

2018

Latin American and Caribbean Macroeconomic Report

COORDINATED BY

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A Mandate to Grow

Coordinated by
Eduardo Cavallo and Andrew Powell

Inter-American Development Bank 2018

Cataloging-in-Publication data provided by the Inter-American Development Bank Felipe Herrera Library

A mandate to grow / coordinated by Eduardo Cavallo and Andrew Powell.

p. cm.

Includes bibliographic references.

"2018 Latin American and Caribbean Macroeconomic Report."

1. Economic development-Latin America. 2. Economic development-Caribbean Area.

3. Latin America-Economic integration. 4. Caribbean Area-Economic integration. 5. Latin America-Economic policy. 6. Caribbean Area-Economic policy. 1. Cavallo, Eduardo A.

II. Powell, Andrew (Andrew Philip). III. Inter-American Development Bank. Department of Research and Chief Economist.

IDB-AR-161

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Foreword

ast year's Latin American and Caribbean Macroeconomic Report, "Routes to Growth in a New Trade World," argued that the region could boost growth without large fiscal outlays by deepening regional integration. In *A Mandate to Grow*, we revisit the growth debate considering the region's experience over the past half century. Placing the growth debate in this perspective allows for a focus on the structural factors that have prevented countries in the region from achieving growth rates that match other faster growing regions and that would be required to fulfill the aspirations of its vibrant population.

A year on, global fundamentals remain benign for the region, providing opportunities to implement much needed reforms. Global growth has strengthened, commodity prices remain firm, and major central banks in advanced economies are moving forward with the normalization of monetary conditions. Still, several risks remain, including the potential for higher inflation and faster monetary normalization with impacts on global asset prices as well as the possibility of the world turning more protectionist. If these risks materialize, they could have serious impacts on the region. Igniting the domestic engines of growth can boost underlying potential growth and can be a hedge against these more negative scenarios, making the region's economies stronger and more resilient.

This year's report identifies both the low level and quality of investment as the major factors hindering long-run growth in the region. Removing those constraints requires focusing on efficiency, and channeling more public and private resources to productive sectors. Simply investing more will not necessarily raise productivity if resources are misallocated, rendering such an effort ineffective to sustain higher long-run growth. The relative importance of the underlying explanations varies country by country, and thus the appropriate policy agenda for each country should draw on rigorous evidence. With that objective in mind, *A Mandate to Grow*, revisits evidence compiled in recent editions of the IDB's flagship Development in the Americas (DIA) series and in previous editions of the Latin American and Caribbean Macroeconomic Report, to shed new light on the growth problem and propose workable solutions.

Achieving and sustaining higher growth will also demand a stable macroeconomic environment. Therefore, this year's report includes fiscal and monetary chapters that analyze the implications of macroeconomic policies for growth and stability. On the fiscal front, most countries in the region are in the process of consolidating fiscal positions. For those countries, the focus should be on getting the mix between tax and expenditure

policies right and on promoting specific reforms to enhance productivity in order to cement that basis for faster long-run growth. There are encouraging signs. For example, the ongoing adjustment is less focused on trimming public investment than in the past. On the monetary front, inflation in the region has been declining in most countries across different monetary regimes. The region has been a pioneer in redefining inflation targeting, navigating the fine line between allowing the exchange rate to adjust to external shocks while keeping inflation expectations anchored. At the same time, external buffers—such as international reserves—have been declining which may increase vulnerabilities to external shocks. Strengthening fiscal and external accounts would reduce exposure to changing global financial conditions.

Regardless of developments in the world economy, crafting and implementing the right domestic policies will allow countries to achieve more rapid growth.

José Juan Ruiz Chief Economist

Acknowledgments

his report was prepared by a team of economists from the Research Department, the Fiscal and Municipal Management Division (all from the Vice-Presidency of Sectors and Knowledge), and the Vice-Presidency of Countries of the Inter-American Development Bank (IDB).

The team consisted of Martín Ardanaz, João Ayres, Rodrigo Azuero, Matías Busso, Francesca Castellani, Eduardo Cavallo, Andrés Fernández, Gustavo García, Daniel Hernaiz, Juan Hernández, Victoria Nuguer, Andrew Powell, Ernesto Stein, and Rodrigo Suescun.

The report was coordinated by Eduardo Cavallo and Andrew Powell. They were very efficiently assisted by Mariano Sosa and Juan Espinosa.

Santiago Levy, vice president for Sectors and Knowledge, and José Juan Ruiz the chief economist and general manager of the Research Department, provided many comments and suggestions.

Further inputs were provided by Fabiano Bastos, Eduardo Fernández-Arias, Alejandro Izquierdo, Osmel Manzano, Jorge Puig, Diego Rodríguez, Marta Ruiz Arranz, Moisés Schwartz, Mariano Sosa, Guillermo Vuletin, and the 26 IDB country economists.

Invaluable research assistance was provided by Paola Alvarado, Javier Andrés Caicedo, Haydeeliz Carrasco, Carlos Castillo, Juan Espinosa, Allen Espinoza, María José Hernández, Alejandro Parraguez, and Mariano Sosa.

Rita Funaro edited the report. Tom Sarrazin, Cathleen Conkling-Shaker, Sebastián Oliva, and Aglae Parra provided invaluable support. Alberto Magnet translated the report into Spanish. The Word Express created the cover design and typeset the publication.

CHAPTER 1

Global Developments: Risks and Opportunities

rowth for the world economy in 2018 is set to be 3.9%, a level not seen since 2011, and highly synchronized across countries. No less than 185 countries out of 193 are expected to register positive growth, and at least 80 economies are expected to post growth rates of more than 3.5% for 2018.¹ The United States, Europe, and China—all major trading partners for Latin America and the Caribbean—have recently had their growth forecasts revised upwards

In the case of the United States, growth is expected to be 2.7% for 2018, some 0.2% higher than the January 2017 estimate. The Federal Reserve expects the short-term policy interest rate to rise in 2018 and 2019, bringing the short-term policy rate to around 2.5%–2.75%, and given the often-heralded decline in natural or equilibrium interest rates, this may mean that the interest rate aspect of monetary normalization could then be close to completion.²

However, markets remained skeptical that the Federal Reserve would act at this pace and at the same time the U.S. stock market had boomed. Buoyant earnings, low inflation, and positive sentiment for the future, particularly given the recent U.S. tax reform, spurred stock market valuations to record values. The sharp declines in stock market indices in early February, accompanied by rises in longer-term interest rates, signal the vulnerability of bond and stock market prices to indicators of the likely course for inflation. It seems likely that stock-markets and longer-term interest rates will continue to be volatile as they react to new data releases, particularly regarding inflation and the likely course of action by the Federal Reserve.

Moreover, in September 2017 the Federal Reserve announced a program of balance sheet normalization to off-load its substantial holdings of longer-term assets acquired as a consequence of quantitative easing.³ While this will be a gradual process and may be calibrated to longer-term interest rate levels and the state of the U.S. economy, there is also some uncertainty regarding its impact.

¹ Based on IMF (2017c, 2018).

² See Federal Reserve System (2017a, 2018).

³ The Federal Reserve owns some US\$4.2 trillion of securities outright including US\$2.5 trillion of U.S. Treasuries and US\$1.8 trillion of mortgage asset backed securities, see Federal Reserve System (2017b).

As longer-term rates move higher, borrowing costs for firms and governments in the region will increase and the potential remains for further market volatility to affect global asset prices, which could provoke a flight to safety, thereby affecting capital flows.

Turning to Europe, the Euro-area is set to grow at 2.2% in 2018, revised up by 0.3% since October 2017. At its January 2018 meeting, the European Central Bank's (ECB) Governing Council decided against starting to raise its short-term policy-rate, but many expect monetary normalization to commence in Europe in the first half of 2018.⁴ German bond yields have also been rising but remain at very low levels. They are expected to continue to rise gradually, although well-behind the hikes in U.S. rates. The ECB and the Bank of Japan also have substantial assets on their balance sheets which may be tapered in the years ahead.⁵

In the case of China, growth is expected at 6.6% for 2018—a little less than the 6.8% of 2017, which ended on a surprisingly strong note. The Chinese economy has rebalanced to some degree away from its significant reliance on exports and investment. As Chinese citizens become wealthier (GDP per capita is now approaching the level of Brazil) this process is likely to continue. There are still risks related to this process, particularly related to credit markets. A further development has been the growing importance of China in the production of commodities. While still a major importer, particularly of metals and grains, China now has substantial domestic production. Changes in Chinese domestic production, as well as stock holding decisions, have the potential to affect global markets.

Still, commodity prices are expected to be relatively stable through 2018.⁶ Recent increases in the prices of metals and oil, sparked by higher global growth and relatively tight supply conditions, are expected to be maintained, but further gains may be modest. Grain prices are also expected to remain stable. As stressed in previous editions of this report, however, such prices can be extremely volatile as current prices alter to continually reflect expected future demand and supply conditions in the years ahead. Any forecast of commodity prices (including those derived from futures prices) are subject to considerable potential errors.

Prospects for Latin America and the Caribbean

Despite this relatively rosy picture for global economic fundamentals, Latin America and the Caribbean is expected to grow at just 1.9% in 2018. This disappointing performance given the developments in the rest of the world is due to both structural and temporary factors.

⁴ See ECB (2018).

⁵ The IMF estimates the stock of assets held by the Federal Reserve, the Bank of Japan, the ECB, and the Bank of England amounted to about 35% of GDP of these respective countries (IMF, 2017b, Figure 1.13).

⁶ See World Bank (2017).

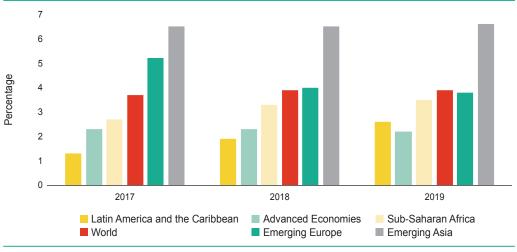


FIGURE 1.1 Growth Rates of Selected World Regions

Source: IMF (2018).

Regional growth figures, however, are lower given the ongoing crisis in Venezuela. Growth for 2018 is now projected at -15% for 2018, although there is always considerable uncertainty attached to any estimate of such a deep recession.⁷

Excluding Venezuela, regional growth is expected to be 2.5% in 2018. As the largest economy in the region, Brazil carries the greatest weight in regional growth figures and is now recovering from recession, with growth expected to be about 1.9% for 2018.8 Excluding Venezuela, all IDB borrowing countries are now expected to post positive growth for 2018. Nine countries are expected to grow at more than 3.5%, including the Dominican Republic, Nicaragua, Panama, and Peru—all expected to grow at 4% or higher.

Still, as discussed in greater depth in the next chapter, the region may only recover back to its mediocre longer-term average (per capita) growth rate in the coming years. Sub-Saharan Africa, Emerging and Developing Europe, and Emerging Asia are all expected to grow faster both in the short and longer term. Global economic growth is expected to be higher than the region's at around 3.8% for the coming years. The region will therefore lose ground in terms of its share of global GDP given these projections (see Figure 1.1).

Thus, even in this sweet spot for global fundamentals, the region will likely post only moderate growth rates for the coming years. A boost to potential growth is required to at least maintain the region's share of global output and, in some countries, this would also help ensure fiscal sustainability. This report is largely dedicated to analyzing why economic performance has been disappointing and what might be done to boost growth.

⁷ See Werner (2018).

⁸ See IMF (2018). Projections from private firms improved substantially during January and February, to 2.9% growth for 2018 (Focus Market Readout, Banco Central do Brazil).

In the following chapter, a growth accounting analysis concludes that the region has invested less and produced less output per unit of investment compared to other regions. Chapter 3 is devoted to understanding further why this has been the case and discussing selected policy options. Chapter 4 considers both the structural and cyclical aspects of fiscal policy as well as the trade-offs between policies to bolster fiscal sustainability and those to boost growth. The analysis suggests alternative reforms to accelerate growth depending on the starting conditions. Chapter 5 considers monetary policy choices in the current context as well as how countries' buffers such as international reserves match up to optimal levels. It is suggested that certain imbalances may be making optimal reserve holdings higher at the current time and that reducing those imbalances would cut the gap between current reserve holdings and the estimated optimal levels. Chapter 6 draws together the policy suggestions from each chapter. In the remainder of this chapter, selected opportunities and risks to growth prospects in the region are considered, employing a statistical model of the global economy.

Risks and Opportunities

While growth is expected to be relatively low in the coming years, there are also several risks. However, as reviewed in the following chapters, there are also many opportunities to boost growth rates. In this section, simulations of specific risks and opportunities are considered employing a Global Vector-Auto-Regression (G-VAR) model of the world economy featuring 14 Latin American and Caribbean countries.⁹

As postulated in last year's Latin American and Caribbean Macroeconomic report, U.S. growth may well be stronger than anticipated, in part due to recent tax cuts and to the possibility of higher infrastructure spending. However, the U.S. economy is close to full employment and under those conditions, additional stimulus may also provoke higher inflation. Rising prices would likely be met by a faster interest rate normalization than currently anticipated by the markets, and even by the Federal Reserve, which frequently stresses that future actions will be "data driven." As witnessed in early February, the likelihood of higher interest rates, despite the positive news on growth, may provoke a correction in asset prices which may well extend to other global financial markets. Finally, there is continued uncertainty regarding the future of U.S. trade policies, in particular vis-a-vis trade with countries that have large trade surpluses with the United States.

Following the analysis in last year's Report, an aggregate U.S. shock is developed which consists of three elements: i) a positive US. growth shock ii) a fall in global asset

⁹ The model is known as a Global Vector Auto-Regression or G-VAR. See Cesa-Bianchi et al. (2012) and the website detailing the GVAR toolbox for further information on G-VARs: https://sites.google.com/site/gvarmodelling/gvar-toolbox.

prices (affecting the United States and Europe and as a response to higher interest rates) and iii) a trade shock that hits those countries with large trade surpluses with the United States. The first shock is calibrated to be one half of a standard deviation of U.S. growth; the second and third (a fall in stock prices in the United States and Europe and a shock to U.S. trade partners with large current account surpluses with the United States) are adjusted such that the overall impact on U.S. growth is roughly neutral. The calibration of the aggregate shock to be roughly neutral for the United States may be justified, given that with unemployment at just 4.1%, the economy is fairly close to full-employment; the idea is that the positive growth shock is largely absorbed by higher interest rates and the negative trade shock. Still, while this shock is roughly neutral for the United States, it turns out to be negative for Latin America and the Caribbean. If the shock were significantly net positive for the United States, then the risks to the region would naturally be lower.

Baseline average growth for the 14 countries in the G-VAR is some 2.6% per annum for 2018–2020. It is estimated that this aggregate U.S. shock would depress growth in the region by about 0.34% per annum for the three years or some 1% of GDP in total. Note that the negative impacts from the trade and the financial shock are counterbalanced to some extent by the positive shock to U.S. growth. However, the impact of the shock would not be homogeneous across countries and, as can be seen, Mexico would be the most affected, losing some 0.84% of GDP per annum each year for three years, or some 2.5% of GDP in total relative to the baseline, although all regions are negatively affected. The three shocks and their impacts are detailed in Table 1.1 and graphed in Figure 1.2A.

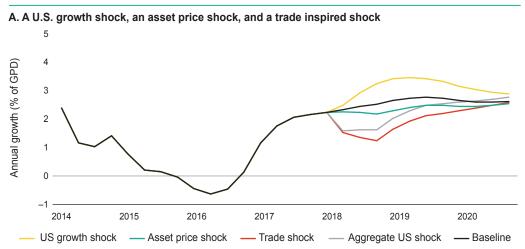
TABLE 1.1 The Impact of Shocks to U.S. Growth, Asset Prices, and Global Trade

	Baseline growth	Difference in growth with respect to baseline (2018–2020 average)			aseline
Country	Average (2018–2020)	U.S. growth shock	Asset price shock	Trade shock	Aggregate U.S. shock
Latin America and the Caribbean	2.6%	0.6%	-0.2%	-0.7%	-0.3%
Southern Cone except Brazil	2.9%	0.7%	-0.3%	-0.6%	-0.2%
Andean Region	3.4%	0.6%	-0.2%	-0.8%	-0.4%
Central America and the Caribbean	3.0%	0.2%	-0.1%	-0.1%	0.0%
Brazil	2.0%	0.4%	-0.2%	-0.2%	0.0%
Mexico	2.7%	0.8%	-0.4%	-1.3%	-0.8%

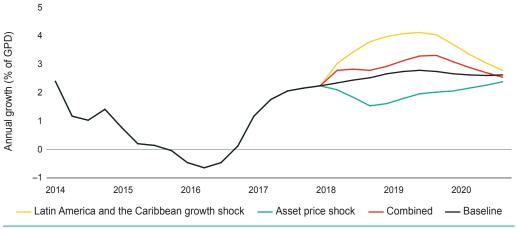
Source: IDB staff calculations and baseline drawn from IMF (2017c) and IMF (2018).

Notes: The U.S. growth shock is a 1/2 standard deviation shock to growth designed to reflect a package of economic stimulus, deregulation, and tax cuts. The asset price shock represents a shock to asset prices in the United States, the Euro Area and the United Kingdom and the trade shock is a set of shocks to those countries with large trade surpluses with the United States. The relative size of the trade shocks are a function of the trade surplus with the United States (as a percent of GDP) and the volatility of the economy in question. The Aggregate U.S. Shock is the combination of the three shocks and the asset price shock and the trade shock are calibrated such that the aggregate U.S. shock is neutral for the U.S. economy.

FIGURE 1.2 Growth Simulations for Latin America and the Caribbean



B. An asset price shock and a positive shock to growth in Latin America and the Caribbean



Source: IDB staff calculations; the baseline is drawn from IMF (2017c) and IMF (2018).

A further risk is a significant fall in global asset prices, provoking a deterioration in financial conditions. To model this risk, a larger negative shock to asset prices in the United States and Europe is considered. The shock is calibrated to be one standard deviation of the relevant stock market index. The impact on Latin America and the Caribbean is significant, with a loss of 0.7% of GDP per annum for three years or some 2.1% of regional GDP in total over this period. Again, the impacts vary across the region with Mexico and the Southern Cone (countries that are more financially integrated) particularly hard hit (see Table 1.2 and Figure 1.2B).

On a more optimistic note, and as argued in the remainder of this report, there is considerable room for Latin America and the Caribbean to boost growth by investing more, and increasing efficiency. If the 14 countries in the region included in this analysis

TABLE 1.2 The Impact of Shocks to Global Asset Prices and to Latin American and Caribbean Growth Rates

	Baseline growth	Difference in growth with respect to baseline (2018–2020 average)		
Country	Average (2018–2020)	Asset price shock	Latin American and Caribbean growth shock	Combined shock
Latin America and the Caribbean	2.6%	-0.7%	1.0%	0.3%
Southern Cone except Brazil	2.9%	-0.8%	1.3%	0.5%
Andean Region	3.4%	-0.5%	1.2%	0.7%
Central America and the Caribbean	3.0%	-0.2%	0.6%	0.3%
Brazil	2.0%	-0.5%	0.8%	0.2%
Mexico	2.7%	-1.0%	1.0%	0.0%

Source: IDB staff calculations based on IMF (2017c, 2018).

Notes: The asset price shock is a 1 standard deviation shock to asset prices in the United States, the Euro Area, and the United Kingdom. The shock to Latin American and Caribbean growth is a one-third standard deviation shock to each of the 14 countries in Latin America and the Caribbean included in the G-VAR which adds up to a 1% shock to GDP of the region. The combined shock captures the combined effect in the region of those two shocks.

boosted growth by just one-third a standard deviation of their own growth rates (spread over 2 years), then this would boost regional growth by a full 1% per annum for three years (some 3% of regional GDP in total). The initial shock for the 14 countries amounts to some 1% of regional GDP (roughly 0.5% each year for 2 years), and then a further 2% of regional GDP comes from the positive growth externalities that exist between countries. This implies that even if global asset prices suffered a substantial correction affecting the region significantly, this could be offset by improving growth through domestic measures. The interesting aspect of this analysis is that if several countries improved growth prospects, then the positive externalities would provide a further significant boost to growth. Hence, the combined impact of the decline in global asset prices and the positive shock to growth is actually an increase in growth of about 0.3% per annum for three years (see Table 1.2 and Figure 1.2B).

Conclusions

Growth in Latin America and the Caribbean is set to continue to recover from the negative rates experienced in 2016, but growth projections only indicate a convergence to the region's long-term average growth rate, which is below those of other regions and below world growth rates. At these projected growth rates, the region will continue to lose its share in global GDP and may not satisfy the aspirations of its growing middle class.

Moreover, there are risks to these moderate growth rate projections. Apart from geopolitical risks, perhaps the most significant economic risk is an uptick in world inflation leading to a faster than anticipated rise in global interest rates, which in turn may impact global asset values in financial markets. Even a positive stimulus to U.S. growth, combined with an accompanying faster move in interest rates and a trade shock, could prove negative overall for the region. And if asset prices fall from recent record levels more significantly, then this could severely impact growth projections.

Latin America and the Caribbean needs to boost potential growth. The good news is that there are ways to enhance growth rates. If this could be achieved, then given the links between countries in the region, positive externalities would likely result. Such actions could be seen as a way to increase growth rates to match those of other regions and as a hedge against the current risks in the world economy. The following chapters analyze the region's growth performance and offer policy suggestions to boost growth.

CHAPTER 2

Searching for Higher Economic Growth

fter two years of slow growth, Latin America and the Caribbean is set to recover gradually in 2017-18. Unfortunately, the growth rate of real GDP in the typical country will be about the same as the region's simple average growth rate since 1960—not enough to help the region catch up with advanced economies or faster-growing developing countries.

Between 1960 and 2017, the average per capita growth rate of real GDP in Latin America and the Caribbean was 2.4% per annum—substantially below that of the rapidly-growing Emerging Asian countries (4.9%) and behind the 2.6% average for all countries in the world that are not in the region (see Figure 2.1.A). 1.2.3 Consequently, while the typical country in Emerging Asia caught up substantially with the income per capita of the United States, from 11% of United States' per capita income in 1960 to 58% in 2017, the typical country in Latin America and the Caribbean gained only 4% of the per capita income of the United States, from 20% in 1960 to 24% in 2017 (see Figure 2.1.B).

Despite the positive global outlook, the prospects for relatively low growth in the region mean boosting income is a high priority. Higher growth on a sustained basis is required to raise the living standards of the population enough to match the aspirations of the growing middle class and to ensure the region reduces the income gap with the advanced economies.

Not only has growth been mediocre, but volatility has also been high, even after smoothing the series. Figure 2.1.A shows the average growth rate of the *filtered* real GDP per capita in the region.⁴ Three waves are visible: (i) the period from the 1960s to the

¹ Estimates based on data from PWT 9.0, using real GDP series in 2011 US\$ PPP units. Latin America and the Caribbean is the simple average of Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela, RB.

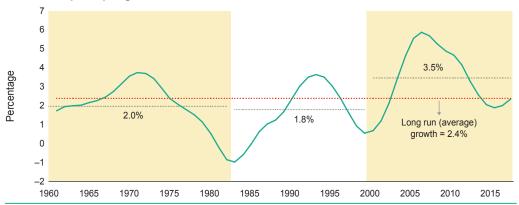
² Rest of the world consists of the simple average of all non-Latin American and Caribbean countries in the sample (74 countries in total). The results are similar when using a synthetic control group comprised of all the non-Latin American and Caribbean countries with similar levels of GDP per capita. For simplicity and tractability, the non-synthetic control group is used as the comparator of choice.

³ Emerging Asia is the simple average of China, Hong Kong SAR, Indonesia, Republic of Korea, Malaysia, Singapore, and Thailand.

⁴ The series were filtered using the Hodrick-Prescott filter with smoothing parameter λ =7 to remove cyclical fluctuations.

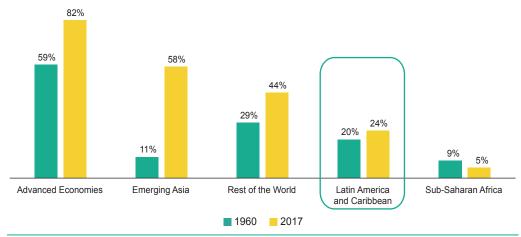
FIGURE 2.1 Latin America and the Caribbean's Long-run Performance





Note: The real GDP series are in 2011 US\$ PPP units. Series were filtered using the Hodrick-Prescott filter with smoothing parameter λ =7 to remove cyclical fluctuations. The regional average is computed as the simple (unweighted) average by country. The average growth rate for the whole period (1961–2017) and three subperiods (shaded) are plotted in the graph.

B. Real income per capita relative to the United States



Source: IDB staff calculations based on Penn World Table 9.0 database.

Note: The real GDP figures are in 2011 US\$ PPP units. The regional average is computed as the simple (unweighted) average by country.

trough of 1983 (when the region was in the midst of the debt crisis); (ii) the period starting in the aftermath of the debt crisis and extending through the late 1990s (ending in a series of emerging market financial crises); and (iii) the period from 2000 to the recent decline in growth following the global crisis of 2008. During the last period, the average growth rate increased to 3.5% per year—higher than in the preceding two periods—thanks in large part to favorable external conditions. However, more recently, the growth rate has fallen back to the period average.

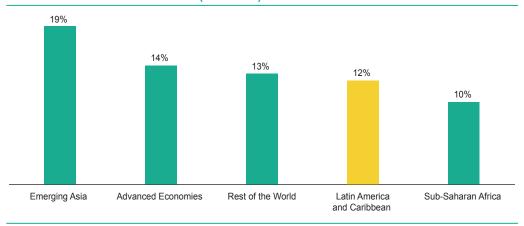


FIGURE 2.2 Net Investment Rates (% of GDP)

Note: Net investment rates are computed taking the ratio between the change in the real capital stock (numerator) and GDP (denominator). The regional averages are computed as the simple average by country over the period 1960–2017.

The large fluctuations identified in the real GDP per capita growth rate may also be harmful to growth. Per capita growth rates are more volatile in Latin America and the Caribbean than in the comparator groups. Thus, Latin America and the Caribbean faces a dual challenge: to increase growth, and to make growth more stable. While this is not a new problem facing policymakers in the region, it has become urgent. As reviewed in Chapter 4, fiscal positions have deteriorated in recent years, and in some countries higher growth has become important to ensure fiscal sustainability.

What factors have impeded sustained economic growth in the region? Economies grow by accumulating the inputs (or factors) of production (i.e., more labor, greater investments in human and physical capital) and by employing those factors more efficiently (increasing total factor productivity). The region has suffered from both a low accumulation of capital and low productivity growth (see Navarro, Llisterri, and Zúñiga, 2010; Powell, 2014; Cavallo and Serebrisky, 2016).

Investment Rates and Total Factor Productivity Growth: Low and Lower

Capital accumulation expands the productive capacity of the economy. Figure 2.2 shows the average annual investment rates (capital accumulation net of capital depreciation) for selected regions in the world since 1960.⁵ Latin America and the Caribbean invested

⁵ It is calculated as the annual change in the actual physical capital stocks, normalized by real GDP. Country data on capital stocks and GDP come from PWT 9.0 database.

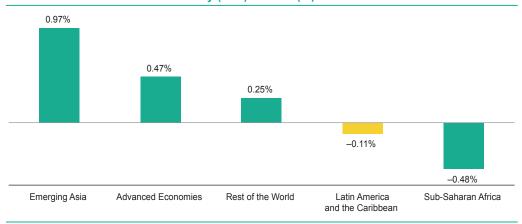


FIGURE 2.3 Total Factor Productivity (TFP) Growth (%)

Note: TFP growth is computed by country taking the year-on-year change in TFP. TFP is computed as a residual of a log-linearized Cobb-Douglas production function, using the methodology described in Fernández-Arias and Rodríguez-Apolinar (2016). The regional averages are computed as the simple average by country over the period 1960–2017.

less (as a share of GDP) than any other region, except for Sub-Saharan Africa, which is a region with a significantly lower level of development.

Low capital accumulation would be less of a problem by itself if the factors of production were employed efficiently, yielding high output despite low inputs. However, the growth of total factor productivity, which is the most widely used measure of aggregate economic efficiency, has also lagged in Latin America and the Caribbean relative to other regions (Figure 2.3).

The evidence shows that Latin America and the Caribbean invests less than fast growing regions. It also invests poorly, meaning it is not investing its economic resources in ways that promote aggregate efficiency.

Accounting for Economic Growth

To identify the sources of economic growth, it is useful to analyze the data through the lens of a model that can combine the various inputs of the production process. Consider the following aggregate production function:

$$Y_t = A_t K_t^{\alpha} (h_t L_t)^{1-\alpha} \tag{1}$$

Equation (1) is a Cobb-Douglas specification of the production process. Y is aggregate output, α is the output elasticity to physical capital (K), hL is the productive capacity of the labor force, which in turn corresponds to the headcount of the labor force (L), multiplied by its average level of skills (h). Finally, A is total factor productivity (TFP),

TABLE 2.1 Growth Accounting Decomposition, Selected Countries/Groups (Average 1960–2017)

	Full period: 1960–2017				
		Contribution of:			
	GDP growth (per capita)	TFP	Capital Accumulation	Skills	Labor
	$\Delta \left(\frac{\mathbf{Y}}{\mathbf{N}} \right)$	$\frac{1}{1-\alpha}\Delta A$	$\frac{\alpha}{1-\alpha}\Delta\left(\frac{K}{Y}\right)$	Δh	$\Delta \left(\frac{L}{N} \right)$
Advanced Economies	2.71%	0.84%	0.92%	0.76%	0.20%
United States	2.04%	0.79%	0.28%	0.59%	0.38%
Emerging Asia	4.86%	1.72%	1.09%	1.28%	0.77%
Rest of the World	2.60%	0.45%	0.98%	0.98%	0.20%
Latin America and the Caribbean	2.40%	-0.20%	1.01%	0.92%	0.66%

Source: IDB staff estimates based on data from Penn World Table 9.0 database.

Notes: Linear growth accounting decomposition using Cobb-Douglas production function (see equation A4 in Appendix A). N is population. α is constant and equal across countries and equal to 0.43. Average annual growth rates (in percent).

which captures the effectiveness with which accumulated factors of production are used to produce output. Total factor productivity captures everything else that affects output that is not specified elsewhere in this equation, and captures any misspecification of the production function. The sub-index t introduces the time dimension to the process.

Decomposing growth from 1960 for selected groups of countries yields some very interesting results (see Table $2.1)^6$

Both skills and raw labor contribute positively to growth in Latin America and the Caribbean. This is not surprising; since the 1960s, the region has benefited from the "demographic bonus" of falling population dependency ratios (i.e. the share of non-working age to working age populations), which accounts for a significant fraction of economic growth.⁷ The expanded labor force has also become more educated. Presently, the region has almost universal access to primary education; three out of four children enroll in secondary school, and countries in the region are systematically expanding access to preschool and tertiary education.⁸ The expansion of education has led to an increasingly skilled labor force. Going forward, however, the demographic bonus is disappearing because

 $^{^6}$ The raw data comes from the Penn World tables database (PWT 9.0). The decomposition is done by first transforming equation (1) to per capita terms by dividing both sides by population, then taking logs to both sides of equation (1), and finally taking first differences to express the variables in growth rates. It is assumed that α is constant and equal across countries (see Appendix A for details on growth accounting).

⁷ See Cavallo, Sánchez, and Valenzuela (2016).

³ Despite the progress in terms of skills accumulation, compared to countries with similar levels of development, skills in the region are low at every stage of life (see Busso et al., 2017).

TABLE 2.2 Growth Accounting Gaps

	Full period: 1960–2017					
		Contribution of:				
Latin America	GDP growth (per capita)	TFP	Capital Accumulation	Skills	Labor	
and the Caribbean minus	$\Delta \left(\frac{\mathbf{Y}}{\mathbf{N}} \right)$	$\frac{1}{1-\alpha}\Delta A$	$\frac{\alpha}{1-\alpha}\Delta\left(\frac{K}{Y}\right)$	Δh	$\Delta \left(\frac{L}{N} \right)$	
Advanced Economies	-0.31%	-1.04%	0.09%	0.17%	0.47%	
United States	0.35%	-1.00%	0.74%	0.33%	0.28%	
Emerging Asia	-2.47%	-1.92%	-0.08%	-0.36%	-0.10%	
Rest of the World	-0.21%	-0.65%	0.03%	-0.06%	0.46%	

Notes: Linear growth accounting decomposition using Cobb-Douglas production function (see equation A4 in Appendix A). N is population. α is constant and equal across countries and equal to 0.43. Average annual growth rates (in percent).

the population is aging and, therefore, the margin to increase labor participation is being exhausted. The region still has ample scope for investing in human capital; however, the rapid increase in skills based on the massive extension of the education system of the past will eventually reach its limit.

The most striking result derived from Table 2.1 is that in Latin America and the Caribbean, the overall contribution of TFP growth to GDP per capita growth has been negligible (-0.2%). This is largely to blame for the relatively poor growth performance visà-vis the comparators. Instead, physical capital accumulation has contributed 1 percentage point to GDP per capita growth over this period.⁹

To shed more light on the factors contributing to the poor *relative* performance of Latin America and the Caribbean, it is useful to compute the growth gaps vis-à-vis the comparator groups. Table 2.2 shows the results.

In the 1960–2017 period, the average per capita growth rate in Latin America and the Caribbean has been almost 2.5 percentage points below that of Emerging Asian countries, in large part due to slower TFP growth. In relation to other comparator groups, the growth gaps are smaller; however, in all cases, the relative contributions of TFP growth are negative. On the other hand, the autonomous contribution of physical capital accumulation has been in line with comparators, while the contributions of skills and labor have often exceeded those of other country groups (except for Emerging Asia).

⁹ The long-run averages employed naturally wash out some interesting temporal variation. In unreported results, the contributions of TFP growth and capital accumulation (0.12% and 1.38%, respectively) were higher in the sub-period 1990-2017 vis-à-vis the sub-period 1960-1989 (-0.51% and 0.65% respectively). However, the improved performance in the latter period was not enough to make up for the gaps that were opened during the first period.

These growth accounting results raise an important question: Why is the contribution of physical capital accumulation to growth in line with comparators (Tables 2.1 and 2.2) while at the same time investment rates in Latin America are lower than in other regions (Figure 2.2)? The answer is low investment efficiency.

Low Investment Efficiency

The results of the growth accounting exercise reveal that slow total factor productivity growth is the main factor behind Latin America's mediocre long-run economic performance. However, this does not imply that investment levels are always adequate. Indeed, as reviewed in Chapter 3, investment rates in some countries are very low. Moreover, the investment that does occur may be inefficient. For example, investment may not be in the most productive firms or the returns from public investment may be low.

Another way to consider the poor growth performance of the region is precisely through the efficiency of investment. To see this, note that capital accumulation (ΔK) in the economy is usually measured as relative to initial output (Y). The ratio of capital accumulation to initial output $\frac{\Delta K}{\gamma}$ is the investment rate. At the same time, capital accumulation (ΔK) is one of the determinants of the growth rate of output (ΔY) as per equation (1). Thus, for any given investment rate, the capital-output ratio evolves at a pace that is determined by how much the capital accumulation (ΔK) increases output (ΔY). This pace varies across countries depending for example, on how efficient countries are in employing productive inputs.

Latin America and the Caribbean had the lowest capital-output ratio of any region in the early 1960s (see Figure 2.4). However, since then, the capital-output ratio has increased steadily, in line with the trajectories in other regions. This is consistent with the growth accounting exercises showing that the contribution of physical capital accumulation—which is measured in terms of changes in the capital to output ratio (see Appendix A)—in Latin America and the Caribbean was similar to other regions. However, in the case of Latin America and the Caribbean, increasing the capital-output ratio was not the product of high investment rates. In fact, between 1960 and 2017, investment rates in the region were on average 7 percentage points of GDP lower than in Emerging Asia (Figure 2.2). Instead, a plausible explanation is that the few resources that were devoted to accumulating physical capital have yielded even less incremental output.¹⁰ In other words, capital-output ratios

A simple numerical illustration is useful to make the point. Take, for example, the cases of South Korea and Brazil in Emerging Asia and Latin America, respectively. In South Korea, the capital stock was 158 times larger in 2017 than in 1960. Real output was 64 times larger in 2017. The ratio of the increase in capital to the increase in output during this period was 2, meaning that capital increased twice as much as output. In Brazil, the capital stock was 50 times larger in 2017 than in 1960. Real output was 18 times larger in 2017. The ratio of the increase in capital to the increase in output in Brazil during this period was 3, meaning that the stock of capital increased 3 times as much as output.

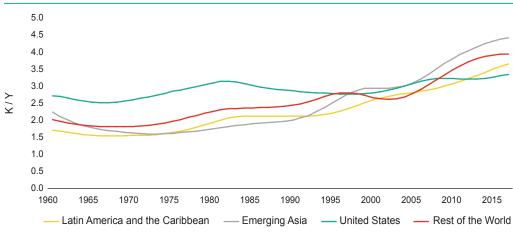


FIGURE 2.4 Capital to Output Ratios

Note: Output ratios are computed as the ratio between the real capital stock (numerator) and GDP (denominator); both series are in 2011 US\$ PPP units. The capital stock (K) is the broadest concept of physical capital, including both public and private capital (both residential and non-residential). The regional averages are computed as the simple average by country.

may have increased in Latin America despite the low investment rates because output growth has performed relatively worse. This is consistent with low investment efficiency in Latin America and the Caribbean. But it is not proof.

A problem with pairing the accounting identities with investment efficiency is that it is tantamount to attributing all the incremental output to physical capital accumulation.¹¹ This is erroneous because human capital and labor are other factors of production contributing to growth; and those factors also contribute differently to growth across regions. To address this shortcoming, a proxy of investment efficiency is constructed that filters output from the contributions of skills and raw labor.

Take the log linear version of equation (1):

$$\Delta Y = \Delta A + \alpha \Delta K + (1 - \alpha) \Delta h + (1 - \alpha) \Delta h L \tag{2}$$

Where Δ denotes the growth rate of the corresponding variable, and time subscripts are omitted for notational simplicity.

Define
$$\Delta Y_1 = \Delta Y - (1 - \alpha)\Delta_h - (1 - \alpha)\Delta L$$

Then, investment efficiency is defined as the ratio of GDP growth (net of the contributions of raw labor and skills) to the net investment rate, or:

The reader may be reminded of the concept of ICOR, or the incremental capital-output ratio, which is a concept that was often considered a measure of the "quality of investment."

Investment Efficiency (IE) =
$$\frac{\Delta Y_1}{\frac{\Delta K}{Y}}$$
 (3)

Using this proxy, IE in Latin America and the Caribbean is lower than Emerging Asia and the rest of the world: while a percentage point of incremental investment as a share of GDP yields about 0.28 percentage points of higher GDP growth per annum in Emerging Asia, it yields about 0.20 percentage points in Latin America. These differences accumulate over time to produce significant growth gaps between the regions.

Paths to Higher Growth

Latin America and the Caribbean has lower investment efficiency than Emerging Asia. How much additional growth could the region reap from its investment effort if it were able to achieve the same level of investment efficiency as Emerging Asia?

To answer this question, Emerging Asia's average IE calculated using equation (3) is combined with Latin America and the Caribbean's annual investment rate. The result is a counterfactual path of GDP for Latin America and the Caribbean. This counterfactual is plotted in Figure 2.5, along with the actual GDP for the region during the period (both indexed to the GDP level of 1960).

Counterfactual real GDP would be approximately twice as large as the actual GDP if the region had the average level of efficiency of Emerging Asian economies (i.e., 0.28 vs 0.20 percentage points of incremental output per unit of net investment).

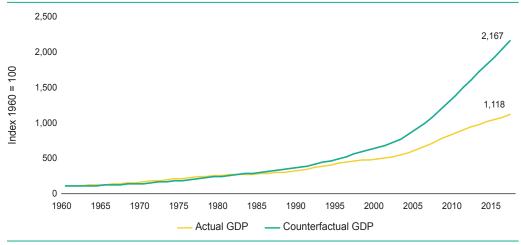
During the period analyzed, net investment rates in Latin America and the Caribbean were on average 7 percentage points of GDP lower than Emerging Asian countries. The region could spur growth by investing more. If Latin America and the Caribbean had matched the investment rates of Emerging Asia, what would its GDP growth have been?

If Latin America had either invested as much or had the same investment efficiency as Emerging Asia, its GDP would have been higher compared to the actual by about the same order of magnitude. In other words, the impact on GDP growth would have been the same in either case.

But what if the region had managed to do both? If Latin America and the Caribbean had enjoyed both Emerging Asia's investment efficiency and investment rates, how much would the region's GDP have grown?

The regional values of IE are computed in three steps. First, by taking the average of the numerator and the denominator of expression (3) separately for every year. Next, the ratio between the two is computed to obtain the investment efficiency for each region on an annual frequency between 1960 and 2017. Finally, the average regional values are obtained by averaging across years.

FIGURE 2.5 Latin America and the Caribbean's Actual and Counterfactual GDP with Emerging Asia's Investment Efficiency



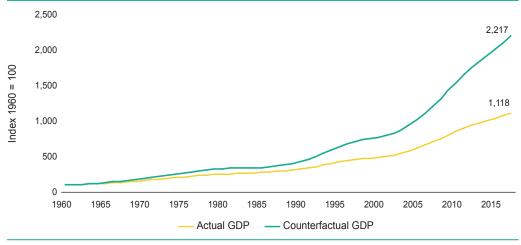
Note: Counterfactual GDP growth rates for Latin America and the Caribbean are calculated using equation (3). Counterfactual ΔY_1 for Latin America and the Caribbean is the product of the IE for Emerging Asia (IE) $_{\rm EA}$ —average value for the 1960–2017 period—times the actual investment rate of Latin American countries $\frac{\Delta K}{2}$ year by year.

(Y)

Counterfactual ΔY is obtained adding Latin America and the Caribbean's $(1-\alpha)\Delta h + (1-\alpha)\Delta L$ to counterfactual ΔY_1 as per equation (2).

The figure traces the actual and counterfactual GDP series for Latin America and the Caribbean, indexing GDP = 100 in 1960, and applying the actual and counterfactual GDP growth rates respectively.

FIGURE 2.6 Latin America and the Caribbean's Actual and Counterfactual GDP with Emerging Asia's Investment Rates



Source: IDB staff calculations based on Penn World Table 9.0 database.

Note: Counterfactual ΔY_1 for Latin America and the Caribbean is the product of the IE for Latin America and the Caribbean (IE)_{LAC} times the actual investment rate of Emerging Asia countries

 $\left(\frac{\Delta K}{Y}\right)_{EA}$ year by year.

7,000 6.264 6.000 5,000 ndex 1960 = 100 4,000 3.000 2,000 1,118 1,000 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 Actual GDP Counterfactual GDP

FIGURE 2.7 Latin America and the Caribbean's Actual and Counterfactual GDP with Emerging Asia's Investment Rates and Investment Efficiency

Note: Counterfactual ΔY_1 for Latin America and the Caribbean is the product of the IE for Emerging Asia (IE) _{EA}—average value for the 1960–2017 period—times the actual investment rate of Emerging Asia countries

 $\left| \frac{\Delta K}{V} \right|$ year by year.

This exercise combines the preceding two and shows the joint impacts of higher investment efficiency and higher investment rates. If Latin America and the Caribbean had invested more (+ 7 p.p. of GDP) and better (IE = 0.28), real GDP by 2017 could have been an impressive 6 times higher.

Conclusion

Latin America and the Caribbean must search for sources of growth that can drive its economies forward. The expansion of the labor force and improving skills (human capital) have significantly boosted growth over the last 50 years. And while there are still major gains to be realized from further improving skills, the demographic trends are no longer favorable because population is now aging. This puts the onus for raising long-term growth on the shoulders of capital investment and aggregate productivity growth. The evidence shows long-run growth has been constrained by the level and the quality of capital investment. The region must thus invest more and raise efficiency to increase growth and to make it sustainable.

CHAPTER 3

Low Growth: **Diagnosis and Remedies**

hapter 2 highlights that growth in Latin America and the Caribbean has been mediocre and that growth would be boosted with higher investment and with greater investment efficiency-getting more out of each dollar invested. This chapter explores why investment rates and investment efficiency have been relatively low and how they can be enhanced in the years ahead to boost growth.

Why Is Investment Low?

As discussed in Chapter 2, the region does not invest as much as most other regions of the world. Indeed, while investment grew somewhat in the 2000s it has fallen again in recent years, such that among world regions, only Sub-Saharan Africa invests less as a percentage of GDP (see Figure 3.1). Investment rates vary considerably, however, across countries (see Figure 3.2). Still, most are below the average investment rate for emerging

45 40 35 % of GDP 30 25 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 1984 1986 - Advanced Economies - Emerging Asia --- Emerging Europe - Middle East & North Africa --- Sub-Saharan Africa --- Latin America and the Caribbean

FIGURE 3.1 Total Investment Rates

Source: IDB staff calculations based on IMF (2017c).

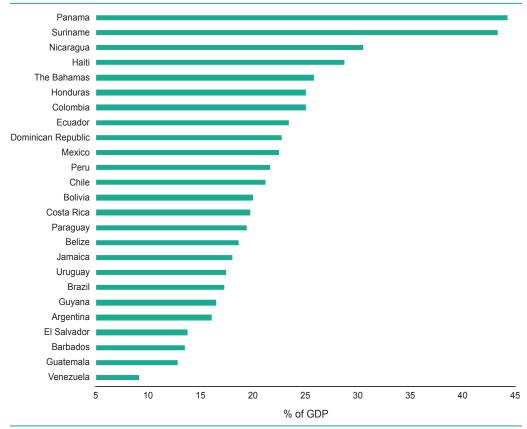


FIGURE 3.2 Total Investment Rates, 2017

Source: IDB staff calculations based on IMF (2017c).

Europe—around 25% of GDP—let alone the higher rates in Emerging Asia or the Middle East and North Africa.

Private investment tends to drive these total investment rates in Latin America and the Caribbean. Public investment has been extremely low, averaging just 5% of GDP since 2001 for the typical country. The following chapter focuses on the reasons for such low public investment rates. A first potential reason for a lack of total investment is a lack of savings. Total investment rates go hand in hand with rates of gross national savings, as illustrated in Figure 3.3 (see also Cavallo and Pedemonte, 2016). This implies that countries with low domestic savings do not, to a large degree, employ foreign savings to supplement their relatively low investment rates. It appears that at best, foreign savings are an imperfect substitute for domestic savings (Cavallo, Eichengreen, and Panizza, 2017).

Still, this does not necessarily imply that the amount of savings is the binding constraint. The level of domestic interest rates may indicate if the problem is truly a lack of savings, which constrains the quantity of investment, or a lack of profitable opportunities, which

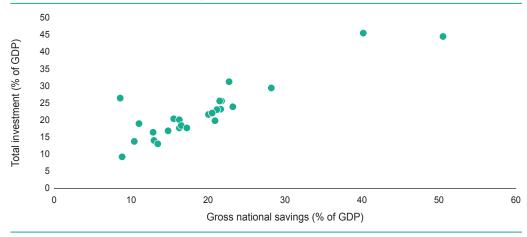


FIGURE 3.3 Gross National Savings and Total Investment, 2017

Source: IDB staff calculations based on IMF (2017c).

Note: Each dot represents a country in Latin America and the Caribbean.

may affect the quantity and quality of investment. In countries without many good investment opportunities, firms may end up either not investing, or investing in low productivity projects yielding low measured investment efficiency. High interest rates would suggest that while profitable investment projects may exist, funding for them may be scarce. That scenario would then support low savings and/or poor domestic financial intermediation (such as high banking spreads) as the explanation for low investment rates. Indeed, this is the starting point for the analysis proposed by Hausmann, Rodrik, and Velasco (2008) to diagnose critical barriers to growth.¹

A number of countries in the region with low investment rates have high real interest rates and high banking spreads suggesting that in those cases, low savings and poor domestic financial intermediation may well be critical constraints. Figure 3.4 plots real lending rates and Figure 3.5 illustrates the often-high contribution of banking spreads to bank lending rates in selected countries in the region.

However, several countries with low investment rates (and low savings) also have low domestic interest rates. This suggests a lack of profitable projects rather than a scarcity of funds as the binding constraint. One reason might be perceived problems for investors to appropriate profits—referred to as a problem of appropriability.² Creditor rights may be limited and corporate governance may be weak such that minority shareholders or arms-length creditors are unwilling to invest in firms, even if their activities are profitable.

¹ See also Agosin, Fernández-Arias, and Jaramillo (2009) for a set of growth diagnostic studies for Latin America and the Caribbean.

² Credit rationing based on imperfect information may also explain low interest rates and why profitable projects may go unfunded (see Stiglitz and Weiss, 1981).

Honduras Dominican Republic Peru Paraguay Barbados Jamaica Bolivia Trinidad and Tobago Costa Rica Belize Guatemala Uruguay Colombia Nicaragua Panama Guyana The Bahamas Mexico Chile Haiti Argentina Suriname Venezuela -20-15 -10-5 10 15 20 Percentage

FIGURE 3.4 Real Lending Interest Rates, 2016

Source: IDB staff calculations based on World Bank (2017).

Note: information for Venezuela is for 2014.

These problems may simultaneously limit the size of financial systems and reduce the supply of projects that investors are willing to finance. Such problems often go hand in hand with what is referred to as financial repression. In this case, economic policies may be the culprit. Well-meaning actions to regulate and limit the level of interest rates or to protect consumers (for example by not allowing banks to seize collateral on default) may also inhibit investment and repress the size of financial systems.³ Also, institutional factors such as deficient regulation, corruption, crime, and low quality and availability of infrastructure, can negatively affect investment incentives.⁴

Finally, some countries, typically those with higher investment rates, may face alternative barriers to boost those investment levels. In these cases, financial systems tend to be deeper and domestic financial markets may be working relatively well (or there may be

³ Consumer protection is a valid concern in financial markets. An alternative to interest rate caps is to focus on regulating the types of products offered and enhancing competition through transparency and regulation of anti-competitive practices, and on financial education.

⁴ See, for example, Djankov et al. (2002), Rodrik and Subramanian (2004), Aterido, Hallward-Driemeier, and Pagés (2011), and Escribano and Guasch (2012).

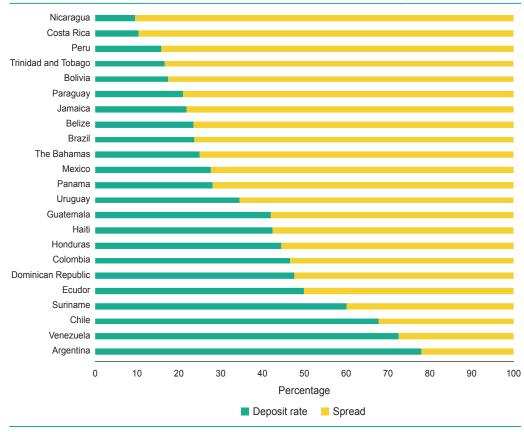


FIGURE 3.5 Deposit Rate and Spread Components of Nominal Lending Interest Rate, 2016

Source: IDB staff calculations based on World Bank (2017).

ample access to foreign savings), interest rates tend to be relatively low and the binding constraint on boosting investment further may be related to the supply of complementary inputs. Depending on the case, countries may lack necessary infrastructure, human capital, or skills to boost the supply of profitable projects. Appendix B includes a short description of the growth diagnostics approach applied to selected countries.

While the growth diagnostics methodology in its purest form purports to find the (single) binding constraint to higher investment rates, in practice it is often hard to isolate one particular factor.⁵ Indeed, economies are complex systems and many constraints to growth in different sectors or in different regions may be simultaneously relevant.⁶

⁵ Hausmann, Rodrik, and Velasco (2008) stress the focus should be on the "most binding constraint."

⁶ Growth diagnostic analyses themselves sometimes mention relevant factors from both sides of the tree (low returns versus high-cost finance) and frequently mention multiple factors within each side of the tree (see Agosin, Fernández-Arias, and Jaramillo, 2009).

Background country analyses at the IDB often employ three methodologies to isolate potential barriers to growth i) Growth Diagnostics (as discussed earlier and in Hausmann, Rodrik, and Velasco, 2008); ii) Development Gaps; and iii) Priorities for Productivity and Income.

- Development Gaps considers a wide set of indicators across many sectors and, controlling for countries' income per capita, then determines for each country the sectors in which indicators are significantly below expected levels (see Borensztein et al., 2014).
- Priorities for Productivity for Income clusters countries according to income per capita. Using indicators in different sectors and an econometric methodology, it identifies which sectors appear to be critical to increase the probability of a country moving to the next income category (see Izquierdo et al., 2016; Powell, 2016).
 This last methodology calculates the increase in probability of moving to the next income level given specific improvements in the indicators in selected sectors.

Each particular methodology has both advantages and limitations; therefore, it's interesting to see where at least two of the methodologies agree. Table 3.1 illustrates the critical sectors that may be limiting growth by country and where at least two of the three methodologies are in agreement.⁷ As shown in Table 3.1, infrastructure and financial markets appear as the top priorities in terms of the number of times they are mentioned; both are mentioned 15 times.⁸

Innovation and Integration (meaning lower competitiveness and a low level of more sophisticated exports) are also mentioned several times in Table 3.1. A low propensity to innovate and adopt better technologies may hinder productivity and growth. Interestingly, while there has been a diffusion of knowledge from advanced economies to Latin America and the Caribbean, this has not boosted productivity as might have been expected. Appendix C discusses knowledge diffusion and what might be done to improve technology adoption. A lack of experimentation may also limit the production of more complex and higher-value

The methodologies do not use exactly the same terminology; for example, Hausmann, Rodrik, and Velasco (2008) refer to "bad local finance" while the other methodologies refer to (indicators of the size and efficiency in) the "financial sector." While growth diagnostics refers to infrastructure as a whole, the other methodologies try to isolate whether the constraints may be in particular sectors such as transport or energy. The agreements between the three methodologies indicated in Table 3.1 then rely on a mapping between the different terms used in each.

⁸ These two priorities may of course be related. Ketterer and Powell (2018) discuss the more microeconomic reasons that may explain a lack of infrastructure financing, including the nature of the risks and the potential inadequacy of current instruments to manage them, while Cavallo and Serebrisky (2016) argue from a more macroeconomic standpoint that a lack of domestic savings (related to financial markets) is a constraint to adequate infrastructure investment.

⁹ Prescott (1998) and Parente and Prescott (1999) argue that productivity differences between countries are due to the lack of adoption of new technologies and the inefficient use of existing technologies.

TABLE 3.1 Critical Sectors to Enhance Growth

Country Potential Barriers to Growth						
Argentina	Financial Markets	Infrastructure	Innovation and Integration	Institutional Strengthening	_	-
The Bahamas	Financial Markets	Infrastructure	Education	Health	Innovation and Integration	_
Bolivia	Education	Financial Markets	Health	Infrastructure	Innovation and Integration	Institutional Strengthening
Brazil	Financial Markets	Infrastructure	-	-	-	-
Chile	Financial Markets	Health	Infrastructure	Innovation and Integration	Institutional Strengthening	_
Colombia	Infrastructure	Education	Financial Markets	Institutional Strengthening	-	_
Costa Rica	Financial Markets	Infrastructure	-	-	-	-
Dominican Republic	Financial Markets	Education	Infrastructure	Institutional Strengthening	-	_
Ecuador	Innovation and Integration	Financial Markets	Institutional Strengthening	-	-	_
Guyana	Innovation and Integration	Education	Financial Markets	Health	Institutional Strengthening	_
Haiti	Education	Infrastructure	Institutional Strengthening	_	_	_
Honduras	Education	Health	Infrastructure	Institutional Strengthening	_	_
Jamaica	Financial Markets	Innovation and Integration	Institutional Strengthening	-	-	_
Nicaragua	Education	Infrastructure	Innovation and Integration	Institutional Strengthening	-	_
Paraguay	Innovation and Integration	Education	Financial Markets	Infrastructure	Institutional Strengthening	_
Peru	Financial Markets	Infrastructure	_	-	-	-
Suriname	Innovation and Integration	Education	Financial Markets	Health	Infrastructure	Institutional Strengthening
Trinidad and Tobago	Education	Health	Infrastructure	Innovation and Integration	Institutional Strengthening	_
Uruguay	Financial Markets	Infrastructure	_	_	_	_

Source: IDB staff calculations.

Note: The sectors in red are those in which the three methodologies agree. Sectors in black are those in which two methodologies agree.

goods. Such goods tend to require higher levels of coordination within the private sector (including more complex supply chains) and between the public and the private sector in order to secure the appropriate inputs.¹⁰ Moreover, shifts in international prices or other shocks may enhance profitability in some sectors but render firms in other sectors uncompetitive prompting a potentially costly adjustment process. Active productive development policies can enhance coordination and may allow for a more efficient transformation towards more sophisticated products and to ease structural transformations in the face of external shocks (see Crespi, Fernández-Arias, and Stein, 2014). There have been particularly interesting policy measures adopted in the region to address this last issue (see Box 3.1).

This discussion is based on the mechanical application of these three specific, largely growth-oriented methodologies. In practice, country development challenges are broader and more nuanced. In-depth country-specific analyses are required to then truly isolate overall priority actions. Such analyses are contained in IDB Country Development Challenges documents that serve as inputs to country strategies and the basis for country dialogue. Moreover, Latin America and the Caribbean appears to suffer from more microeconomic issues that may explain why it obtains less from each dollar of investment than other regions. The next section digs deeper to analyze why investment may be less productive in Latin America and the Caribbean than elsewhere, and what might then be appropriate policy responses.

Investment Efficiency: Are Resources Misallocated?

Investment efficiency as defined in the previous chapter is part of a broader concept that economists refer to as total factor productivity, or TFP. TFP is computed as everything regarding the output of an economy that cannot be explained by measuring how much capital and how much labor the economy is using. The twist in the previous analysis is that the amount of labor is adapted by considering the skills of the workforce. Thus, any increase in output that is not explained by employing more capital or more labor or by increasing skills is, by definition, due to an increase in productivity with which an economy employs its inputs.

The productivity of the economy as a whole can be thought of as the sum of the productivity of each individual firm. However, large firms that produce more have a higher weight in such a calculation than smaller firms. Therefore, aggregate productivity is the weighted sum of the individual firm productivities. Mathematically, aggregate TFP can be thought of as the *weighted* (w_i) sum of the firm-level TFP_i (of the *existing* population of firms that currently operate in the economy). That is,

¹⁰ These arguments are highly complementary to analyses of the product space in Latin America and the Caribbean and the apparent lack of complexity in those products (see Hidalgo et al., 2007; Hidalgo and Hausmann, 2009).

¹¹ As examples, please refer to IDB (2015a, 2015b, 2016a, 2016b, 2017a, 2017b, 2017c, 2017d, 2017e).

BOX 3.1 New Productive Development Policies in Latin America

Industrial or productive development policies (PDPs) have had a checkered history in the region. Frequently, they appeared to protect internal markets rather than to take advantage of the opportunities offered by international markets, and have often been a response to rent seeking by affected business owners. The IDB flagship, *Rethinking Productive Development* (Crespi, Fernández-Arias, and Stein, 2014), however, argues that PDPs may be good or bad depending on how they are designed and implemented.

A recent and promising PDP to assist in transforming the economy is Argentina's *Productive Transformation Program (PTP)*, which aims to help reallocate workers from companies and sectors with low productivity and low competitiveness to companies and sectors with greater potential. What to do with the productive sectors that lose competitiveness as the economy becomes integrated into the world? Until recently, the answer in Argentina was the Productive Recovery Program (REPRO). If a company was in a crisis situation, this program granted it a job subsidy of a minimum wage per worker for up to one year. There were two conditions. The first was that the company had to submit a plan detailing the actions it would take to recover. The second was that the company had to make a commitment not to dismiss workers and maintain the total payroll. As a result, REPRO granted subsidies that, in fact, preserved employment in troubled firms, typically in uncompetitive sectors.

The PTP, which was introduced at the end of 2016, is in some way the "REPRO backwards." Instead of preserving the productive factors in firms in trouble, its aim is to facilitate their reassignment to dynamic firms with competitive potential. How does it work? This is best explained by an example. Think of a company that makes computers under very high protection schemes. After opening the sector, the company loses competitiveness. One option is to close (in this case they do not access the PTP). Another option is to transform their activity; for example, focusing on sales of imported computers, and providing technical services. But in this new modality, the number of workers required is much lower. With a transformation plan, the company can access the PTP. What does it receive? Dismissed workers receive expanded unemployment insurance up to 2.5 minimum wages for six months—much more generous than normal unemployment insurance, which does not reach half the minimum wage. If the transformation project requires investments, the company can receive a 5 percentage point interest rate subsidy to finance these investments.

In addition to these "transformable" firms, the program also admits "dynamic" companies, which are able to absorb the dismissed workers. Dynamic firms receive a job placement subsidy up to a maximum of one minimum wage per worker absorbed from the program for up to 9 months.^a Dynamic firms also receive a 5 percentage point interest rate subsidy to finance amounts up to 1 million pesos (about \$50,000) per worker absorbed.

For transformable firms, the key benefit is expanded unemployment insurance for dismissed workers, which allows them to reduce disputes with unions, give support to workers, and advance their transformation processes. The profiles of dismissed workers are shared with the relevant dynamic companies to facilitate job transition, with close monitoring by the program throughout the process. For the dynamics, both the job placement subsidy and the subsidized financing are important elements.

Aside from these benefits, the program offers resources to train dismissed workers, although so far the training component has been very limited. It also includes a transfer subsidy but, despite this, reluctance to move has been a major obstacle to the program.

The program involves a great deal of public-public coordination. Although it is led by the Secretariat of Productive Transformation of the Ministry of Production, there is considerable

(continued on next page)

BOX 3.1 New Productive Development Policies in Latin America (continued)

involvement by the Ministry of Labor. The other participants are the Argentine Agency for Trade and Investment (which analyzes the investment projects of the transformable and dynamic companies), ANSES (the social security agency (which makes the payments related to the unemployment insurance), the Secretariat of Commerce (which sometimes sets an opening timetable for the transformation), and in some cases the National Institute of Industrial Technology (INTI) to provide support to those firms in quality improvement programs. There is also strong involvement at the local level, both by municipal development departments and local Employment and Labor Training Offices.

Although the program is very new (the first firms entered the program in the first quarter of 2017), there are already some interesting results. In December 2017, some 26 firms with competitiveness problems had been approved (with another 36 awaiting approval), with a total of almost 1,000 dismissals. In addition, 34 dynamic firms were approved, with another 53 in the approval pipeline. Up to mid-December, 316 workers had been rehired, 115 of them in the dynamic companies in the program. Although dismissals and rehirings have speeded up considerably in recent months, it is still not clear to what extent the program can be scaled up in order to have a strong impact on the Argentine economy. The program is in its infancy and the results should be monitored and assessed over time. Still, this appears to be an interesting approach to assist economic transformation.

^a Workers must remain in the new job at least one year after hiring. If the match is not good, the company can dismiss them during a trial period, provided they are replaced by other workers from the program.

$$TFP = \sum_{i \in \Phi} w_i TFP_i$$

How aggregate productivity changes over time may then depend on three critical aspects. First, the efficiency of each individual firm TFP_i is a function of several traits, such as entrepreneurial ideas, organization of the firm, ability to innovate and use better technologies; and higher efficiency means being able to produce more from the current level of capital and from workers' skills. An economy with firms that are able to extract more output from the same amount of inputs will have higher investment efficiency.

Second, the weights (the w_i 's in the formula above) may play a very important role. In general, large firms are more productive; in that case, the weights (which would be large for larger companies) would work in favor of overall efficiency. Aggregate productivity is higher if more productive firms have higher weights. This, then, suggests that resources are allocated efficiently. But if some large firms have low productivity, then that would be a misallocation and drag down overall efficiency levels. And if there are many small firms that have low productivity, together they may carry a large weight in determining overall efficiency levels, and again the outcome might be a low level of aggregate efficiency. The allocation of resources across firms in the economy may then be a critical aspect of overall efficiency. The larger are more productive firms (more employment and more capital), the greater will be overall efficiency.

Third, the weights change over time. An economy with more competition in which the more productive firms gain market share and prosper while the least productive firms lose market share and exit the market would be more productive than one that favors the least productive entrepreneurs. This is often referred to as Schumpeterian competition or creative destruction. On the other hand, if inefficient firms survive and high productivity firms for some reason exit, then the growth in efficiency will decline, which may even cause productivity to decline.¹²

To sum up, from a micro-perspective, changes in aggregate productivity are driven by at least three forces: (i) the extent to which each firm in the economy becomes more productive (through, for example, greater *innovation*); (ii) how the allocation of resources changes—if the allocation becomes more efficient then overall productivity will increase (reduced *misallocation*); and (iii) the degree to which the market allows for more productive firms to survive and prosper and induces less productive firms to shrink and eventually exit the market (healthier *firm dynamics*). The question asked in this section is how these three forces might be affecting changes in overall investment efficiency in Latin America and the Caribbean.

A Region of Small Firms

Comparing the size distribution of firms in the United States against, say, Mexico and Peru (which have good data on firm size) is very revealing. In both Latin American countries, about 95% of firms have fewer than five employees whereas just over 40% of firms in the United States have such few employees. There are so many of these small firms in Mexico and Peru that they employ as much as 40% of the labor force and have around 15% of the capital in the economy. And yet they produce only a small fraction of the total value added, implying they have very low productivity (see Figure 3.6). In Peru, for example, the productivity levels of micro firms are estimated to be just 3% of the productivity of large firms, while for small firms the same figure is 49% (IDB, 2017e). The distribution of firms in the region appears to be heavily skewed towards small, unproductive enterprises.

Firm Innovation: Lagging Behind

Moreover, almost any indicator of firm innovation suggests Latin America and the Caribbean lags behind other regions. Firms in the region adopt new technologies at a slower pace.

¹² Cole et al. (2005) emphasize the role of barriers to competition as a determinant of Latin America's poor long-run growth performance.

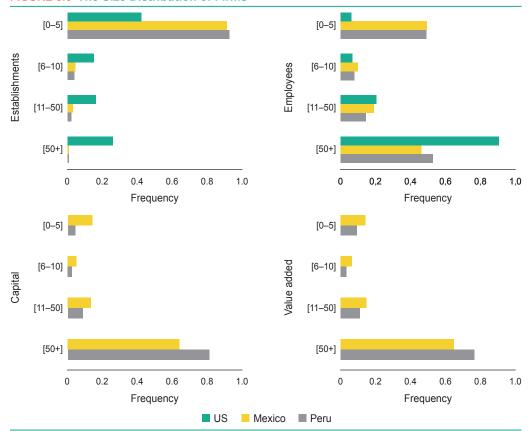


FIGURE 3.6 The Size Distribution of Firms

Source: IDB staff calculations based on the economic censuses produced by Mexico's INEGI, Peru's INEI, and United States' Census Bureau.

Figure 3.7 Panel A shows an index of digital adaptation for different regions composed of a simple average of four indicators: the percentage of businesses with websites, the number of secure servers per million residents, download speeds, and 3G coverage in the country (World Bank, 2016). Figure 3.7 Panel B shows the number of patents per million people produced in the region and Figure 3.7 Panel C compares spending on research and development across regions. Many countries in Latin America and the Caribbean lag advanced economies and a group of comparator nations in terms of both technology adoption and innovation.

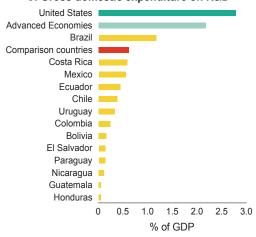
Impacts on Productivity

The Region faces significant challenges to boost individual firm productivity levels. To illustrate this, Busso, Madrigal, and Pagés (2010) conduct an exercise to assess how aggregate productivity would rise if low productivity firms were to adopt new technologies, thereby raising their individual productivities. Suppose the firms in the bottom 10%, in

A. Digital adoption index B. Patent applications United States **United States** Advanced Economies Advanced Economies Chile Comparison countries Uruguay Brazil Brazil Chile Mexico Colombia Comparison countries Mexico Venezuela Uruguay Ecuador Paraguay Dominican Republic Ecuador Colombia Costa Rica Guatemala Dominican Republic El Salvador Venezuela Paraguay Guatemala = Costa Rica Bolivia Honduras Honduras Nicaragua El Salvador Bolivia Nicaragua = 100 1000 20 40 50 Technology adoption index (%) Patents per million of population

FIGURE 3.7 Innovation and Technology Adoption

C. Gross domestic expenditure on R&D



Source: Busso et al. (2017) based on data from World Bank. Panel B is from World Intellectual Property Organization and Panel C from UNESCO.

Note: Comparison countries' and advanced economies' values were calculated as the simple mean across countries. Comparison countries include countries within the same range of GDP per capita (Albania, Algeria, Armenia, Bulgaria, Croatia, Georgia, Hungary, Indonesia, Kazakhstan, Latvia, Macedonia, Malaysia, Morocco, Philippines, Poland, Romania, Serbia, Thailand, Tunisia, and Turkey). Advanced Economies include: Australia, Austria, Belgium, Canada, Czech Republic, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Korea, Lithuania, Luxembourg, Netherlands, New Zealand, Portugal, Spain, Sweden, Switzerland, and United Kingdom.

terms of productivity were to raise their efficiency to the level of the most productive firm in that same group. And then suppose firms in the bottom 20% were to raise their productivity to the level of the most productive firm in that group, and so on. Repeating this exercise for each decile of the productivity distribution and then calculating how aggregate productivity would change allows a curve to be plotted. This curve is illustrated for both El Salvador and Mexico in Figure 3.8.

60 50 Percentage increase in aggregate productivity 40 30 20 10 0 -0 1/10 1/5 3/10 2/5 1/2 3/5 7/10 4/5 9/10 Productivity (as a fraction of the sector average) --- El Salvador --- Mexico

FIGURE 3.8 The Effect on Aggregate Productivity of Raising Productivity among the Least Productive Manufacturing Firms

Source: Busso, Madrigal, and Pagés (2010).

Note: This figure plots the resulting increase in aggregate productivity from raising productivity of all firms, within every industry, below some value X to that value X, where X then takes values such as 1/10th of the average productivity of each industry, 1/5th of the average productivity of each industry etc. The data for El Salvador correspond to the year 2005 and for Mexico is 2004.

As expected, raising the productivity of the least productive firms does increase aggregate TFP. However, at the beginning these gains are very small. For example, raising all the firms in the bottom 10%, to the level of the most productive firm in that group would increase aggregate productivity in manufacturing in Mexico by just 3.8%, while in El Salvador this gain would be close to zero (0%). This is because even the most productive firm in that group has such low productivity. As the threshold is moved up, the impact of the exercise increases. Increasing the bottom 60% of firms to the productivity level of the most productive firm in that group, boosts aggregate productivity in Mexico by over 30% and in El Salvador by more than 10%. Only when a relatively large part of the distribution is affected are significant increases in productivity registered. This suggests that the problem is not one of just a few firms; rather, it is endemic. The region faces a systemic productivity challenge suggesting that the underlying issue may also be quite fundamental in nature.

Reallocating Resources: How Much Could Be Gained?

How much would an improved allocation of resources boost aggregate productivity? To answer this question, Hsieh and Klenow (2009) develop an economic model. It is assumed that firms have different productivity levels and face different prices (for both outputs and inputs) due to distortions in the economy that may vary across firms. In

3.5 3.0 Ratio between high and low 2.5 productivity firms 2.0 1.5 1.0 0.5 0 Uruguay Brazil Bolivia Mexico S El Salvador Argentina Mexico El Salvador Chile Peru Mexico Ecuador Chile /eneznela Salvado Colombia Sample: firms with 10 or more workers Sample: firms with Sample: all firms 30 or more workers

FIGURE 3.9 The Dispersion in Marginal Revenue Product as an Indicator of Misallocation

Source: Busso, Madrigal and Pagés (2010).

Note: The dispersion is the ratio between the 90th and the 10th percentiles in each narrowly defined sector. The data reported for each country is either at the 4 or 5 digit sector level and correspond to economic censuses (of varying coverage) for the following years: USA, 1997; Colombia, 1998; Bolivia and Venezuela, 2001; Argentina, 2002; El Salvador, Ecuador, Uruguay and Brazil, 2005; Chile, 2006; Peru, 2007 and Mexico, 2013.

an economy without distortions, all firms would hire inputs until the financial benefit of hiring a new worker or a new machine is the same across firms; this is known as the marginal revenue product. On the other hand, in an economy with distortions, the marginal revenue product will vary across firms. Firms that face negative distortions (let's say a higher price for an input) will hire fewer resources and firms with positive distortions will hire more. This then creates a misallocation of resources that reduces productivity. The differences (or dispersion) in the marginal revenue product across firms is, then, a good measure of this misallocation.

Following this approach, Busso, Madrigal, and Pagés (2013) calculate the dispersion of marginal revenue product within very narrowly defined sectors for several countries using a variety of datasets¹³ and Figure 3.9 illustrates the dispersion.¹⁴ The degree of misallocation is larger than that of the United States and resource misallocation has actually increased rather than fallen in almost all countries in the region.

¹³ See Busso, Madrigal, and Pagés (2013) for a thorough description of the data.

¹⁴ It should be noted that these statistics are computed from economic censuses that cover different sectors of the economy and sample frames with firm sizes that vary from country to country. These data are, therefore, not necessarily comparable. Nonetheless, the analysis provides a broad picture of the magnitude of the distortions prevalent in the region.

Following the methodology of Hsieh and Klenow (2009), it is estimated that productivity would be some 65% higher in the region in the theoretical optimal allocation relative to the actual one. Mexico has the highest dispersion of marginal revenue product for any country in the region and the gains in productivity of a move to the optimal allocation are estimated to be above 133%. Recent estimates for Chile suggest 90% gains in productivity (see Banco Central de Chile, 2017). Interestingly, productivity losses appear to be much higher in retail commerce than in manufacturing (Busso, Fazio, and Levy, 2012).

Firm Dynamics and the Life-Cycle of Firms

In a competitive economy, more productive firms should grow while less productive ones would be expected to shrink and eventually close down. Studies tend to find a positive relationship between firm size and the age of firms (Hsieh and Klenow, 2014). And theoretical papers employing assumptions regarding firm entry, growth, and exit would also support that finding (Aghion and Howitt, 1998; Hopenhayn, 1992).

The firm life-cycle is driven in large part by firm productivity growth, which in turn is related to the accumulation of various components of capital (Prescott and Visscher, 1980; Atkeson and Kehoe, 2005). Consider for example the airline Copa. Copa was founded in 1947 with flights to three cities in Panama using DC3/C47 planes. It acquired its first jet in 1980—a Boeing 737-100—and thereafter focused exclusively on international flights. Today, Copa Airlines has 48 aircraft and flies to 55 destinations. Copa has grown over the years, but how? First, it has expanded its fleet of aircraft and, therefore, grown through tangible capital investment. Second, it hired and trained more staff: growth through human capital investment. Third, it innovated: it created a hub (known as the Hub of the Americas) and streamlined operations to provide for a fast turnaround of planes and efficient connections between flights. In other words, it has developed and deployed new ideas, often referred to as intangible capital. It is often useful to distinguish between these different components of growth.

But Copa may be something of an exception. In the United States, surviving firms grow fairly consistently over 15 years to almost 3 times the size of the average young firm and to almost 5 times the average size of a young firm after 30 years. However, in Mexico for example, firms appear to stop growing after around 10 years. Older Mexican establishments do not keep growing compared to younger firms and do not keep hiring more workers as they operate longer in the market (see Figure 3.10).

¹⁵ Information on Copa Airlines is taken from www.copaair.com. See Haskel (2012) for a similar discussion regarding the growth of Ryan Air.

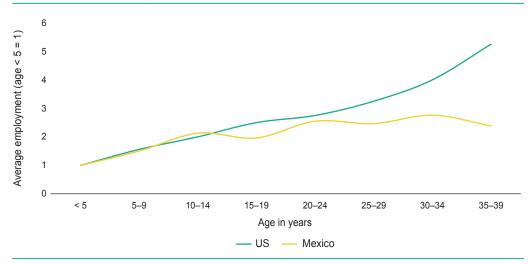


FIGURE 3.10 The Life-Cycle of Firms

Source: Hsieh and Klenow (2014) for the United States; IDB staff calculations for Mexico based on the 2013 economic census. Note: The starting employment level is normalized to 1.

Figure 3.10 illustrates the trajectories of surviving firms (referred to as the intensive margin); but what about firms that are born and ones that exit the market (the extensive margin)? Economic growth is fueled by entrepreneurial experimentation combined with good selection (Luttmer, 2007). Entrepreneurial ideas become an actual firm operating in the market when the ideas work; experiments that do not work should exit. In such a context, reducing the cost of entry fosters entrepreneurial experimentation while promoting a competitive environment induces the exit of firms that are not profitable.

High barriers to entry, such as legal and other fees to register a firm, allow unproductive firms to survive and deter more productive ones from entering, thereby lowering overall productivity. Entry barriers are estimated to account for a staggering 30% of output per worker in developing countries; Barseghyan and DiCecio (2011) argue that this channel may account for virtually all of the losses in productivity as estimated in analyses of misallocation.

Ideally, from a productivity standpoint, the most unproductive firms in the economy should leave the market and firms that enter should have high productivity. However, in Mexico it appears that productive firms are almost as likely to exit as more unproductive ones. Specifically, a firm in the bottom 10% of the productivity distribution has a 9.5% probability of exit in a year, while for firms in the top 10% that figure is 7.5% (see Figure 3.11). Moreover, unproductive firms also appear to enter. Thus, while firms exit and enter, indicating some measure of experimentation, the selection process does not appear to favor firm productivity as would be suggested by economic theory.

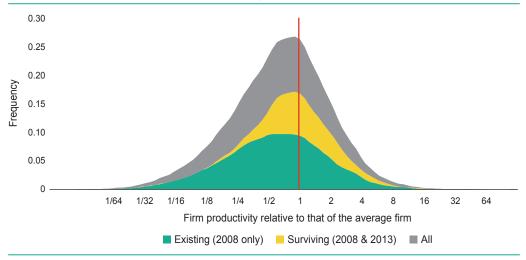


FIGURE 3.11 Distribution of Firm Productivity: Survivors and Those that Exit.

Source: Levy (2018).

Conclusions and Policy Discussion

Latin America and the Caribbean suffers from both relatively low rates of investment and low investment efficiency. In many countries, low investment rates appear to co-exist with relatively high lending interest rates, implying a lack of savings or poor financial intermediation rather than a lack of profitable projects per se. In other countries with lower interest rates, high macroeconomic risks or concerns regarding appropriability may be more relevant. Still, economies are complex systems and several constraints may be relevant. Other methodologies also point to a lack of complementary inputs such as infrastructure.

But the region also suffers from low productivity. This may stem from individual firms being less productive, unproductive firms surviving and productive firms not growing as fast as their potential, and an inefficient allocation of resources. Leading explanations for such distortions relative to a more productive economy include financial market imperfections, uneven taxation, poorly enforced labor market regulations, high entry costs, and other barriers to competition.

Financial markets perform at least two critical functions. First, they provide financial resources so that firms can grow. But secondly, they act as a screening device, only providing those resources to the more productive firms that will be successful and able to repay any loans granted. However, to function effectively such markets need several complementary inputs. These include a legal system that gives adequate protection to creditors and systems that allow collateral and or other guarantees to be deployed effectively. Moreover, there needs to be adequate information about borrowers. Without good information, banks

and other financial firms will find it hard to distinguish between good bets and bad ideas. Problems with the underlying plumbing of financial markets may lead to distortions that prevent productive firms from securing access to resources to fund good ideas and attain their optimal size.¹⁶ This can provoke misallocation leading to lower productivity.

Other possible culprits for resource misallocation are corporate tax systems and tax administration. Tax authorities naturally want to maximize revenues at minimum cost. This implies that where enforcement is not perfect, they will naturally focus enforcement efforts on larger firms where they have more revenue to gain. Smaller firms may fly under the radar and hence be able to evade taxes more easily. Effective tax rates for smaller firms may then be lower, creating incentives for firms to stay small. As small generally means unproductive, a tension arises between the objectives of raising tax revenues in an environment of imperfect enforcement and enhancing productivity. Moreover, several countries have special tax regimes for smaller firms. In some cases, the after-tax profits for firms may actually fall as firms grow in size. Tax systems that tax larger firms proportionally more and include generous, special tax regimes for smaller entities may create incentives for firms to stay small and operate informally, or at least partially informally. If such firms compete with larger, formal firms in the same industry, then this creates an unfair playing field. Smaller and less productive firms may survive, and competition may not lead to the exit of unproductive firms, dragging down aggregate productivity.

Labor market regulations may provide a third possible explanation. Latin America and the Caribbean is characterized by restrictive hiring and firing regulations. In addition, a number of social insurance programs are paid for with relatively high labor taxes. Again, enforcement may focus on larger firms and smaller firms may not abide by the regulations, thereby creating incentives for firms to stay small and setting up an unlevel playing field. Also, even larger firms may have incentives to hire temporary or informal workers to evade such regulations. Once again, a tension exists between obtaining revenues (through labor taxes) and ensuring adequate protection for workers and policies to enhance productivity.

This discussion suggests a range of policy actions. One set of policies includes revising tax and labor policies to ensure a healthy degree of competition that allows more productive firms to grow and induces firms with lower productivity to shrink and eventually to exit. Tax policies can be redesigned to expand the tax base to obtain more revenues and at the same time reduce incentives for firms to stay small. Labor taxes can be reduced and social programs can be financed from more general taxation. Policies that enhance innovation and credit availability to productive firms (but not to unproductive ones) may also be considered. It is also important to boost savings, including public savings and public investment.

¹⁶ Midrigan and Xu (2014) develop an interesting model along these lines.

CHAPTER 4

Towards Growth-Friendly Fiscal Policy

iscal policy has implications both for short-run and long-term growth. In many countries across the region, fiscal deficits remain high, constraining the use of expansionary fiscal policy when growth is low and contributing to the structural problem of *low* savings and investment. In addition, distortions in tax and expenditure policies hamper economic growth by further reducing the quantity and quality of investment. Policy tradeoffs may exist between short-run demand management and structural growth objectives. Lowering distortionary taxes to boost long-run growth may imply lower revenues in the short run. To improve fiscal balances, reducing capital expenditures (investment) may be easier than cutting rigid current expenditures (consumption) but that may well harm growth. However, some pro-growth reform opportunities are revenue neutral. Restructuring special tax regimes for small firms is a case in point. These tax schemes create distortions that stunt the growth of productive firms without adding much revenue. This chapter analyzes fiscal trends, analyzes the more structural characteristics of fiscal policies that may be limiting growth, and then discusses how to navigate the various trade-offs depending on individual country characteristics.

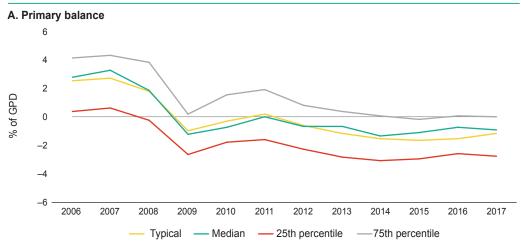
Overall Fiscal Trends

Fiscal deficits remain relatively large across Latin America and the Caribbean. While the average primary deficit declined to 1.2% in 2017 from 1.5% percent of GDP in 2016, there is increasing dispersion across countries, with primary deficits for a quarter of the IDB borrowing countries increasing to 3% of GDP or more. The overall deficit for a quarter of the IDB borrowing countries was at least 6% of GDP (see Figure 4.1). Given overall deficits, average debt levels continue to rise: debt rose in the typical country by 2 percentage points of GDP in 2017.

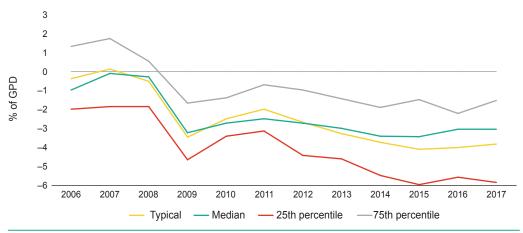
Persistent fiscal deficits are a key contributor to low public savings and investment in Latin America and the Caribbean.¹ But fiscal policies affect long-run economic growth through several other channels reviewed in this chapter.

¹ See Cavallo and Serebrisky (2016).

FIGURE 4.1 Primary and Overall Fiscal Balances



B. Overall balance



Source: IDB staff calculations based on IMF (2017c).

Fiscal Policies and Economic Growth

Structural aspects of both tax and expenditure policies may have strong implications for economic growth.

Taxes: More than Just Revenue

Over the last 20 years, many countries have implemented significant tax reforms. While in general these have increased revenues,² less emphasis appears to have been placed on reforms to spur growth; even when growth has been the motivation, it's not clear that they

² See Corbacho, Fretes Cibils, and Lora (2013) and Arenas de Mesa (2016).

have delivered.³ In some cases, reforms may even have had a negative impact on growth. In particular, several countries have introduced special regimes for small businesses that can create negative incentives. Moreover, high labor taxes can create incentives for firms and employees to operate in the informal economy, which again may impact growth. These two aspects are reviewed in greater detail below.

Still, other characteristics of tax regimes not discussed here may also deserve attention given their potential growth impacts. These include very high taxes on firms in some countries, coupled with a small tax base⁴ and a tendency to focus compliance efforts on large firms, which are generally the most productive. Thus, the most productive firms may face higher *effective* tax rates, giving smaller, unproductive firms that may fly under the radar incentives to stay small. Some countries also have systems of turnover taxes levied on sales; the "cascading effects" of the rules make it difficult to know what the effective tax rates are.⁵ Some countries also rely on other taxes—including taxes on financial transactions, wealth and exports—that distort incentives and may reduce activity.⁶

Special Tax Regimes: Small Is Not Always Beautiful

As discussed in the previous chapter, Latin America and the Caribbean has many small firms; many of those firms suffer from low productivity and operate informally.⁷ In that context, several countries have implemented special tax regimes. These regimes establish a lower statutory tax rate for small firms.⁸ The eligibility requirements are not unique:

³ For example, using a "narrative approach" that analyzes public records to identify the principal motivation behind tax policy changes in Latin America, Gunter et al. (2017) find that only one-fifth of reforms to value-added taxes were motivated by long-run growth considerations (i.e. the belief that a tax cut will raise output).

⁴ In Latin America and the Caribbean, average corporate income tax rates (at about 26%) are higher than in Emerging Asia (21%) and Advanced Economies (about 24%). The effective corporate tax rates in Latin America and the Caribbean (18.3% of profits) are higher than in Emerging Asia (14.1%) and Advanced Economies (15.5%) (World Bank and PwC, 2015). This characteristic has significant negative implications for growth because: (i) a relatively high tax burden on compliers reduces the investment capacity of formal firms; (ii) the tax structure breeds informality (as firms try to evade high tax burdens) and thereby distorts the efficient allocation of economic resources, lowers productivity growth, and reduces the returns to saving and investment (see Cavallo and Serebrisky, 2016).

⁵ Such taxes are applied at every stage in the supply chain, without any deduction for the tax paid at earlier stages, which reduces competitiveness and distorts the organization of the value chain towards vertical integration. In federal countries where the turnover tax is applied at the subnational level, different tax rates apply depending on the origin and destination of goods. Thus, the turnover tax also acts as an interprovincial tariff barrier.

⁶ The taxation of commodity exports is particularly important given the region's relatively high dependence on these goods and is fraught with complex trade-offs (see Manzano, Navajas, and Powell, 2018).

⁷ Either the firm itself may be informal or, even if formal, it may not declare all of its workers.

⁸ Different forms of special tax regimes for small businesses have been introduced in countries outside of the region including France, United States, India, South Africa, Yemen, and Ukraine, among others (Garicano, Lelarge, and Van Reenen, 2016; Coolidge and Yilmaz, 2016).

some establish a limit on annual sales; or a maximum number of employees; or a maximum number of years since legal registration. Likewise, the benefits differ across regimes. In some cases, eligible firms are exempt from all tax obligations while in other cases they are exempt from a fraction of the income tax, value-added taxes, or social security contributions. The contribution to overall revenues is generally very low (Table 4.1 describes some of the main features of 10 special tax regimes in the region).

The stated goal of special tax regimes is to encourage the formalization of small firms by reducing the costs of operating in the formal market. In principle, firms choose whether to operate formally, or not, considering the costs and benefits of each option. Having excessive regulation and high taxation makes the formal sector less attractive for small firms. Thus, according to this view, the main factor explaining the substantial number of small firms operating in the informal sector is the costs of complying with all the

TABLE 4.1 Special Tax Regimes in Selected Countries

Country	Regime	Key Features	Revenue from special tax regime as % of GDP	Revenue from special tax regime as % of total government revenue ^a
Argentina Monotributo	Individuals with revenues under AR\$1,050,000 in retail or \$700,000 ARS in services Fixed amount replacing VAT, corporate income	0.1000%	0.38%	
		tax, and own contributions to social security Amount varies between \$787 ARS and \$5,922.1 ARS per month, depending on revenues, surface of the business, energy consumed, rent, number of employees, and economic sector		
Brazil	SIMPLES	Regime for firms in manufacturing, retail, and services Yearly revenues should be under R 4.8 million or R 9.6 if firms exports Only firms in retail, manufacturing or services are eligible Single tax covers payroll, sales, and corporate income tax Progressive tax rates depending on sector and revenues	0.0030%	0.01%
Colombia	Monotributo	Individuals in retail trade with revenues under \$111,506,500 COL with fixed establishment smaller than 50m2 Monthly payments between \$43,000 COL and \$85,000 COL depending on annual revenue Individuals might be eligible for a subsidized pension as well as an insurance for risks related to work	n.a.	n.a.

(continued on next page)

TABLE 4.1 Special Tax Regimes in Selected Countries (continued)

Country	Regime	Key Features	Revenue from special tax regime as % of GDP	Revenue from special tax regime as % of total government revenue ^a
Ecuador	RISE	Only for individuals with revenues under \$60,000 US. Single monthly tax covering income and value added tax. Progressive tax rates depending on income and sector	0.0200%	0.12%
Mexico	RIF	Only for individuals in retail or providing services that do not require college degree Yearly revenues should be under \$2,000,000 MXN Progressive tax rates depending on economic sector	0.0299%	0.19%
Nicaragua	Special Regime for Corporate Income Tax	Individuals or firms with yearly revenues below C\$12,000,000 Progressive corporate tax with rates ranging from 10% to 30%	n.a.	n.a.
Peru	RER	Individuals and firms with yearly revenues under S/. 525,000 Tax paid replaces corporate income and value-added taxes Single tax of 1.5% on monthly revenues replacing 28% tax rate on corporate income	0.0298%	0.19%
Uruguay	Literal E	Individuals or firms with yearly revenues below \$U 305,000 Does not pay corporate income tax Pays only monthly tax equivalent to "Minimum VAT amount" which, for 2016, was \$U 2,950	0.0540%	0.28%

Source: Argentina and Ecuador: IDB/CIAT, (https://www.ciat.org/idb-ciat-revenue-collection-database/?lang=en) fraction corresponds to year 2015. Brazil: Receita Federal, 2017; fraction corresponds to year 2016. Mexico: Servicio de Administración Tributaria; fraction corresponds to year 2016. Peru: Superintendencia Nacional de Aduanas y de Administración Tributaria; fraction corresponds to year 2016. Uruguay: Dirección General Impositiva; fraction corresponds to year 2016. No data for Colombia given that the "Monotributo" started in 2017.

rules, including paying taxes.⁹ The emergence of special tax regimes in Latin America and the Caribbean during the 1990s is in part a consequence of such a view. Yet, what is the available empirical evidence on the effects of these types of regimes?

Most special tax regimes establish a cutoff rule such that firms with a level of sales, employees, or physical space, below a given threshold, are eligible for the tax discount being offered. Firms close to the threshold may then have incentives to remain small, if the increase in profits from growing is not enough to compensate for the increase in taxes to be paid.

^a Calculated as proportion of tax revenue from IDB/CIAT.

⁹ See, for example, de Soto (1989).

A second concern is that special tax regimes imply lost revenues.¹⁰ Moreover, revenues are forgone, not only from firms that are eligible for the tax discount, but also from firms that underreport their true size or level of economic activity (a form of tax evasion), and so claim the special treatment that is on offer.

Third, these regimes may have negative effects on aggregate levels of productivity. Given the correlation between size and productivity, the special tax regimes imply a subsidy to the least productive firms in the region. Box 4.1 presents a case study of Peru with evidence on the unintended impacts of special tax regimes.

The possible benefits that stem from these regimes (inducing formality versus informality for very small firms) may then be outweighed by the costs. Other alternatives are outlined below that may allow small but productive firms to develop while curtailing some of the problems highlighted here of special regimes.

High Labor Taxes and Informality

The total amount of social security contributions and taxes paid on labor income by the average worker in Latin America and the Caribbean is around 22% of the total labor cost for employers (OECD/CIAT/IDB, 2016). Although payroll taxes represent a major source of funding for health insurance, social security, and other worker-benefits, they may alter employer and employee incentives. The higher are such taxes, the more likely employers will find it attractive to hire workers informally and avoid such payments. If employees do not value highly the benefits obtained (for example, if the healthcare provided is of poor quality), then workers may also think they would be better off receiving a higher informal wage in their pocket and foregoing those services than working formally. These considerations may well lie behind the negative relationship between hiring costs (including payroll taxes) and formal employment in the region (see Figure 4.2).

The Impact of Tax and Spending Policies on Growth: Multiple Multipliers

When considering any tax or spending reforms, knowing how any changes would impact growth is extremely valuable information. Indeed, if an objective is to boost growth without harming fiscal balances (or to increase fiscal surpluses or reduce deficits without negatively affecting growth) such knowledge is essential in order to design successful reforms.

¹⁰ Tax revenues in the region are already relatively low (22.8% of GDP on average in 2015) compared to the average OECD country (34.3% of GDP). See *Revenue Statistics Report* (OECD/ECLAC/CIAT/IDB, 2017).

This number corresponds to the "tax wedge," which is equal to the total amount of social security contributions and taxes paid by both employers and employees, minus family benefits received by the employee, as a proportion of the cost of labor for employers (OECD/CIAT/IDB, 2016).

BOX 4.1 Analysis of Special Tax Regimes in Peru

Peru has two special tax regimes for small firms: the Simplified Unique Regime (RUS), and the Special Regime for Income (RER).^a The RUS establishes monthly quotas for individuals with business activities whose sales did not exceed S/. 60,000 a year. These quotas replace all other tax obligations. The RER applies to individuals and legal entities with annual net income not exceeding S/. 525,000. The participants in the RER must pay a tax equivalent to 1.5% of the monthly net income, thus replacing the general income tax, whose rate is 28% on annual profits. Finally, firms with less than 20 employees are exempt from the law of distribution of profits to workers.^b

Firms are also subject to different labor codes depending, among others, on the level of annual sales. One special code requires large and small firms to pay two additional monthly wages to all its employees while micro-firms are exempt. The code for large firms requires a minimum of 30 days of annual leave for its employees while the requirement for micro and small firms is only 15 days. The prevalence of different labor codes, combined with the special tax regimes, generates a series of distortions. Figure B4.1.1 reports the hypothetical profits of a firm depending on its annual

A. Special tax regimes Special labor Code II Special labor Code I General labor Code 1,400 Profits (thousand of Soles) 1,200 1,000 800 600 400 200 13 278 785 38 63 89 114 139 1,038 1,291 1,544 1,797 2,051 2,304 2,557 Sales (UIT) B. Effect of a tax regime change C. Effect of a labor regime change 160 1,200 Profits (thousand of Soles) Profits (thousand of Soles) 150 1,100 140 1,000 130 900 120 800 110 700 144 1,544 1,595 1,646 1,696 1,747 1,797 1,848 Micro firm - General Regime - Micro firm - RER Micro firm – RUS General labor code Special labor code II Source: Azuero, Bosch, and Torres (2017).

FIGURE B4.1.1 Distortions in Tax and Labor Market Regimes

(continued on next page)

BOX 4.1. Analysis of Special Tax Regimes in Peru (continued)

sales, considering that profits might change as firms grow (i.e., higher sales) due to different labor codes and tax regimes.c

There are several discontinuities in the simulated profit schedule of a firm illustrated in Figure B4.1.1.A. Panels (B) and (C) zoom in on two of those discontinuities. In Panel (B), a firm with annual sales of 132 UIT (UIT is a unit of sales)^d is eligible to pay taxes according to the RER scheme. If this firm were to sell a little bit more, it would have to pay taxes according to what is specified by the general regime; thus, profits would fall by approximately 25%. A similar drop in profits occurs in the transition between special labor code II and the general labor code, Panel (C).

Evidence of Perverse Incentives

Some firms with sales (firm income) close to the thresholds where the discontinuities accrue will find it more profitable to remain below the threshold and pay taxes according to the special regime, instead of increasing their scale and paying higher taxes. Figure B4.1.2 shows the distribution of firms according to their annual sales; there is a large group of firms that bunch just before S/. 525,000 which is the threshold to qualify for the RER regime.

Evidence of Tax Evasion

Figure B4.1.3 reports the distribution of profits and average costs for firms with different numbers of employees. Panel (A) shows a positive correlation between the number of employees and the firm's profits. However, there is a discontinuity around 20 employees, which is the legal threshold to avoid profit distributions. This suggests that companies with 20 or more workers may have incentives to sub-report profits to avoid the payments. There is no other economic reason for such a sharp decline in profits at about 20 employees. In fact, Panel (B) shows no discontinuity in the costs of the firm at the threshold.

Evidence on Misallocation

Table B4.1.1 reports the average value-added per worker for Peruvian businesses depending on various criteria such as the number of employeese, the volume of annual sales, and whether the units are registered in a special tax regime for small businesses (RUS or RER) as opposed to the general regime. Results are that the value added per worker is greater for firms with more employees, firms with higher

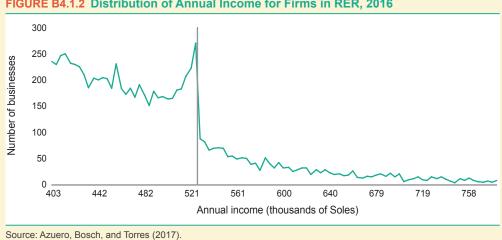


FIGURE B4.1.2 Distribution of Annual Income for Firms in RER, 2016

(continued on next page)

FIGURE B4.1.3 Median Profits and Costs of Firms by Number of Employees A. Median Profits of Firms B. Median Personnel Costs 200 800 180 700 160 **Thousands of Soles** Thousands of Soles 600 140 500 120 400 80 300 60 200 40 100 20 0 0 5 10 15 20 25 5 10 15 25 30 **Employees** Employees

Source: Azuero, Bosch, and Torres (2017).

sales, and firms in the general regime. This suggests that larger firms are more productive in Peru, which in turn implies that aggregate productivity would increase by shifting resources from small to large firms.

TABLE B4.1.1 Value Added per Worker of Peruvian Businesses

Number of employees		Annual sales		Registration in special tax regime	
<20	>=20	Under 525,000 Soles	More than 525,000 Soles	RUS or RER	General Regime
14,085	62,461	8,581	70,165	9,254	16,126

Source: Azuero, Bosch, and Torres (2017).

Note: all values in Soles.

Tax Rates and Changes: Before and After

As suggested in previous editions of this report, the impact of changing tax rates may depend on country characteristics and in particular on the current tax rate. An increase in tax rates is normally thought to reduce growth—a negative tax multiplier. However, recent evidence suggests that the multiplier after two years of a change varies significantly across countries in Latin America and the Caribbean (see Figure 4.3)¹². In particular, when raising tax rates,

^a In Spanish, RUS stands for "Régimen Único Simplificado" and RER stands for "Régimen Especial de Impuesto a la Renta".

^b The law of profit sharing requires firms with 20 employees or more to distribute a proportion of their profits, varying between 5% and 10%. The proportion depends on the economic sector of activity.

^c The hypothetical profits are computed considering a mark-up of 30% and an increase of 10% in costs due to changes in the labor code from labor-code 1 to labor-code 2 and from labor-code 2 to the general labor code. ^d UIT=\$3,950 Nuevos Soles.

^e The last round of the economic census in Peru was in 2007.

¹² The figure draws on evidence from a novel dataset on value-added taxes (VAT) for 51 countries (including 24 Latin American and Caribbean countries) for the period 1970–2014 (Gunter et al., 2017).

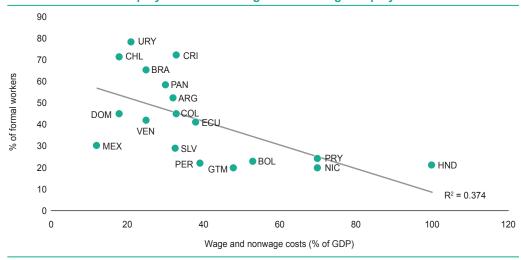


FIGURE 4.2 Formal Employment versus Wage and Nonwage Employment Costs

Source: Alaimo et al. (2015).

the impact depends on the initial tax rate; the higher that initial tax rate is, the larger the negative impact on output will be. On the other hand, if initial tax rates are low, the output cost of increasing taxes is close to zero. Interestingly, several countries in the region, most notably some Caribbean and Central American countries, fall into this second category.

Spending Better to Enhance Growth¹³

Turning to the expenditure side of fiscal policy, expenditure composition is important for economic activity.¹⁴ In particular, the effect of public investment on growth is larger than that of current spending. Estimates suggest that the multiplier of current spending on output is virtually zero in the medium-run (i.e., 2 years after the increase in spending). In contrast, estimates of the effect of a one dollar increase in public investment is about one dollar in output over the same period on average (see Izquierdo et al., 2017 and Figure 4.4).¹⁵

However, capital expenditure multipliers vary across countries (Figure 4.5). While in eight countries the effect of a dollar increase in investment is estimated to be \$1 or

¹³ The discussion of expenditure composition in this chapter is focused exclusively on the economic classification of public spending (current vs. investment spending). The forthcoming 2018 edition of the Development in the Americas flagship publication will provide a comprehensive analysis of public expenditures, including policies to support the development of human capital (see Izquierdo, Pessino, and Vuletin, forthcoming).

¹⁴ See, for example, Ilzetzki, Mendoza, and Végh (2013), Furceri and Li (2017), and Abiad, Furceri, and Topalova (2016).

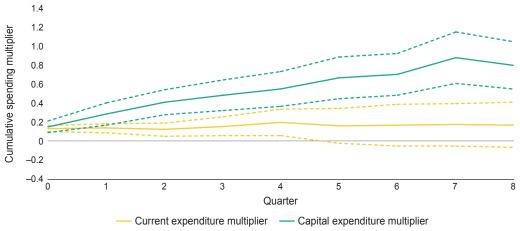
¹⁵ Izquierdo et al. (2017) use quarterly data to identify exogenous fiscal shocks, under the assumption that government spending is unlikely to respond to macroeconomic shocks within the same quarter. Once public spending shocks are identified, the local projections approach is used to derive the short- and medium-run expenditure multipliers (see Jordà, 2005).

5 40 30 VAT rate (%) 20 10 Argentina Bolivia Belize Peru Panama Mexico Nicaragua Guatemala Paraguay Suriname The Bahamas **Dominican Republic** Sarbados Costa Rica El Salvador **Frinidad and Tobago** Venezuela Haiti Colombia Honduras Ecuador Point estimate after 2 years (right axis) VAT rates (left axis)

FIGURE 4.3 Value Added Taxes: Rates and Multipliers

Source: Gunter et al. (2017).





Source: Izquierdo et al. (2017).

Note: Dashed lines are 90% confidence limits.

more, in five it is not possible to identify a statistically significant effect (Izquierdo et al., 2017). What explains the cross-country heterogeneity in capital expenditure multipliers?

Among other determinants, the economic and social impact of public investment depends on the degree of efficiency with which investment spending is managed.¹⁶ Comparing

¹⁶ See, for example, IMF (2015) and Gupta et al. (2014).

3 Cumulative spending multiplier 2 -1 Panama Chile Costa Rica Colombia Argentina Brazi Jominican Republic Nicaragua Uruguay Bolivia Ecuador /eneznela Frinidad and Tobago Barbados Suatemala Paraguay El Salvado Honduras

FIGURE 4.5 Capital Spending Multipliers

Source: Izquierdo et al. (2017).

Note: The dots represent point estimates and the lines are 90% confidence limits.

the value of public capital (input) and a measure of infrastructure quality (output) across countries reveals significant differences in public investment efficiency levels.¹⁷ While the size of the efficiency gap shrinks as the level of income rises, inefficiencies in public investment in Latin America and the Caribbean remain above 30% for the typical country—well above global comparators (Figure 4.6A). Interestingly, a positive correlation between the size of capital spending multipliers and efficiency levels is observed across the Latin American countries in the sample (Figure 4.6B), suggesting that one channel to increase multipliers is to improve the public investment management process; for example, strengthening project selection criteria and improving monitoring to reduce cost overruns and delays.¹⁸

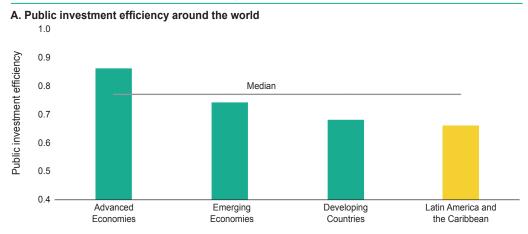
The Bias against Public Investment

It is worrying indeed that the share of public investment in total public expenditure has been declining over time in the region. The share of capital spending has fallen by almost 10 percentage points (from about 29% of total spending to 19%) since the 1980s (see Izquierdo, Puig, and Vuletin, forthcoming, and Figure 4.7A). This bias against capital spending is found in other regions as well, but it is particularly strong in Latin America and the Caribbean (Figure 4.7B).

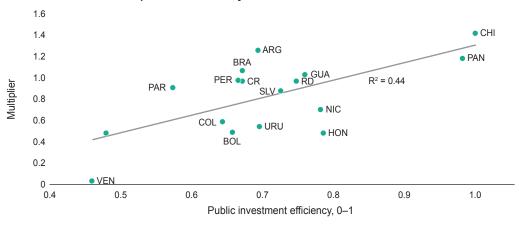
¹⁷ See Appendix D for technical details on the measurement of public investment efficiency using frontier analysis.

Armendáriz and Contreras (forthcoming) estimate an index of public investment management efficiency in 16 Latin American countries covering all stages of the investment cycle. On average, the areas showing the weakest performance were strategic guidance and project appraisal, ex-post evaluation and audits, as well as scrutiny and public access to information over the investment cycle.

FIGURE 4.6 Public Investment Efficiency and Multipliers



B. Public investment multipliers and efficiency in Latin America and the Caribbean



Sources: IDB staff calculations based on Izquierdo et al. (2017) for multipliers, and IMF (2017c) and World Economic Forum (2017) for efficiency.

Note: Public investment efficiency is an index between 0 and 1 (see Appendix D).

The bias against public investment is reinforced by the way in which governments allocate spending over business cycle fluctuations. Current expenditure increases in good times—but does not fall in bad times—while the opposite holds for real capital expenditure: it falls in bad times, but it does not increase in good times. It seems that when governments must adjust their budgets in bad times, they find it easier to cut public investment than consumption. The procyclical bias against public investment in bad times is evident in a wide sample of countries but is more pronounced in Latin America and the Caribbean (See Ardanaz and Izquierdo, 2017). Urrent expenditures then tend to increase as a share of total expenditure and capital spending shares decline.

¹⁹ The bias is defined by the sign and size of the country correlation between the cyclical component of GDP and public investment in bad times, defined as periods in which the output gap is negative. Positive (negative)

A. Shares of current and capital spending in typical Latin American and Caribbean country 85 35 % of primary expenditures % of primary expenditures 80 30 75 25 20 70 15 65 10 Bias against capital = -9.7p.p.60 1980 1985 1990 1995 2000 2005 2010 2015 Capital spending (left axis) Current spending (right axis) B. Bias against capital spending Latin America and the Caribbean -9.7 **Developing Countries** -8.5 **Emerging Asia** -8.2 Africa -7.3**Industrial Countries** -3.7

FIGURE 4.7 Evolution of Capital and Current Spending

Source: Izquierdo, Puig, and Vuletin (forthcoming).

Fiscal Space for Pro-growth Policies

G7 –12

-10

The fiscal space available for countries to reduce revenues or increase spending critically impacts the types of fiscal reforms that are feasible while maintaining sustainability. There are many dimensions of fiscal space; here, the focus is on the debt-to-GDP ratio and the fiscal adjustment needed to maintain the debt-to-GDP ratio constant over time. These are both useful indicators, but a much more detailed analysis is required to assess all aspects of sustainability.

-8

-6 -% of primary expenditures

The estimated required fiscal adjustment to stabilize debt-to-GDP ratios in 2018 remains broadly unchanged at 2.2% (compared to 2.4% in 2017 and 2.2% in 2016). Ten countries require no (or even negative) adjustments, while 15 require fiscal adjustments,

values indicate more procyclical (countercyclical) reactions. The median value for Latin American and Caribbean countries (0.14) is twice as large as in Developing Europe or Asia (for the median OECD country, the correlation is -.10). See Ardanaz and Izquierdo (2017) for details.

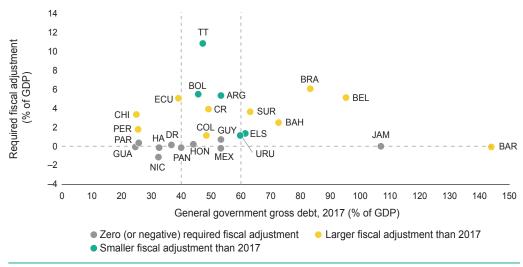


FIGURE 4.8 Estimated Required Fiscal Adjustments and Debt Levels

Source: IDB staff calculations based on IMF (2017c).

Note: The required fiscal adjustment to keep debt constant is calculated using estimates for long-run growth and interest rates.

of which 9 countries require adjustments close to or larger than 4% of GDP to stabilize debt ratios (Figure 4.8). The further a country is to the Northeast in this graph (top right), the more concerning is the fiscal situation.

Countries are in very different positions. For instance, Barbados and Jamaica are already running significant fiscal surpluses to reduce their high debt levels and do not require additional fiscal adjustments to maintain current levels.²⁰ Chile and Peru both have low debt levels and while they may need to adjust in order to stabilize debt ratios they may also be in a position to consider expanding fiscal policy temporarily if output is below potential. Brazil has gross debt of over 80% of GDP and is estimated to require a substantial fiscal adjustment of over 5% of GDP to stabilize that debt ratio. It plans to achieve this stabilization gradually as the country grows, with a cap on real expenditures that will then fall as a percentage of GDP, thereby improving the fiscal balance.

Indeed, considering Figure 4.8, all countries analyzed need some fiscal adjustment to maintain stable debt ratios and, considering budgets for 2018, most have planned to make some sort of adjustment.²¹ For those that have budgeted adjustments, the average improvement in the fiscal balance is projected to be almost 2% of GDP. Still, this falls short of the average required fiscal adjustment, which has increased (as debt levels have grown)

²⁰ Debt-to-GDP for Barbados reported in Figure 4.8 differs from the ratio reported in the *World Economic Outlook* database because it includes the debt of the central government with the National Insurance Scheme. The ratio reported in the figure is from national sources (see Government of Barbados, 2017).

²¹ Out of 25 countries with available information, in 20 the difference between the required and budget balance is equal or above 0.5 percentage points of GDP.

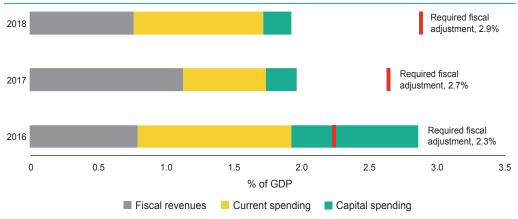


FIGURE 4.9 Required vs. Planned Fiscal Adjustments

Source: IDB staff calculations based on national sources

Note: The required fiscal adjustment is the average for those countries that have an improvement in budgeted fiscal balances.

to 2.9% of GDP (Figure 4.9). On the positive side, the composition of fiscal consolidation plans continues to improve as capital spending is projected to account for a smaller share of total planned adjustment than in previous years. Still, these plans imply a cut in capital spending on top of the reductions in capital spending shares noted above.

The region appears to have opted for a slower adjustment, or to put it another way, many countries have embraced *gradualism*. This is justified in those cases where output is below potential, as fiscal multipliers may be higher in downturns; the impact on output of reducing spending or increasing taxes may be greater. However, the success of a gradual approach is not guaranteed, particularly if markets do not think the announced plans are credible and demand higher interest rates which will then increase the adjustment actually required. It is then critical to ensure those gradual plans are perceived to be credible. Greater transparency on budget assumptions, having an independent agency to review such plans and outcomes, and introducing multi-annual budgeting can all help to improve credibility. Many countries in the region have implemented fiscal rules but the institutional details to ensure that those rules are credible, and that give the greatest chance of using judicious policies to abide by them, rather than policies that may harm growth, remains a work in progress.²²

Policy Alternatives

The most judicious fiscal reforms will depend on country characteristics and, in particular, where countries lie along the dimensions discussed in preceding sections (see Figure 4.10).

²² See Powell (2017b) and Ardanaz (2017).

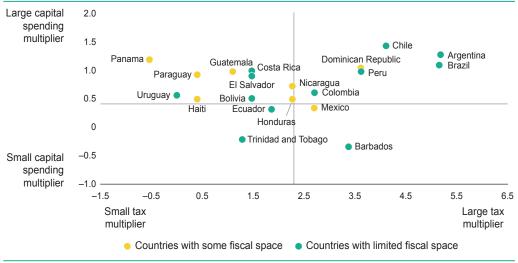


FIGURE 4.10 Country Positions in the Policy Space

Source: Gunter et al. (2017) for tax multipliers, Izquierdo et al. (2017) for spending multipliers.

For example, where tax multipliers are estimated to be small and the capital spending multipliers significant, countries may wish to increase taxes to raise public investments.

In countries where the tax multiplier is estimated to be large, policy options vary depending on available fiscal space. If countries can afford to reduce revenues in the short run, they may want to lower taxes, along the lines of some recent initiatives (see Box 4.2); and focus on expenditure switching policies to reduce the bias against capital expenditures.

On the other hand, in those cases in which fiscal adjustment is required to lower high and increasing debt ratios, the revenue neutrality of any tax reform (see Box 4.2) may be a necessary if not always a sufficient condition. However, note that even a revenue neutral reform, say by switching expenditures from current to capital spending, would have a positive impact on debt ratios assuming that capital spending had an impact on the denominator: GDP. Countries with low estimated capital expenditure multipliers should strive to strengthen the public investment management process (a contributing factor to low public investment efficiency), to boost the growth impacts.

Moreover, according to IDB estimates, savings of approximately 2 percent of GDP on average could be generated by reducing leakage in current expenditures in areas such as social assistance, tax expenditures, and subsidies in the energy sector.²³

Countries may also want to reconsider the role of special tax regimes directed at small firms. An alternative approach would be to reduce the costs of complying with tax obligations but equalize rates with large firms. Currently, an average of 28 tax payments are required to

²³ See Powell (2015) and Cavallo and Serebrisky (2016).

comply with tax obligations for the typical country in the region, while the corresponding figure for a typical OECD country is 11.²⁴ Tax benefits with strict time limits for small businesses might also be a viable alternative; Colombia and Mexico follow this approach. Peru is also considering a reform in one of its special regimes to eliminate any fall in after-tax profits as firms grow. In the reform of 2017, Argentina excluded legal entities from any form of eligibility into special tax regimes directed at small contributors. This type of policy is aimed at leveling the field for all firms, by guaranteeing competition under similar conditions.

With regard to payroll taxes, the high rates of informality observed in the region pose a dilemma for governments: how to fund social security, health insurance, and other types of benefits for workers that are currently funded via payroll taxes in ways that do not discourage formalization. Governments also face a dilemma in terms of equity considerations. In principle, incentives should be such that having a formal job is more attractive to a worker than having an informal one. However, excluding informal workers from health insurance, social security, or other services is a regressive policy as these workers are, on average, poorer and less educated. Thus, the goal of labor reform should be to reduce the penalty to formal employment while guaranteeing equal benefits, regardless of whether workers are formal or informal. In this regard, governments in the region could explore shifting to alternative funding sources such as increasing the VAT in countries with low tax rates; eliminating tax expenditures; or improving the efficiency of tax collection.²⁵

On the expenditure side, a common challenge is to increase the ratio of capital to current expenditures in public outlays. A first step is to protect capital spending during recessions and to introduce fiscal rules aimed at containing the increase in current expenditures during booms. Mexico, Peru, Paraguay, and more recently Argentina are already moving in that direction. Beyond fiscal rules, improving expenditure efficiency remains a priority for most countries in the region. In this regard, there is ample space to improve public investment management institutions, for example by upgrading the procedures for project appraisal, selection, monitoring, and ex post evaluation. Better institutions would help improve the planning of investments, better align allocations with government priorities, and help ensure implementation avoids waste, cost overruns, and delays.

Conclusions

In Latin America, high fiscal deficits coexist with distortionary features of tax and spending regimes that impede an efficient allocation of resources, reduce investment and worsen

²⁴ See World Bank (2018).

²⁵ One possibility is to fund social security and health insurance via consumption taxes while guaranteeing that health insurance and social security benefits are equal between formal and informal workers. This is the suggestion offered by Antón, Hernández, and Levy (2012) for the case of Mexico. The authors estimate that a uniform VAT rate of 16% would be enough to fund universal health insurance while eliminating payroll taxes in the economy.

BOX 4.2 Growth-Friendly Tax Reforms

ARGENTINA: The tax reform approved in December 2017 aims to improve investment conditions, boost firm competitiveness, and increase quality employment by eliminating a series of distortions in the tax system with potentially positive effects in terms of economic growth. The reform alters key parameters of the tax structure, including VAT, corporate personal income taxation, and social security contributions, among others, and is expected to be implemented gradually over a five-year period. Among measures aimed at encouraging investment and employment, the reform includes the gradual reduction of the statutory corporate income tax rate (from 35% to 25%), early VAT refunds from capital investments, a minimum non-taxable threshold in employer social security contributions, and allowance of the highly distortionary financial transaction tax (which is levied on every transaction in checking and saving accounts) to be creditable against income taxes. The tax reform has been complemented by additional agreements between the federal and subnational governments to gradually reduce highly distortionary taxes such as the provincial turnover tax (*impuesto sobre los ingresos brutos*), which is levied on sales at every stage in the supply chain, and the stamp tax. The tax bill was approved in the context of a broader set of measures aimed at strengthening fiscal responsibility frameworks at all government levels.

JAMAICA: Before the reform, the tax system in Jamaica was complex, discretionary, costly for tax payers and non-neutral in resource allocation. It was built around high import tariffs and corporate tax rates. Uneven tax treatment of goods, sectors and firms distorts resource allocation and compromises economic efficiency. On average, these special treatments account for 7% of GDP. The tax reform approved in 2013 included: (i) a simplified tariff structure with much lower rates; (ii) a simplified rate structure of the General Consumption Tax (VAT) by reducing the application of the zero rate (including government purchases and several non-export goods) and extending the standard rate of 16.5%; (iii) substituting individual or sectoral tax benefits with horizontal tax credits for the corporate income tax (CIT) and the personal income tax with a limit in any fiscal year and establishing a Minimum Business Tax (MBT) for all corporations; (iv) lowering the maximum CIT rate from 30% to 25%; and (v) eliminating all ministerial discretion in granting tax incentives, benefits, and exemptions. The reform was aimed at reducing economic distortions and promoting economic growth by reducing the level and dispersion of tariffs and the effective marginal tax burden on corporations, while improving horizontal equity. Lower tax expenditures compensated for the reduction of import tariffs and the CIT rate. The reform was supposed to be revenue neutral, but the recovery of growth contributed additional tax revenues amounting approximately to 2% of GDP.

MEXICO: The tax system traditionally exhibited a high level of tax expenditures (close to 5.5% of GDP) and horizontal inequities and complexities because of: (i) many special regimes; (ii) the overlapping of three business income taxes—the ISR, the flat-rate business tax (IETU), and the tax on cash deposits (IDE); (iii) too many exemptions for individuals, including exemptions for capital gains from the sale of securities on the stock market and dividends paid; (iv) certain unlimited deductions that significantly reduced the effective marginal tax rate for certain sectors and high income individuals; and (v) a special small taxpayer regime (REPECOS), which was a mechanism for joint payment of the ISR, the value added tax (VAT), and the IETU for smaller companies, highly exposed to evasion and that fostered informality. This tax structure created a high dispersion of effective marginal tax rates among economic sectors and activities that affected resource allocations, in addition to horizontal inequities and costly tax expenditures. In 2013, a tax reform was approved aimed at simplifying the system, reducing horizontal inequities and tax expenditures, and diminishing resource misallocation.

(continued on next page)

BOX 4.2 Growth-Friendly Tax Reforms (continued)

These objectives were achieved by reforming the ISR to eliminate some of the exemptions and to include all capital income (dividends, capital gains, etc.). It also capped income tax deductions for individuals and companies, and lowered the benefits in the presumptive tax regime governing the maquilas. The simplification of the income tax was achieved by: replacing the special tax regime for micro and small business (REPECOS) with a novel scheme for transitioning to the general regime; eliminating the "intermediate" and "simplified" special regimes; and eliminating the IETU and the IDE.

COLOMBIA: Colombia's public finances were negatively affected by the decrease in fiscal revenue from falling oil prices amounting to 3% of GDP during 2014-2016, which jeopardized compliance with the medium-term path of the fiscal rule. At the same time, Colombia had the highest marginal corporate income tax rate (40%). There was also a tax on corporate capital equity or personal net wealth that reached its highest level in 2015 up to 1.5% and was reduced to 1% in 2016. The VAT on capital goods was not creditable for VAT payments and could not be deducted as an expense in the CIT, acting as a de facto tax on fixed investment. The authorities were convinced that a structural tax reform had to be adopted that would increase revenue to compensate for the fall in oil income, while at the same time reducing or eliminating taxes detrimental to growth, savings, and investment. The reform was approved by year-end 2016 and included the reduction of the marginal CIT to 33%. Also, the VAT on capital goods can now be fully deducted from the CIT. The reform included an increase in the general VAT rate of 3 percentage points, from 16% to 19%, while several excise taxes were increased (including taxes on liquor and tobacco) and new green taxes on the consumption of hydrocarbon products were created. The higher general VAT rate, all new excise taxes and the increase in the rates of those that already existed compensated for the fall in oil revenues and the lower tax burden on corporations. The net impact on growth is expected to be positive as saving and investment are treated much more favorable than final consumption.

investment efficiency. The mix of reforms that can help overcome these problems varies across countries. While there is no one-size-fits-all solution for all countries, some shared challenges include eliminating distortions created by poorly designed tax policies, and reversing the bias against capital expenditures that has been built into public spending patterns.

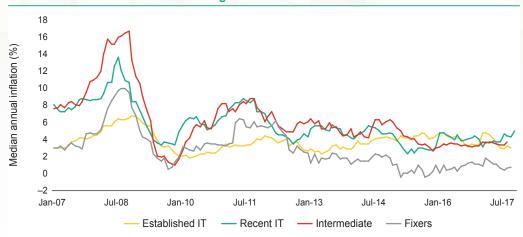
Some countries have more room to maneuver than others. For those countries that must engineer fiscal adjustments in the short run, the focus should be on fine-tuning the mix between tax and expenditure policies in order to cement the basis for faster long-run growth. This implies avoiding introducing distortionary taxes, and prioritizing productive capital expenditures (public investment) over current expenditures (government consumption).

CHAPTER 5

Monetary Policy and Reserve Management

nflation remains low for most countries across a variety of monetary policy regimes in the region (see Figure 5.1). For the IDB borrowing countries, median inflation was below 3% in the second half of 2017. However, several challenges for economic and monetary stability persist. Economic growth rates remain below potential in several countries, justifying a relatively accommodative policy stance. But at the same time, inflation expectations should remain anchored to preserve economic stability. This tension represents a tradeoff for central banks. A further challenge is to identify and maintain an appropriate level of buffers to ensure sustainability of the adopted regime. This is particularly important in those countries with an explicit exchange rate peg and in those with more active exchange rate management policies, although inflation targeters also maintain a significant level of reserves (see Appendix E for details on country classifications by monetary policy regimes). This chapter first considers the monetary policy choices facing selected inflation targeters

FIGURE 5.1 Inflation Rates across Regimes



Source: IDB staff calculations based on Latin Macro Watch data.

Note: This graph depicts median inflation rates for different exchange regimes. Established IT: Brazil, Chile, Colombia, Mexico, and Peru; Recent IT: Argentina, Costa Rica, Dominican Republic, Guatemala, Paraguay, and Uruguay; Intermediate: Bolivia, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Suriname, Trinidad and Tobago; Fixers: The Bahamas, Barbados, Ecuador, El Salvador, and Panama.

and secondly, how countries across the region may wish to analyze reserve levels noting the heightened challenges that have developed in this area.

Inflation and Output Gaps: The Case of Inflation Targeters

In recent years, a group of established inflation targeters shifted from having positive output gaps (output above potential) coupled with positive inflation gaps (inflation above target) to negative output gaps while inflation remained above the target (see Powell, 2017a). As illustrated in Figure 5.2, Panel (quadrant II), inflation targeters have now spent three years hovering in the *troublesome quadrant* of inflation above target and output below potential. In this quadrant, monetary policy tradeoffs are harsher. Reducing the policy interest rate would help reduce the negative output gap but may risk higher inflation (expanding the inflation gap), while increasing the policy rate may shrink the inflation gap but at the expense of lower output.

Still, inflation was just 0.6% above target through 2017 while the expected average inflation gap for 2018 is virtually zero (-0.1%). On the other hand, output is expected to be 1.5 percentage points of GDP below potential for 2018, only slightly less than the 2017 output gap (-1.7%). This implies that, on average, these inflation targeters will gradually exit the troublesome quadrant and will have both negative output and inflation gaps, justifying a continued relaxation of monetary policy observed since early 2017 (see Figure 5.2 Panel C).

While looking at averages is informative, it can mask differences across countries. Inflation gaps in 2017 for Brazil and Chile were no longer positive, but Colombia, Peru, and Mexico continued to have inflation above target combined with a negative output gap (see Figure 5.2, Panel B). This limits the potential role of monetary policy to stabilize output in the face of a negative shock. Still, inflation is expected to decline in these three countries during 2018. In the case of Brazil and Chile, inflation is expected to rise somewhat but to remain below or at the target.

Quantifying the Risks and Monetary Policy Impacts

The conduct of monetary policy under an inflation targeting framework involves identifying the types of shocks that may affect the economy and determining appropriate responses. Employing an economic model, this section quantifies how inflation and output may move given a set of potential shocks that might appear and incorporating an estimated policy response. The analysis also considers how different policy actions might affect outcomes, thereby illustrating the impact of monetary policy and the trade-offs faced by central banks.

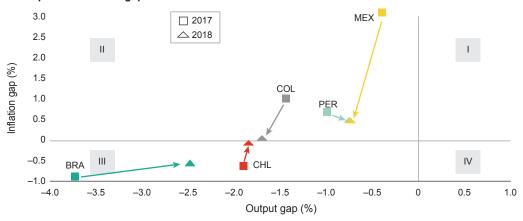
A limited set of shocks are considered following the discussion of downside and upside risks in previous chapters. A significant risk for the region is higher inflation in

FIGURE 5.2 Inflation Gaps, Output Gaps and Policy Rates

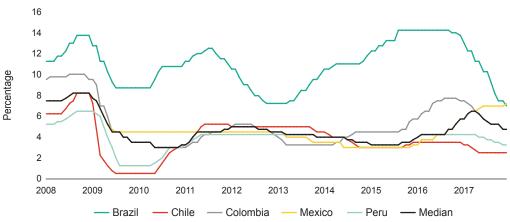




B. Output and inflation gaps: Established IT



C. Policy rates



Source: IDB staff calculations based on IMF (2017c) and Thompson Reuters.

Notes: In panel (A), the inflation gap for 2018 uses IMF (2017c) for projected CPI; in panel (B) the triangle for 2018 uses IMF (2017c).

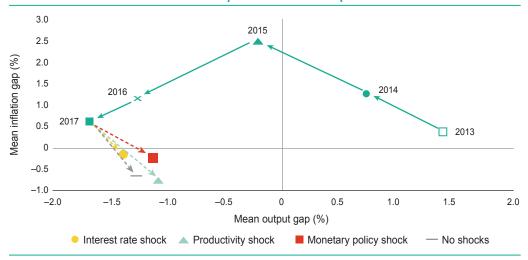


FIGURE 5.3 Alternative Scenarios: Output and Inflation Gaps

Source: IDB staff calculations based on IMF (2017c).

Notes: The output gap for 2018 was computed using the quarterly GDP forecasts of the model. The forecasts were filtered and seasonally adjusted. The inflation gap for 2017 was computed as the difference between the model's forecast for inflation and the current inflation target.

the United States, leading to a faster-than-expected rise in international interest rates and lower global asset prices. Higher borrowing costs could also emerge due to an increase in the risk premium that emerging markets pay when issuing debt abroad. Thus, a first risk considered is a rise in country borrowing costs. Following the discussion in Chapters 2 and 3, if countries boost investment efficiency, then this would imply higher productivity which would translate into higher than expected longer-term growth. A positive shock to productivity is the second shock modeled. Finally, to illustrate the impact of monetary policy, a deviation in the estimated policy rule is analyzed: what might happen if central bankers cut policy rates more aggressively than suggested by the estimated rule?

Box 5.1 presents further details regarding the model and these simulations. Suppose there are no shocks in 2018. In this case, output is expected to increase towards potential and inflation will fall. Indeed, the economic model employed here suggests inflation will fall (to 0.5 percentage points below the target), while output increases, albeit substantially below potential (1.3 percentage points below potential by the end of 2018). This scenario is represented by the gray line in Figure 5.3. Note that here, no shocks and no deviations in the policy rule occur while in Figure 5.2, panel (A), the scenario for 2018 comes from the IMF's *World Economic Outlook*, which may assume new developments in the global economy as well as potential shifts in the policy response. The scenario of higher than expected borrowing costs for the region is depicted in yellow. Interestingly, this shock provokes a depreciation in the exchange rate. Output does not increase as much in the

BOX 5.1 The Role of Monetary Policy in an Uncertain World

Assessing the impacts of shocks, incorporating the role of monetary policy is not straightforward. Economic agents are forward looking and take into account expected future monetary policy decisions when deciding on their current action. In this chapter, a structural Dynamic Stochastic General Equilibrium (DSGE) model is employed to shed light on the effect of both selected shocks and deviations in the anticipated monetary policy. The model allows for several sources of uncertainty. These include the shocks to the interest rate at which domestic actors can borrow from abroad and shocks to productivity that impact long-term growth. Other sources of uncertainty are also included such as commodity price fluctuations. Finally, the model allows for changes in a monetary policy rule. The model is calibrated to represent the average of five inflation targeters (Brazil, Chile, Colombia, Mexico, and Peru) for the post-2000 period. Further details of the model and its estimation were discussed in the previous Latin American and Caribbean Macroeconomic Report (see Appendix A in Powell, 2017a).^a

A baseline scenario with no new shocks predicts that output, inflation, and other variables will eventually converge to their long-run values. Inflation continues a downward trend to below its long-term average and then from the 3rd quarter of 2018 rises to that long-term level. The reason for this predicted trajectory is that inflation has been falling and, in the past, the inflationary process has been persistent; therefore, the model picks up that momentum. The baseline is the "no shocks" (gray) line depicted in Figure 5.3. A scenario of higher than expected international interest rates is depicted in yellow and assumes a one standard deviation increase in both the international interest rates (the return on 10-year US treasuries) and in countries' risk premium (the average EMBI spread) over the first year of the simulation. The result is that the exchange rate depreciates, and inflation rises. The estimated (Taylor-type) monetary policy rule implies higher interest rates in this scenario and investment and consumption fall. Higher domestic and foreign interest rates imply output grows at a slower pace than in the baseline.

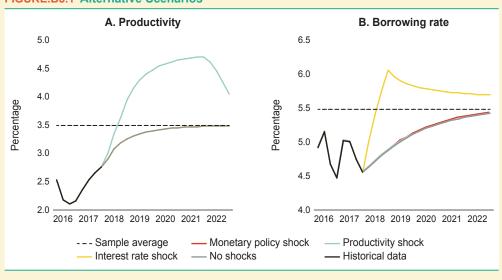
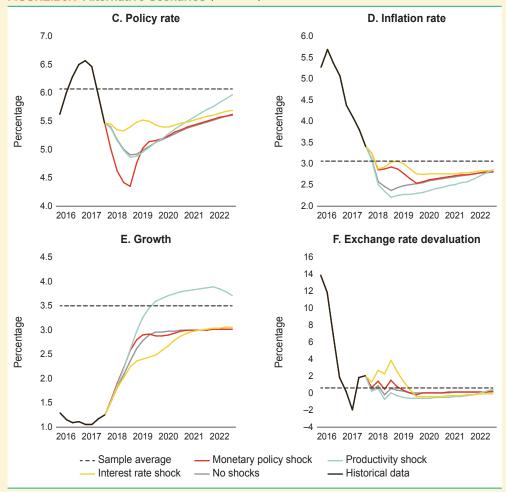


FIGURE.B5.1 Alternative Scenarios

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BOX 5.1 The Role of Monetary Policy in an Uncertain World (continued)

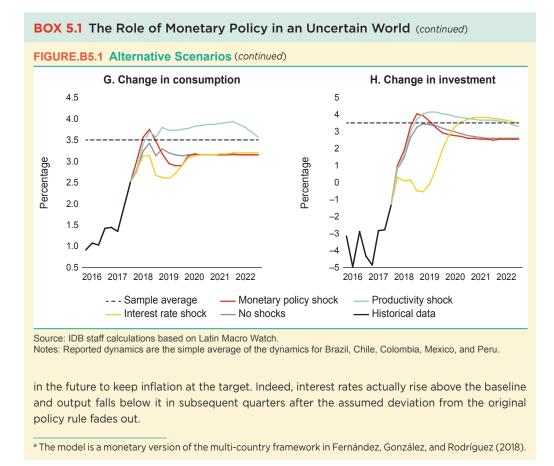
FIGURE.B5.1 Alternative Scenarios (continued)



The upside risk scenario of higher than expected growth is depicted in light green. The shock is spread evenly over the forecasting horizon of four years and is one standard deviation of the annual fluctuations in productivity in each of those years. Output increases faster in this scenario, so the negative output gap closes more quickly. This is a positive supply shock and in addition the exchange rate appreciates, the estimated policy rule allows interest rates to fall somewhat, and inflation is lower.

The final scenario (red) is that of an unanticipated change in the monetary policy rule towards a less restrictive policy, and modeled as a 1.5 standard deviation reduction in interest rates over four quarters (0.33 standard deviations per quarter). Note that inflation is higher although it stays below the target. There is some positive impact on output, but it is quite small. The reason is that agents realize that inflation will start to drift up again and the central bank will have to raise rates

(continued on next page)



baseline of no shocks, although the difference is fairly small. However, the exchange rate depreciation feeds through to prices, so inflation does not fall as much (see Box 5.1 for further discussion). In the scenario of higher than expected productivity, depicted in light green, output increases more. As this is a positive shock to supply, inflation falls further below the inflation target, allowing more room to reduce policy interest rates. Finally, in the case of a less restrictive monetary policy, (the red line), output increases faster while inflation falls by less than in the baseline. In fact, given the calibration of the model, inflation falls to a level very close to the target. Still, the benefit in terms of higher output is small.

Inflation Expectations and a Policy Discussion

As economic agents base current actions on what they think will happen in the future, expectations can play a critical role. The model employed in the previous section assumes

that the monetary policy rule is known and is fully credible, which is akin to saying that any inflation target is fully credible since the central bank would always act if it saw inflation getting too high—or too low. Medium-term inflation expectations would then not deviate from that target. In practice, expectations do sometimes deviate. And if inflation expectations become de-anchored (e.g.: move significantly above the target for some time), then it may be costly to bring them back into line; if there is a negative shock, then that would also limit the possibility of using monetary policy to attempt to stabilize output.

Considering five inflation targeters in Latin America, inflation expectations are within the inflation target bands. However, shorter-term expectations for inflation in Mexico and Peru are close to the target ceiling. Shorter-term expectations tend to be more volatile and may not take into account the full effects of recent monetary policy decisions that operate with a lag. Medium-term inflation expectations may then be a better indicator of whether expectations are anchored (see Box 5.2). While inflation rates vary, median medium-term expectations in the five countries in general have remained well-anchored. However, the dispersion of medium-term inflation expectations has increased in some countries and in Mexico has reached its highest level since the Great Recession. Agreement between individual forecasters that inflation is expected to be below the target (i.e., low dispersion at or below the target level) is normally thought to indicate high credibility (see Appendix E on the distribution of inflation expectations over the short- and medium-term for five countries). Moreover, in Mexico the evidence suggests that median inflation expectations have risen in the last period of the sample analyzed.

There is an ongoing debate over the value of credibility and how to assess that credibility. Moreno and Villar (2009) suggest that credibility, and the role played by expectations, may be an important determinant of inflation persistence in line with what is referred to as New Keynesian economic models. Demertzis and Viegi (2016) argue that credibility becomes particularly important at times of higher uncertainty. Mariscal, Powell, and Tavella (forthcoming) suggest that in a credible regime, current inflation shocks should not have significant impacts on medium-term inflation expectations and claim that the credibility of inflation targeting regimes in Latin America on average have grown over time. Using this last paper as a starting point, Box 5.2 presents a new analysis with an expanded dataset on selected individual countries.

The results suggest that the high credibility of the inflation targeting regime in Chile may have allowed for the active counter cyclical use of monetary policy during the great recession. While hard to quantify, one view is that credibility as a concept resembles capital, with particularly high returns to high credibility during tougher times; and if credibility is lost, then it may be costly to reaccumulate. The stock of credibility may then depend on the actions taken by central banks to date. As illustrated in Figure 5.4, several banks raised interest rates given inflation was above target even though output was below potential.

BOX 5.2 Inflation Expectations and Credibility

According to the former Governor of the Bank of England, Mervin King, "the real influence of monetary policy is less the effect of any individual monthly decision on interest rates and more the ability of the framework of policy to condition inflation expectations" (see King, 2006). If inflation rises in a regime with high credibility, expectations should remain stable and a central bank may then need to raise rates less to bring inflation down. Moreover, in the bad times, the central bank may be able to lower rates more without risking higher inflation. In other words, in a regime with high credibility the central bank may be able to ensure stable output growth at lower inflation volatility or stable inflation with a lower volatility of output. But how can credibility be assessed?

One way is to consider how medium-term inflation expectations react to changes in actual inflation.^a Under a highly credible inflation-targeting regime, anchored medium-term expectations should not react to the actual inflation rate. In an econometric analysis, this is exactly the result obtained for Chile (see the first column of Table B5.2). In the case of Colombia for the whole sample, inflation expectations do react to inflation shocks (column 2 of Table B5.2).^b For Mexico, the same simple regression specification shows no impact of inflation shocks on inflation expectations (column 3 of Table B5.2) but when an additional term is added, indicating when inflation is above the target, inflation shocks do appear to impact medium-term expectations (column 4 of Table B5.2). (see Appendix E for methodology and additional regression results).

These results suggest that in Chile, despite shocks to actual inflation, medium-term expectations have been firmly anchored. In Colombia and Mexico, there has been some reaction

TABLE B.5.2 Effects of Observed Inflation on Medium-Term Inflation Expectations

	Chile	Colombia	mbia Mexico	
	(1)	(2)	(3)	(4)
L. IE	0.826*** (0.09)	0.555*** (0.13)	0.799*** (0.08)	0.681*** (0.10)
L. Inf	0.000 (0.00)	0.0381*** (0.01)	0.006 (0.01)	0.0488** (0.02)
Dummy (=1 if L. Inf > Target)				0.197** (0.08)
L.Inf * L.Dummy				-0.0545** (0.02)
Constant	0.524* (0.27)	1.274*** (0.39)	0.683*** (0.26)	0.962*** (0.29)
Observations	96	35	96	96

Source: IDB staff estimates based on the Latin Macro Watch and Central Banks' websites.

Note: The sample ranges from Jan-2010 to Dec-2017. The dependent variable is the median of the medium-term inflation expectations in each country and explanatory variables include the lagged medium term expectations (L.IE) and the lag of actual inflation (L.Inf). In column (4), a dummy is added equal to 1 if inflation is above the target band, and 0 otherwise, and an interaction term of this dummy with the lag of inflation.

Newey-West Standard Errors in parentheses.

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^{***} p < 0.01, ** p < 0.05, * p < 0.1.

BOX 5.2. Inflation Expectations and Credibility (continued)

in medium-term inflation expectations given shocks to actual inflation, although the quantitative impact may be quite small—in the case of Colombia a 1% rise in inflation on average provokes a rise of 0.04% in inflation expectations. These results are based on historical data; in other words, they reflect the actual policies and interest rate decisions made. However, no counterfactual exists. What would have happened under another policy scenario is unknown.

This has been labeled pro-cyclical monetary policy¹ but it is hard to know the counterfactual and whether a less restrictive policy would have implied a greater de-anchoring of expectations with then higher costs to re-anchor and regain any credibility lost.

This discussion is relevant to the question of how quickly central banks might currently be able to lower policy rates as inflation subsides (as illustrated in Figure 5.2 this question is particularly relevant for Colombia, Mexico, and Peru). The model estimated in the previous section suggests that monetary policy might be somewhat less restrictive than in the past and inflation will continue to fall to target levels. However, the benefit in terms of higher output was estimated to be small. Moreover, interest rates are lower and output is somewhat higher through 2018, interest rates then rise above, and output falls below, the baseline in subsequent quarters. The reason for this behavior is that lower interest rates imply somewhat higher inflation and the central bank has to react to that in the future. In addition, this model assumes that any monetary policy rule adopted had full credibility. In practice, central banks may wish to condition the speed at which interest rates are reduced on indicators of how well inflation expectations are anchored, such as the level and the dispersion of inflation expectations. And if the output gains of lowering rates quickly are slim and the cost of regaining lost credibility are large, then this may justify erring on the side of caution.

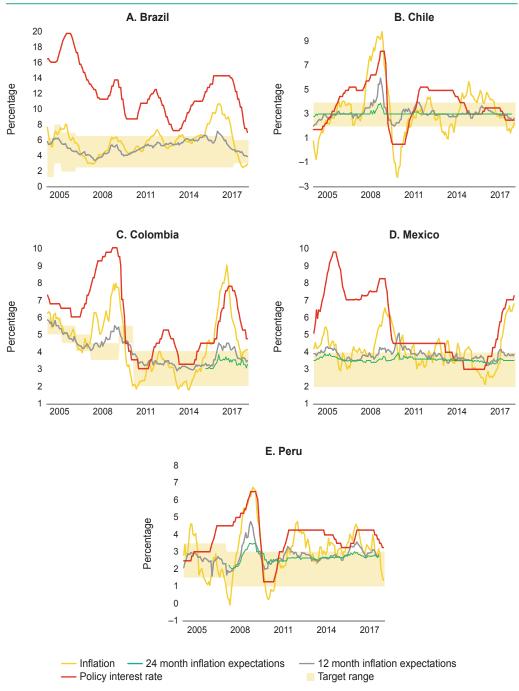
Given these scenarios, an effective communication strategy may improve the tradeoffs considerably. Guaranteeing that market participants understand current policy and how future actions may be determined helps the central bank maintain inflation expectations focused around the target. Since its inception, inflation targeting has been thought of as a policy framework to enhance transparency and coherence of monetary policy (Bernanke and Mishkin, 1997). An effective communication strategy is an indelible element of inflation

^a See, for example, Huang and Trehan (2008) and Mariscal, Powell, and Tavella (forthcoming).

^b In the case of Colombia, the sample includes only 2015-2017 due to the limited availability of inflation expectations at the 24-month horizon.

¹ The procyclical movement in interest rates was frequently a response to large exchange rate depreciations that may have had stimulative effects, particularly through import substitution. Thus, while interest rates may have been procyclical, the monetary policy stance (including the behavior of exchange rates) may have been counter cyclical in nature (see Powell, 2017a).

FIGURE 5.4 Median Inflation Expectations at Two Horizons



Source: IDB staff calculations based on the Latin Macro Watch and Central Banks' websites.

Note: Inflation expectations are the median reported by the surveys of the Central Banks. 24-month expectations are illustrated where available. In the case of Mexico, four-year inflation expectations are depicted instead of the 24-month expectations. Furthermore, from 2004 to 2008, the Policy Interest Rates is an indicative policy rate.

targeting. such that agents can better understand and anticipate central banks' actions. This, in turn, can increase the effectiveness of monetary policy, while help keeping inflation expectations well-anchored (Woodford, 2005). For those central banks that are currently in the process of reducing policy rates, providing an explanation of the anticipated pace of policy actions and detailing which new developments might alter those plans may allow rates to be reduced faster while maintaining inflation expectations anchored.

Building External Buffers: The Role of Foreign Reserves

As discussed in Chapter 1, monetary normalization and a tapering of the large balance sheets of the U.S. Federal Reserve, the European Central Bank and the Bank of Japan are likely to gain pace in the coming years, potentially reducing trillions of dollars of global liquidity. This change in global financial conditions may have repercussions for the region, namely via capital outflows and exchange rate pressures, particularly in countries that have chosen either to fix or to stabilize the nominal exchange rate. The question tackled here is, how do external buffers measure up to this challenge to ensure economic and monetary stability?

Foreign exchange reserves provide buffers that can help accommodate external shocks, thereby reducing the probability of costly crises.² Following Calvo, Izquierdo, and Loo-Kung (2013), the optimal level of international reserves is the level that minimizes the expected cost of a Sudden-Stop event given a global liquidity crunch, while considering the opportunity cost of holding liquid international reserves.³ The framework assumes that the conditional probability of a Sudden-Stop and the output cost associated with such an event depend on the country's fundamentals: i.e., the fiscal and external accounts' balance, the level of liability dollarization, and the amount of available international reserves. The opportunity cost of holding reserves is the difference between the interest a country pays on its foreign debt, and the return on its liquid foreign assets (i.e., U.S. Treasury bonds). The product of the estimated probability and cost of a Sudden Stop is the expected loss given such an event. Appendix E contains further details on the data and methodology.

Following this approach, Figure 5.5, panel (A) shows the estimated expected loss given a sudden stop in capital flows for established inflation targeters (IT'ers), recent IT'ers and those with intermediate exchange rate regimes in the region. While the established IT'ers appear to be less vulnerable in absolute terms according to this metric, the expected

² Complementary buffers, such as contingent credit lines from international financial institutions, have not been widely implemented among countries in the region. The buildup of international reserves has been the preferred instrument, hence the analysis that follows focuses on international reserve holding only.

³ A global liquidity crunch is an adverse scenario in which market participants are reluctant to invest in anything but the safest assets.

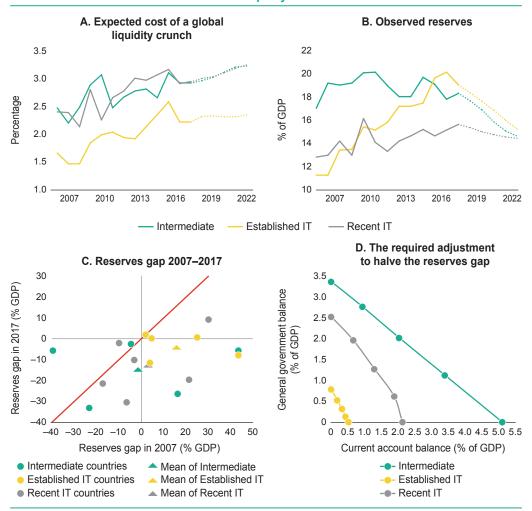


FIGURE 5.5 Selected Indicators on the Adequacy of External Buffers

Source: IDB staff calculations based on national sources, IMF and World Bank data.

Note: In Panel (A), the graph illustrates the average expected cost of global liquidity crunch; Panel (B) depicts the average observed level of international reserves as a percentage of GDP. In Panel (C), the graph illustrates the gap between observed reserves and optimal reserves as a percentage of GDP in 2007 and 2017 for 16 countries. Each dot represents one country and the triangles represent the mean of each group of countries. Finally, Panel (D) depicts the combinations of adjustments in the government and current account balances to halve the observed 2017 reserves gap. Values from 2017 to 2022 are projected from IMF (2017c).

Established IT: Brazil, Chile, Colombia, Mexico and Peru; Recent IT: Argentina, Costa Rica, Dominican Republic, Guatemala, Paraguay and Uruguay and Intermediate: Bolivia, Honduras, Jamaica, Nicaragua and Venezuela.

loss has increased across the three country groups since the pre-crisis years. This suggests that increases in fiscal and current account deficits and in liability dollarization between 2007 and 2017 (Table 5.1) outweighed the increasing levels of international reserves that countries accumulated (Table 5.1 and Figure 5.5, Panel B).

As a result, the gap between observed and optimal reserves has widened in all three groups of countries (Figure 5.5, Panel C). In particular, more than half of the countries

TABLE 5.1 Factors Affecting Expected Loss in Case of a Sudden Stop

	Fiscal I	Balance	Current Account Bal. Liability Dollarization			Reserves		
(% of GDP)	2007	2017	2007	2017	2007	2017	2007	2017
Established IT	1.3%	-3.9%	0.3%	-2.1%	8.4%	11.9%	13.4%	19.1%
Recent IT	0.2%	-3.7%	-1.4%	-1.3%	14.7%	19.2%	14.2%	15.7%
Intermediate	-1.0%	-5.6%	-4.5%	-4.1%	20.8%	19.3%	19.1%	18.4%

Source: IDB staff calculations based on IMF (2017c).

analyzed are to the right of the y-axis suggesting that observed reserves exceeded optimal levels in 2007, but almost all of them are below the x-axis suggesting the opposite was true in 2017. The fact that most country dots lie below the 45-degree line signals the widening of reserve gaps.

Using the forecasts for the underlying variables from IMF (2017c),⁴ the exercise is extended through 2022. Observed reserves are forecast to fall (as a share of GDP) in all three country groups as the unwinding of global liquidity positions continues. The expected loss given a sudden stop is predicted to increase, especially among countries in the Intermediate group and the recent IT'ers. While these results may call for faster accumulation of international reserves to reduce countries' vulnerability, doing so may be a challenge over the coming years because Central Banks in advanced economies will be mopping up liquidity. The alternative is to strengthen countries' fiscal and external accounts, and to reduce domestic liability dollarization where possible. Figure 5.5, Panel (D) shows, for example, the combinations of estimated joint adjustments in fiscal and current account balances required to reduce the gap between observed and optimal reserves to one half of its current levels (assuming domestic liability dollarization remains unchanged). Thus, established IT'ers in the region may reduce their vulnerability to sudden stops by either increasing the fiscal balance by 0.8% of GDP on average; or by increasing the current account balance by about 0.5% of GDP on average; or by some combination of the two. The most challenging task ahead is for countries with intermediate regimes. Simulations for countries within that group suggest that to reduce the reserves gap to one-half of its current level, fiscal balances should adjust by more than 3 percentage points of GDP; or the current account balance must improve by 5 percentage points on average; or some combination of the two. The countries in the recent IT'ers group lie in between the two other cases.

⁴ The IMF's *World Economic Outlook* database includes 5 year forward forecasts for key macroeconomic variables of each country. For this exercise we use forecasts on GDP, Trade Balance, Current Account, Fiscal Balance and International Reserves. The only variable in the model that is not forecasted in the WEO is Liability Dollarization, for which we use its 2017 level for the forecasts.

Achieving higher economic growth, which is the main tenet of this report, would help to reduce the estimated required adjustments, allowing countries to reduce vulnerabilities to external shocks. At the same time, the region must avoid the costly financial crises that in the past erased the beneficial effects of reforms. Therefore, preserving macroeconomic stability by building adequate external buffers is an indispensable part of any pro-growth agenda.

CHAPTER 6

Conclusions and Policy Suggestions

he long-run growth performance of Latin America and the Caribbean has been mediocre. Growth rates have been lower and more volatile than in other regions. The region is currently growing below potential and projected growth rates only return to these historical mediocre rates in the years ahead. Projected growth is likely to be insufficient to fulfill the aspirations of the population and other countries in the world may pull further ahead.

Not all the growth ingredients have been in short supply. Since the 1960s, Latin America has benefited from the "demographic bonus" of falling dependency ratios. Furthermore, labor participation (among the working age population) increased on the heels of higher female labor participation rates. The expanded labor force has also become more educated. Going forward, however, these vibrant sources of growth will naturally taper off: the demographic bonus will disappear as the population ages; growing female participation rates will slow down as they approach parity with men; and the massive extension of the education system, will reach the limit of universal coverage¹. The region needs to focus on those growth factors that are lacking: investment in physical capital and the efficiency of that investment.

Investment rates are lower than in other fast-growing emerging economies; and in certain categories such as infrastructure, for example, they are below the levels required to upgrade capital stocks to match those of comparable countries. Some countries do not invest more because they are constrained by low domestic savings. Moreover, foreign savings have not been a good substitute as few countries have been able to import savings for prolonged periods of time without abrupt reversals, or without incurring severe external indebtedness problems that have led to recurrent financial crises.² The alternatives are to reduce the risks of foreign savings and to mobilize greater domestic savings. Domestic savings are constrained by small and inefficient financial systems that do not reach all savers with adequate saving instruments, and that channel a limited amount of

¹ While coverage has become nearly universal, the level of skills remains low compared to other regions (Busso et al., 2017).

² See Cavallo, Eichengreen, and Panizza (2017).

financing to productive investment; poor contract enforcement that throws sand in the wheels of efficient financial intermediation; pension systems that fail to mobilize enough savings for retirement while contributing to public dissaving as governments have to step-in to cover the systems' deficits; low levels of financial literacy limiting personal savings and constraining savings through formal channels; inefficient government spending leading to high public deficits; and a bias against public investment in the composition of government expenditures.³

Investments financed by public resources should, however, be carefully chosen and the overall policy framework should be conducive to boosting private sector investments with high private and social value. Smart productive development policies can encourage investment and particularly those investments with positive externalities, increasing their social value. Many opportunities exist for policy actions to boost investment and growth that may not need substantial fiscal resources.⁴

In addition, the evidence presented in this report suggests that it is important to focus on the *quality* of investment. While simulations in Chapter 2 show that the growth potential of more (quantity) and better (quality) investment is similar when measured against the experience of Emerging Asia, GDP gains produced by additional investment require generating (or borrowing) the resources to invest (with consequent impacts on debt levels). Instead, the GDP gains produced by more efficient investment do not require such efforts (or risks).

An interesting question is whether investment and productivity are related. As new investments will tend to focus on the latest equipment, either an innovation or a replacement of an element from a past vintage, greater investment will likely mean higher productivity growth. In developing economies this effect may be particularly strong as it offers an opportunity to catch up with more advanced economies by adopting, perhaps with some adaptation, existing technologies and practices employed elsewhere. Furthermore, investment may facilitate the reallocation of productive factors towards higher productivity sectors, thereby further increasing aggregate productivity. However, something in the investment profile of Latin America and the Caribbean has prevented the investment effort that has taken place from generating the productivity gains observed in other regions. One possible explanation relates to the allocation of that investment.

A crucial element for a country's investment profile is which firms invest. Aggregate productivity is a weighted average of the productivity of individual firms. Therefore, if larger firms are more productive and they invest and grow while unproductive firms shrink and eventually exit, then aggregate productivity will rise. Any distortions that prevent such a dynamic will lower productivity compared to its potential. Unfortunately, there is evidence

³ See Cavallo and Serebrisky (2016).

⁴ See Crespi, Fernández-Arias, and Stein (2014) for further discussion.

of such distortions in the region, at least in those countries where there is good data. High effective taxes on larger firms (the most productive) which are the focus of enforcement efforts, high labor taxes (pushing firms to hire informally), special tax regimes, product market distortions, and credit frictions may all stunt the growth of productive firms. The result is a proliferation of small, informal, low-productivity firms that employ the majority of workers and a significant amount of capital, dragging down aggregate productivity.

Another dimension of a country's investment profile relates to public investment. Within public investment categories, infrastructure is both particularly important as a productive input, and especially scarce in the region. According to some estimates, Latin America requires additional investment in the range of 2 to 2.5% of GDP per year, approximately US\$ 150 billion, to close the existing infrastructure gap. 5 Lifting infrastructure investment that much will require an increase in both public and private investment.

On the public investment side, governments can consider two key reforms: to improve the deficient public investment management processes that conspire against efficient public investment;⁶ and to design fiscal rules and targets that direct a higher share of total expenditures to public investment and counter the political economy forces that bias expenditures toward public consumption in both good and bad times.⁷

On the private side, it is valuable to recognize that the private sector is not a monolith. It consists of different agents with different expertise and different risk appetites: Investors in infrastructure projects can be local or foreign; institutional investors such as pension funds or individual (retail) investors may seek to diversify portfolios through mutual funds or other investment vehicles. One route is to develop infrastructure as an asset-class, allowing the expansion of existing investment vehicles, or creating new ones to attract the most suitable investors at each stage of the project cycle.⁸ This alternative requires revamping the public investment management process for many reasons: the pipeline of well-prepared projects is small; project bonds (tradable financial instruments of sufficient liquidity) are lacking; daunting inconsistencies persist in procurement contracts, concessions, and bidding documents; and, moreover, contract enforcement is low. These factors contribute to explain why close to 90% of investors in Latin America and the Caribbean consider institutional weaknesses a major constraint to increase infrastructure investment, compared to 40% in Europe and the Middle East, and just 30% in Asia and the Pacific.⁹

What role can macroeconomic policies play in promoting higher and more stable growth? Fiscal policy has implications for both short-run and longer-term growth. However, a tension often exists between the two. For example, the ability to lower distortionary

⁵ See Cavallo and Serebrisky (2016).

⁶ See, for example, Gupta et al. (2014).

⁷ See Izquierdo, Puig, and Vuletin (forthcoming).

⁸ See Ketterer and Powell (2018) and BlackRock (2015).

⁹ See BlackRock (2015).

TABLE 6.1 A Taxonomy of Suggested Fiscal Reforms

Fiscal Space (High/Low)	Estimated Negative Tax Multiplier (Large/Small)	Estimated Positive Capital Expenditure Multiplier (Large/Small)	Policy Recommendation
High	Large		Lower taxes / eliminate distortionary taxes
Low	Large		Rationalizing spending / Reduce current expenditure leakages
	Small	Large	Increase Value Added Tax / sales tax to finance public investments
	Large	Large	Focus on expenditure switching policies: from current (consumption) to capital (investment)
		Small	Strengthen public investment management process.

taxes, or to raise certain productive public investments usually collides with the fiscal space available to countries. The appropriate policy actions then depend on where countries are, according to specific key dimensions. Table 6.1 illustrates recommended policy combinations.

The majority of countries in the region are in the midst of fiscal adjustments to reduce high fiscal deficits and stabilize increasing debt-ratios, or to reduce debt from high levels. An analysis of the fiscal plans for 2018 reveals that the composition of this adjustment effort is now falling more on cutting current expenditures (public consumption) than on capital spending (public investment). Still, on average countries plan to cut current levels of capital spending as a percentage of GDP on top of the previous cuts to capital spending reviewed in Chapter 4. If capital spending multipliers are significantly higher than those on current spending, there is still an argument for expenditure switching to boost growth. In those few countries with fiscal space and where output is below potential, there may be room for some shorter-term fiscal policy to boost demand. In this case, the policies to boost growth should focus on areas where multipliers are higher and if they are viewed as a counter-cyclical demand management tool, they should be explicitly temporary in nature.¹⁰ This would appear to count against boosting current spending as a demand management device.

However, for the majority of countries the question is not whether to adjust, but how. Current plans for 2018 do not reflect the adjustment required to stabilize debt completely, implying that many have chosen a more gradual approach and that debt will continue to rise at least for some years to come. But gradualism can have its complications. If a plan lasting several years is not viewed as credible then the private sector may demand higher

¹⁰ See Powell (2017a) and previous Latin American and Caribbean Macroeconomic reports for an account of how the region came to be in the current position of high deficits and higher debt ratios.

interest rates; then, servicing that debt will be more expensive, implying that even more adjustment will actually be required. Given the gradual nature of the adjustment plans it is particularly important to ensure that those plans are credible and that the deeds match those plans. Measures such as having multi-annual budgeting, greater transparency in the budgeting process, and an independent agency to assess performance of fiscal goals can play a useful role.¹¹

Growth in the region has also been too volatile, and banking and currency crises have been all too frequent events. Ensuring financial and macroeconomic stability is a prerequisite for more steady progress towards higher income levels. The positive news is that while the region has a variety of monetary regimes, median inflation in each is low and under control. For five established inflation targeters, failing the appearance of new shocks, inflation should trend towards their respective targets in 2018. But on average for these economies, output remains below potential. This suggests a prima facie case for adopting less restrictive monetary policy. However, the analysis in this report suggests exercising caution to ensure that inflation expectations remain firmly anchored.

As reviewed in Chapter 1, the global economy still faces significant risks, including the possibility of a correction in global asset prices, that have likely priced-in an optimistic scenario of continued low inflation and very gradual monetary normalization. If inflation is higher and monetary normalization is faster than expected by private markets (for example if in the United States monetary normalization turns out to be as fast or even faster than indicated by Federal Reserve Governors), then this may have considerable fall out for global financial markets. These risks may be particularly acute for those countries that have chosen to fix exchange rates or manage exchange rates actively. The vulnerability to external shocks has risen in many countries because fiscal and external positions have deteriorated more than foreign reserves have increased to provide a buffer, and also because domestic liability dollarization has risen in some cases. While these results may call for a faster accumulation of international reserves to reduce countries' vulnerability, accumulating reserves may be difficult to achieve just when Central Banks in advanced economies will be mopping-up global liquidity. An alternative may be to strengthen fiscal and external accounts by reducing domestic absorption, and to reduce domestic liability dollarization where possible by regulating the banking system or by allowing for exchange rate volatility while avoiding implicit exchange rate insurance as suggested in previous

¹¹ See Powell (2017a) and, for a succinct discussion, see Powell (2017b).

¹² As noted in Chapter 1, there are exceptions. Most notably, Venezuela is unfortunately entering a period of hyperinflation and is in a deep economic crisis.

¹³ The analysis pertains to the five countries in the Established IT'ers group defined in Chapter 5: Brazil, Colombia, Chile, Mexico, and Peru.

¹⁴ See, for example, Powell (2014).

editions of this report.¹⁴ Other measures may include finding ways to enhance reserves, for example by signing a Flexible Credit Line with the IMF or seeking other contingent financing liquidity arrangements.

Global growth has been strong and broad-based. But even so, Latin America and the Caribbean is projected to grow at only the mediocre average rates achieved over the last 50 years. That pace of growth is not sufficient to maintain the region's share of global GDP, let alone match the faster-growing developing nations of East Asia. If Latin America and the Caribbean hopes to grow faster and be more prosperous, it must prioritize investment and raise investment efficiency to make sure that the effort pays off. The region has a mandate to grow; to fulfill that mandate successfully is not an easy task. While market volatility and higher interest rates may limit the room for maneuver, the current favorable global fundamentals may provide an opportunity to craft and implement the right policies.

APPENDIX A

Growth Accounting Exercises

Consider the following aggregate production function:

$$Y_t = A_t K_t^{\alpha} (h_t L_t)^{1-\alpha} \tag{A1}$$

Where Y is real aggregate output, K is the physical capital stock, α is the output elasticity to physical capital (K), hL is the productive capacity of the labor force, which in turn corresponds to the headcount of the labor force (L), multiplied by its average level of skills (h). Finally, A is total factor productivity (TFP), which captures the effectiveness with which accumulated factors of production are used to produce output. The sub-index t introduces the time dimension to the process.

It is traditional to perform growth accounting exercises using a production function like (A1). However, this approach does not allow for disentangling the part of the process of physical capital accumulation that is caused by growth in total factor productivity (that increases returns to investment), from the part that is independent of it (i.e., higher investment effort caused, for example, by a reduction in the cost of capital). This distinction is important to account for the role of productivity growth including its indirect effect on capital accumulation. To address this problem, it is useful to transform the production function into "intensive form" (Klenow and Rodríguez-Clare, 2005).

Divide both sides of the production by $(Y_t)^{\alpha}$ and solve for Y_t to get:

$$Y_t = A_t^{\frac{1}{1-\alpha}} \left(\frac{K_t}{Y_t} \right)^{\frac{\alpha}{1-\alpha}} h_t L_t \tag{A2}$$

Next, dividing both sides of (A2) by total population (N_{\star}) gives:

$$Y_t = A_t^{\frac{1}{1-\alpha}} \left(\frac{K_t}{Y_t} \right)^{\frac{\alpha}{1-\alpha}} I_t h_t \tag{A3}$$

Where
$$Y_t = \frac{Y_t}{N_t}$$
 and $I_t = \frac{L_t}{N_t}$.

In the neoclassical growth model in the tradition of Solow (1956) and Swan (1956), the capital to output ratio $\frac{K_t}{Y_t}$ does not depend on total factor productivity. Therefore, using this functional form for the production function, the contributions of productivity to the growth process are separated from the contributions of capital accumulation.

The decomposition is done by first taking logs to both sides of equation (A3), and then taking first differences to express the variables in growth rates. It is assumed that α is constant and equal across countries.²

$$\Delta Y = \frac{1}{1 - \alpha} \Delta A + \frac{\alpha}{1 - \alpha} \Delta \left(\frac{K}{Y} \right) + \Delta I + \Delta h \tag{A4}$$

Where the Δ symbol denotes the growth rate of the corresponding variable.

The components Y, L and K come from Penn World Table database (PWT 9.0). Concerning the skill level h, the approach by Bils and Klenow (2000) is followed to derive h as a function of the years of schooling of the labor force considering their impact on relative wages (see Fernández-Arias and Rodríguez-Apolinar, 2016 for details). TFP is not directly observable. Instead, it is estimated as a residual, thus the name Solow-residual. This chapter employs a Solow residual computed using the methodology described in Fernández-Arias and Rodríguez-Apolinar (2016), updated using cross country data from the (PWT 9.0).

Raw annual data are filtered to obtain smooth series.³ All the cleaning and filtering yields a balanced sample of 74 countries with annual data on all the components of equation (A1) over the period 1960–2017, including 18 countries from Latin America and the Caribbean.

Country Groups

Latin America and the Caribbean: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela, RB.⁴

¹ For technical elaborations on this point see Jones (2016) and Daude and Fernández-Arias (2010).

² The results reported here do not change materially when α is allowed to vary overtime.

³ Following Fernández-Arias and Rodríguez-Apolinar (2016), in order to obtain the trend series, logarithms of the series of output (Y), physical capital (K), skill level (h) and labor headcount (L) respectively were filtered with a Hodrick-Prescott filter with smoothing parameter λ =7, and then inverted with the logarithmic transformation. These filtered series were used to compute the measures of productivity. To avoid end-point problems in the filtering process, WEO projections for 2017–2022 were used. Trend per capita measures were obtained by filtering the population series.

⁴ Bahamas, Barbados, Belize, El Salvador, Guyana, Haiti, Nicaragua, Suriname and Trinidad and Tobago were excluded because the necessary data to perform the growth accounting decomposition was not available for all the series in the Penn World Table database.

Emerging Asia: China, Hong Kong SAR, China, Indonesia, Korea, Rep., Malaysia, Singapore, and Thailand.

Advanced Economies: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

Sub-Saharan Africa: Benin, Cameroon, Central African Republic, Cote d'Ivoire, Ghana, Kenya, Malawi, Mali, Mozambique, Niger, Senegal, South Africa, Tanzania, Togo, Uganda, and Zambia.

Rest of the World is a synthetic group comprised of all the non-Latin American and Caribbean countries. It includes all of the countries in the other country groups plus Bangladesh, Egypt, Arab Rep., India, Iran, Islamic Rep., Morocco, Nepal, Pakistan, Philippines, Romania, Sri Lanka, Tunisia, and Turkey.

APPENDIX B

Growth Diagnostics: A Primer

raditionally, indicators of economic growth consider quantities. Changes in real output (growth rates of gross domestic product, GDP) attempt to show how quantities change, keeping prices constant. If prices are fully flexible, markets are competitive, there are no transaction costs, and economies are open, there are no other distortions and all markets are clear, then prices are generally uninteresting. However, if there are shortages of particular inputs or distortions in specific sectors or in critical economy-wide services (such as credit), then prices, including interest rates, can be highly revealing. This was one of the intuitions that lead to a now classic analysis of barriers to growth known as growth diagnostics.¹

Growth diagnostics may be likened to a detective story in which the villain is the current binding constraint to growth. The clues are pieces of economic information on prices and quantities that may be used to answer a set of questions leading the detective to (hopefully) the right conclusion. The underlying idea is that some distortion may be holding an economy back; solve that and growth will increase and then perhaps another constraint will bind, and again economic analysis may be able to detect that constraint. A caveat is that the methodology boils down to identifying the binding constraint to investment. It has less to say about why investment may not be very efficient; it is more relevant to the first part of Chapter 3 than the second.

The questions to be answered may be illustrated by means of a decision tree and a simplified version of the full tree is provided in Figure B.1. The starting point is a very basic question, namely, whether investment would be higher if a) there were more profitable projects or b) there were more funds available to finance investment. If domestic lending interest rates are high, then this would signal that demand for investment exists (presumably from profitable projects) but that something is amiss with the supply of investible funds. On the other hand, if interest rates are low, then ample investment funds are likely available, but something is wrong with the supply of projects.

¹ See Hausmann, Rodrik, and Velasco (2008) for a further description of the methodology and Agosin, Fernández-Arias, and Jaramillo (2009) for a set of studies on Latin America and the Caribbean.

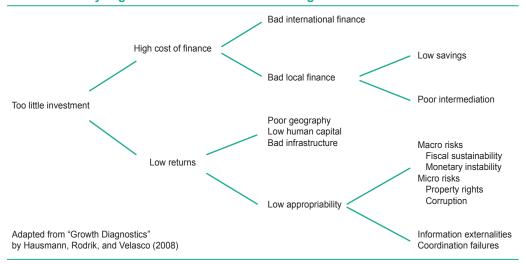


FIGURE B.1 Why Might Private Investment Be Lacking?

Consider the high interest rate branch of the tree. A high cost of finance may be due to problems with domestic financial intermediation or with accessing foreign savings- that is, borrowing from abroad. In the case of the former, banks may be inefficient, competition may be lacking, or something else may be preventing domestic savings from growing and financial intermediation from being deeper at home. In the latter case, high perceived risks may have led to a high country-lending spread, the conditions for foreign direct investment may be poor, or international lenders may be suffering from high risk-aversion.

On the other hand, the return on projects for investors may be low (the low interest rate branches of the tree). This would indicate a problem with the supply of healthy and profitable projects. Too little "self-discovery" could be the culprit. To put it another way, the country may only have the ability to produce basic goods and may not be particularly competitive at doing so- a poor location in the "product space" in the language of Hidalgo et al. (2007). In general, only those countries that produce many things then develop the capabilities and expertise to produce more sophisticated goods with higher differentiation and greater value added (see Hidalgo and Hausmann, 2009).

Problems in the supply chain may also occur if coordination is poor, either between necessary private suppliers along the supply chain, or with the public sector that might need to supply particular inputs in order for a particular activity to take off. In these cases, negative externalities or spillovers are at work.

Alternatively, there may be problems of appropriability. Investors will only finance a project if it is profitable and if they are sure they will be paid, and their contracts will be enforced. Uncertainty regarding contract enforcement will prevent the demand for financing from becoming truly effective. In this case, only those profitable projects with

adequate security will be financed and the interest rates actually visible in the economy will be low.² This may be due to poor rule of law, high taxes, an inefficient tax structure, or even worse, corruption.

Finally, low returns may stem from a lack of complementary inputs. If the country lacks the necessary infrastructure or human capital to produce or market more sophisticated goods, then the demand for credit will below.

Consider the case of Brazil. Brazil has been growing relatively slowly for some time (average growth is 2.2% for the last 30 years) and suffered a recession in 2015 and 2016 (less than -3% growth in both years). As discussed in Chapter 4, Brazil has a significant debt burden, a high fiscal deficit, and relatively high country risk spreads. As shown in Figure 3.2, investment rates are low (about 17% of GDP for 2017), real interest rates are high, and banking spreads are a significant component of the nominal lending interest rate. In Brazil, possibilities do not appear to be lacking, rather finance is expensive due to a lack of savings and to the high costs of financial intermediation and expensive foreign financing, possibly related to the current macroeconomic imbalances. In line with current policies, raising both government and private savings would boost growth, as would lowering the costs of financial intermediation (see Agosin, Fernández-Arias, and Jaramillo, 2009; Hausmann, Rodrik, and Velasco, 2008).

Other issues are also important in the case of Brazil, this is simply the logic of one particular methodology. As discussed extensively in Chapter 3, a whole set of microeconomic challenges may be lowering investment efficiency. Improving investment efficiency, among other policies may also help boost growth. For a more comprehensive discussion of economic challenges in Brazil, refer to IDB (2015a). On the other hand, in a country like Guyana, other forces may be at play. Guyana has grown at an average rate of about 3% for the past three decades. Total investment to GDP is also around 17% of GDP and real lending rates were 7.6% in 2016-not very low but lower than most countries in the region. While there may be relevant issues in financial intermediation, the main barrier to growth may be more related to the supply of new projects in different areas of the "product space" that would generate greater value-added . Guyanese exports are dominated by relatively few basic commodities and currently, it may not enjoy a central or valuable location in the product space. Boosting complementary inputs such as infrastructure and human capital could help the private sector, as would enhancing innovation and product experimentation. Significant recent discoveries of oil and gold create a huge opportunity. A challenge, in such circumstances, is how to harness such windfalls to increase sustainable private sector growth across the economy. Again these arguments follow the logic of just one methodology and the development challenges in Guyana may include many other aspects. Please refer to IDB (2017c) for a more comprehensive discussion.

 $^{^{2}\,}$ The situation may be similar to that of credit rationing as in Stiglitz and Weiss (1981).

APPENDIX C

Technological Diffusion and Growth

nnovation may generate new production processes, products, and services, and boost the quality of existing goods and services, thereby expanding the technology frontier of the world. New technologies may be available worldwide and they can be used simultaneously in many locations-they are non-rival in the language of economics. A country's total factor productivity (TFP) can then be decomposed into a global component, $A^{frontier}$ (the world technology frontier), and a country-specific component, $\theta \psi$, where θ is the rate of adoption of new technologies, and ψ denotes the idiosyncratic efficiency in the use of new technologies in each country.

Cole et al. (2005) and Jones (2016) suggest an approach that assumes that advanced economies, where the bulk of innovation takes place, are normally operating at the world technology frontier. The TFP of other countries may vary according to variations in the technology frontier and variations in their adoption rates and relative efficiencies. In Latin America and the Caribbean, for example, TFP growth has been lower than in the United States (see Chapter 2), which suggests that the adoption rate, θ , and/or idiosyncratic efficiency, ψ , have decreased over time.

What are some of the specific mechanisms through which technology diffuses across countries? While there is no consensus in the literature, two candidates are international trade in goods and services and foreign direct investment (FDI). The process of exchanging goods and services, and international investments imply economic interactions that may allow for new technologies to become known in partner countries. New evidence pertaining to FDI highlights the importance of these interactions for diffusion.³ Suppose that the headquarters of a multinational enterprise produces the know-how that is used in the production of final goods and services by its subsidiaries both in the home country

¹ It does not mean that they can be adopted without a cost (consider royalties for example).

² There is evidence to support the hypothesis that technology innovations are effectively transmitted across countries following the pattern described. (See, for example, Greenwood, Hercowitz, and Krusell, 1997; Herrendorf, Rogerson, and Valentinyi, 2014; Comin and Mestieri, 2014).

³ The focus is on indirect measures of technology diffusion. See Comin and Mestieri (2014) for an example of studies that use direct measures.

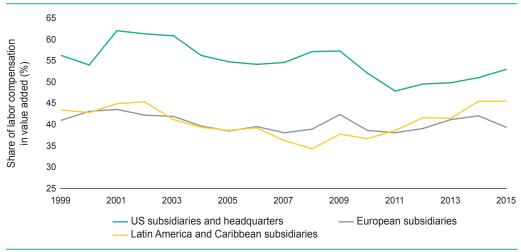


FIGURE C.1 Labor Share in US Multinational Enterprises

Source: BEA.

and abroad—the approach followed in Ayres (2017). The production of knowledge requires inputs of labor and capital, and their payments are observed in the data. However, the output of knowledge is not observed because of its intangible nature and because of the absence of third-party transactions. Under the hypothesis that most of the knowledge is produced by the headquarters in the home country and that subsidiaries use similar technologies to produce goods and services, the data should show a larger labor share (ratio of compensation of employees to value added) in the home country relative to their foreign subsidiaries. Figure C.1 shows that this is exactly the pattern observed for U.S. multinational enterprises. Their labor share in the home country, the United States, is significantly higher than in their subsidiaries in Latin America and Europe, and the differences are persistent over time. In this case, the production of knowledge by the headquarters in the United States increases the frontier technology and is diffused to other regions through its subsidiaries.

The importance of countries' interactions in the process of technological diffusion suggests that there is space to increase the rate of adoption in Latin America through policies that deepen trade integration, which is still low in the region (Powell, 2017a) and by expanding and diversifying FDI flows which are presently concentrated in a few countries, and are allocated to commodity-related sectors in the recipient economies (Powell, 2013).

⁴ Figure C.1 focuses on manufacturing, which accounts on average for 47% of the value added of U.S. multinationals in Latin America. The same results hold when aggregating all sectors.

APPENDIX D

Measuring the Efficiency of Public Investment

he public investment efficiency scores presented in Chapter 4 are based on frontier analysis techniques. Typically, these techniques estimate the efficiency of a set of units by selecting the combination of input-output that reflects the most optimal use. Then, those units whose combination of inputs and outputs deviates from this optimal combination are considered "inefficient," and the distance to the frontier can be defined as the "efficiency gap."

Several approaches have been developed to estimate the efficiency frontier. The two basic ways to classify these approaches depend on whether the frontier is parametrically or non-parametrically estimated, or on whether the approach is stochastic or deterministic. We use a common non-parametric technique called Data Envelope Analysis (DEA). Technically, DEA solves a linear programming problem of the following form:

$$\begin{aligned} &\textit{Min}_{\left\{\lambda_{k},Z_{1},Z_{2},...,Z_{n}\right\}}\lambda_{k} \\ &\text{Subject to:} & &\lambda_{k}C_{k}-\sum_{j=1}^{n}Z_{j}C_{j}\geq0 \\ &&\sum_{j=1}^{n}Z_{j}y_{jr}\geq y_{kr} \;\; \textit{with $r=1,....,s$.} \\ &&\sum_{j=1}^{n}Z_{j}=0. \\ &&\lambda_{k},Z_{j}\geq0 \;\; \textit{for $j=1,...,n$.} \end{aligned}$$

 C_k and C_j are respectively the total input for decision making units (DMU) k and j. The output r for these DMU is denoted as y_{kr} and y_{jr} . The number of outputs is represented by s and n is the number of DMU's. Finally, z_j are weights given to DMUs that are compared to DMU in order to compute the efficiency score λ .

An advantage of this technique is that it avoids the use of strong assumptions regarding the functional form of the relationship between inputs and outputs that are common in the

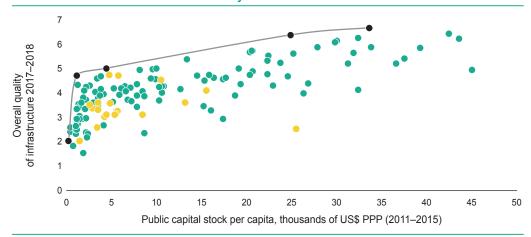


FIGURE D.1 Public Investment Efficiency Frontier

Source: IDB staff calculations based on IMF (2017a) and World Economic Forum (2017). Note: The overall quality of infrastructure is an index on the scale of 1 to 7, where 7 is the highest.

deterministic frontier approach and the stochastic frontier approach. Also, this technique keeps the assumptions regarding production technology to a minimum. In particular, DEA with variable returns to scale assumes that the best-practice frontier is strictly convex.

A final point relates to the orientation of the efficiency model. In an *input-oriented model*, the emphasis in on the amount of inputs used to produce a given outcome. The *output-oriented model* pays special interest in the amount of output generated for a given level of input. Decision making units on the frontier will exhibit scores of 1, and less efficient governments will show scores between 0 and 1 (See Figure D.1 for an example, Latin American and Caribbean countries in yellow). To generate the output oriented efficiency scores, we use average capital stock per capita levels for the period 2011–15 as the input measure (IMF, 2017a), and a survey-based assessment on the overall quality of infrastructure as output (World Economic Forum, 2017).

APPENDIX E

Background Analyses for Chapter 5

Classification of Monetary Regimes

Throughout Chapter 5, countries are classified into four groups according to the monetary regime, namely, Established Inflation Targeters (Established IT), Recent Inflation Targeters (Recent IT), Intermediate, and Fixers. Established IT countries are those that have had an inflation targeting regime for 15 years or more and include Brazil, Chile, Colombia, Mexico and Peru. The Recent IT comprises countries that adopted inflation targeting within the last 15 years and include: Argentina, Costa Rica, the Dominican Republic, Guatemala, Paraguay, and Uruguay.

The countries classified as Inflation Targeters are also classified as Floating or Free Floating in the 2016 Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) published by the IMF (IMF, 2016). In these economies the exchange rate moves relatively freely. Still, there may be exchange rate interventions for mercantilist or financial stability purposes

In those countries in the Intermediate category, the monetary authorities manage the exchange rate more actively, and may use the exchange rate as a nominal anchor to guarantee price stability. The Intermediate group consists of Bolivia, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Suriname, and Trinidad and Tobago.

Finally, Fixers are either fully dollarized or have a hard exchange rate peg to the US dollar. This group includes: The Bahamas, Barbados, Ecuador, El Salvador, and Panama. The last three countries mentioned are fully dollarized and use the US dollar as their domestic currency without a separate legal tender.² Given the methodology adopted, it is not possible to estimate optimal reserve holdings for this group of countries.

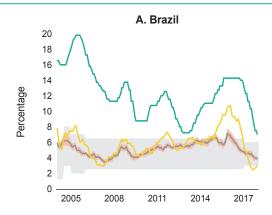
Distribution of Inflation Expectations - Established IT

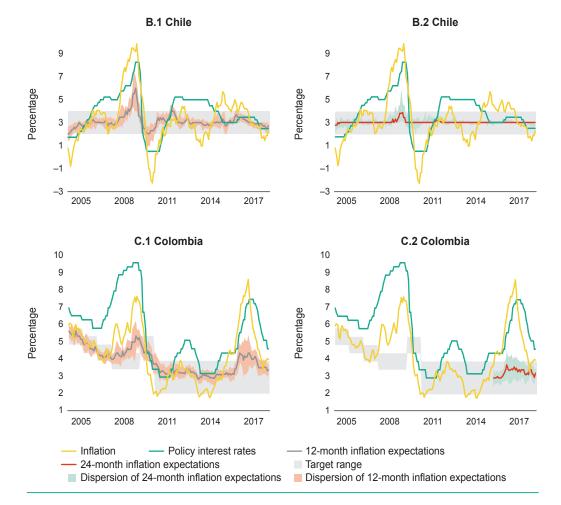
Figure E.1 illustrates the median inflation expectations and their dispersion for both the short and medium term for the five established inflation targeters in Latin America. The figure displays the dispersion of short-run (12-month) expectations and the dispersion

¹ Two exceptions are Costa Rica and the Dominican Republic.

² Except for the use of coins.

FIGURE E.1 Median and Dispersion for Short- and Medium-Term Inflation Expectations





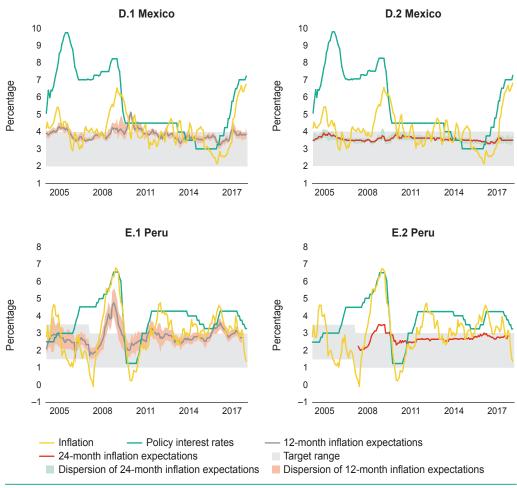


FIGURE E.1 Median and Dispersion for Short- and Medium-Term Inflation Expectations

Source: IDB staff calculations based on the Latin Macro Watch and Central Banks' websites.

Note: Inflation expectations are the median reported by Central Bank surveys. 24-month expectations are illustrated where available. In the case of Mexico, four-year inflation expectations are depicted instead of the 24-month expectations. Furthermore, from 2004 to 2008, the policy interest rate is an indicative policy rate.

of medium-term (24-month) expectations.³ As the literature suggests that the degree of agreement among forecasters may be a measure of the credibility of the regime, monitoring the dispersion of these expectations is of considerable interest.⁴

In the short run, median inflation expectations appear to be anchored for all five countries, but dispersion has increased slightly in Mexico. On the other hand, the dispersion

³ For Mexico, it is the 1-4 years inflation expectation.

⁴ See Capistrán and Ramos-Francia (2010) and Brito, Carrière-Swallow, and Gruss (2018).

of expectations decreased markedly in Colombia over the last year. Short-term expectations tend to be more sensitive to current inflation and temporary shocks. Regarding the medium-term expectations, they remain well anchored inside the target band for the countries with available data. While the dispersion has increased slightly for Mexico and Chile, expectations remain inside the target band.

Regression Results

Table E.1 shows the expanded results for the econometric analysis presented in Chapter 5, Box 5.2. For all regressions the dependent variable is medium-term inflation expectations. There are two specifications; the one in the first three regressions has as explanatory variables the lag in inflation expectations and the lag in observed inflation, while the last three add a dummy variable that is equal to 1 if inflation is above target and the interaction between the dummy variable and the lag in inflation. The sample ranges from February 2004 to December 2017 (columns (1) and (4)) and it was segmented into two periods, from 2004 to 2009 (columns (2) and (5)) and from 2010 to 2017 (columns (3) and (6)), to isolate the impact of the Financial Crisis of 2008–2009. We follow Mariscal, Powell, and Tavella (forthcoming) in estimating the regressions in levels while including the lagged dependent variable in each regression.

Optimal Reserves Calculations

The methodology to estimate the level of optimal international reserves follows Calvo, Izquierdo, and Loo-Kung (2013). This methodology postulates that the probability of a Sudden-Stop (SS) is a function of international reserves (IR), the government deficit (GD), the current account balance (CA) and gross liability dollarization (LD), all scaled as a percentage of GDP. The same variables are then employed to estimate the cost of a Sudden Stop. The opportunity cost of holding reserves is the return differential on the country's external debt versus the yield of the relevant US Treasury bill, i.e.: the sovereign spread.

The optimal level of reserves is the amount that minimizes the total expected cost for the sovereign, namely the cost of a sudden stop times its probability, plus the opportunity cost of holding reserves:

$$\min_{\mathit{IR}} \mathit{Prob}_{\mathit{SS}}(\mathit{IR}, \mathit{CA}, \mathit{GD}, \mathit{LD}) \times \mathit{Cost}_{\mathit{SS}}(\mathit{IR}, \mathit{CA}, \mathit{GD}, \mathit{LD}) + \mathit{IR} \times \mathit{Spread}$$

In the exercises reported in Chapter 5, the optimal level of reserves is computed for each year from 2005 until 2017, following the same procedure used by Calvo, Izquierdo, and Loo-Kung (2013), with updated data through 2017. In addition, the IMF's (2017c)

TABLE E.1 Effects of Observed Inflation on Medium-Term Inflation Expectations

Variable		(1)	(2)	(3)	(4)	(5)	(6)
Chile	L. IE	0.834*** (0.10)	0.811*** (0.10)	0.826*** (0.09)	0.768*** (0.08)	0.747*** (0.09)	0.819*** (0.08)
	L. Inf	0.005 (0.00)	0.008 (0.01)	0.000 (0.00)	0.003 (0.00)	0.003 (0.00)	0.001 (0.00)
	Dummy (=1 if L. Inf > Target)				-0.083 (0.07)	-0.113 (0.09)	-0.001 (0.00)
	L.Inf * L.Dummy				0.016 (0.02)	0.020 (0.02)	-0.001 (0.00)
	Constant	0.483 (0.31)	0.547* (0.30)	0.524* (0.27)	0.693*** (0.22)	0.748*** (0.25)	0.543** (0.25)
	Observations	167	71	96	167	71	96
Colombia	L. IE			0.555*** (0.13)			0.465*** (0.16)
	L. Inf			0.0381*** (0.01)			-0.089 (0.16)
	Dummy (=1 if L. Inf > Target)						-0.648 (0.63)
	L.Inf * L.Dummy						0.145 (0.17)
	Constant			1.274*** (0.39)			2.102** (0.98)
	Observations			35			35
Mexico	L. IE	0.861*** (0.04)	0.894*** (0.04)	0.799*** (0.08)	0.848*** (0.04)	0.869*** (0.04)	0.681*** (0.10)
	L. Inf	0.009 (0.01)	0.012 (0.01)	0.006 (0.01)	0.008 (0.01)	-0.002 (0.01)	0.0488** (0.02)
	Dummy (=1 if L. Inf > Target)				0.071 (0.05)	0.084 (0.09)	0.197** (0.08)
	L.Inf * L.Dummy				-0.012 (0.01)	-0.008 (0.02)	-0.0545** (0.02)
	Constant	0.456*** (0.14)	0.333** (0.14)	0.683*** (0.26)	0.504*** (0.14)	0.449*** (0.15)	0.962*** (0.29)
	Observations	167	71	96	167	71	96

Source: IDB staff estimates based on data from Revela, Latin Macro Watch and Central Banks' individual websites. Note: For regressions 1 and 4 the sample period ranges from Jan-2004 to Dec-2017, for regressions 2 and 5 from Feb-2004 to Dec-2009 and 3 and 6 from Jan-2010 to Dec-2017. The dependent variable is the median of the mediam-term inflation expectations in each country and explanatory variables include the lagged medium term expectations (L.IE) and the lag of actual inflation (L.Inf). In columns (4) – (6), a dummy is added equal to 1 if inflation is above the target band, and 0 otherwise, and an interaction term of this dummy with the lag of inflation.

Newey-West Standard Errors in parentheses *** p < 0.01, ** p < 0.05, * p < 0.1.

projections are employed to extend the exercise until 2022.⁵ The sample includes data for 16 Latin American countries. The results are presented for three groups of countries, namely the Established Inflation Targeters (Brazil, Chile, Colombia, Peru, and Mexico), Recent Inflation Targeters (Argentina, Costa Rica, Dominican Republic, Guatemala, Paraguay, and Uruguay); and the countries classified as having Intermediate monetary regimes: (Bolivia, Honduras, Jamaica, Nicaragua, and Venezuela).⁶ Data sources for the analysis are: *World Development Indicators* (WDI); the *International Financial Statistics* (IFS); and the *World Economic Outlook* (IMF, 2017c).

⁵ The only series that is not forecast due to data availability is gross liability dollarization. In that case, the values for years 2018-2022 are held constant at the December 2017 values.

⁶ Given aspects of the methodology and data requirements, it was not possible to extend this to the Fixers group of countries.

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