younger, S. D., Khachatryan, A., Gyulumyan, G., Sinha, N., and Bartsch, U. (2019). "CEQ Master Workbook: Armenia (2011)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University, and the World Bank. June 8, 2019.
- Younger, S., Osei-Assibey, E., and Oppong, F. (2018). "CEQ Master Workbook: Ghana (2012-2013)." CEQ Data Center on Fiscal Redistribution. CEQ Institute, Tulane University. October 27, 2018.



Regional Integration

08

Marcelo Olarreaga
*University of Geneva
and CEPR*

The author thanks Lian Allub, Christian Daude, Marcela Eslava, Pablo Sanguinetti, Marcel Vaillant, and Hernán Vallejo for their constructive comments, as well as participants of the workshop “Latin America: The Development Challenge”, organized by CAF in Bogotá, in August 2019.

1. Introduction

One of the key elements of development strategies in Latin American countries, which worked as counterparts for national policies, is the advocacy for higher economic integration, both at a regional and a global level. The need to expand internal markets accounts for this strategy, attracting investments that, together with a bigger scale of production, will bring in productivity gains and employment through resource reallocation toward sectors and companies which are relatively more productive or through better access to quality inputs.

Even though most countries in the region have witnessed higher integration to global markets, this was not the case at a regional level. The region has made progress in the implementation of important regional integration agreements (e.g. Mercosur, Pacific Alliance, etc.) but these were accompanied by a relatively moderate increase in terms of intra-regional trade.

This chapter will examine the causes for this moderate increase in intra-regional trade, focusing, on the one hand, on the relatively high costs of regional trade and, on the other hand, on the need for better integration of the productive structures of the countries in the region, which results in a significant lower participation in regional value chains compared to the rest of the world. The low participation in regional and global value chains of a large number of Latin American countries represents a significant competitive disadvantage since exporting companies cannot benefit from efficiency gains (static and dynamic) associated with more sophisticated forms of specialization and economies of scale within value chains.

The specialization associated with regional and global value chains not only brings efficiency gains, but is also accompanied by distributive effects that can impact income distribution within countries and affect unstable political balances. For that reason, the chapter concludes by examining the impact of trade on income inequality in the region.

The structure of the rest of the chapter is as follows: Section 2 explores the relationship between trade and economic growth in Latin America. Section 3 focuses on the regional integration process in Latin America and compares it with the integration process in other regions. Section 4 explores the reasons underlying the low level of intra-regional trade in Latin America. Section 5 examines the impact of regional trade on income inequality, and section 6 concludes with economic policy recommendations for the regional integration process in Latin America.

2. Trade opening and economic growth in Latin America

This section analyses the advantages of trade as a driver of economic growth and the productivity of the economies. Firstly, there is an assessment of several theoretical approaches that suggest different courses of action and the existing empirical evidence. Secondly, the role of regional integration processes is analyzed more specifically, as well as the relationship between trade and economic growth.

2.1. Trade and growth: theory and evidence

The neoclassical growth theory explains that the declining marginal returns linked to the accumulation of capital, account for decreasing growth rates in a closed economy. In those models, the only source for growth in the long-term is the increase of productivity. Within the framework of the classical theory on comparative advantages, Ventura (1997) explains how international trade makes it possible to overcome the boundaries of growth imposed by decreasing marginal returns. The key in Ventura's model is that, when capital is accumulated, the comparative advantage of an economy turn to strengthening the capital goods-intensive sector, as suggested in Rybczynski's Theorem (1955). Such changes in the production structure make it possible for the country to accumulate capital without diminishing marginal returns to capital since, by changing the comparative advantage, capital demand based on exports of such intensive sector increases, providing for constant return to capital. As a consequence, trade opening enables economic growth by capital accumulation without the need to observe (exogenous) increases of productivity.

This essential outcome may be modified when productivity growth rates by sector are different. In fact, Matsuyama (1992) shows that, upon economy openness, resources are redirected to sectors with fewer growth opportunities, thus leading to a reduced aggregated economic growth through a simple composition effect. Let us take, for example, the case of agriculture and manufactured goods and suppose that the agricultural sector has a lower rate of growth (exogenous) in productivity with respect to the manufacturing sector. If the economy has a comparative advantage in agriculture, it will specialize in this sector, therefore evidencing lower levels of productivity, leading to lower global economic growth compared to the growth that could be attained if the economy was protected and diversified toward the manufacturing sector, which has higher levels of productivity.

When theory provides ambiguous outcomes, researchers resort to empirical evidence to solve this ambiguity. Up to the end of the 20th century, empiric literature used to suggest unequivocally that international trade was associated to a greater economic growth (see, for example, Sachs and Warner, 1995; Frankel and Romer, 1999 or Edwards, 1998). At the beginning of the 21st century, Rodríguez and Rodrik (2000) contributed harsh criticism to that empirical literature based on measurement, endogeneity and trade policy definition problems that –according to them– led to biased results. The use of cross-sectional data from countries with very different levels of development and other initial conditions added to the assumption that the response to trade reforms could be homogeneous were the base for criticism about the empirical literature that existed at the end of the 20th century.

More and more literature has focused on the criticism of Rodríguez and Rodrik, in an attempt to assess the empirical importance beyond the works analyzed in the study of these two economists. The work of Wacziarg and Welch (2008) may be most overarching. Using time variation –but within each country in terms of trade policy, trade and economic growth– and using an empirical method that takes into account different initial conditions in each country (a difference-by-difference estimator), Wacziarg and Welch show that, upon the economies' trade openness, GDP increases 2 percentage points on average. It also provides evidence that the mechanism through which GDP grows is due to a strong increase in investment after trade reforms.

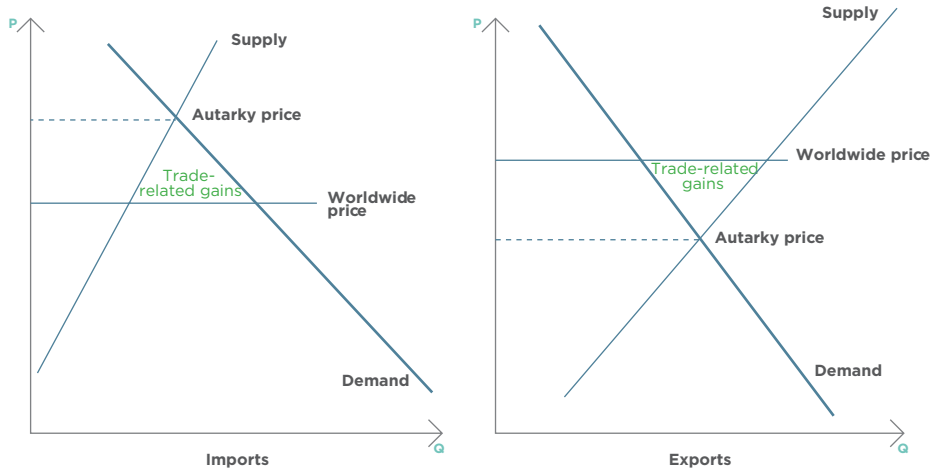
Perhaps the most interesting critical attitude of Rodríguez and Rodrik is that, although average economic growth is higher, it remains to be explained why the impact of trade on economic growth is stronger in some countries and why sometimes trade opening is accompanied by a slowdown in economy instead of growth.

The work of Freund and Bolaky (2008) was one of the best to explore systematically the heterogeneity of the impact of international trade on economic growth. They think that the sign and the size of the impact of trade on growth depend on how flexible regulations imposed on the private sector are. The mechanism is simple: to be able to tackle the new opportunities offered by trade opening, production factors (capital and work) must be reallocated and shifted from less productive sectors to sectors where domestic companies have a comparative advantage. To this end, regulations for the creation and closure of companies have to be flexible enough to guarantee that companies can effectively cease their activities, and their resources may effectively be used in new, more competitive companies.

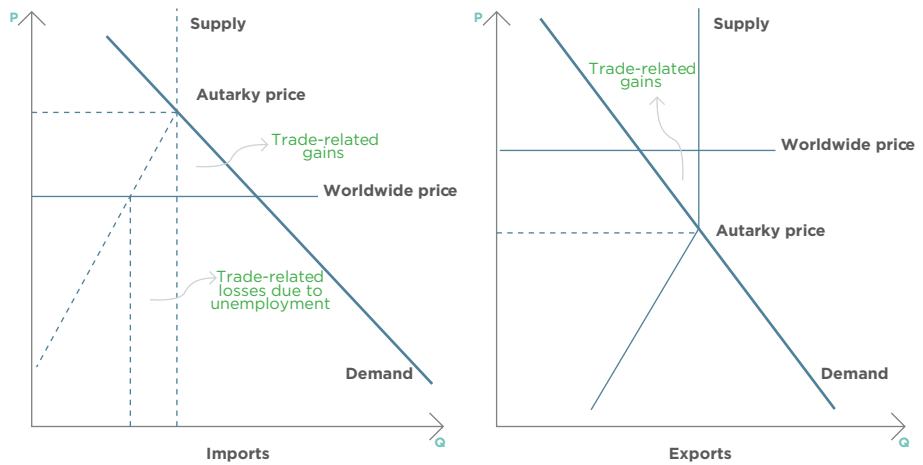
Chart 1 shows the role played by the barriers to the creation of new companies in the determination of their trade opening-related gains or losses in a two-sector trade model. Graph A shows the classic trade-related gains in case there are no entry costs. Graph B shows additional trade-related losses in case entry costs do not allow the reallocation of resources from low to high-productivity sectors and, as a result, factors of production are unemployed when domestic companies that compete with imports are closed down. When production factors are unemployed, loss of income may be greater than the income derived from efficiency gains associated with trade.

CHART 1. Trade-related Gains and Losses with and without Entry Costs for New Companies

Graph A: Trade-related Gains without Entry Costs for New Companies



Graph B: Trade-related Gains and Losses with Entry Costs for New Companies



Source: Author's elaboration.

Freund and Bolaky (2008) examine empirically the forecast that economic growth would be stronger after trade opening in case that countries had more flexible regulations on the activities of private businesses. They divide selected countries in their study between those with highly restrictive business regulations, in terms of entry and exit of companies, and those with more flexible business regulations. They found that, in the first group,

there is no relationship between trade opening and economic growth, while in the second group, trade opening has a positive and relevant impact on economic growth.

Chang, Kaltani and Loayza (2009), based on Freund and Bolaky (2008), explore how other types of different complementary factors, other than regulations on the entry and exit of companies, may affect the relationship between trade and economic growth. In terms of interaction, they examine how the impact of trade reforms on economic growth varies according to the level of education, financial depth, inflation, communications infrastructure, governance and labor market flexibility. They found that financial depth, a better governance and telecommunications infrastructure, as well as enhanced labor market flexibility can turn the impact of trade opening on economic growth from negative into positive.

These results are important for two reasons. In the first place, they clearly explain the heterogeneity they observe in different experiences regarding trade opening, and they do it systematically. Second, they suggest that, from a political point of view, trade opening must be accompanied by other economic reforms if a positive impact on economic development is expected.

The classic trade approach is focused on comparative advantages and assumes that all companies are similar to each other (they have the same technology and productivity capacities within each sector). More recently, an approach has emerged that warns about a great productivity disparity (due to the use of different technologies, entrepreneurship, diverse management methods, etc.) among companies in different sectors. This approach contributes a new and interesting perspective about the mechanisms through which trade impacts on economic growth. The first has to do with the reallocation of resources, not across sectors as in the classical models, but within sectors and through companies. In the presence of companies with different levels of productivity, the increase in competition associated with trade opening pushes the least competitive companies out of the market, or reduces their production, and reallocates resources toward the more competitive companies within the sector, which generates aggregate productivity gains. The second mechanism is associated with the increase of productivity within the same company (innovation channel) based on higher competitiveness (pro-competitive effects) or on the fact that, thanks to trade opening, it has access to higher quantities of foreign inputs of better quality.¹

In one of the first empirical works in this area, Pavcnik (2002) examines the impact of Chile's significant trade openness in the late 1970s. It was then that Chile implemented a reform that eliminated most of its non-tariff barriers and reduced tariffs that, in 1974, were often above 100%, to a uniform tariff of 10% in 1979. Pavcnik finds that, after this radical change in the trade policy, the productivity of Chilean companies in sectors in direct competition with imports grew from 5% to 10%, faster than in the non-tradable goods sector. It

1 See Amiti and Konings (2007) for empirical evidence about the relevance of imported inputs on productivity and Topalova and Khandelwal (2011) for empirical evidence on the importance of the two mechanisms: pro-competitive effects and the access to imported inputs.

suggests that exposure to foreign competition forced companies in the import sector to become more efficient (pro-competitive gains from trade). It also finds that plants that are forced out of the market by competitive pressure are on average 8% less productive than companies that continue to produce. This result implies that the exit of plants also contributes to the reallocation of resources within the economy, from less productive to more productive companies, which results in a greater aggregate productivity due to a simple composition effect.

This last result has political implications similar to those by Freund and Bolaky (2008) discussed above. Excessive business, financial and labor regulations that, for example, hinder the bankruptcy of less efficient companies or the reallocation of capital and labor from existing less productive companies to more productive ones, not only across sectors but also within sectors, have negative consequences on aggregate productivity and economic growth. This implies that the benefits of trade will be seriously undermined in countries with excessive regulations.

However, the fact that the aforementioned policies favor the reallocation of resources toward more productive sectors and companies and that this leads to higher levels of trade and, in particular, the increase of exports, may imply an additional positive effect on the productivity of businesses. The evidence on exporting companies and productivity for developed countries tends to show that exporting companies are more productive, but that this is mainly explained by a selection effect: the most productive companies become exporters (Bernard and Jansen, 1999). However, this conclusion is not the same when emerging countries are examined.

In an empirical study on productivity and exports that employs data of emerging countries, Van Bieseboreck (2005) offers evidence of exports-related learning experience in companies that become more productive when they start to export. Using data from businesses, Álvarez and López (2005) show evidence that both effects (selection and learning) are present in the case of Chile. Fernández and Isgut (2005) also show key evidence on the effects of learning linked to the increase on productivity rates from 4% to 5% per year of exports in Colombian companies.

Therefore, in emerging countries, when companies receive incentives to export, they improve their production capacity and their efficiency and this, in turn, improves global economic productivity. One way to create incentives for companies to export is to negotiate regional agreements stating preferences that provide for domestic companies to enter foreign markets and to enhance their efficiency by exports-related learning experience. This topic is analyzed in detail in the next section.

In summary, literature on trade and economic development shows that there are several mechanisms by which trade can boost economic growth (reallocation of resources to more productive sectors and businesses, pro-competitive effects, access to a wider variety of higher-quality inputs, etc.). However, in order to materialize as the largest part of those gains, it is necessary to apply complementary policies on the entry and exit of

companies, infrastructure, financial depth, labor market flexibility, etc. In addition, regional integration agreements offer the opportunity to benefit from exports-related learning experience within the region, in the case of emerging countries, attracting profits from global productivity.

2.2 Trade agreements and economic development

Notwithstanding the benefits of regional integration, it is necessary to have adequate policies in place so the impact of trade on economic development is positive. Conceptually, there are two additional reasons why regional trade triggered by regional integration agreements may not necessarily result in gains in terms of economic development.

The first reason is that the proliferation of regional agreements can represent an obstacle or substitute for global trade openness. Therefore, the gains at the regional level are obtained at the expense of potential gains at the global level. Bhagwati (1992) study was a pioneer in the main literature analyzing whether the proliferation of regional agreements benefits or damages global trade opening (*building versus stumbling blocks* hypothesis). The empirical literature finds that, at least in Latin America (although in other regions as well), the proliferation of regional agreements was accompanied by global trade opening (Freund and Ornelas 2010, and Baldwin 2014). The general conclusion is that regionalism has helped and not damaged global trade opening.

More interestingly, regional agreements helped in lowering global protection more significantly in countries that originally had higher levels of protection. Crivelli (2016) shows that this is true for a set of Latin American countries and provides evidence suggesting that the mechanism is associated with the loss of income on tariff rates when preferences are given to the trading partner, and such partner increases its market share. In order to avoid a large loss of income on tariff rates, Latin American governments with high initial levels of external protection lowered their external tariffs. Tovar (2019) shows that the external tariff reduction is also more important when the initial part of imports coming from the rest of the world is higher.

It is important to note that these studies estimate regional averages and that the reality in some countries or trade blocs may be very different. Lalanne and Vaillant (2019), for example, show that in the last decade, Mercosur countries, particularly Uruguay, moved away from the concept of open regionalism, consolidating itself as a region with relatively high tariffs.

To summarize, in terms of the first reason that could qualify the benefits of regional trade on economic development, we can conclude that it is not relevant in the case of Latin America, where it has been observed not only that the increase in regional agreements was accompanied by a global openness, but this global openness was also more important in the countries that needed it most (since the cost of trade diversion is higher in countries with higher multilateral protection). This is consistent with the notions of “open regionalism” used in Latin America by the end of the 20th century.

The second reason that could qualify the gains in terms of economic development associated with regional integration is that the latter can generate distortions by giving tariff preferences to regional members that are not necessarily the most competitive in global terms, creating inefficiencies that distort incentives to invest in the region.

There is empirical evidence that regional agreements in Latin America, at least initially, were accompanied by a diversion of trade (or a decrease in imports originating from the rest of the world). Carrère (2006) shows that, in the case of the Andean Pact, the Common Market of Central America, Mercosur, and the Latin American Integration Association (LAIA), a significant trade diversion is observed, with a statistically significant drop in their imports from the rest of the world. Robertson and Estevadeordal (2009) also show an increase in trade diversion in the region by the end of the 20th century.

There are four responses to the observation that regional agreements in Latin America have been accompanied by trade diversion and that this damages the economic impact of such agreements. The first is that there is empirical evidence that when trade diversion is significant, the countries in the region tend to reduce external protection, which, in turn, reduces trade diversion. Bohara, Gawande and Sanguinetti (2004) offer empirical evidence for Mercosur, and Crivelli (2016) for the entire region. This suggests that the trade deviation is a temporary phenomenon that eventually tends to disappear.

The second response is that, although the trade deviation damages the importing country within the bloc and the bloc as a whole, the exporting country within the bloc is benefited by this distortion and, therefore, can also benefit certain other members. Moncarz, Olarreaga and Vaillant (2016) show that Brazil benefited from trade deviation in respect to other Mercosur countries, allowing Brazil to move its regional exports to more complex products with a higher potential of growth. In the short-term, this gain is obviously made at the expense of the other member countries of the bloc.

The third response is that other new regional agreements of the 21st century are deepening and include harmonization topics beyond tariffs (environmental, labor and investment issues, technical and sanitary barriers, etc.). The nature of such reforms implies that there is little discrimination between the benefits agreed upon by trading partners. The implication of such agreements is that the deviation of trade is less than in more superficial agreements of the 20th century (see Mattoo, Mulabdic and Rute, 2017). The necessary deepening of the agreements in the region should reduce the risks of trade deviations.

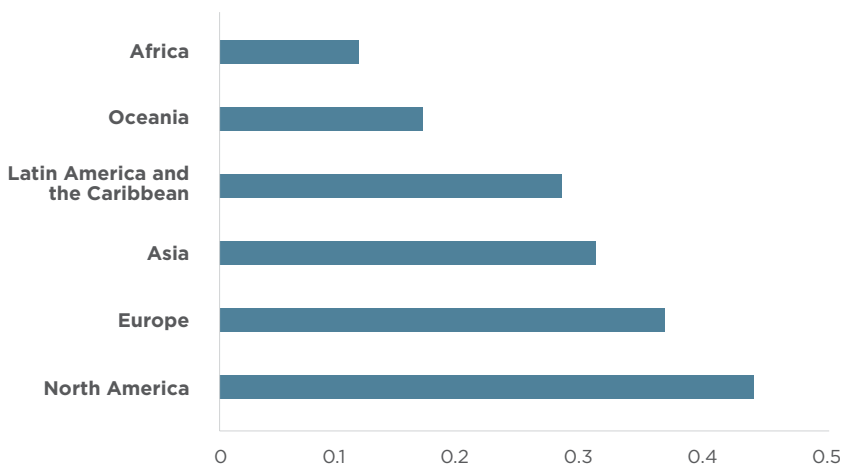
The fourth and last response based on the idea that trade deviation in Latin America may severely reduce gains arising from this activity, is that regardless of any trade deviation that might have taken place in Latin America, it could not have had strong economic consequences since intra-regional trade in Latin America is relatively low, as it will be explained in the following sections.

3. Trade integration in the region: comparative analysis

The important emergence of trade agreements in the region in the last two decades means that more than 80% of intra-regional trade benefits from tariff preferences. Estevadeordal and Salazar (2017) state that more than 50% of this preferential trade is observed within four agreements that have eliminated or are about to eliminate tariffs among their members. Based on these facts, one could conclude that the region has one of the most integrated regional markets, which would imply a high share of intra-regional trade within the total trade in Latin America and the Caribbean.

Chart 2 shows that, despite a big share of intra-regional trade today offers tariff preferences in the region; the share of intra-regional trade over the period 1995-2017 is lower than the one observed in other regions. Only Africa and Oceania, with significant barriers to trade due to the lack of infrastructure, or simply to geographical reasons, have lower rates of intra-regional trade than Latin America and the Caribbean. North America has an internal trade rate 56% higher than Latin America and the Caribbean. In Europe, the rate is one-third higher and in Asia a 10% higher than in the region.

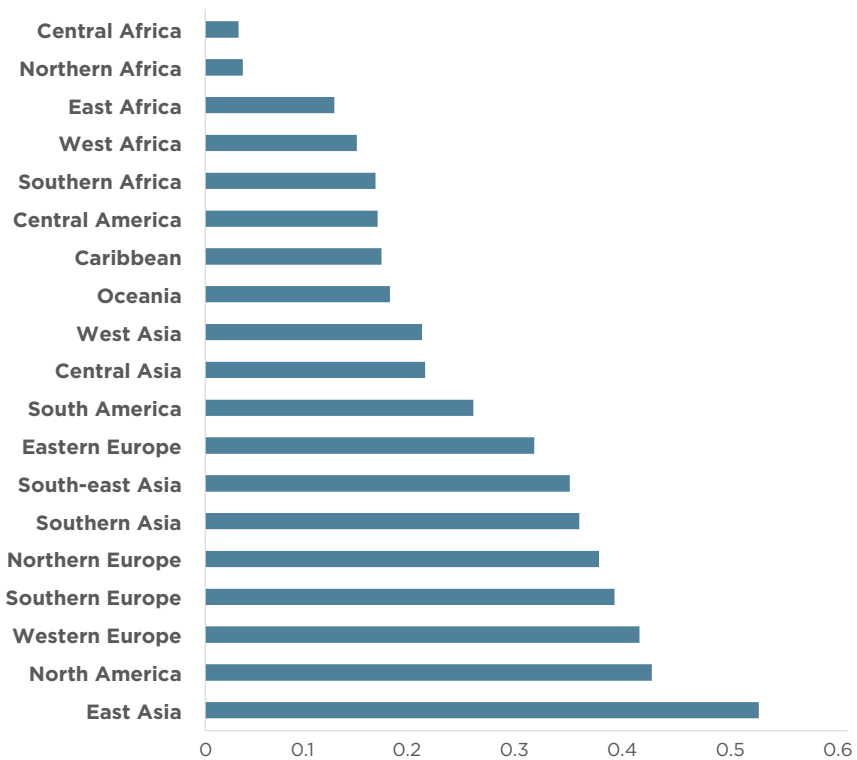
CHART 2. Share of Intra-regional Trade by Continent, 1995-2017



Source: UN COMTRADE data and author's calculations.

Chart 3 shows intra-regional trade share by sub-region, as defined by the United Nations. Therefore, Latin America and the Caribbean is divided into 3 regions: Central America, the Caribbean and South America. Considering this disaggregation, it is observed that Oceania now has a higher share of intra-regional trade than Central America and the Caribbean. The only sub-regions that have a lower share of intra-regional trade than Central America and the Caribbean are the African sub-regions. South America has a slightly higher share, which ranges around 25% over the 1995-2017 period, but is only higher than the intra-regional trade share in Western Asia, Central Asia and Oceania, in addition to the sub-regions of Africa, and well below what is observed in Asia, Europe and North America.

CHART 3. Intra-regional Trade Share by Region, 1995-2017

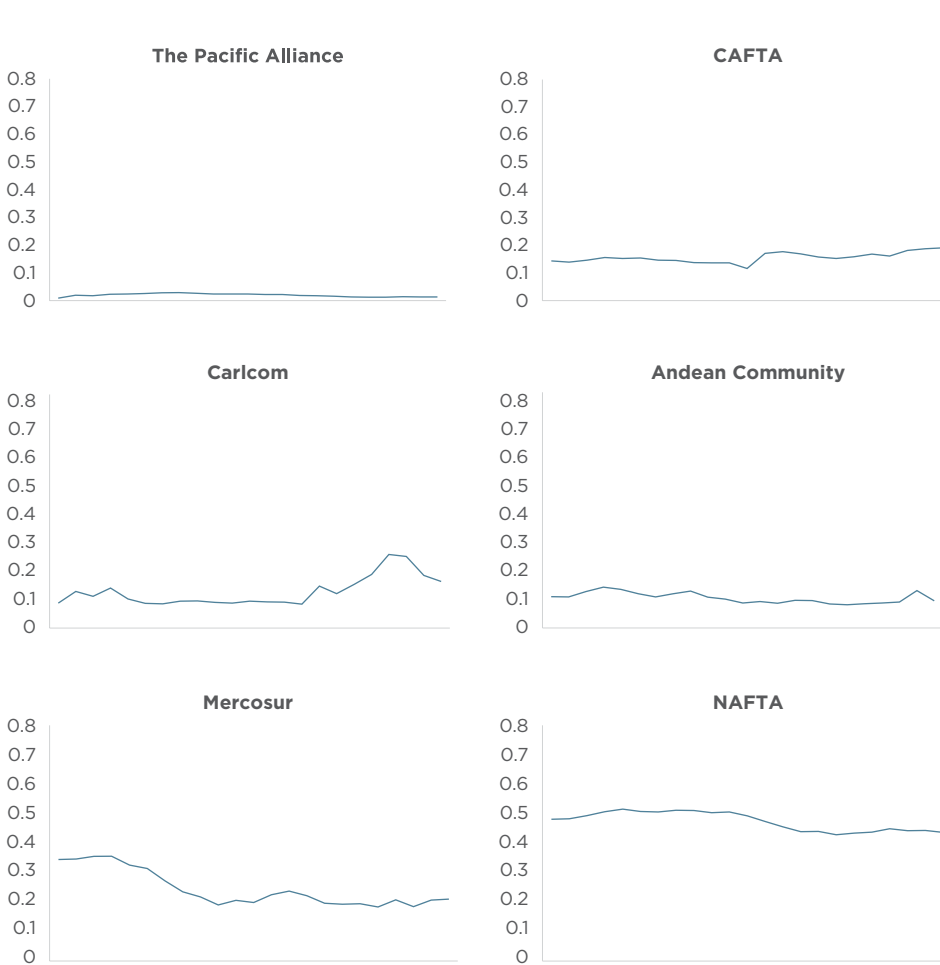


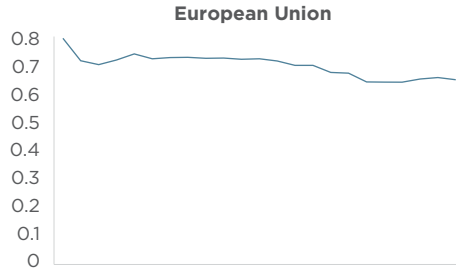
Source: UN COMTRADE data and author's calculations.

When levels of intra-regional trade are analyzed considering current agreements or blocs, this scenario is not substantially modified. Chart 4 shows that the intra-regional trade of the main regional agreements is a good deal lower than what is observed in the European Union or in the area of the North American Free Trade Agreement (without Mexico) over the

period 1995-2017. However, it is important to highlight that there is no clear tendency as to an increase or reduction of intra-regional trade in any of the blocs during the period.

CHART 4. Evolution of the Share of Intra-Regional Trade by Bloc, 1995-2017





Note: The North American Free Trade Agreement (NAFTA) does not include Mexico.

Source: UN COMTRADE data and author's calculations.

We conclude that, although Latin America has a large number of regional integration agreements that aim to facilitate intra-regional trade, the efficiency of these agreements in promoting trade is relatively limited, which implies relatively low intra-regional trade rates.

4. Explaining the low level of intra-regional trade

To understand the low level of intra-regional trade, we propose two explanations: i) the high cost of trade within Latin America (different from tariffs) when compared to other regions and ii) the low integration of the productive structure between countries in the region.² Each of these explanations undoubtedly carries different implications for public policies. In the case of the first explanation, the effort should focus on reducing barriers to intra-regional trade, facilitating investment in intra-regional transport infrastructure, but also information and regulations, such as Authorized Economic Operator programs, single electronic windows in customs or e-trade schemes focused on intra-regional commerce and its peculiarities (see Carballo, Schaur and Volpe, 2016; Carvallo, Graziano, Schaur and Volpe, 2016, and Lendle, Olarreaga, Schropp and Vézina, 2016). In the case of the second explanation, it would be about promoting intra-industrial trade that, in other regions, such as Europe and Asia, has developed significantly, trying to find a greater integration of the production chain at the regional level (see Cadestin, Gourdon and Kowalski, 2016).³

To measure the costs of trade, we use the methodology developed by Novy (2013). This methodology is based on the structural gravity model that shows that the cost of bilateral trade is a geometric mean of bilateral flows between countries, normalized by internal trade within each country and transformed by the elasticity of substitution between imported varieties from different origins. Arvis, Shepherd, Duval, Utoktham, and Raj (2015) implemented the methodology using UN COMTRADE data.⁴ In this work, we use the new data base version dated July 2019.⁵

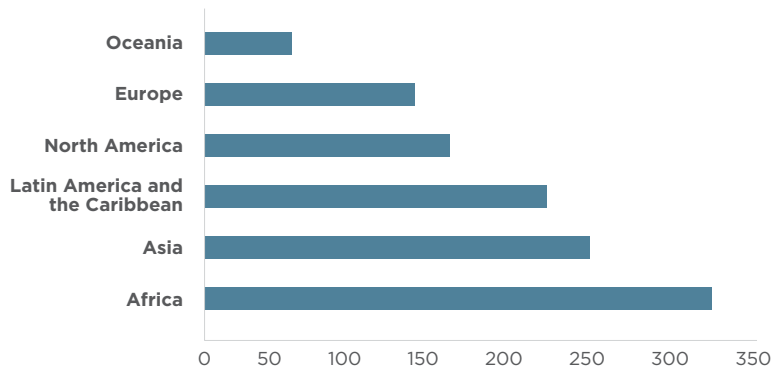
Chart 5 shows that the costs of intra-regional trade in Latin America are at the world average. Although they are slightly lower than intra-regional costs in Africa, they are still significantly higher than what can be observed in Europe or North America. The cost in intra-regional trade in Asia is marginally higher than what can be observed in Latin America.

² Of course, both explanations are related to and determined by the costs of trade.

³ The third explanation, that is frequently quoted, is that the productive structure is very similar in Latin America, accounting for the low level of trade. Although this is true, the productive structures of France and Germany are also very similar and, in spite of that, both economies are well integrated in terms of intra-industry trade, as shown by the analysis below.

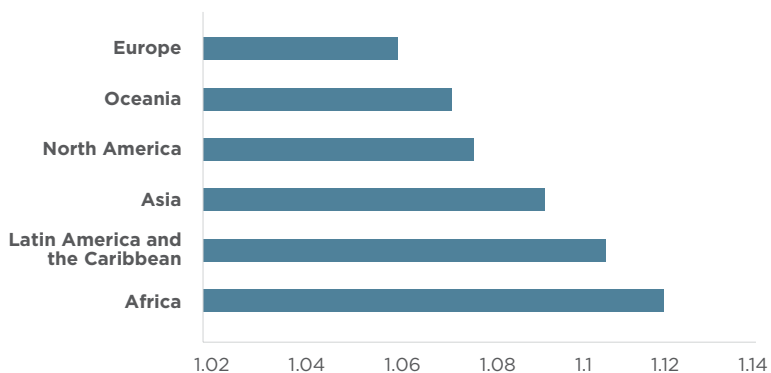
⁴ The methodology is simple: if bilateral trade between countries is generated by the bilateral gravity equation, and the symmetry of bilateral trade costs prevails (the cost in Guatemala and Chile is the same as between Chile and Guatemala), it can be calculated, with bilateral trade data in both directions and internal trade in both countries, the cost of bilateral trade using estimates of the elasticities of substitution between varieties produced in different countries.

⁵ Statistical data from the UN is available at <https://www.unescap.org/resources/escap-world-bank-trade-cost-database>.

CHART 5. Intra-regional Trade Costs by Continent, 1995-2017

Source: Economic and Social Commission for Asia and the Pacific (ESCAP 2018) data and author's calculations.

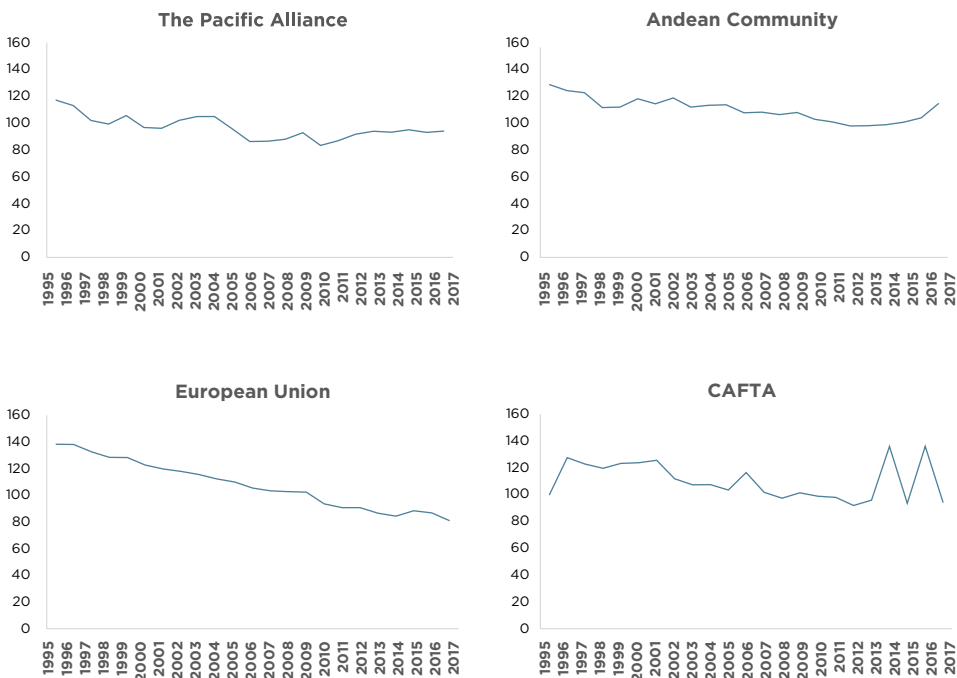
Chart 6 shows that intra-regional trade costs cannot be explained by internal trade tariffs, which represent a small fraction of intra-regional trade costs shown in Chart 5. Indeed, the average domestic tariff on intra-regional trade only represents around 1% in all regions over the period 1995-2017, which is well below the average cost of trade in Latin America and the Caribbean, which amounts to 215% during this same period. Furthermore, no significant variation in tariffs is perceived across the different regions to explain the significant variation in intra-regional trade.

CHART 6. Intra-regional Trade Tariffs by Continent, 1995-2017

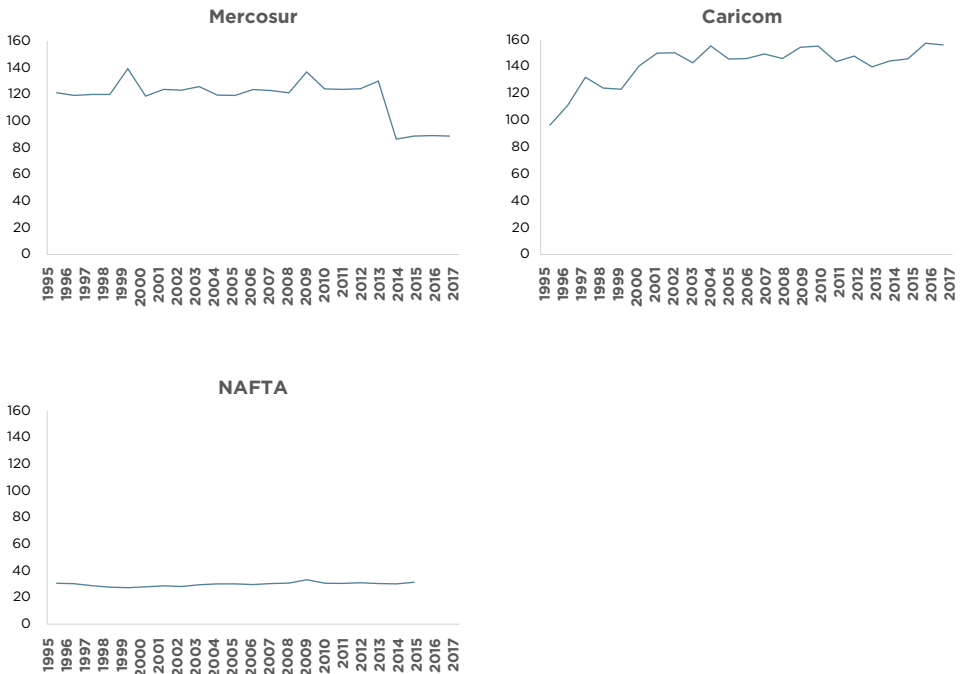
Source: Economic and Social Commission for Asia and the Pacific (ESCAP 2018) data and author's calculations.

The evolution within the main trade blocs in the region does not show a downward trend in trade costs during a period in which regional integration processes accelerated (Chart 7).⁶ This is because integration processes were essentially concentrated on tariff barriers, leaving infrastructure and regulation issues essentially out of the scope of the agreements. It is worth noticing that, during the same period, European Union countries showed a reduction of almost 50% in the costs of intra-regional trade while they deepened their integration process.

CHART 7. Evolution of Intra-regional Trade Costs by Bloc, 1995-2017

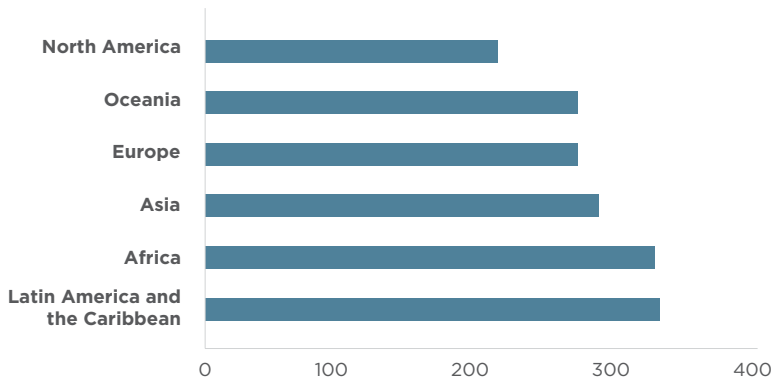


⁶ It is important to stress that the costs within the main blocs of Latin America are the lower than the average costs for Latin America and the Caribbean, since the first do not include the costs to extra bloc trade, but the costs within the region. Comparing these two magnitudes allows us to conclude that the costs to extra-bloc trade are greater than the costs to intra-bloc trade in Latin America and the Caribbean.

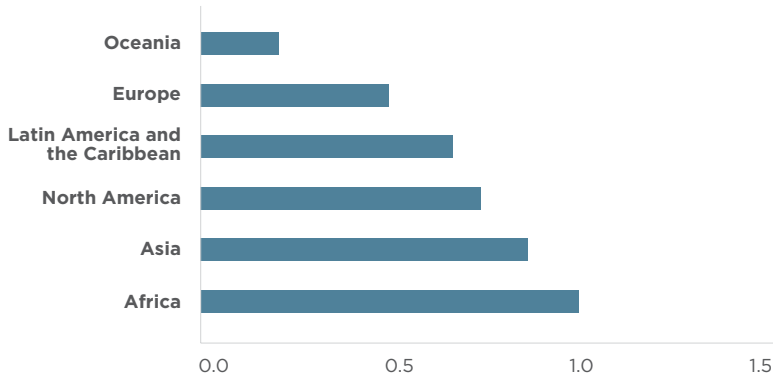


Source: ESCAP (2018) data and author's calculations.

For the high costs of intra-regional trade in Latin America to be able to explain the small share of this type of trade within the total trade, the costs of extra-regional trade should not be any higher than the former in comparison to other regions. Indeed, if intra-regional and extra-regional trade costs were high, they could not explain the reduced intra-regional trade share, since the numerator and denominator of the fraction of intra-regional trade would be affected by the high costs of trade. Chart 8 shows that Latin America and the Caribbean is the continent with the highest extra-regional trade costs. When we calculate the ratio of intra-regional trade cost over the extra-regional trade cost, we find that Latin America has relative lower internal trade costs than all the other regions, except for Oceania and Europe (see Chart 9).

CHART 8. Extra-regional Trade Costs by Continent, 1995-2017

Source: ESCAP (2018) data and author's calculations.

CHART 9. Ratio of Intra-regional and Extra-regional Trade Costs by Continent

Source: ESCAP (2018) data and author's calculations.

This would lead us to conclude that, although intra-regional trade costs are relatively high in Latin America and the Caribbean, the same applies to extra-regional costs, therefore, suggesting that the explanation underlying the low level of intra-regional trade is not found in intra-regional costs, which are disproportionately higher than extra-regional costs.

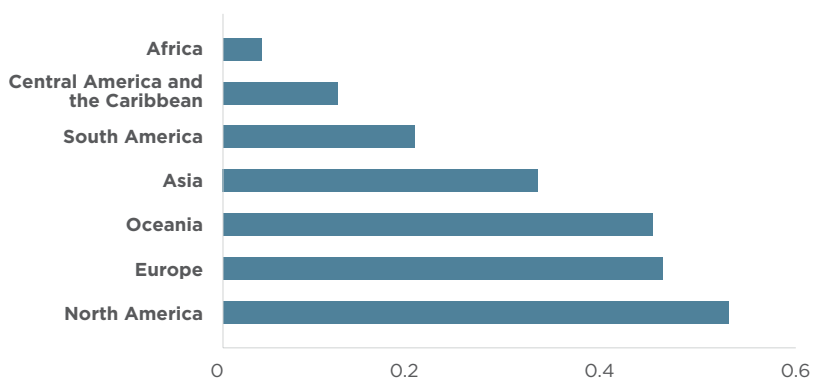
This conclusion has to be taken cautiously for two reasons. Firstly, the trend in the majority of the countries in the region is a relative reduction of the extra-regional costs. This trend suggests the importance of placing more emphasis on intra-regional costs. The second reason is that, if this is added to the fact that production costs are relatively higher in the region, the new economic geography models stated by Krugman would predict a relative impoverishment of the region if there is no adequate response from the side of costs to intra-regional trade or from production costs within the region.

Moneke (2020) shows that there is a positive impact of investment in infrastructure that reduces the costs of extra-regional trade on economic development and the inequality, if such investment is accompanied by an investment that helps to lower production costs in the peripheral regions (i.e., Latin America). This implies that, by investing in reducing the costs of intra-regional trade, it is necessary to invest in infrastructures that allow the reduction of production costs in the region (intra-regional routes, electricity, telecommunications, etc.).

The second possible explanation for the low level of intra-regional trade in Latin America has to do with the poor integration of the productive structure across the countries in the region. Of course, this depends in part on high intra-regional trade costs. One way to measure the integration of the productive structure between countries is by using the Grubel and Lloyd intra-industry trade index. The index measures the portion of bilateral trade between two countries that takes place within the same industry. As Brühlhart (2009) shows, the index can be added at country group level to measure the share of trade within a region that occurs within the same industry.

Chart 10 illustrates the Grubel and Lloyd indices calculated by Brühlhart (2009) for different regions. Africa is the only region with a lower intra-industry trade index than Latin America and the Caribbean. While South America has a share of intra-industry trade almost twice as high as that of Central America and the Caribbean, its intra-industry trade represents less than half of what is observed in North America and Europe. This implies that, if South America had the same level of intra-industry trade within the region (being the remainder constant) that we observe in North America or Europe, its share of intra-regional trade would be more than twice as high. For Central America and the Caribbean, intra-regional trade would four times as high.

CHART 10. Grubel-Lloyd Index for Intra-industry Trade within Each Region

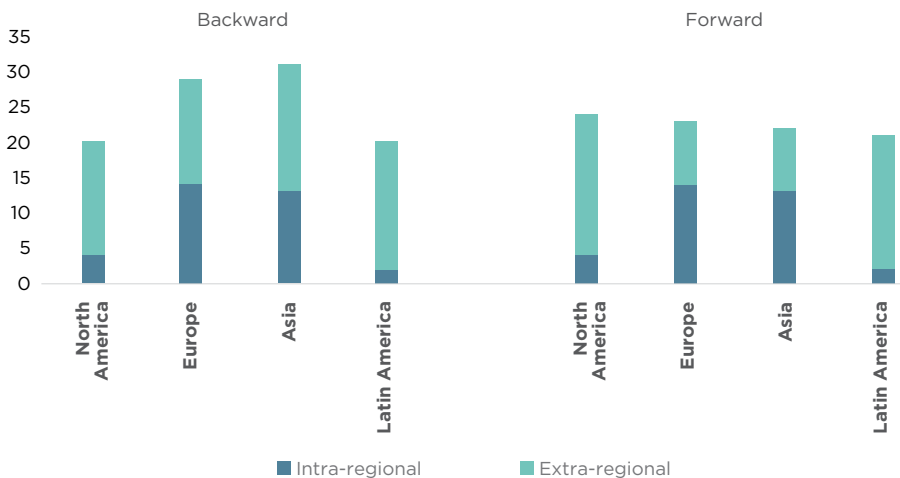


Source: Brühlhart (2009) data, Table 3, and author's calculations.

It is important to note that the near absence of intra-industry trade within the region does not mean that regional countries do not participate in other value chains outside the region. Mexico and Costa Rica are relatively well integrated in the value chains of North America. Chile and Peru are increasingly more integrated with Asian value chains. However, the integration of some countries in the region within global value chains does not contribute to intra-regional trade, since Latin America has a very low degree of participation in intra-regional value chains, even when compared to emerging countries in other regions (Blyde, 2014).

Chart 11 shows, for different regions, *forward participation* and *backward participation* within intra-regional and extra-regional value chains based on Cadestin *et al.* (2016) data extracted from TiVA database of the OECD. Forward participation is calculated as a country's added value that is used in exports from the rest of the world and backward share is the share of foreign added value in a country's exports. Chart 11 disaggregates these forward and backward participation measures for intra-regional and extra-regional trade. Although forward participation of Latin American exporters at a global level is not very different from that of other regions (a large part of the added value of the exports of the Latin American countries is used as an input in exports of other Latin American countries), the level of intra-regional forward participation is much lower than that observed in Europe or Asia. The level of backward participation of Latin American countries is lower than that of other regions at intra-regional and extra regional levels (also see Lalanne, 2019).

CHART 11. Participation in Intra-regional and Extra-regional Value Chains, 2011



Source: Data from Cadestin *et al.* (2016), Chart 4 and author's calculations.

This absence of intra-regional value chains in Latin America is one of the explanations underlying the low levels of intra-industry and intra-regional trade. But it is also worrying from the point of view of economic growth because, as Baldwin (2012) argues, participation in global value chains allows companies to increase their productive efficiency thanks to better specialization and economies of scale. Without access to these efficiency gains through global value chains, companies in the region will find it increasingly difficult to maintain their competitiveness against companies in other regions that are increasingly integrated into value chains.

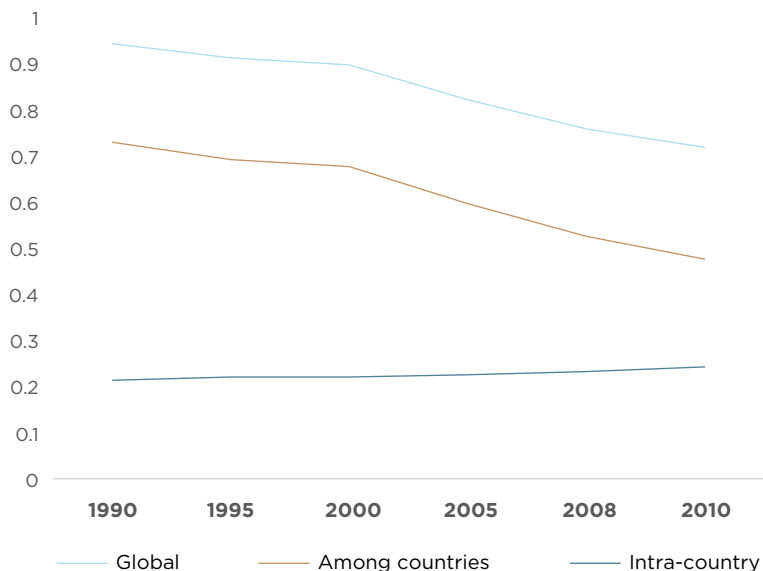
Therefore, it is essential to try to understand the reasons for the low participation of the countries in the region in regional value chains. Cadestin *et al.* (2016) suggest that one of the main reasons is the numerous and complicated rules of origin associated with preferential agreements within the region. These serve as a barrier to the effective use of tariff preferences and the integration of the region not only in regional value chains, but also in global chains, since they hinder the use of inputs sourced from the rest of the world.

Although the region has a relatively large number of bilateral and regional trade agreements when compared to other regions, there is a great lack of coordination between these agreements, which overlap one another (see Chart 12). This brings up the need to use rules of origin so that exporters can benefit from negotiated tariff preferences. Today there are more than 47 different regimes of rules of origin in the region (Estevadeordal and Salazar, 2017). The increasing complexity of these rules of origin and the lack of coordination between agreements within the region end up transforming this large number of trade agreements into a weakness rather than a driving force for intra-regional trade. In fact, Cadestin *et al.* (2016) calculate that only 20% of extra-regional exports are affected by rules of origin outside the region. In the case of intra-regional trade, more than 80% of exports face rules of origin.

5. Trade and income inequality

The insertion of emerging countries in global markets accelerated in the 1990s and occurred together with a significant decrease in income inequality between countries (Bourguignon, 2016). The consequence was a decrease in global income inequality and income inequality between countries. As illustrated in Chart 13, global income inequality and income inequality between countries has decreased in a monotonic fashion since the early 1990s, gaining momentum at the beginning of this century. This evolution is largely explained by the higher rate of integration to world markets in emerging countries, which was accompanied by a faster growth in those countries, reducing the difference in GDP per capita between rich and emerging countries.

CHART 13. Global Income Inequality among Countries and within Each Country



Note: Inequality is measured by the Theil index. Higher values indicate greater inequality. The Global Theil index measures income inequality among all the citizens of the world. This is broken down into a Theil index among countries, which measures inequality between the average citizen of each country and the Theil index within countries, which measures the average of income inequality of each country.

As Chart 13 illustrates, along with the decrease in global inequality, there was an increase in the average of income inequality within countries. The increase was modest (around 10% over the period), but the media attention has focused on this phenomenon for two reasons. First, the public is more concerned about national than international problems, which implies that inequality among citizens of a country is subject to more scrutiny than the evolution of inequality of the average citizen of a country in relation to the average citizen in the rest of the world. Second, the average increase in inequality within countries hides great heterogeneity. Inequalities have increased at a much higher growth rate in several high-income countries, such as the United States, but the trend has been different in most countries in the region.

One of the culprits for the increase in income inequalities within countries that is the most popular in the press, and in policy debate is the same one that has also brought a reduction of income inequalities among countries: international trade and globalization. This may seem illogical but it is not. Indeed, important empirical literature on the subject, which uses microeconomic data on workers and companies to better understand the phenomenon, tends to suggest that international trade has contributed to increase income inequality within countries (without discussing the greater contribution to the reduction of income inequality from one country to the other).

The key to introducing inequality into trade models is to work with models that recognize the heterogeneity of workers (i.e., they do not assume a single type of worker) and take into account the existing frictions in labor markets. The new microeconomic databases at the company and worker levels allow both.

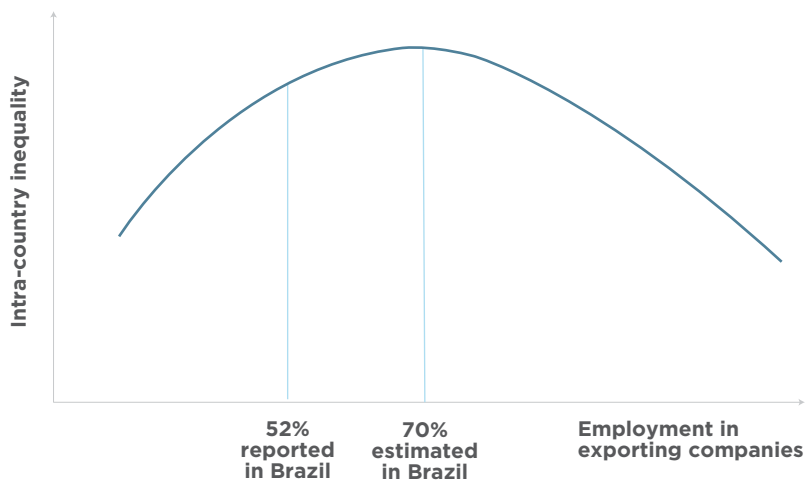
This new literature has three main messages. The first is that international trade is theoretically and empirically associated with an increase in wage inequalities within countries, as mentioned above. The reasons are various, but the main reason is that international trade reallocates resources toward the most competitive companies and these companies are the ones that employ a higher proportion of skilled workers, thus increasing the relative demand for such workers and income inequality. The second important message of this literature is that, although trade contributes to the increase in inequality, it explains a very small part of the observed increase in inequality, as shown, for example, by Galiani and Sanguinetti (2003) using microdata for Argentina. In a study focused on 60 countries, Burstein and Vogel (2017) find that, on average, the existing trade opening explains only 5% of the increase in the salary difference between skilled and unskilled workers. The third main message emerging from this new literature is that, while trade contributes to increasing income inequality, what is needed to decrease income inequality is more trade and not less.

This may seem counterintuitive at first glance, but the work of Helpman, Itskhoki, Muendler, and Redding (2017) offers a simple explanation. As in the work of Burstein and Vogel (2017), trade reallocates resources toward exporting companies, which are the most productive. This initially creates increased income inequality, as only the most productive companies benefit from the broader global market and can pay higher wages to their workers.

Less productive companies cannot pay fixed export costs and can only access national markets or have to stop producing due to the increased competition they face within the domestic market. This implies that only the most productive companies, which have already been paying higher salaries, benefit from trade opening and end up increasing even more their employees' wages, who had already been earning higher wages than those of other companies, therefore, increasing income inequality.

However, as trade costs eventually fall, smaller and less productive companies can pay the fixed cost to export and gain access to international markets, allowing them to increase their sales and their labor demand. From a certain point of view, the entry of these less competitive companies to international markets reduces income inequality. At the limit, when trade costs are low enough, all companies enter the international market and this source of inequality disappears. The logic is similar to what takes place in Lewis' dual economy models and the effect of growth on inequality (Kuznets, 1955). Initially, reductions in trade costs offer new opportunities only to the most productive companies, and this contributes to inequality. However, when the trade opening process deepens and all companies have access to new opportunities, inequality decreases (see Chart 14).

CHART 14. Trade and Income Inequality



Source: Helpman *et al.* (2017).

Helpman *et al.* (2017) offer empirical evidence of these mechanisms in Brazil. According to their estimates, the movement from autarky to the observed level of trade in Brazil resulted in an increase of 7.5% in wage inequality. They also found that a further marginal reduction in trade barriers would be accompanied by an increase in income inequality in Brazil, at least until employment in exporting companies reached a 70% share of total employment. Their study evidence a share of employment in exporting

companies of 54%. Increasing that share from 54% to 70% would increase income inequality by 3%.

As from 70% onwards, any additional reduction to trade barriers that translates to an increase in the share of employment in exporting companies reduces income inequality. So the problem with income inequality in Brazil is not the excess of trade, but the lack of trade. When more than 70% of Brazilian citizens work in exporting companies, the deepening of trade will bring a decrease in income inequality.

Intra-regional trade can be an important tool to reduce export barriers, and as such it can allow a greater number of companies to access global markets, which would contribute to the reduction of income inequality. The reason is that one of the main trade barriers is related to issues of asymmetric and incomplete information that are accentuated outside the domestic market. Knowledge of the demand, its customs and contractual and legal requirements is more difficult to acquire in the international market.

Regional agreements can be a very useful instrument in this context because, through the preferences they offer; they tend to encourage companies to experiment with intra-regional exports. In this way, preferential access enjoyed under regional agreements increases the expected export profitability and pushes some companies to venture abroad and acquire information about the demand and market conditions outside domestic markets.

There is empirical evidence of this type of effects for the countries in the region. Borchert (2009) finds that the growth of Mexico's exports to other Latin American countries is positively correlated with the tariff preferences that Mexico receives within the North American Free Trade Agreement (NAFTA). A study conducted by Molina, Bussolo and Iacovone (2010) shows that tariff preferences encouraged small companies in the Dominican Republic to experiment in the Central American Common Market after their joining.

More generally, Albornoz, Calvo-Pardo, Corcos and Ornelas (2012) show that when companies experiment with new products in a foreign market, they acquire information about the demand in those markets, which facilitates future entry into markets similar to the initial market. In this way, regionalism helps to increase the share of companies and workers exposed to foreign markets and thus contributes to the reduction of income inequality.

6. Conclusions

Latin America and the Caribbean is one of the regions with the highest number of bilateral and regional trade agreements. However, the share of intra-regional trade is below the levels observed in other regions such as North America, Europe and Asia. One might think that one of the reasons is that trade agreements in the region have focused on the reduction of internal trade tariffs, but have ignored other trade barriers (transportation infrastructure and services, regulatory barriers and standards, etc.) which explains that internal trade barriers (other than tariffs) in the region are among the highest in the world. Given that barriers to extra-regional trade are also relatively high in Latin America and the Caribbean, this may explain their low levels of intra-regional and extra-regional trade, but it does not account for the small share of intra-regional trade compared to total trade.

An important precision in this conclusion is that the changes in extra-regional trade costs have tended to decrease in the region, while intra-regional trade costs have increased. This must be contributing negatively in the size of intra-regional trade share, although its temporal evolution is not very pronounced over the period under study. This is a worrying trend since the expected consequence of this phenomenon in economic geography models would be an impoverishment of Latin America (peripheral region). The correct policy response to this trend is to use instruments and investment tools that lower intra-regional trade costs and production costs in the region (see Moneke, 2020).

One possible explanation for the low level of share of intra-regional trade in total trade is the lack of integration of the productive chains of the different countries in the region (which, obviously, depends in part on the high costs of intra-regional trade). This results in intra-industry trade indices that are among the lowest in the world and a very low participation in regional and global value chains (with some exceptions in the case of global value chains, such as Mexico, Chile, Costa Rica, and Colombia). The lack of participation in these value chains implies a cost in terms of efficiency that damages the competitiveness of Latin America and the Caribbean when compared to other regions that are better integrated.

This low participation in value chains can be explained by the high costs of intra-regional and extra-regional trade, but, on the contrary, this cannot explain the relatively lower participation in regional value chains, since, as indicated above, both Intra-regional and extra-regional trade costs are high in Latin America and the Caribbean.

An explanation suggested by several authors (Cadestin *et al.* 2016; Estevadeordal and Salazar, 2017) has to do with the huge number of and lack of coordination among the 47 groups of rules of origin that exist in the region. These numerous and restrictive rules of origin lead to the almost complete nullification of the benefits associated with trade preferences and diminish the incentives to join global and regional value chains. It is not a surprise that countries in the region such as Chile, Costa Rica and Mexico, which have adopted more flexible types of rules of origin in their agreements, are also the ones that are better integrated into value chains.

The deepening and harmonization of existing agreements and the creation of new agreements between large blocs in the region (Mexico and Mercosur, for example), accompanied by more inclusive accumulation rules (such as those that allow accumulation between all preferential trading partners and the use of self-certification of origin by exporters), should allow the correction of this problem and facilitate greater participation in regional and global value chains.

In today's world, with tensions and trade wars that have already begun to affect countries in the region (with recent statements by the US president suggesting the imposition of barriers to exports from Argentina and Brazil into the United States), this deepening of the regional process can also serve as an insurance policy against a multilateral process that shows signs of deterioration. The greater uncertainty in multilateral relations should be responded to with greater certainty in trade links within the region.

Finally, while the most-recent literature on trade and inequality seems to suggest that international trade tends to be associated with increases in inequality within countries, the same literature points out that what is needed to reduce inequality is more, and not less, trade openness. In this way, more companies (and their workers) are allowed access to global markets, instead of having their incomes limited only by the potential of internal markets.

One way to enable a greater number of companies to participate in global trade is to allow these companies to reduce their costs in acquiring information on international markets, experimenting as an exporter within the region. A fundamental mechanism to create incentives for acquiring exports-related experience at a regional level is deepening the integration process in the region.

Bibliography

- Álvarez, R. and López, R. (2005). “Exporting and performance: Evidence from Chilean firms.” *Canadian Journal of Economics* 38(4), 1384-1400.
- Albornoz, F., Calvo-Pardo, H., Corcos, G., and Ornelas, E. (2012). “Sequential exporting.” *Journal of International Economics* 88(1), 17-31.
- Amiti, M. and Konings, J. (2007). “Trade liberalization, intermediate inputs and productivity.” *American Economic Review* 97(5), 1611-1638.
- Arvis, J.-F., Shepherd, B., Duval, Y., Utoktham, C., and Raj, A. (2015). “Trade costs in the developing world: 1995-2012.” Working Paper Developing Trade Consultants 2015-2.
- Baldwin, R. (2012). “Trade and industrialization after globalization’s second unbundling: How building and joining a supply chain are different and why it matters. R. Feenstra and A. Taylor (eds.), *Globalization in an age of crisis: Multilateral economic cooperation in twenty first century*. University Chicago Press.
- Baldwin, R. (2014). “WTO 2.0: Governance of 21st. century trade.” *The Review of International Organizations*. 9(2), 261-83.
- Bernard, A. and Bradford, J. (1999). Exceptional exporter performance: Cause, effect, or both? *Journal of International Economics* 47(1), 1 – 26.
- Bhagwati, J. (1992). “Regionalism and multilateralism: An overview. J. de Melo and A. Panagariya (eds.), *New dimensions in regional integration*. Cambridge University Press.
- Blyde, J. (2014). *Synchronized factories: Latin America and the Caribbean in the era of global value chains*. Springer.
- Bohara, A., Gawande, K., and Sanguinetti, P. (2004). “Trade diversion and declining tariffs: Evidence from Mercosur.” *Journal of International Economics* 64(1), 65-88.
- Borchert, I. (2009). *On the geographic spread of trade*. Mimeo. World Bank.
- Bourguignon, F. (2016). *The globalization of inequality*. Princeton University Press.
- Brühlhart, M. (2009). An account of global intra-industry trade, 1962-2006. *World Economy* 32(3), 401-459.
- Burstein, A. and Vogel, J. (2017). “International trade, technology and the skill premium.” *Journal of Political Economy* 125(5), 1356-1412.
- Cadestin, C., Gourdon, J., and Kowalski, P. (2016). “Participation in global value chains in Latin America.” OECD Trade Policy Paper 192. Paris: OECD.
- Carballo, J., Graziano, A., Schaur, G., and Volpe, C. (2016). *The border labyrinth: Information technologies and trade in the presence of multiple agencies*. Mimeo, IDB.

- Carballo, J., Schaur, G., and Volpe, C. (2016). *Trust no one? Security and international trade*. Mimeo, IDB.
- Carrère, C. (2006). "Revisiting the effects of regional trade agreements on trade flows with proper specification of the gravity model." *European Economic Review* 50(2), 223-247.
- Chang, R., Kaltani, L., and Loayza, N. (2009). "Trade can be good for growth: The role of policy complementarities." *Journal of Development Economics* 90, 33-49.
- Crivelli, P. (2016). "Regionalism and external protection in high and low tariff members." *Journal of International Economics* 102(C), 70-84.
- Edwards, S. (1998). Openness, productivity and growth: What do we really know? *Economic Journal* 108(447), 383-398.
- ESCAP (2018). *ESCAP-World Bank Trade Cost Database*. The Economic and Social Commission for Asia and the Pacific (ESCAP). Available at: <https://www.unescap.org/resources/escap-world-bank-trade-cost-database>
- Estevadeordal, A. and Salazar, M. (2017). "Acuerdos regionales de comercio y el futuro de América Latina." *Puentes* 18 (7). ICTSD.
- Estevadeordal, A. and Souminen, K. (2008). "Trade effects of rules of origin." A. Estevadeordal and K. Souminen (eds), *Gatekeepers of Commerce: Rules of Origin in Regional Trade Agreements*.
- Fernandes, A. M. and Isgut, A. (2005). "Learning-by-doing, learning-by-exporting, and productivity: Evidence from Colombia." Policy Research Working Paper 3544. Washington, D.C.: World Bank.
- Frankel, J. and Romer, D. (1999). "Does trade cause growth?" *American Economic Review* 89(3), 379-99.
- Freund, C. and Bolaky, B. (2008). "Trade, regulations, and income." *Journal of Development Economics* 87(2), 309-321. Available at <https://ideas.repec.org/a/eee/deveco/v87y2008i2p309-321.html>
- Freund, C. and Ornelas, E. (2010). Regional trade agreements, *Annual Review of Economics*, Annual Reviews, vol. 2(1), 139-166. Available at: <https://ideas.repec.org/a/anr/reveco/v2y2010p139-166.html>
- Galiani, S. and Sanguinetti, P. (2003). "The impact of trade liberalization on wage inequality: Evidence from Argentina." *Journal of Development Economics* 72, 497-513.
- Helpman, E., Itskhoki, O., Muendler, M.-A., and Redding, S. (2017). "Trade and inequality: From theory to estimation." *Review of Economic Studies* 84, 357-405.
- Labraga, J. and Vaillant, M. (2019). "Integración en la era progresista: Mercosur una promesa incumplida." Documento de trabajo del Departamento de Economía, Facultad de Ciencias Sociales, UdelaR.
- Lalanne, A. (2019). "Fragmentation of production from a regional perspective: An application for the South American case." Working Paper from the Department of Economy, School of Social Sciences, University of the Republic of Uruguay.
- Lendle, A., Olarreaga, M., Schropp, S., and Vézina, P.-L. (2016). "There goes gravity: eBay and the death of distance." *Economic Journal* 126 (591), 406-441.

- Matsuyama, K. (1992). Agricultural productivity, comparative advantage and economic growth. *Journal of Economic Theory* 58, 317-354.
- Mattoo, A., Mulabdic, A., and Ruta, M. (2017). "Trade creation and trade diversion in deep agreements." Policy Research Working Paper 8206. Washington, D.C.: World Bank.
- Molina, A.-C., Bussolo M., and Iacovono, L. (2010). *The DR-CAFTA and the extensive margin: A firm level analysis*. Mimeo. Graduate Institute of International and Development Studies.
- Moncarz, P., Vaillant, M., and Olarreaga, M. (2016). "Regionalism as industrial policy." *Review of Development Economics* 20(1), 359-373.
- Moneke, N. (2020). "Can big push infrastructure unlock development? Evidence from Ethiopia." Job market paper, London School of Economics.
- Novy, D. (2013). "Gravity redux: Measuring international trade costs with panel data." *Economic Inquiry* 51 (1): 101-21.
- Pavcnik, N. (2002). "Trade liberalization, exit and productivity improvements: Evidence from Chilean plants." *Review of Economic Studies* 69(1), 245-276.
- Robertson, R. and Estevadeordal, A. (2009). "Gravity, bilateral agreements, and trade diversion in the Americas." *Cuadernos de Economía* 46, 3-31.
- Rodríguez, F. and Rodrik, D. (2000). "Trade policy and economic growth: A skeptic's guide to the cross-national evidence." B. Bernanke and K. Rogoff (eds.), *NBER Macroeconomics Annual 2000*, vol. 15, pages 261-338.
- Rybczynski, T. (1955). "Factor endowment and relative commodity prices." *Economica* 22(88), 336-341.
- Sachs, J. and Warner, A. (1995). "Economic reform and the process of global integration." *Brookings Papers on Economic Activity* 1995(1):1-118.
- Topalova, P. and Khandelwal, A. (2011). "Trade liberalization and firm productivity: The case of India." *The Review of Economics and Statistics* 93(5), 995-1009
- Tovar, P. (2019). "Preferential and multilateral liberalization: Evidence from Latin America's use of tariffs, antidumping and safeguards." *Journal of Development Economics* 141.
- Van Biesebroeck, J. (2005). Exporting raises productivity in sub-Saharan African manufacturing firms. *Journal of International Economics* 67(2), 373-391.
- Ventura, J. (1997). "Growth and interdependence." *Quarterly Journal of Economics* 112(1), 57-84.
- Wacziarg, R. and Welch, K. (2008). "Trade liberalization and growth: New evidence." *World Bank Economic Review* 22(2), 187-231.



Digital Revolution **and Employment in Latin America**

09

Eduardo Levy Yeyati
*Universidad Torcuato Di
Tella and NBER*

The author thanks the invaluable collaboration of Martín Montané and Luca Sartorio, and the comments of Pablo Sanguinetti, Lucila Berniell, and Christian Daude for the ideas and organization of this chapter. Any remaining errors the reader may find are solely attributable to the author.

1. Introduction

Because in many cases, the debate is ahead of empirical evidence available, the discussion about the impact of technology on employment creates divisions. On the positive side, there are those who point out that technologies that favor the digitalization and automation of production processes, the use of large databases (*big data*), blockchains, and the Internet of things will cause sustained increases in productivity by drastically reducing production and transaction costs, facilitating product and service innovation and diversification (which could, in turn, create new jobs and income-generating opportunities for workers and entrepreneurs). On the negative side, some argue that these aspirations collide with a reality in which productivity does not grow enough, fueling fears that a secular standstill (Gordon, 2000; Summers, 2015) or an increase in productivity concentrated in few hands – as in the case of technological “superstars”– (Autor *et al.*, 2017), inhibit the incentives for investment in research and development necessary for these technologies to evolve and flourish.¹

In both cases, but especially if the incentives for technological change are preserved, there is a certain risk that these changes, both in the relative demand of factors and in the modes of production, will generate disruptive consequences in the labor market by replacing human labor or eliminating labor-intensive links in sectors as diverse as retail sales, transportation, and logistics, or audiovisual media. In other words, many fear that the acceleration of technological progress and task automation will usher machines and programs into replacing human labor. The impact on consumption would lead to a secular standstill (Frey, 2015). Others fear an exacerbated competition for any remaining jobs at the expense of wages, as evidenced by the recent drop in the product’s wages share and the relative fall in low and medium-rating jobs’ salaries in developed countries (Autor, 2015).

The potential impact of new digital technologies on employment and labor income distribution has generated worldwide concern, sparking off a debate about the future of jobs and the appropriate regulatory and political response to this new context. Driven by the alarming forecasts of the first estimates (Frey and Osborne, 2017; World Bank, 2016), the discussion originally focused on technological unemployment: a dystopian fantasy of a world in which

¹ An alternative version of this problem is the one that arises from the debate on the measurement of national accounts (in particular, of GDP) and its inadequacy to reflect the appearance of better quality and variety of products and services (Byrne *et al.*, 2016), both in the technology and service sectors (Hsieh and Rossi-Hansberg, 2019). It could be also said that much of the added value by the free digital economy (the most mentioned case, but not the only one, is that of free information on the Internet) is only partially commercialized (for example, through the sale of information on its users) and does not enter GDP measuring (Nakamura *et al.*, 2017).

“hard” and “soft” machines replaced labor, making human activity redundant in the production of goods and services, and in which labor income was a thing of the past.

Far from this dark scenario, evidence has confirmed that the digital revolution seems to have a mildly positive impact on the number of “human” employment and its aggregates (Autor and Salomons, 2017; 2018). Productivity profits increased by technology in any given industry lead to a decrease in employment in that industry (“direct negative impact”), but boost employment in other related ones (“indirect positive impact”) due to lower costs (if technology cheapens intermediate goods and services’ production) or higher demand (higher disposable income derived from cheaper final goods and services).

In addition, more recent forecasting about jobs at risk, based on a “critical threshold” of automatable *tasks* (as opposed to thresholds defined by *jobs*), led to significantly lower labor exposure rates: for example, a 2017 study conducted by the McKinsey Global Institute finds that, for 60% of the jobs, at least 30% of their tasks are replaceable and only 5% of the jobs are entirely made up of replaceable activities. Consider, for example, a general practitioner who diagnoses using IBM’s Watson-like *software*: neither Watson replaces general practitioners, nor do they compete with the system; both complement each other. The general practitioner is “partially automatable.” In this sense, a recent work by Freeman, Ganguli, and Handel (2020) points out that, based on data from the United States O*Net questionnaires, variations in the tasks performed by workers are due less to changes in employment jobs rather than changes in the composition of tasks within each job. Rather than disappearing as a result of technology, jobs will probably change in their task composition, as has been the case for years.²

However, the degree of potential automation of a certain task does not necessarily entail that such task will actually be replaced by machines. Technology adoption may not occur in the short term, even when there is technical competence to do so. Issues connected with profitability; legal, ethical and cultural restrictions –hard to predict –; or the political economy of the technological change – which considers the socio-economic impact of job displacement – make that transition difficult.

Nevertheless, there are three aspects of the previous analysis that suggest current partial conclusions should, at least, be explained. Firstly, theory and debate may be moving ahead of data. The new industrial revolution does not consist of robots in the strict sense, but of artificial intelligence. The new automation does not replace humans (something that has been happening for a long time). Instead, it competes with the human brain, above all, in more analytical tasks that require using and combining information and knowledge on a large scale. Since automation has come true for practical purposes in the past few years –and, as Brynjolfsson, Rock, and Syverson (2017) suggest, it may take years to reveal all of its impact–, the empirical findings that inform the debate cannot fully grasp the effect of automation on employment.

² This means that what we call “job” is a set of changing tasks. As it will be seen later, this should explain the results of the working positions’ estimates subject to automation, which implicitly entail a menu of stable composition jobs.

Secondly, human capital is not expendable: labor competencies can only be partially transferred between jobs. An approach to the net impact of technology on aggregate hours overlooks what we believe to be its most immediate impact on the labor market: a combination of a change in the characteristics of demand (related to skills, age, gender, or contractual terms) and a limited transferability of these characteristics. This means that the excess supply of displaced workers in automated activities and the extra demand for new jobs may not be mutually offset. Thus, even if technology created as many positions as it destroys, or even if changes in labor demand took place *within* the same jobs (if, as Freeman *et al.*, 2020 suggested, jobs keep their names but change attributes and tasks, hence changing the profile of workers), the impact these changes could have on job composition would have immediate unintended socio-economical effects.

Finally, most of the existing analysis is based on few developed economies. It could be guessed that the two issues above are even more relevant in developing economies, where technology introduction is still incipient, and workers are less educated (their skills are less transferable).⁵ Estimates of labor exposure to automation are based on the task descriptions of individual jobs in the United States, which *a priori* should differ considerably among countries (consider a construction worker in the United States, Europe, and Bolivia). Similarly, studies on self-employment tend to focus on platform workers (e.g., Uber) in developed economies and often exclude low-wage, low-skilled, informal self-employment from developing economies, employment about which there is little systematic information –the impact of technology on this labor universe is prematurely difficult to anticipate.

To sum up, we are far from making predictions like “X number of tasks in job Y will be replaced in Z years” or “X percent of tasks in job Y will be automated in Z years.” The maturing time of technology introduction does not eliminate the risk and need for a debate, but it grants time to gather evidence for our assumptions and measure the policies necessary to moderate the unwanted effects. On the other hand, we still do not have enough information on regions such as Latin America to describe the strengths and weaknesses; we only have the feeling that the majority of our workers, due to their low rating and poor transferability could be closer to the firing line. If we also consider that we live in a region with structural deficits as to quality employment that affect growth, equity, and fiscal solvency, the need to document technologies’ employment impact becomes evident. It is also surprising that this debate still come in second place when discussing the region’s public policies.

This chapter tries to synthesize existing theory and evidence regarding this debate in the regional context.

5 It could be argued that the first works on the subject pointed to non-routine or empathy-based manual tasks as less automatable and that, within this group, there are low-rating jobs (for example, housework or caregiving tasks). Regardless of whether this remains true in the future, this argument does not invalidate the advantages of skills. The jobs mentioned tend to be precarious and low-paying (despite the growing demand), in part because they compete with those displaced in the average rating group. The focus on the impact on employment sometimes overshadows the impact on wages, which, based on the preliminary evidence available, would appear to be the predominant response.

2. Labor polarization and wage dispersion

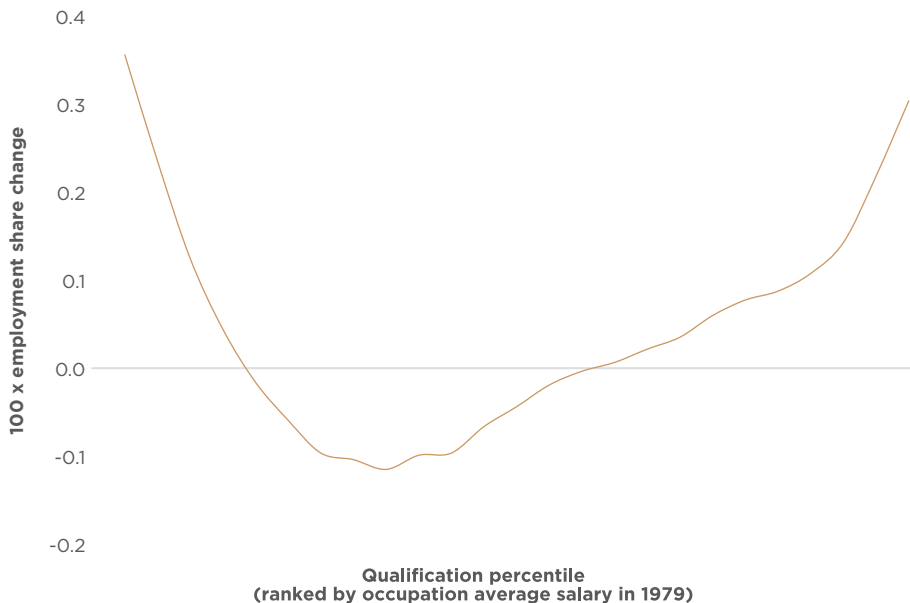
Starting with the works of Autor, Levy, and Murnane (2003), and Acemoglu and Autor (2011) and their hypothesis of “*skill-biased technological change*”, automation analysis has been changing its focus, moving away from the concept of full-time jobs to concentrate on their composition: replacement affects particular tasks within each job position. Specifically, it tends to replace “routine tasks”, which follow a set of easily definable procedures and can be specified through a series of executable instructions by computerized equipment. In fact, if the procedure necessary to perform a task can be specified, it is possible to describe that task in a coded language and automate it. This reasoning recalls the historical quote of the mathematician John von Neumann: “If you tell me precisely what a machine cannot do, then I can always build a machine to do just that.” These routine tasks are typically characteristic of middle-income and mid-rating jobs, both in “*blue-collar*” manual jobs and in trades and manufacturing jobs replaced by industrial equipment and administrative and “white collar” jobs, more threatened by algorithms and the increasing volumes of data.

In contrast, computers and robots tend to face obstacles to perform tasks in unpredictable environments and hard-to-define execution processes. As Autor (2015) argues, computers do not think for themselves, do not have common sense and do not improvise solutions for unexpected scenarios. If the person who designs computers’ functionalities cannot rigorously understand the sequence of steps to execute a specific task, such a person will not be able to develop a program that allows the machine to simulate a defined procedure. Autor calls the “Polanyi paradox” (with reference to Michael Polanyi, who said that humans “can know more than we can tell”) the fact that automation is limited when dealing with a series of extremely familiar tasks with unclear or undefined “rules”.

This framework distinguishes two types of “non-routine tasks” distant to technology: “abstract tasks”, which require skills such as creativity, originality, persuasion or problem solving, among others (typical of managerial, technical and professional jobs, generally highly qualified), and “non-routine manual tasks”, which require visual and language recognition, personal interaction, and situational adaptability (typical in low-skilled services such as cleaning, cooking, security, transportation, or child and elderly care). Despite their unsophisticated nature, these last tasks appeal to inherently human virtues that do not follow explicit and easy-to-define rules, such as the empathy of a caregiver or the adaptability of a security guard to changing environments in unpredictable contexts.

As it was already mentioned, the relatively stable level of employment in the face of technological changes and digitalization hides important distributive consequences, resulting from the creation and loss of different types of jobs. In developed economies, the main phenomenon associated with these trends is labor polarization, highly documented in literature: growth in the share of total employment in high-rating and low-rating jobs, at the expense of medium-rating jobs, usually considered “middle-class” jobs (Chart 1).

CHART 1. Changes in Employment by Job Rating Intensity Percentile, 1979-2012



Note: The chart adds the changes in the labor share of every percentile during each of the decades reported in Autor (2015).

Source: Levy Yeyati and Sartorio (2018).

From this labor polarization, one might expect a similar polarization of labor income, with wages at both ends of the rating benefiting at the expense of “middle” wages. However, employment polarization is essentially a demand story that does not translate into wage polarization. Any systematic impact on wages must consider several aspects that condition the effects of demand on labor price.

The first one is trivial, statistical (McIntosh, 2013): if wages in each job remain constant, employment polarization will increase the analyzed wage inequality. For example, the ratio between wages in the 90th and 10th percentiles would increase simply because the number of high and low-wage jobs increases (the 90th percentile wage rises with the number of high-wage workers, and the 10th percentile decreases).

Another more intuitive aspect refers to the complementarity of technology and work, greater high-rating abstract tasks in goods and services. Highly qualified jobs develop more complementarities with new technologies as opposed to low-rating jobs: a petroleum engineer nowadays uses more productive equipment; a senior manager can perform sophisticated analysis using large databases; a software developer can create applications with greater functionalities and services for the end-user. In contrast, the daily routine of a waiter or cleaning employee has largely remained unchanged over the past 80 years, and digital progress has not substantially altered the value of work produced in low-rating services. In other words, labor productivity in the highly qualified group goes in the same direction as the demand for employment, while in the low-rating group, it is—at best—neutral (Autor, 2014).⁴

Finally, and perhaps more important for Latin America, the transmission of the demand for employment to wages is conditioned by the elasticity of the job offer, higher in medium and low rating tasks, due to the need for less training and to greater transferability of the tasks involved. In particular, as Autor (2014) points out, pay increases in intensive manual-task jobs tend to generate a quick response regarding the offer. If we also consider that displaced workers in the middle group compete for jobs of the same or lower rating—precisely because of their lower entry costs—at the expense of less qualified workers, we understand why employment polarization translates into greater wage inequality—between highly qualified jobs, on the one hand, and those with a medium and low rating, on the other hand— (Chart 2). In other words, displaced workers compete for the most basic jobs, decreasing low wages and widening the job gap.⁵

4 Autor also mentions the greater elasticity of demand for qualified services (education, health, finance, and design) and discusses the reasons behind the growth of the share of these services in total expenditure.

5 In this framework, professional training and retraining policies become particularly important since they prevent these workers from pay scale slippage (or workers' discouragement), the loss of human capital that disorderly displacement implies, and its consequences in terms of income inequality.

CHART 2. Changes in Average Pay by Rating Intensity Percentile: Full-time Employees Yearly

Note: The figure shows the average pay changes in each of the decades reported by Autor (2015).

Source: Levy Yeyati and Sartorio (2018).

3. Concentration of economic activity and drop in labor share regarding income

As it was mentioned, the immediate impact of technology can be seen more directly in labor income than in the feared technological unemployment. The other side of polarization does not only account for a growing wage inequality resulting from the disruptive changes of the digital revolution, but also a drop in the wage share regarding products.

Indeed, the growing disparity between workers is accompanied by a growing gap between labor and capital regarding total product distribution, both in developed and developing countries, as evidenced by the empirical literature. When analyzing the 1975–2012 period, Karabarbounis and Neiman (2014) find a decrease in labor-force participation in 42 of the 59 countries in their sample (statistically significant in 37 of them), including seven of the eight largest world economies. In a recent report by the International Monetary Fund (IMF) with more than 60 countries, Dao, Das, Koczan, and Lian (2017) documented the downward trend in labor-force participation of both advanced and emerging economies (in the latter case, evolution is more heterogeneous, but both the average and the median economy confirm the declining trend).⁶

As expected, one of the main mechanisms behind the labor-force participation drop regarding income is related to the automation of employment. In their analysis of 19 advanced economies, Autor and Salomons (2018) find that technological improvements (which drive productivity growth in the benefited value chain) have negative effects on wage share regarding income—even in the cases in which these changes generate increases in the economy's aggregate productivity, boosting employment through their indirect effects.⁷ In other words, it is not a question of a drop in labor income, but rather a lesser increase than the total income.

This negative bias of technological change in the wage share regarding income is not a peculiarity of advanced economies. Dao *et al.* (2017) document a negative effect of technological change in emerging markets, excluding China, in 1993–2014. According to this empirical research, the interaction between high exposure to routine tasks and the change in the relative price of investment goods explains a significant drop in labor share both in developed and emerging countries.⁸

6 Other researchers that report a drop in labor-force participation since the 1980s and 1990s in large groups of countries are Piketty (2014) and Autor, Dorn, Katz, Patterson, and Van Reenen (2017).

7 More precisely, indirect mild effects of productivity growth on wage share (through the impact on other links in the production chain in which the activity benefited by technological changes is registered, and on disposable income and goods and services final demand) do not compensate for the reduction in wage share within the activity subject to these technological changes.

8 The authors mention other possible causes behind the drop in labor share, including the cheapening of physical capital thanks to technology in the developed world and globalization in developing economies.

What is behind this pattern? To what extent does technology fall upon the factorial distribution of products? In recent literature, the high concentration observed in a large part of the new digital economy, which takes advantage of its market power to obtain lower wages is one of the mentioned mechanisms (Levy Yeyati and Sartorio, 2018)

The most notorious companies in the digital economy (the “superstars”) often operate under the “winner-take-all” logic, typical of network economies, whereby performance grows with the market fraction. Social media provides the classic example: we all prefer to chat on the platform where we find most of our acquaintances or trade on buying and selling websites where there are more suppliers, more users reviewing products, and a solid base of potential customers. Furthermore, many digital giants have strong blocking effects (incentives to block customers’ migration to other potential competitors). Think of a program or an operating system whose languages and customs are well known by customers and developers, or a social network that stores a lot of shared information of interest to the user. And there are, in many cases, increasing returns to scale if, for example, the number of customers improves the quality, quantity, and efficiency of the product, as in algorithmic search engines. In turn, these network externalities favor concentration and imply high margins and profits for these companies. The concentration process itself leads to a drop in the average wage share as to income within these industries as allocated resources concentrate on some companies within the same sector (Autor *et al.*, 2017). An alternative –but related– argument points to the impact of these superstars’ market power on their costs, in particular, on workers’ wages. By concentrating a significant fraction of the labor demand in the activity –and often in the job search zone–, they have monopsony power in hiring labor workers and can pay lower wages.⁹

Recent studies show that, as from the 1980s, the drop in labor-force participation in the United States was accompanied by a decrease in the traditional capital income share, in favor of a higher share of business income tied to the growing power market of companies (Barkai, 2019; De Loecker and Eeckhout, 2017; Kurz, 2017). Not without controversy, this phenomenon has begun to be related to the specific characteristics of the digital economy market. Kurz (2017), for example, documents that companies whose business models were transformed by information technology (IT) development are particularly predominant in market concentration growth. Thirty-six out of the 50 companies with the highest extraordinary income in 2015 were key players in the digital revolution, and many of them did not even exist in the mid-1970s. In this connection, in the United States and the European OECD countries, labor-force participation decreases the most in industries where the superstars obtained the largest market share, which –in turn– tend to be those industries that experienced the greatest technological changes (Autor *et al.*, 2017). On the other hand, in the United States, there is a positive tie

9 Dube Jacobs, Naidu, and Suri (2020) find this for online work based on data from the Amazon Mechanical Turk. The evidence on the relationship between concentration and wages is more general. Abel Tenreyro and Thwaites (2018) exhibit a recent example.

between the share of a company's IT workers and their relevant market share, labor productivity, and operating margins (Bessen, 2017).¹⁰

In any case, the concentration of these new markets, which is not necessarily associated with little-competitive practices, presents unprecedented challenges for competitive regulations since they must not only prevent abuse but also contain the effects on equity, all this without penalizing innovation. This is a challenge that is just entering the political debate in the developed world¹¹ and that, for several reasons, is even more urgent in our region, where the effects of concentration are combined with transnationalization (scale economies penalize small markets) and the presence of a less qualified labor force (less elasticity of the job offer to wages) and, therefore, more exposed.

10 According to Bessen, it is not the use and promotion of technology per se that stimulates concentration but the development of markets where these systems are owned by a single company. For example, the telephone or fax service also involves strong network effects, but the telephone network is not owned by only one single company, and companies compete with each other to offer the best service within the same network. In contrast, in the case of digital platforms or operating systems on which developers operate, the network is owned by a single provider (or a few networks coexist and offer services with a certain degree of differentiation).

11 This has been the criterion adopted by the European Commission in recent decisions against Google (a USD 2.7 billion fine for several non-competitive practices, including the privileged placement of its own services), Amazon (forced to change the terms of the agreement with e-book publishers), and Facebook (a USD 122 million fine for evading its commitment not to combine data sets with the recently acquired WhatsApp).

4. Polarization in Latin America: from the “U” of Employment to the “L” of Wages

Estimates from the CAF (2016), the World Bank (2016), and Maloney and Molina (2016) indicate the absence of employment polarization generalized patterns, such as those observed in high-income countries. Furthermore, Dao *et al.* (2017) find a drop in labor-force participation in these economies, but with a much more heterogeneous behavior than in advanced economies, making general and comprehensive analysis difficult.¹²

Finally, far from being a novelty of the digitalization and the knowledge economy, self-employment is a historical characteristic of these economies as the strong incidence of self-employment and informality—later in this chapter—is not a recent phenomenon.

Should we then disregard these concerns? On the contrary, there are reasons to think that technological change is as urgent as in advanced countries.

According to Das and Hilgenstock (2018), exposure to routine employment (industrial, office, and administrative jobs) has grown steadily in emerging and developing economies, in contrast to high-income countries. Even when the effect is not as profound as in advanced economies, Dao *et al.* (2017) identify a negative partial impact of technological change on the variation of labor-force participation in emerging countries. However, both studies show that a predominant factor behind the recent evolution of labor participation in emerging countries' income is globalization driven by low wages. This fact opens up additional exposure to automation. Not only does technology tend to replace these jobs more easily—as it is already happening in Southeast Asia—but it also reduces the comparative advantages of emerging economies—low wages—. Thus, there has been a trend toward deglobalization (*reshoring*) of previously relocated links in the value chain (for example, transferring labor-intensive sections from Southeast Asia to Eastern Europe). The impact of this incipient trend in Latin America will be very assorted. Just as the region did not benefit from globalization, Latin American countries will be less exposed to this deglobalization or could even benefit from it—as in the case of Mexico, a destination of the relocation of the United States' industry.

Unfortunately, the vast majority of academic production that has tried to analyze empirically the labor and distributive impacts of technological change has been highly concentrated in advanced economies. There is little evidence available and it is biased in many cases as the databases used describe

¹² In the particular case of Latin America, the analysis becomes more complex because—from the late 1990s to the mid-2010s, and unlike the rest of the world—premiums for secondary and higher education fell. In part, this drop resulted from an increase in the supply of skilled workers (education coverage). This higher supply does not necessarily respond to the demand evolution for skills due to the technological change (see Levy Yeyati and Pienknagura, 2014, and Nora Lustig's Chapter 7 in this book).

different labor realities (for example, the O*Net, used in the mentioned World Bank study). Such evidence indicates that there are relevant differences in the degree of exposure, adaptation speed, and pre-existing preparation of workers and safety nets to adapt to these disruptive changes.

A particular bias must be taken into account when analyzing the literature applied to countries in the region. It has already been mentioned that our workforce's human capital is lower than that of the developed countries illustrated by the U-shaped curve of polarization, but how different are they? And what specific implications does it have on the metrics seen so far?

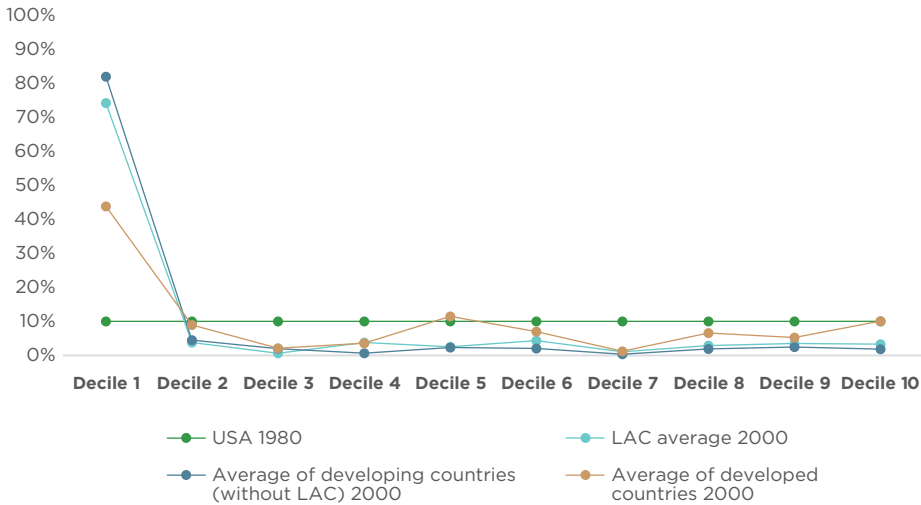
Levy Yeyati and Sartorio (2020) do a simple exercise to answer this question: they map the distribution of skills by employment type in Latin American countries, in other developing and developed countries in 2000. To do this, they use the skills distribution scale of the United States in 1980 (starting point of several polarization charts, including the U-shaped curve of labor polarization mentioned above).

Mapping is not trivial: it requires an absolute measure of competence, i.e., one that is comparable across countries. In the chart, education content is used as a proxy for rating level. More specifically:

1. It defines a skill scale for each job based on education (1 = incomplete primary school; 2 = primary school; 3 = secondary school; 4 = university).
2. It calculates the average education level of workers in each individual job in the United States in 1980.
3. It ranks jobs according to their average level of education in the United States in 1980.
4. It divides jobs into deciles (each decile includes 10% of the jobs).
5. This ranking provides for minimum and maximum education values for each decile.
6. It replicates the calculation for other countries in the 2000s.
7. It locates jobs according to the average level of education and the United States' relevant ranges in 1980.

As observed in Chart 3, the rating level thus measured in all the sample countries is substantially lower than that of the United States twenty years earlier. Moreover, supposing in these countries, as in the United States, jobs from the 50% bottom are those that suffer the most from the impact of technological displacement on labor income. In that case, the problem is much more serious, since the majority of the labor force is precisely included in these deciles.

CHART 3. Distribution of Jobs by Average Level of Education in the United States in 1980 vs. Latin America and Developed Countries



Note: LAC includes Argentina, Costa Rica, Chile, Ecuador, Paraguay, the Dominican Republic, and Uruguay. Developing countries include Botswana, Fiji, Ghana, India, Malaysia, Morocco, and Thailand. Developed countries include Spain, Greece, Hungary, and Portugal.

Source: Levy Yeyati and Sartorio (2020).

In simple terms: seventy-five percent of Latin American workers perform medium-skilled jobs (strictly speaking, an average educational level of Latin American workers) similar to that of the bottom decile in the United States in the 1980s. According to the literature, this group is exposed to wage pressure resulting from competition with technology. For the sake of data conciliation (this result vs. estimates from the World Bank or the McKinsey Global Institute), it should be noted that these are based on two rather heroic assumptions: 1) that job X has the same task composition everywhere; 2) that the representative worker of job X has the same skills everywhere. Assumption 1 is difficult to validate due to the lack of compilations similar to the O*Net in other countries. Chart 1 challenges the second assumption: based on task descriptions of jobs in the developed world, if skill level is correlated with exposure to automation, estimates for the developing world would be biased.¹⁵

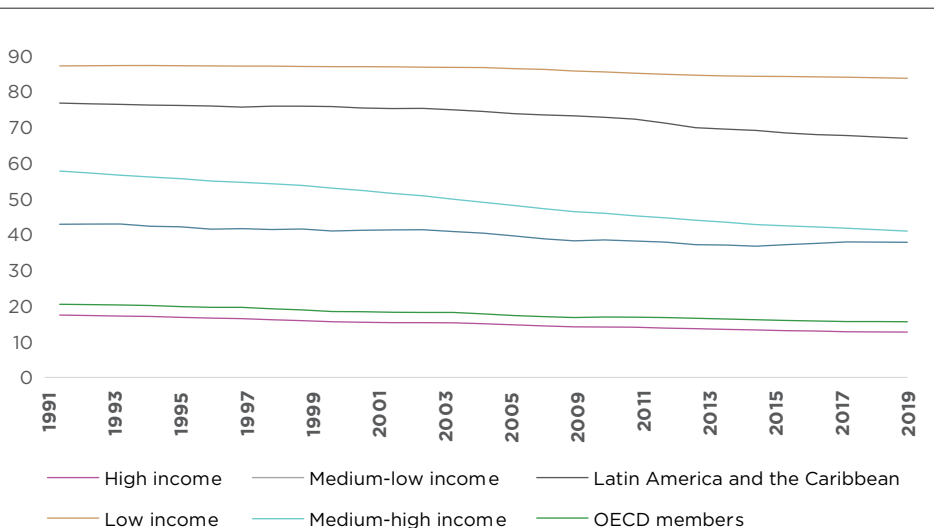
¹⁵ It is difficult to compare the intensity of occupational skills between countries due to the lack of common nomenclature.

5. New types of employment

Another main challenge associated with technology's disruptive changes is their potential distributive impact between salaried and independent workers. At the digitalization boom, collaborative economy platforms could expand self-employment not achieved by labor regulation and social protection systems.

This concern may seem rushed in a context where there is no visible growth in self-employment as part of total employment, neither in high-income countries nor in low-income countries. On the contrary, self-employment would be stable or decreasing worldwide (Chart 4). However, three considerations must be kept in mind. First, labor surveys are limited in tracking the growth of these contractual arrangements and often classify workers only by their main occupation, ignoring the income-generating activities of people that supplement their primary labor income. Second, it is logical to think that we are just “on the tip of the iceberg”, since the gig economy is expected to grow soon.

CHART 4. Self-Employed Workers (% of Employed)

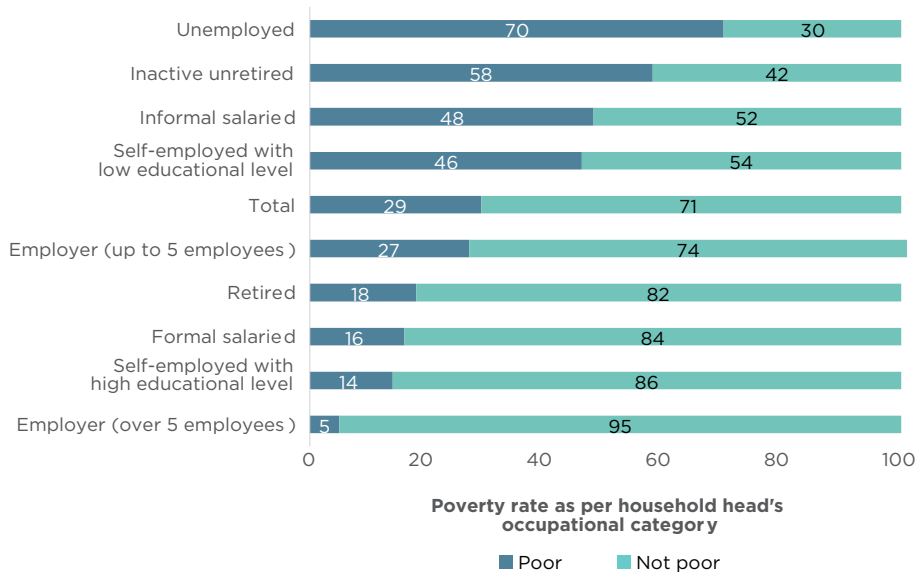


Note: It includes four subcategories: employers, self-employed, members of producer cooperatives, and family workers.

The third aspect is more local. These new types open a priority discussion in Latin America due to the historical prevalence of non-salary work arrangements. Countries with fewer resources are characterized by a higher proportion of independent workers (mostly precarious) and a lower proportion of workers under a contract of employment, especially in rural areas and urban peripheries. This fact complicates the statistical distinction between the new types (temporary or gig workers [*giggers*] and independent workers [*freelancers*]) and precarious work.

One way to distinguish both groups of freelancers easily is by educational level. Chart 5 exhibits an example of this type of classification for Argentina. With the caveats of simplification, data shows that the representative self-employed (a low-rating and low-wage precarious) worker is closer to the subsistence farmer, the informal salesperson, or the small workshop worker when compared to the qualified *freelance* programmer or designer, characteristic of urban areas in industrial countries or high-income neighborhoods in Latin American cities.

CHART 5. Two Types of Latin American Self-employment: Argentina's Example



Source: Levy Yeyati (2018), based on the Continuous Household Survey.

The new types of employment –typical of the collaborative economy– can be seen as a natural evolution of work arrangements or as growing disorder symptom. When they result from an active choice of individuals, they are a clear reflection of the workers' preference for agreements that give them autonomy to choose projects, clients, and schedules. However, the growth of these contracts may also be the result of an increase in displaced workers from the traditional formal sector of the economy, who –unable to access a

stable job— decide on specific or temporary platform jobs (*gigs*) that, in most countries, lack social protection benefits. In the case of an active choice, it may even happen that freelancers underestimate the deficits of this type of employment in terms of benefits, stability, and financial inclusion, creating a contingent liability that public policy should not ignore.¹⁴

How much choice and how much need is there in these contractual arrangements? There are few large-scale studies that seek to answer this question, and most of them have been carried out in developed economies. A survey conducted by the McKinsey Global Institute in 2016, and based on 8,000 interviews in high-income countries, showed that approximately 70% of freelancers said they preferred their respective work arrangements, and only 30% answered that they agreed to work under these conditions out of necessity or as a last recourse. However, this reality is hardly comparable to that of freelancers in emerging or developing economies. It is typically more associated with low-wage, low-rating jobs (as described above) than with high-quality self-employment activities; thorough research is required to characterize this phenomenon. For example, Levy Yeyati (2018), based on the 2017 household survey in Argentina, estimated that the ratio of voluntary freelancers in that country is similar to that of the McKinsey study: 71%. However, the percentage of full-time self-employed workers (whose main and often only income comes from independent work) is 82%, almost double the average reported for developed countries.

TABLE 1. Freelance Work: Obligation or Choice?

| 2017 | Full-time | Overtime |
|--------------------------------|-----------|-----------|
| Freelancers "by choice" | 57% (30%) | 14% (40%) |
| Freelancers "out of necessity" | 25% (14%) | 4% (16%) |
| Total | 82% (44%) | 18% (56%) |

Note: Percentage (without parentheses) figure for the case of Argentina; in parentheses, percentage of developed countries.

Sources: Argentina, Levy Yeyati, (2018), based on the Continuous Household Survey (criterion: not looking for another job or working more hours). Developed countries, McKinsey Global Institute, 2016.

In both cases, but even more in low-rating countries, freelance work questions *status quo* and its historical evolution. Since labor benefits resulted from struggles focused on industrial work sources—company, activity, and salaried employment—, non-salaried workers lack rights beyond those universally provided by the State. This gap between those inside and outside the

¹⁴ The case of countries such as Argentina must be added to this liability, which—in order to compensate for precariousness—offer freelancers pension benefits well above the contributions they have made (and even through a universal basic income system, including those who have not made such contributions). This cooperates with the structural deficit of the pension system.

system could deepen as the Fourth Industrial Revolution promotes new types of independent work, even those with high ratings. Regarding this assumption—which sounds feasible and usually arises from the debate on technology and work—it should be clarified that data is not yet verified, beyond some specific cases such as the United States and England, neither is work on platforms, which still represents a smaller fraction of employment.

To this question about the proliferation of qualified freelancers in developing countries, the question about the impact of technology on low-rating precarious workers (small-business owners) is added, from which little or nothing has been studied. Generally, the effect of technology on the gap between labor market's members and adherents (*insiders* and *outsiders*) is a growing concern in a region where the pay level has been historically low.

A final relevant point, although there is little evidence of it—in part, because of the focus it receives on advanced economies—is the extent to which low-rating informal freelancers can transition to self-employed platform jobs that, although they would get a low pay—in any case, much lower than those of the qualified freelancers—, would imply an improvement in relation to the initial informal situation in terms of labor benefits and income stability. Some examples suggest a positive answer. Among others, the growing regulations of transportation platforms, such as Uber in Colombia, or *delivery* companies, such as Rappi or Glovo in Argentina, add a set of basic benefits (compensation, leaves) to these low-rating jobs that place them above the average informal job.¹⁵ On the other side, experiences such as those of Samasource¹⁶ in Africa, in digital *tagging* tasks for minimum-rating workers, suggest that not all the new jobs associated with new technologies pertain to *insiders* and that there is room for the new jobs and types of employment to have an inclusive role.

15 The case of Argentina, although nowadays it is only a project under discussion, raises an interesting experiment—a mixture of the traditional model (severance pay at employers' cost), the Austrian model (leave fund paid by the employee, recoverable after dismissal) and the flexible one (internal flexibility: regarding the choice of labor hours through the platform) that can be an example to follow by other countries in the region.

16 There is information about the platform plans available at: <https://techcrunch.com/2019/11/20/samasource-raises-14-8m-for-global-ai-data-biz-driven-from-africa/>

6. Technology and work in public policies

How can the challenges posed by automation, globalization, and demographic change on the labor market and income distribution be faced? The first response from private businesses and public policy drafters circles is more and better education. There is nothing inherently wrong with this answer; as the economist Jan Timbergen said, inequality is a race between technology and training. But what kind of education is necessary and which orientation? What other policies should be intertwined to enhance training policies? What else is there to do if none of this stops the deterioration of equity and its macroeconomic effects?

Naturally, there is no simple answer to these questions. The first two questions refer to an agenda that could be included under the Active Labor Market Policies (ALMP) umbrella, which has been receiving increasing attention in the last decade—the third question will be discussed in the next section.

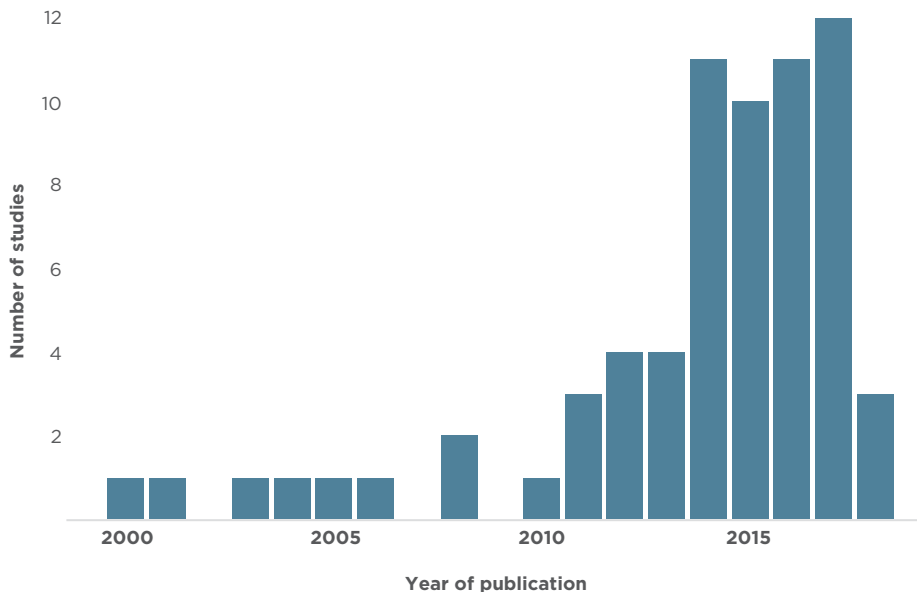
ALMP is a general name for specific policies that could be arranged in three main blocks: training (job education), information (job search agencies, training [*coaching*] and certification of skills), and transfers (subsidies and exemptions to employment). Governments allocate significant fiscal resources to ALMPs to reduce unemployment levels, increase labor income and facilitate the adoption of new technologies that boost productivity. In the last ten years, ALMPs have accounted for more than 0.5% of GDP in the OECD countries. However, the evidence is often too limited and mixed to lead the design of effective policy solutions.

The three groups of policies mentioned above have something in common: *a priori*, none of them seems to exhibit a measurable positive impact. According to a meta-analysis by McKenzie (2017), training programs have positive—but very modest—impacts on employment level or labor income. This may be due to the poor quality of the training offer; or as Jochen Kluge, a researcher at the International Labor Organization (ILO) points out in his study of training programs in Latin America and the Caribbean: “Educating adults is difficult and takes time.” The same is found in other areas; however, a fourth block stands out: the demand promotion, more specifically, the support to small-business owners or freelancers to increase their productivity and overcome the usual problems in these undertakings (informality, poor working conditions, self-exploitation).

In a recent article, we analyzed the effectiveness of these policies by systematically reviewing more than 100 experimental evaluations that document the effectiveness of ALMPs around the world. We focused on programs evaluated through Randomized Controlled Trials (RCTs), taking

advantage of the fact that the last five years have witnessed a wave of RCTs that shed new light on the impact and profitability of ALMPs (Chart 6).¹⁷ The approach on RCTs reduces the number of relevant evaluations, but allows us to focus on estimates with high internal validity and refine the metrics used to compare results, making the results of individual evaluations more naturally comparable.¹⁸ To the three types of ALMPs mentioned above, we add a fourth one: programs to promote self-employment.

CHART 6. RCTs of Pro-employment Policies



Note: Number of trials included in the sample according to the year of publication. For the year 2018, only trials published up to June 2018.

Source: Levy Yeyati, Montané, and Sartorio (2019).

The effectiveness of multidimensional and complex policies such as ALMPs depends on their design, their implementation, their development context, and their target population. For example, a professional training program may differ in cost and duration, its curricular content, and industry participation and may target a very different audience, from experienced *software* developers in Tokyo or Chicago to vulnerable young people in the Madhya Pradesh state of India. Following Pritchett, Samji, and Hammer (2013), the work refers to the four

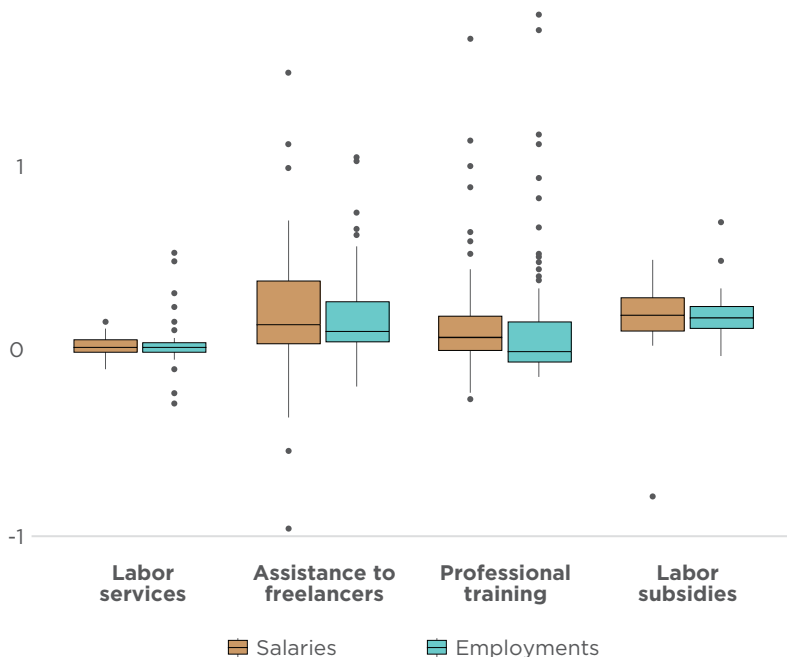
¹⁷ Due to the relatively small number of RCTs prior to 2014, these trials represent a smaller part of the sample covered by previous surveys (see Card, Kluge, and Weber, 2010 and 2017). The meta-analysis by Kluge *et al.* (2019) also benefits from ALMPs' RCTs recent batch but restricts attention to youth-oriented programs and complements its sample with other evaluation approaches.

¹⁸ Old and recent evaluations were collected to generate a database containing 652 impact estimates and 102 interventions worldwide, based on 75 experimentally designed impact evaluations. The base is available at bit.ly/quefuncionacepe

groups of policies as “classes” that could be designed and implemented in very different ways and be addressed to varied demographic groups, with varying effectiveness. To reduce the size of the problem, we propose a design space characterized by i) the components of the programs; ii) the characteristics of implementation and the type of public-private participation; and iii) the economic context and target population.

In this way, we find that wage subsidies and assistance to freelancers show the highest average impact on wages, with 16.7% and 16.5% improvements, respectively (Chart 7). On the other hand, professional training programs have a 7.7% impact, while employment services show an insignificant effect. The implications for employment exhibit a similar pattern. Interestingly, employment services interventions have a 2.6% impact, consistent with short-term, low-cost interventions that do not attempt to generate human capital but rather improve the tendency to find jobs immediately.

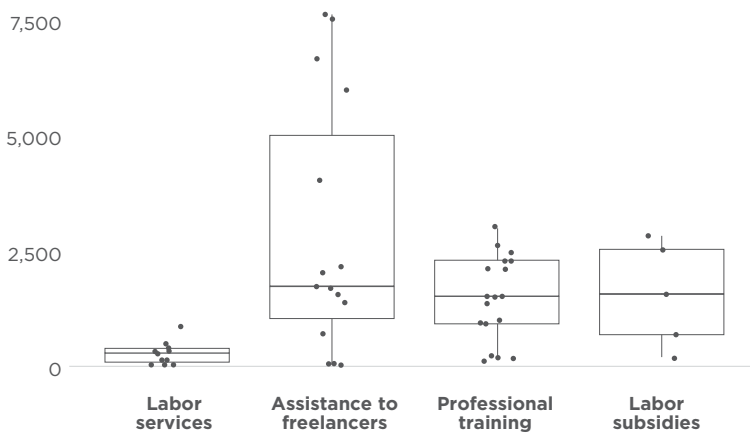
CHART 7. Meta-analysis of the Impact of Pro-employment Policies



Note: Box plot of the 652 coefficients according to the controlling group's estimated effect, by type of program and category of results. The tables represent 50% of the main coefficients reported. The horizontal lines show the median value. The vertical lines show the last coefficient that falls within the $\pm 1.5 \times$ IQR limit. Dots are observations above or below the $\pm 1.5 \times$ IQR limit.

Although the ALMPs' sample regarding cost data is limited, we can identify some indicative patterns.¹⁹ Wage subsidies, support for freelancers or small-business owners, and professional training have a comparable average cost per participant of USD 1,744 to USD 1,518 (2010 Purchasing Power Parity [PPP]), with much greater variability in the second group. In turn, employment services are less expensive policies, with an average cost per participant of USD 277 (2010 PPP) and limited variability between programs (Chart 8).

CHART 8. Unit Costs of Pro-employment Policies



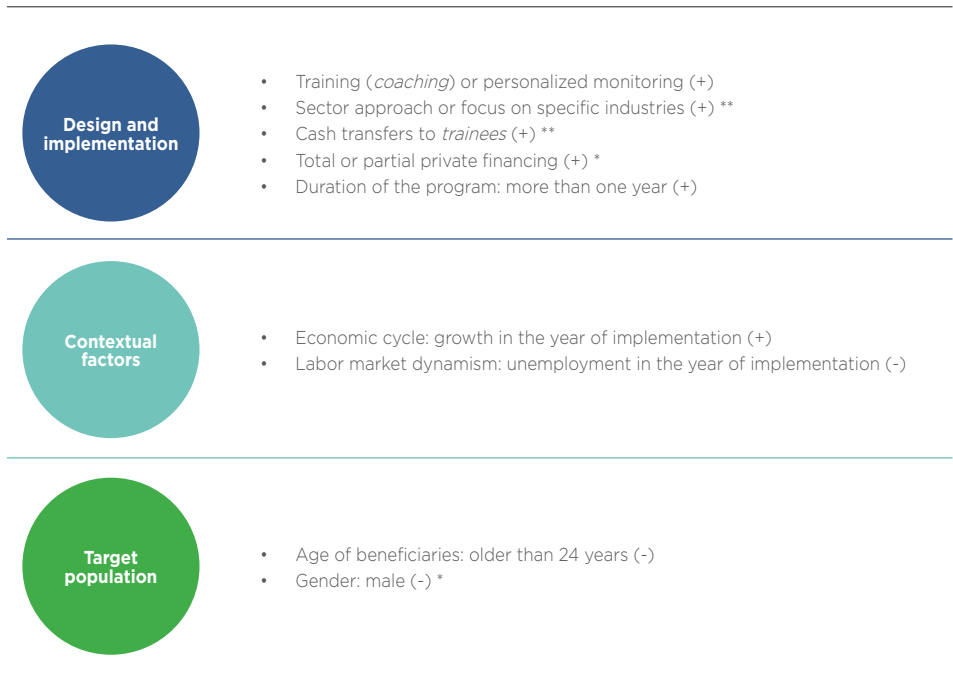
Notes: Unit costs' box plot: cost per participant by a four-way program classification (in 2010 PPP/USD).

Source: Levy Yeyati, Montané, and Sartorio (2019).

Although moderately positive on average, the reported impacts of ALMPs on employment and income production are subject to significant variability due to the multidimensional design space of these policies. As we pointed out, ALMPs are generally complex policies consisting of high-dimensional design spaces, highly dependent on contextual factors and quality-related implementation.

To address this issue, we run meta-analytic regressions that take advantage of the design space's descriptive granularity to identify policy components and contextual factors associated with a higher probability of success. Figure 1 summarizes the main findings, including the conventional level statistical significance, in eight different models, the result of the combination of two intersection points for the PSS binary variable (5% and 10%), and four subsamples.

¹⁹ When information is available, we add a continuous variable that identifies the average cost of the intervention per person, in 2010 PPP/US dollars. Only 51 interventions report this critical variable, and 22 carry out a rigorous cost-benefit analysis by means of Net Present Value (NPV), Internal Rate of Return (IRR) or payback periods, highlighting a significant limitation of the usual practice in the impact evaluation literature: costs' recording.

FIGURE 1. Meta-Analytical Regressions: Main Statistically Significant Findings

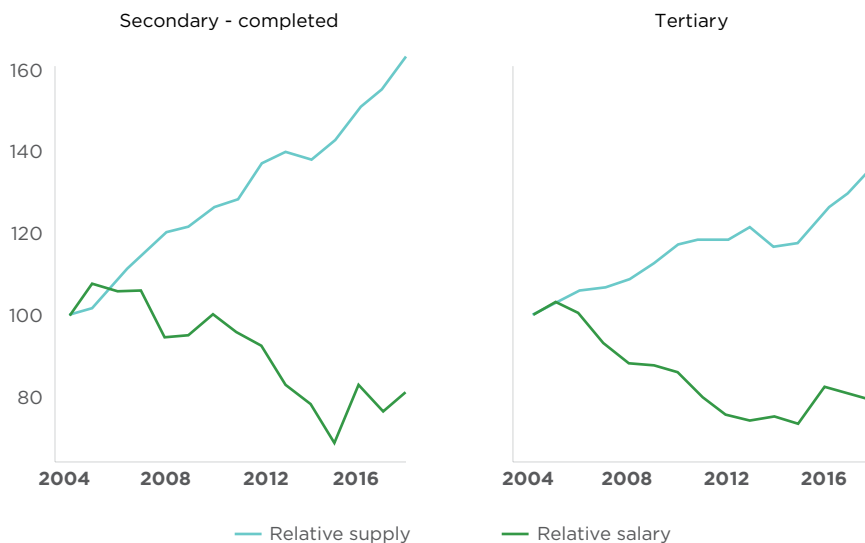
Source: Levy Yeyati *et al.* (2019).

7. The limits of pro-employment policies

From the previous analysis, it can be deduced that employment promotion policies focused on supply must be improved and assessed. Listing training courses or multiplying job offers are insufficient options to improve the relevance of training and promote labor integration. Easing the potential mismatch between labor supply and demand resulting from different workers' displacement with little transferable skills is not enough either. There are tripartite initiatives, such as the skill councils, in which the training supply is assessed with the demands for medium-term qualifications, and job offers are brought closer to the immediate demand. This model, common in developed economies at the national, sectoral, and regional levels, is scarcely present in the region. However, it is more effective than a decentralized training offer of varying quality and relevance, with little certification and an uncertain reputation.

As we mentioned, education is only one part of the agenda to satisfy the impact of technology on employment and labor income. Without going any further, qualification supply does not create its own demand. For example, in the absence of specific demand, producing jobless secondary graduates only depresses these people's relative income or increases the observed overqualification or, in any case, the supply of basic skills, which does not seem to find room in the formal labor market. Chart 9 refers to Argentina, where the increase in secondary graduates' supply compressed the educational premium and raised overqualification.²⁰

²⁰ González Rozada and Levy Yeyati (2018), based on a panel data set of urban areas, illustrate the correlation between secondary graduates' supply and the increase in overqualification. This effect is the natural opposite of the relationship between education and educational premiums mentioned in the previous section.

CHART 9. Evolution of the Relative Supply and the Educational Premium: the Case of Argentina

Source: Author's elaboration based on the Continuous Household Survey from the Argentine Institute of Statistics and Census.

Nonetheless, the drop in the premium and the increase in overqualification in the region also shows the lack of a relevant education offer (would we have overqualification if it were measured considering the required skills by today's jobs?). Formal education in Latin America is still based on a humanistic inclusion model, behind the labor market, aimed toward a university degree that very few can reach and without any alternative options (secondary studies with labor counseling, hierarchical higher education and intermediate university degrees) for those left on the road. There are few cases having a modern system of technical and dual education (combining classroom teaching and in-company training) or professional training systems encouraged by future studies, essential to anticipate future changes, and the interaction with employers, key actors and nowadays virtually absent from adult training (Busso *et al.* (2017) and Levy Yeyati *et al.* (2019) describe some examples in the region).

Lastly, the ALMPs in the region collide with a historical structural deficit in the generation of formal employment (Levy Yeyati and Pienknagura, 2014; Messina and Silva, 2017). In other words, just as schooling does not necessarily translate into education, education does not create its own labor demand. Ultimately, the best complement to retraining policies in order to face technological displacement is to create new jobs, not only in new activities eased by new technologies but also through the expansion of traditional activities.

8. New distributions: utopian arithmetic

“We must create full employment, and we must create income. People must turn into consumers one way or the other. The solution to poverty is to abolish it directly by the guaranteed income.” This is what Martin Luther King said in his last book, *Where Do We Go From Here: Chaos or Community?* Like Henry George before him, he argued that the work for human progress is not that accomplished to satisfy basic needs.

What is this guaranteed universal basic income? It is the payment of a monthly sum of money to all citizens of the country. King was not the first to support universal income. Other pioneer thinkers include the Caliph Abu Bakr, Muhammad’s father-in-law; the utopian thinker Thomas More; the American revolutionary Thomas Paine (who created the social insurance proposed by his friend, the Marquis de Condorcet); and the libertarian philosopher and Nobel Prize winner in Literature Bertrand Russell. Closer in time, in 1968, progressive economists such as Paul Samuelson, James Tobin, and John Kenneth Galbraith published an open letter to the United States’ Congress requesting guaranteed income. It was signed by conservatives such as Friedrich Hayek and Milton Friedman and other thousand economists from different thoughts, which led President Richard Nixon to introduce his unsuccessful Family Assistance Plan in 1969.

Universal income became relevant a few years ago in response to three related fears: 1) the social effects of massive job losses; (which, as we saw, were not verified, nor necessarily will they be); 2) the massive drop in labor income share, with dramatic effects on equity; this is something that, without much drama, has been suggested as possible in recent years, mostly if the adjustment of the labor market to technological change is left in the hands of the market (more wage dispersion, higher income from concentrated companies); and 3) a depression in the accumulation of savings demand if the worker’s lower share concentrates income in rich households with less propensity to consume; this could deepen secular standstill. In this context, a universal income is seen by politicians and business owners as an instrument to reduce the risks of inequity excess and to keep the consumption cycle active.

In the debate concerning its implementation, however, universal income is criticized by left and right-wings ideologists. To begin with, the initiative costs money. If technological progress makes technology owners richer by increasing productivity, part of this wealth could, through taxes, pay for a universal transfer. However, none of this has been verified so far, and taxes’ excess in a modest growth context would overwhelm investment and

progress. The complexity of the universal income fiscal equation must not be underestimated.

On the other hand, universal income outlines at least one delicate moral dilemma: Should those who have the least receive more, everyone the same, or more those who work more? The first option, more progressive, is good from the equity point of view but potentially bad in terms of social justice (*fairness*) and incentive to work: those who do not work earn more.²¹ The second option, the classic one, grants the same benefit to Bill Gates as to the homeless. The third, the salary supplement, is ideal to compensate for the drop in working hours due to technological replacement (it would allow more people to work, fewer hours, completing the salary with a supplement on behalf of the State) and is potentially good for the job offer (it rewards the person who works). However, it would be unfeasible in a highly informal developing economy that cannot verify its income—and it would also exclude domestic workers, volunteers, poets, musicians, artists, and many others.

Another aspect to consider is that both the fiscal cost and the impact on the distribution of a basic income depend on the starting point since not everyone nowadays has the same social safety nets. A classic basic income that would simply rearrange current transfers without doubling them—for example, an income by Milton Friedman, who imagined his *negative income tax* as an alternative for all social programs—could increase paid work supply. This concept is contrary to what it is often thought. In a couple of articles, the economist Ed Dolan illustrates the effects of a universal income on the tendency to work.²² Dolan's analysis is entirely theoretical, but it allows to answer this question in two steps:

1. Let us suppose that there is no social expenditure or subsidies (the libertarian paradise), and let us introduce a conditional cash transfer with these characteristics: a) it guarantees a basic income to all individuals; b) the higher the beneficiary's labor income, it is progressively reduced; c) it is zero above a "sufficient" income floor. In this context, one would expect: i) a "replacement effect": those earning less than the floor (and even those whose income is slightly above the program) work less or turn to be informal (hide their income); and ii) a "wealth effect": those receiving the transfer spend more, reduce the marginal utility of consumption and replace work with leisure.

2. Let us introduce a Universal Basic Income (UBI) to replace the transfer system.²³ This eliminates one of the two aspects of the replacement effect: there are no longer incentives to reduce or hide work effort because the UBI does not depend on labor income (conditionality disappears). However, there is still a wealth effect: the beneficiary receives a universal income when he received nothing before.

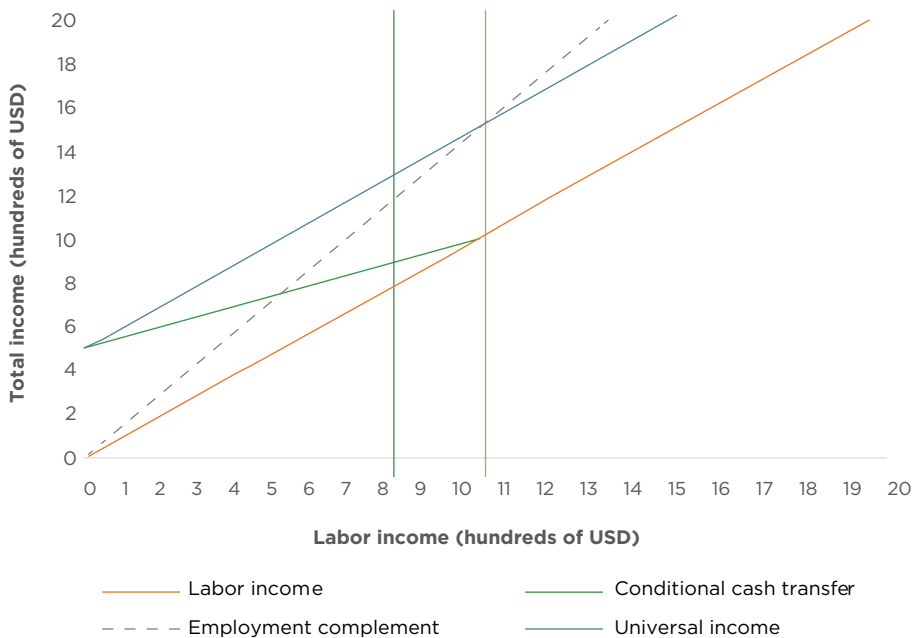
21 Naturally, not necessarily those who do not work are the ones who have the least: those who live off private income without working would not receive the basic income either. However, what is relevant from the moral point of view—and what is important when analyzing the impact on the job offer—is that this outline penalizes those who work.

22 Dolan organizes his analysis in two articles, one in which he performs a theoretical analysis (Dolan, 2014a) and the other in which he synthesizes the available empirical evidence (Dolan, 2014b).

23 Let us suppose, for simplicity, that if there is a difference between the number of transfers and that of universal income, this is financed with high-income taxes that do not affect the job offer.

In Chart 10, the dotted line at 45° indicates the starting situation, where disposable income equals labor income. The green line illustrates the effect of a conditional cash transfer that would guarantee a basic income (let us say, USD 500 per month) and that would gradually decrease as labor compensation increases (USD 500 less for every USD 1,000 pay), until reaching a certain limit level (USD 1,000) at which individuals no longer qualify for the benefit, and their disposable income equals their labor income again. The blue line represents a universal basic income of USD 500, similar to the conditional cash transfer, but independent of labor income.

CHART 10. Impact of Universal Income on the Job Offer



Source: Dolan (2014a).

In extreme poverty cases, the wealth effect of this policy can be positive, encouraging the supply of work and its quality (Mullainathan and Shafir, 2013). For people having high wages, the impact regarding the total disposable income will be relatively low. What is the elasticity of the job offer to income increase in middle-class people? In a study of the Massachusetts lottery winners, Imbens, Rubin, and Sacerdote (2001) found that, generally, individuals do not retire to a life of leisure after being blessed with huge monetary prizes. On average, having obtained a USD 1,000 reward, individuals reduced their labor income by just USD 110.²⁴ On the other hand, Joulfaian and

²⁴ The authors surveyed people who played the lottery in the 1980s and estimated the effect of winning the prize on their income, hours worked, consumption, and savings in subsequent years.

Wilhelm (1994) estimated that the negative effects of inheritances on the work efforts of Michigan's residents were very low.

In short, when studying the effects of universal income on work incentives, we must take into account what we are comparing it with. Introducing universal income into an economy without any kind of social assistance would reduce work incentives. Should this replace or complement an existing conditional cash transfer system, its effects, as it was seen, are much more complex.

Fabre, Pallage, and Zimmermann (2014) wonder whether introducing a universal basic income can generate a more effective safety net than generous unemployment insurance (like the one offered by the Nordic flexicurity). Unemployment insurance focused on the social protection of those who cannot get a job can offer them a more significant benefit without incurring considerable fiscal costs (in contrast to the "blind" distribution of universal income, which implies less coverage for the most in need due—precisely—to its universality). Like any conditional cash transfer, unemployment insurance would necessarily incur costs of state monitoring and inclusion and exclusion errors that we have already mentioned. In addition, it would introduce disincentives to work for those individuals facing the dilemma of re-entering the labor market or continuing to collect the insurance benefit. This effect also affects its fiscal cost: a smaller employed population implies less tax financing for the program.

But the discussion goes beyond the preference for one outline or the other and points to a possible complementarity. A successful implementation of universal income will likely require targeted supplements to ensure somewhat more generous coverage for the population most in need. Finding the balance point between the different alternatives seems a healthier path than limiting to a single tool.

A universal basic income is a simple and plain program, but the preceding conditional social protection systems are not: the replacement of one by the other would generate a complex pattern of unwanted winners and losers. In particular, it could lead to the elimination of programs aimed at low-purchasing power segments and thus limit social policies' progressivity.

A recent OECD report (2017) illustrates this point. The study simulates hypothetical implementations of different basic income outlines to analyze the diversity of the program's impact in four countries having very dissimilar social safety nets: Finland, Italy, France, and the United Kingdom. At first, the authors study an implementation named "budget neutral," which, without reducing or increasing government spending levels, reallocates items. More precisely, it unifies most of the benefits offered to all individuals under 65 years of age into a single social benefit (except for benefits aimed at very specific populations, such as disability pensions), received by all, including high-income segments. This generates the paradoxical effect of reducing the level of benefits for vulnerable people, subject of multiple targeted social programs that would be abolished with basic income.

Second, they analyze the alternative of a basic income that guarantees all individuals under 65 years of age a minimum level of income equal to the

minimum pre-existing social protection in each of the countries, so that, with the change, no individual finds the initial protection level diminished. It is in this case where the fiscal capacity for implementation differs substantially between the four countries. In Finland and Italy, by abolishing other social programs and eliminating certain tax exemptions, the introduction of a basic income would even lead to an increase in the State's net revenue. In France, additional income from the elimination of tax exemptions would offset the basic income cost. On the other hand, in the United Kingdom, a basic income that guaranteed the minimum pre-existing protection level to all individuals would generate a fiscal cost significantly difficult to face, even with the elimination of the already mentioned exemptions. This is nothing more than proof that a fiscally neutral universal income should be more modest in countries that spend less on social protection.

Would basic income improve equity? It also depends on the economy under analysis. Although a greater degree of taxation on individuals having high purchasing power would improve social protection's progressivity in the four analyzed countries, there are differences between countries. In Finland, profits from universal income would be negatively offset almost entirely by benefits' losses and higher taxes, partly because the current system already closely resembles universal coverage. In contrast, the pro-equity effect would be very important in Italy, where the protection system is barely focused on low-income individuals. Finally, although in the United Kingdom, individuals living in extreme poverty would be the main beneficiaries of basic income, there are multiple social programs aimed at low-income segments that are not necessarily in high-poverty situations; its elimination in a neutral universal outline would worsen the economic situation of the lower middle-class segments, beyond the increase in global progressivity.

These disparities are also present when analyzing the case of a basic income that guarantees the minimum pre-existing social protection level, whatever the cost. For example, while in France and Finland, this outline would generate distributive effects very similar to those of the fiscally neutral outline; in Italy, it would have undesirable effects in terms of distribution. It would significantly reduce the tax burden on higher purchasing power households; however, this reduction would not be reflected in a substantial increase in the lower middle-class segments' safety nets. Although, it would improve the situation of the people living in extreme poverty.

Corollary: not all welfare systems are equally prepared for the introduction of a universal transfer.

TABLE 2. What Universal Income Can We Aim for with Today's Social Expenditure?

| | Budget neutral | Minimum pre-existing protection level |
|---|--|---|
| Finland Universal social policies | The progressivity of the system changes slightly: the safety net is already predominantly universal before the introduction of the UBI. | By abolishing social programs, UBI at the minimum protection level could even increase the net revenue of the State. |
| Italy Barely focused social policies | Strong pro-equity effect: it goes from a barely focused system on those who have the least to universal coverage. | By abolishing social programs, UBI at the minimum protection level could even increase the net revenue of the State. |
| The United Kingdom Strongly focused social policies | Regressive effect? By eliminating programs targeting low-income individuals, the economic situation can worsen. | By experiencing a minimum protection high level, this UBI variable would generate a difficult-to-face fiscal cost. |

Source: Author's elaboration based on OECD (2017).

For the universal income debate to go beyond TED talks, Davos meetings, or humanist *best sellers*, it is necessary to discuss its cost and sustainability over time.²⁵ In search of details, in 2016, the economists Howard Reed and Stewart Lansley studied how the fiscal impact and the distributive effect (its incidence in reducing poverty) through an analysis of the number and profile of potential winners and losers in different versions of universal income in the United Kingdom's economy. The fiscal impact means the net cost of universal income if the fiscal benefit of eliminating conditional programs is taken into account. For this, they developed five simulations with different configurations; three of them were of the "complete" type, in which basic income replaces the vast majority of conditional social programs, and the other two were of the "modified" type and maintained the benefits of the current programs with a moderate change. Lansley and Reed (2016) concluded that the most disruptive outlines, those that seek to implement universal income completely and without any sequentiality, imply a very high cost and face too many risks in terms of the winners and losers' pattern. The authors are more optimistic with the modified outlines, which propose a less generous base level, but keep a large part of the benefits focused: they find that the fiscal cost in these cases is more reasonable while avoiding several of the distributive contradictions generated by eliminating conditional programs.²⁶

Naturally, these calculations are very preliminary. Estimating the cost of the program becomes more complex if externalities on the supply of work

²⁵ As an example, a study by the Center on Budget Policy Priorities shows that providing an annual income of USD 10,000 to the entire population of the United States would have an annual cost of USD 5 billion, an amount that represents more than 75% of the annual federal budget.

²⁶ For example, one of the alternatives analyzed has a net cost of GBP 8.2 billion yearly (or about 0.5% of the British GDP), a modest sum given the significant reductions in poverty and inequality that the outline would bring, at least, according to the simulations carried out.

(where less work would imply fewer fiscal resources and more taxes) and the economy (less work can make labor more expensive, more taxes can reduce investment and increase evasion) are considered. In addition, universal income would bring on the arrival of immigrants, increasing the number of beneficiaries. Where would the line be drawn to determine the recipients of this new income? Citizens? Residents? And based on this, how much would these migrations add to the fiscal cost of these benefits?

9. Conclusions

Future-study exercises face an unavoidable bias: it is easy to extrapolate trends, but it is difficult to predict the curves (disruptions) of the future. In the same way that science fiction envisioned flying cars but did not anticipate the drop of cigarettes, environmental movements, or the renewed gender agenda, nowadays it is easy to imagine the digitalization of many current tasks, but difficult to speculate with the new tasks of the future. Hence, propositions such as “x% of jobs will disappear” or “5 out of 7 future jobs are not yet known” or “programming/empathy/creativity will be tomorrow’s skills” are, at best, risky.

Another problem with future studies is that, in the most mechanical version, they ask what is technically possible, often ignoring the political and social viability of innovation. As it was mentioned, whether replacement is feasible and efficient does not imply that it is viable, especially if we think that politics, our benevolent planner, must incorporate, at least, distributive and moral considerations when regulating its implementation. In short, we can anticipate that there will be changes, but not their speed or direction.

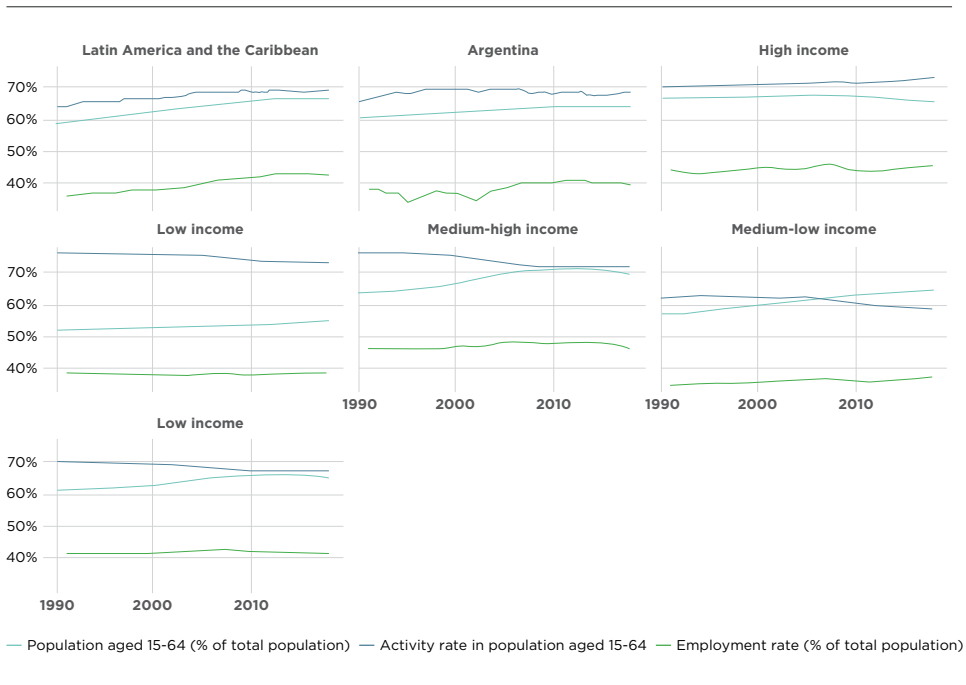
This does not make an analysis of scenarios, conflicts, and public policy responses less urgent, which often require trial and error and time to mature. On the other hand, many of the issues in the debate about the future are the continuity of nowadays problems. Such is the case with the debate on the future of work. The loss of wage shares in total income, the precariousness of self-employment, the loss of human capital due to variations in the skills demanded, the difficulty of retraining adult workers, the lack education relevance, the distributive effects between workers and from workers to companies, the increase in market concentration, its regulation and its impact on labor income and, through it, on demand, investment and growth, and the adaptation of the welfare state to the new income composition are some of the topics briefly covered in this chapter, which have been studied and debated for a long time and to which the technological revolution adds new dimensions and complexities.

In addition, the local aspect has to be considered: the reality of Latin American countries is far from the reality of advanced countries where this debate has risen. All the issues listed in the previous paragraph require adaptation –and data collection, always the Achilles heel of empirical work in the region– and must be complemented with idiosyncratic aspects, such as less human capital or greater informality.

The intersection of technology and work is also essential to understand the fiscal and debt problems of some Latin American countries. Just as demography is a positive factor in most of them thanks to a demographic

bonus of varying magnitude, the labor market presents two major challenges: 1) informality and growing precariousness, with freelancers contributing little or nothing to social security, aggravate the imbalance of a system that –in many countries– already presents serious actuarial mismatches; and 2) low training and job displacement, with their relevant loss of human capital, reduce work productivity and limit growth or, even worse, bring on discouragement and low participation, as observed in the employment rate standstill over population, a measure of the demographic bonus effect on growth (Chart 11).

CHART 11. Demographic Bonus, Active Population and Employment Rate



Source: Levy Yeyati and Montané (2019).

Finally, the technological replacement of human labor, insofar as it represents a reduction in the quality and compensation of the displaced worker, affects one of the focal points of the recent protests in several countries in the region: access –in this case, to services and benefits that are usually tied to formal employment– and upward social mobility –associated, in labor income, jobs and tasks’ stability (Kambourov and Manovskii, 2009; Levy Yeyati and Montané, 2020)–. This is reason enough to place the debate on pro-employment policies and their adaptation to the technological revolution in the Latin American political agenda for the next decade.

Bibliography

- Abel, W., Tenreyro, S., and Thwaites, G. (2018). *Monopsony in the UK*. Centre for Economic Policy Research. Available at: https://cepr.org/active/publications/discussion_papers/dp.php?dpno=13265
- Acemoglu, D. and Autor, D. (2011). "Skills, tasks and technologies: Implications for employment and earnings." *Handbook of labor economics*. Vol. 4, pp. 1043-1171. Elsevier.
- Autor, D. (2014). "Polanyi's paradox and the shape of employment growth", study presented at the Economic Policy Symposium of the Federal Reserve Bank of Kansas City, Jackson Hole, August, 22.
- Autor, D. (2015). "Why are there still so many jobs? The history and future of workplace automation." *Journal of Economic Perspectives*, 29(3), 3-30. Available at: <https://www.aeaweb.org/articles?id=10.1257/jep.29.3.3>
- Autor, D. and Salomons, A. (2017). "Does productivity growth threaten employment?" *ECB Forum on Central Bankin*. Sintra, Portugal (pp. 26-28).
- Autor, D. and Salomons, A. (2018). *Is automation labor-displacing? Productivity growth, employment, and the labor share* (N°W24871). National Bureau of Economic Research.
- Autor, D., Dorn, D., Katz, L. F., Patterson, C., and Van Reenen, J. (2017). "Concentrating on the fall of the labor share." *American Economic Review*, 107(5), 180-85.
- Autor, D., Levy, F., and Murnane, R. (2003). "The skill content of recent technological change: An empirical exploration." *The Quarterly Journal of Economics*, 118(4), 1279-1333.
- World Bank. (2016). *World Development Report 2016: Digital dividends*. World Bank.
- Barkai, S. (2019). "Declining labor and capital shares." *Journal of Finance* (to be published).
- Bessen, J. (2017). "Information technology and industry concentration." *Law & Economics Paper Series (17-41)*. Boston University School of Law.
- Brynjolfsson, E., Rock, D., and Syverson, C. (2017). *Artificial intelligence and the modern productivity paradox: A clash of expectations and statistics* (N° W24001). National Bureau of Economic Research.
- Busso, M., Cristia, J., Hincapié, D., Messina, J., and Ripani, L. (eds.) (2017). *Learning better: Public policy for skills development*. Inter-American Development Bank. Available at: <https://publications.iadb.org/publications/spanish/document/Aprender-mejor-Pol%C3%ADticas-p%C3%BAblicas-para-el-desarrollo-de-habilidades.pdf>
- Card, D., Kluge, J., and Weber, A. (2010). "Active labor market policy evaluations: A meta-analysis." *The Economic Journal*, 120(548), F452-F477.

- Card, D., Kluve, J., and Weber, A. (2018). "What works? A meta analysis of recent active labor market program evaluations." *Journal of the European Economic Association*, 16(3), 894-931.
- Dao, M., Das, M., Koczan, Z., and Lian, W. (2017). *Why is labour receiving a smaller share of global income?* Working Paper WR/17/169. International Monetary Fund. Available at: <https://www.imf.org/en/Publications/WP/Issues/2017/07/24/Why-Is-Labor-Receiving-a-Smaller-Share-of-Global-Income-Theory-and-Empirical-Evidence-45102>
- Das, M. and Hilgenstock, B. (2018). *The exposure to routinization: Labor market implications for developed and developing economies.* Working Paper 18/135. International Monetary Fund.
- De Loecker, J. and Eeckhout, J. (2017). *The rise of market power and the macroeconomic implications.* Working Paper 23687. National Bureau of Economic Research.
- Dolan, E. (2014a). A universal basic income and work incentives. Part 1: Theory [Blog entry]. Money Maven. August, 18. Retrieved from: <https://moneymaven.io/economonitor/emerging-markets/a-universal-basic-income-and-work-incentives-part-1-theory-W3yJ6kRFek6eugtwwZMzXQ>
- Dolan, E. (2014b). A universal basic income and work incentives. Part 2: Evidence [Blog entry]. Money Maven. August, 25. Retrieved from: https://moneymaven.io/economonitor/emerging-markets/a-universal-basic-income-and-work-incentives-part-2-evidence-7ybtWjLlgkiWkmcU_5uk5w
- Dube, A., Jacobs, J., Naidu, S., and Suri, S. (2020). Monopsony in online labor markets. *American Economic Review: Insights*, 2(1), 35-46.
- Fabre, A., Pallage, S., and Zimmermann, C. (2014). *Universal basic income versus unemployment insurance.* Working Paper 5106. CESifo.
- Freeman, R. B., Ganguli, I., and Handel, M. J. (2020). "Within occupation changes dominate changes in what workers do: A shift-share decomposition, 2005-2015." *AEA Proceedings*. Available at: <https://scholar.harvard.edu/freeman/publications/within-occupation-changes-dominate-changes-what-workers-do-a-shift-share>
- Frey, C. B. (2015). "How to prevent the end of economic growth." *Scientific American*. Available at: <https://www.scientificamerican.com/article/how-to-prevent-the-end-of-economic-growth/>
- Frey, C. B. and Osborne, M. A. (2017). "The future of employment: How susceptible are jobs to computerisation?" *Technological Forecasting and Social Change*, 114, 254-280.
- González-Rozada, M. and Levy Yeyati, E. (2018). *Do women ask for lower salaries? The supply side of the gender pay gap.* Universidad Torcuato Di Tella.
- Gordon, R. J. (2000). "Does the "new economy" measure up to the great inventions of the past?". *Journal of Economic Perspectives*, 14(4), 49-74.
- Hsieh, C. T. and Rossi-Hansberg, E. (2019). *The industrial revolution in services* (Nº. w25968). National Bureau of Economic Research.

- Imbens, G. W., Rubin, D. B., and Sacerdote, B. I. (2001). "Estimating the effect of unearned income on labor earnings, savings, and consumption: Evidence from a survey of lottery players." *American Economic Review*, 91(4), 778-794.
- Joulfaian, D. and Wilhelm, M. O. (1994). "Inheritance and labor supply." *Journal of Human Resources*, 12051234.
- Kambourov, G. and Manovskii, I. (2009). "Occupational specificity of human capital." *International Economic Review*, 50(1), 63-115. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-2354.2008.00524.x>
- Karabarbounis, L. and Neiman, B. (2014). "The global decline of the labor share." *The Quarterly Journal of Economics*, 129(1), 61-103.
- Kluge, J., Puerto, S., Robalino, D., Romero, J. M., Rother, F., Stöterau, J., ... , and Witte, M. (2019). "Do youth employment programs improve labor market outcomes? A quantitative review." *World Development*, 114, 237-253.
- Kurz, M. (2017). *On the formation of capital and wealth*. Working Paper. Stanford Institute for Economic Policy Research (SIEPR). Available at: <https://siepr.stanford.edu/research/publications/formation-capital-and-wealth-it-monopoly-power-and-rising-inequality>
- Levy Yeyati, E. (2018). *Después del trabajo. El empleo argentino en la cuarta revolución industrial*. Buenos Aires: Sudamericana.
- Levy Yeyati, E. and Montané, M. (2019). Mapa del trabajo argentino. Buenos Aires: CEPE. Available at: https://www.utdt.edu/Upload/_156561758080852100.pdf.
- Levy Yeyati, E. and Montané, M. (2020). *Five types of seniority: Wages premiums and human capital accumulation*. Working paper 2020/1. School of Government, Universidad Torcuato Di Tella.
- Levy Yeyati, E. and Sartorio, L. (2018). "Technology and the future of work: Why do we care?" *Latin America Policy Journal*. Harvard Kennedy School.
- Levy Yeyati, E. and Sartorio, L. (2020). *Polarization redux: Jobs, wages and the supply of skills in developing countries*. Working paper 2020/2. School of Government, Universidad Torcuato Di Tella.
- Levy Yeyati, E., Montané, M., and Sartorio, L. (2019). *What works for active labor market policies?* Working paper 2019/3. School of Government, Universidad Torcuato Di Tella. Available at: <https://voxeu.org/article/understanding-what-works-active-labour-market-policies>
- Levy, Y. and Pienknagura, S. (2014). "Wage compression and the decline in inequality in Latin America: Good or bad?" VOX. CEPR Policy Portal. Available at: <https://voxeu.org/article/wage-compression-and-falling-latin-american-inequality>
- Maloney, W. F. and Molina, C. (2016). *Are automation and trade polarizing developing country labor markets, too?* World Bank.
- Manyika, J., Lund, S., Bughin, J., Robinson, K., Mischke, J., and Mahajan, D. (2016). *Independent work: Choice, necessity, and the gig economy*. McKinsey Global Institute, 2016, 1-16.

- McIntosh, S. (2013). *Hollowing out and the future of the labour market*. BIS Research paper number 134. Department for Business, Innovation and Skills. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/250206/bis-13-1213-hollowing-out-and-future-of-the-labour-market.pdf
- McKenzie, D. (2017). "How effective are active labor market policies in developing countries? A critical review of recent evidence." *The World Bank Research Observer*, 32(2), 127-154.
- Messina, J. and Silva, J. (2017). *Wage inequality in Latin America: Understanding the past to prepare for the future*. World Bank. Available at: <http://documents.worldbank.org/curated/en/501531515414954476/Wage-inequality-in-Latin-America-understanding-the-past-to-prepare-for-the-future>
- Mullainathan, S. and Shafir, E. (2013). *Scarcity: Why having too little means so much*. Macmillan. Available at: <https://www.hks.harvard.edu/centers/cid/publications/books/scarcity-why-having-too-little-means-so-much>
- Nakamura, L., Samuels, J., and Soloveichik, R. (2017). "Measuring the "free" digital economy within the GDP and productivity accounts." Economic Statistics Centre of Excellence (ESCoE) Discussion Papers ESCoE DP-2017-03. Available at: <https://ideas.repec.org/p/nsr/escoed/escoe-dp-2017-03.html>
- OECD. (2017). "Basic income as a policy option: Can it add up?". *Policy Brief on the Future of Work*.
- Piketty, (2014). *El capital en el siglo XXI*. Fondo de Cultura Económica.
- Pritchett, L., Samji, S., and Hammer, J. S. (2013). *It's all about MeE: Using structured experiential learning ('e') to crawl the design space*. Working Paper, (322). Center for Global Development.
- Reed, H. and Lansley, S. (2016). *Universal basic income: An idea whose time has come?* London: Compass.
- Summers, L. (2013). IMF Fourteenth Annual Research Conference in Honor of Stanley Fischer. November 8th, 2013. Intervention of the IMF in the Economic Forum. Available at: <http://larrysummers.com/imf-fourteenth-annual-research-conference-in-honor-of-stanley-fischer/>



CAF DEVELOPMENT BANK
OF LATIN AMERICA

50
years

