The Labyrinth

How Can Latin America and the Caribbean Navigate the Global Economy

Coordinator | Andrew Powell

2015 Latin American and Caribbean Macroeconomic Report

IDB

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Andrew Powell
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Inter-American Development Bank

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Foreword

Last year's Latin American and Caribbean Macroeconomic Report argued that there were both risks and opportunities regarding the global recovery. Some of those risks and some of the opportunities have been realized. On the bright side, stronger U.S. growth and lower commodity prices, including oil, may give a boost to countries that import energy and have strong trade ties with the United States. On the other hand, global recovery has been delayed yet again with weaker than expected growth in Europe and Japan and lower growth in China. This has contributed to lowering growth expectations for the Latin American and Caribbean region.

This year's report considers a set of obstacles that the region must navigate to achieve the goal of strong and sustainable growth. Dependence on commodities has risen but it seems unlikely that a rebound in prices will provide an exit from low growth. While last year's report argued that U.S. interest rates would rise, European interest rates are set to stay at unprecedented low levels. However, the analysis in this year's report suggests that low-cost euro financing is unlikely to provide a solution to low growth. During the 2008–09 global financial crisis, monetary policy and exchange rate depreciation surely helped the larger economies weather the storm. But inflation levels and firms' balance sheets may prevent monetary policy from helping too much in the current context. Can fiscal policy actions provide salvation from low growth? Unfortunately, the analysis presented suggests many countries need to consolidate fiscal positions and are in no position to pursue anti-cyclical fiscal policy.

The report provides policy advice on how countries may adjust to the global economic context and how important gains in social indicators can be maintained or even improved. The report also calls for more fundamental reforms to secure higher potential growth. Octavio Paz (the 1990 Mexican Nobel laureate) in his most famous work, "The Labyrinth of Solitude," states that "Solitude is the profoundest fact of the human condition. Man is the only being who knows he is alone, and the only one who seeks out another." In a similar vein, while external factors are always extremely important for Latin America and the Caribbean, and countries might like to confront some of these challenges regionally, ultimately each country must fashion its own response based on its own peculiarities and navigate the labyrinth to higher and sustainable growth.

José Juan Ruiz
Chief Economist

CHAPTER 1

Overview

Latin America and the Caribbean is expected to grow at only a modest pace in the coming years given relatively low growth across the globe. While the United States is now growing more strongly implying a likely rise in U.S. interest rates, discussed extensively in last year's report, risks to growth persist in Europe and Japan, and growth may also decline more than anticipated in China. Chapter 2 explores the implications for the region of a baseline and a more negative scenario for European, Japanese and Chinese growth. A positive shock to U.S. growth, coupled with continued low oil prices, would be a net benefit for the region and provide a boost to countries in the Caribbean and Central America. A further conclusion is that while the baseline forecast implies a per capita growth rate of about 2.2% for this decade, the region would have to significantly boost productivity to achieve per capita growth rates as high as other successful regions.

The recent declines in commodity prices are likely to have serious implications. The results of econometric models explored in Chapter 3 do not indicate that a sharp rebound in prices is likely. Projections based on the baseline forecasts for world growth indicate a mild recovery in prices for oil and copper but the negative scenario employed in Chapter 2 suggests continued declines. However, all forecasts are subject to considerable uncertainty. For a set of more commodity dependent countries, the baseline correlates to a decline in fiscal revenues and FDI, which has been strong in commodity sectors. However, for many countries in Central America and the Caribbean, the fall in oil prices is a significant net benefit for the trade balance and provides opportunities for reforming taxation arrangements to enhance fiscal revenues.

The divergent prospects for the U.S. and Europe also imply divergent global monetary policies. The rise in U.S. rates could have a reduced impact if Latin America and the Caribbean can tap euro financing at continued low rates. Having said this, the analysis presented in Chapter 4 indicates that in the past, Latin American and Caribbean firms have not switched currencies in a large or systematic way depending on dollar-euro spreads. In contrast to some other regions, the preferred currency of financing has been highly stable and focused to a very large degree on the U.S. dollar. In turn, this implies that the cost of capital will likely increase for the region's companies as U.S. policy rates rise.

A more general analysis of firms' balance sheets is considered in Chapter 5. Leverage has risen and other indicators have deteriorated as issuance in U.S. dollars has soared. Dollar amortizations are set to double in the coming years although, as noted in last year's report, there

is imperfect information on actual currency mismatches. Chapter 5 also includes an analysis of monetary policy arguing that the trade-offs have become harsher. In the past, the larger economies have used the exchange rate to react to negative shocks. However, with inflation close to or above targets in a number of countries, and potential concerns over balance sheets, monetary policy may be restrained in the future. Finally, credit markets have now cooled and credit growth has fallen back, particularly from private banks. An analysis of how banks maintain stable capital ratios despite economic volatility suggests that banks will likely restrict lending growth or reduce risk to maintain capital buffers. While this pro-cyclical behavior helps protect financial stability, now that credit markets are of a significant size, it may feed back to the real economy.

Fiscal positions and policy alternatives are the focus of Chapter 6. Fiscal positions have continued to deteriorate, structural fiscal deficits have grown and debt is increasing, although there is considerable heterogeneity across countries. For those with large structural fiscal deficits and where output gaps are close to zero, it is clearly time to adjust, and even for those with negative output gaps, expansionary fiscal policy may become self-defeating if multipliers are low and interest rates rise. A few countries combine negative output gaps with low debt that is not sharply rising and so may have fiscal space to contemplate a counter-cyclical policy. The chapter explores where countries are located with respect to these dimensions and considers in more detail the types of policies that may be pursued. For those countries that may wish to adjust, the composition and speed of that adjustment is discussed.

While most countries face a period of tight budgets and fiscal consolidation, specific measures can be implemented to protect the significant gains in social indicators and to enhance incentives for participating in formal markets, thereby supporting productivity. Chapter 7 argues that there is room to improve outcomes from social spending with the current level of resources and that there are better ways to maintain stability for individual workers' income than current arrangements, while at the same time maintaining aggregate productivity and, hence, growth. The chapter also sounds a note of caution in that policies that may look attractive for the short term, particularly at a time of low economic growth, may end up being costly and permanent. The demographic changes being faced by the region should also be taken into account as they may multiply the costs involved.

The title of this report suggests that the region is in a labyrinth with potential exits to strong recovery and sustainable and inclusive growth obstructed by a set of global and domestic factors. The research neither pretends to be complete nor exhaustive but the spirit of the analysis is to attempt to understand each of the selected factors considered, so that policies can be found that would forge a successful path. The final chapter brings together the various policy suggestions highlighted in each chapter.

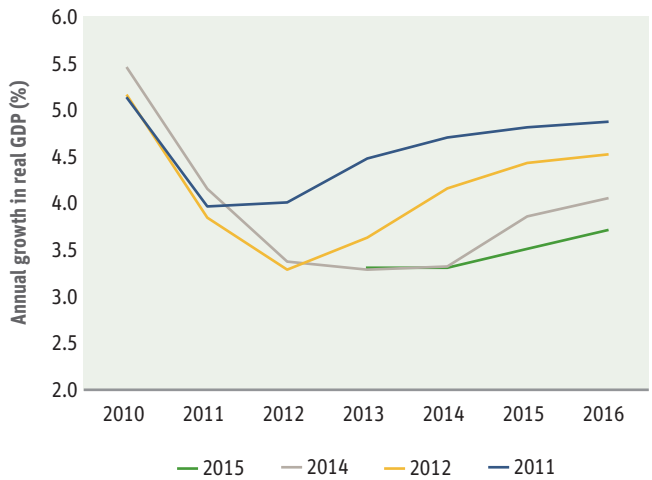
CHAPTER 2

Risks to the Global Economy and Implications for the Region

Despite stronger performance from the U.S. economy, global economic prospects remain lackluster for the years ahead. Growth in Europe continues to be only marginally positive, and so far Japanese growth has failed to pick up significantly. In China, the world's second-largest economy, growth has fallen and is expected to keep declining. Figure 2.1 illustrates how the recovery in global economic prospects has been delayed relative to projections, and Figure 2.2 shows the composition of that delay across the four large economic areas (the United States, Europe, Japan and China). Growth projections have been downgraded for all these economies at all dates illustrated, with the sole exception of the latest projections for the U.S. economy. While the recent fall in oil prices may give a boost to the global economy, that drop is in part related to weak demand, and the portion due to larger than anticipated supplies is not expected to be sufficient to justify a more positive revision in global growth prospects.

Assuming a smooth lift-off in U.S. policy rates back toward more normal levels, these global economic projections are consistent with a moderate to slow recovery in Latin America and the Caribbean.[1] This recovery will be stronger for the countries in Central America that are more linked to the United States and are oil importers, and slower in South America, where weak growth in Europe, falling growth in China, and lower

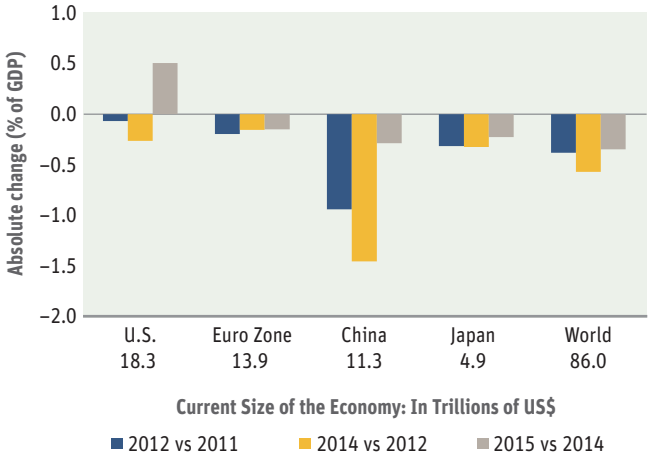
FIGURE 2.1 CHANGING WORLD GROWTH PROJECTIONS



Source: IMF (2011, 2012, 2014b, 2015).

[1] Last year's Latin American and Caribbean report considered a scenario for a rise in U.S. rates combined with a sharp fall in asset prices.

FIGURE 2.2 CHANGING GROWTH PROJECTIONS FOR SELECT COUNTRIES AND AREAS



Source: IMF (2011, 2012. 2014b, 2015).

commodity prices will constrain growth. Oil-importing countries in the Caribbean should also benefit from lower prices and stronger growth in the United States and the United Kingdom, but in some countries growth will be constrained by continued fiscal adjustment.[2]

Moreover, the risk remains that the European and Japanese recovery will be further delayed. The European Central Bank (ECB) has recently announced a program of quantitative easing, and there are interesting parallels between the financial risks in some peripheral European countries and Latin American financial problems of the past.[3] While the ECB's actions may well reduce those risks, much uncertainty remains. In the case of Japan, despite large monetary injections and fiscal actions, low growth and low inflation persist, and there is a risk that the projected recovery may be further delayed. Lower projections for China's growth rates represent another risk. The rapid rise in credit to public or quasi-public institutions has increased fears of problems of swiftly increasing non-performing loans as the economy slows and a real estate boom subsides. China has many tools at its disposal, including more than US$3.8 trillion in reserves, but there may be bumps along the way as the economy adjusts and rebalances with lower investment rates and higher consumption.

In light of these circumstances, an important question for many countries in Latin America and the Caribbean is whether the U.S. economy is immune to lower than expected growth in Europe, Japan, and China. While the United States has grown strongly and remains relatively closed, it cannot be presumed to be unaffected by lower growth elsewhere. If European, Japanese and Chinese growth suffered a shock of one-half a standard deviation of their respective growth rates, simulations from a statistical model of the world economy reveal a significant impact on the United States, as shown in Figure 2.3.[4] According to the model, the average U.S. growth rate falls

[2] Fiscal adjustment in several Caribbean countries is likely to continue for several years given debt ratios; this is discussed further in Chapter 6.

[3] Cavallo, Fernández-Arias, and Powell (2014).

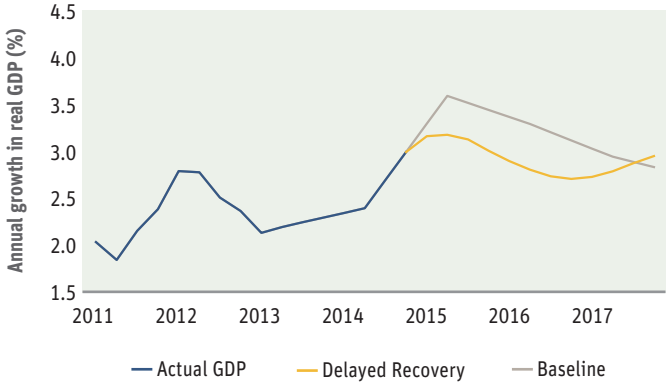
[4] Half a standard deviation of growth in Europe is 0.95%, and for Japan and China is 1.25% and 1.5%, respectively.

by about 0.4% per annum for the next two years.[5]

The impact of negative shocks relative to baseline growth in Europe, Japan and China would also have a significant impact on Latin America and the Caribbean. A half a standard deviation negative shock in these three economic zones would lower growth in the region by 1.4% per annum for the next two years—from 2.4% to 1.0% per annum for 2015 and 2016, as shown in Figure 2.4. Moreover, virtually every economy in the region is negatively affected, in part due to the impacts coming through the United States described above.[6]

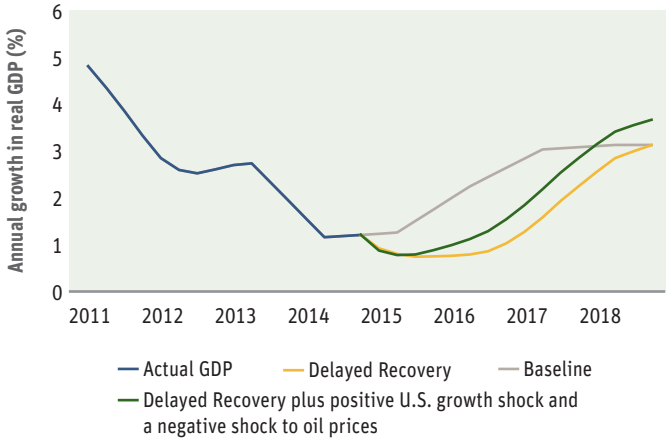
However, there is also upside risk for the U.S. economy. Recent economic data have been relatively volatile, with growth in the third quarter of 2014 exceeding 5% but falling back to less than 3% in the final quarter. The baseline projections assume U.S. annual growth will peak at around 3.3% and then start to decline to 2.7% by 2019, but there is certainly some possibility growth will exceed these figures. The baseline projections also assume that oil prices will increase gradually (to $74/barrel by 2018 for the Brent reference price,

FIGURE 2.3 IMPACT ON THE UNITED STATES OF DELAYED RECOVERY IN EUROPE AND JAPAN AND A SHARPER SLOWDOWN IN CHINA



Source: IDB staff estimates based on IMF (2014b, 2015).

FIGURE 2.4 ALTERNATIVE SCENARIOS FOR LATIN AMERICA AND THE CARIBBEAN



Source: IDB staff estimates based on IMF (2014b, 2015).

[5] For details of the Global Vector Autoregression (GVAR) statistical model developed in the IDB Research Department, please refer to Pesaran, Schuermann, and Weiner (2004), di Mauro and Pesaran (2013) and Cesa-Bianchi et al. (2012).
[6] While the U.S. economy is negatively affected, this may imply less appreciation of the U.S. dollar which would tend to dampen the impact for Latin America and the Caribbean.

TABLE 2.1 INDIVIDUAL COUNTRY PROJECTIONS FOR ALTERNATIVE SCENARIOS

Average real growth rates 2015–17	Baseline	Delayed Recovery Scenario	Delayed Recovery Scenario, Oil negative and U.S. positive
South America	3.8	2.9	3.0
Central America & Mexico	3.4	2.7	3.0
Caribbean	2.0	1.9	2.2
Oil exporters	3.6	3.0	3.2
Metals exporters	4.6	3.6	3.8
Other commodity exporters	3.1	2.0	2.2
Commodity importers	3.0	2.7	2.9
LAC simple average	3.7	2.7	2.9
LAC weighted average	2.7	1.0	1.3

Source: IDB staff estimates based on IMF (2014b, 2015).

as indicated by the current futures curve.[7] An alternative scenario, in which oil prices remain at current low values and the U.S. economy exceeds expectations to the tune of one-half a standard deviation of historical growth, is also illustrated in Figure 2.4.[8] Under this alternative, growth for the region remains below the baseline, but the impact of lower oil prices and stronger U.S. growth also has different effects for different countries. Growth in South America rises, but the rate of growth in Central America and the Caribbean increases more strongly.

Table 2.1 details the growth rates for sub-regions and for groups of countries dependent on commodities. The first column is simply the assumed baseline. The column labelled Delayed Recovery assumes a one-half standard deviation negative shock in growth rates for Europe, Japan and China relative to this baseline. The final column contains the impacts of those negative shocks to world growth—but with a positive shock (again of one-half of a standard deviation) to U.S. growth and a negative shock to oil prices—to keep those prices roughly at today's values.

The Delayed Recovery scenario is negative relative to the baseline for all groups and sub-regions. Average growth (2015–17) falls by about 1% per annum for South America, 0.7% for Central America and Mexico and 0.1% for the Caribbean region. The effect on Central America and Mexico is in part due to the impact of Europe, Japan, and China on the United States. Impacts on South America are significant in part due to the influence of China. A positive shock to the United States, and lower oil prices, improves growth prospects for all groups and subregions. Indeed, for the Caribbean, growth projections exceed those of the baseline, by 0.2%. In the case

[7] Bloomberg (Feb. 2015). In some circumstances futures prices may be roughly thought of as the market's expectation of future spot prices. However, uncertainty in the oil market is very high, implying that these or any other projections may in fact contain rather little information regarding the outcome spot prices (see Chapter 3 below).
[8] Half a standard deviation of the U.S. growth rate is 0.95%.

of commodity importers this shock brings the projections almost back to the levels of the baseline. For the other two sub-regions they improve but still remain below the baseline projections.

Longer-Term Potential Growth Projections

The baseline projections illustrate a recovery in the region, but not to the growth rates witnessed in the period before the global financial crisis. As argued in the previous edition of the Latin American and Caribbean Macroeconomic Report, the region is likely to follow a course of lower growth rates for several years to come, with rather low underlying productivity growth. Indeed, considering a disaggregation of per capita growth into changes in total factor productivity (TFP) and changes in labor and capital inputs, in the period 2001 to 2010 just over 1% per capita growth was due to changes in TFP.[9] The region attained relatively high per capita growth due to a significant boost in employment, accounting for roughly 2% per capita growth. On the other hand, there was a zero—or even slightly negative—contribution from capital.[10]

Considering prospects for this current decade, the baseline projections result in a per capita growth rate of some 2.2%. Using projections regarding employment, the contribution from labor will strongly decrease compared to 2001–2010. Using projections for investment and assuming capital depreciates at a rate of 3.5% per annum, the baseline is consistent with an assumption of TFP growth of just over 1% per annum, similar to that of the previous decade; this is depicted in the second column of Figure 2.5, namely Scenario 1.[11] Note that this implies that capital intensity would increase quite substantially. A reasonable comparator for Latin America and the Caribbean is perhaps the ASEAN group of Asian countries.[12] The average of six countries from this group have a projected per capita growth rate of some 3.5% per annum for the current decade, and over the last decade they enjoyed significantly faster TFP growth than Latin America and the Caribbean. A 3.5% per capita growth rate appears as an ambitious but potentially achievable objective for Latin America and the Caribbean that would allow the region to progress in terms of social indicators. Assuming the change in the employment share is given, the region would have to substantially boost either capital intensity or productivity in order to achieve those growth rates. Scenario 2 illustrates the level of TFP growth required given the baseline growth of capital intensity. TFP growth would have to be almost 2.7% per annum.

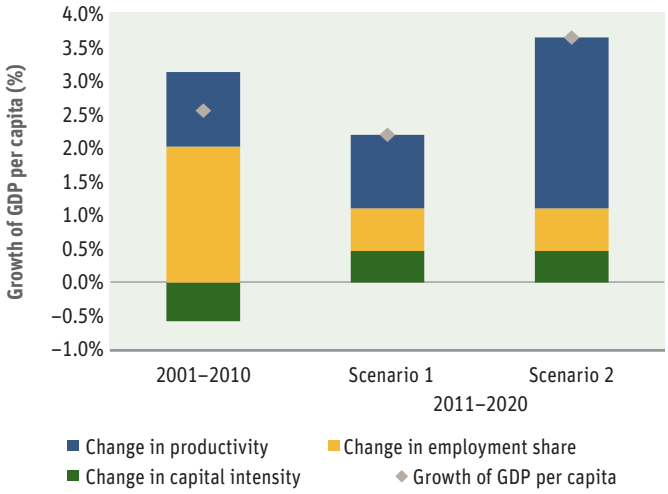
[9] While this chapter largely focuses on GDP growth, to consider a longer time period per capita growth is a more appropriate measure in order to take into account changes in population.

[10] Note that these calculations control for the first-round impacts of commodity prices although they would not take into account the impact changes in these prices have on productivity through changes in sectoral composition. See Powell (2014), Appendix A and Werning (2011) for a discussion.

[11] The depreciation rate of 3.5% is applied following Sosa, Tsounta, and Kim (2013), Ferreira de Abreu Pessôa, and Veloso (2013), and FIEL (2002).

[12] The six ASEAN countries employed as a comparator are Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

FIGURE 2.5 SCENARIOS FOR POTENTIAL GROWTH FOR LATIN AMERICA AND THE CARIBBEAN, 2011–2020



Source: IDB staff estimates based on Penn World tables 8.0 and IMF (2014b, 2015).
Note: Productivity is measured as Total Factor Productivity. The employment share is the ratio of employment to population. The capital intensity is the ratio of capital stock to GDP.

Employing the G-VAR model it is also possible to simulate a regional wave of reforms in Latin America and the Caribbean. Consider the case that each country boosts individual growth by one-half a standard deviation in each country—on average this represents a 0.5% increase in terms of real growth per capita. The economic interactions within the region would then almost double the favorable effect of this positive boost to growth. While the baseline projections were for a per capita growth rate of 2.2% per annum for the remainder of the decade, the result would be 3.0% per annum on average and the growth rate would peak at around 3.5% per capita in 2017. This Macroeconomic Report does not consider the underlying reforms and other policies required to achieve this type of required boost in productivity, as those reforms may vary substantially across countries depending on their particular circumstances and challenges. Other recent IDB reports, however, have addressed how to improve productivity and boost growth from a more microeconomic perspective.[13]

Conclusion

As illustrated in Figure 2.4, the actual growth rate has been falling each year since 2011. The region is likely to experience only moderate growth in the years ahead and significantly less than in the pre-global-crisis period. Moreover, there is a risk of continuing very low growth if the recovery in the global economy is once again delayed. As reviewed in Chapter 6 below, expansionary fiscal policy is unlikely to provide a way out of the labyrinth for the majority of countries; more fundamental structural reforms are required to boost growth for the years ahead.

[13] See Pagés (2010) on the general issue of productivity in the region and Crespi, Fernández-Arias and Stein (2014) on productive development policies. The 2012 Latin American and Caribbean Report considered reforms of labor markets and infrastructure investment as two areas to boost growth.

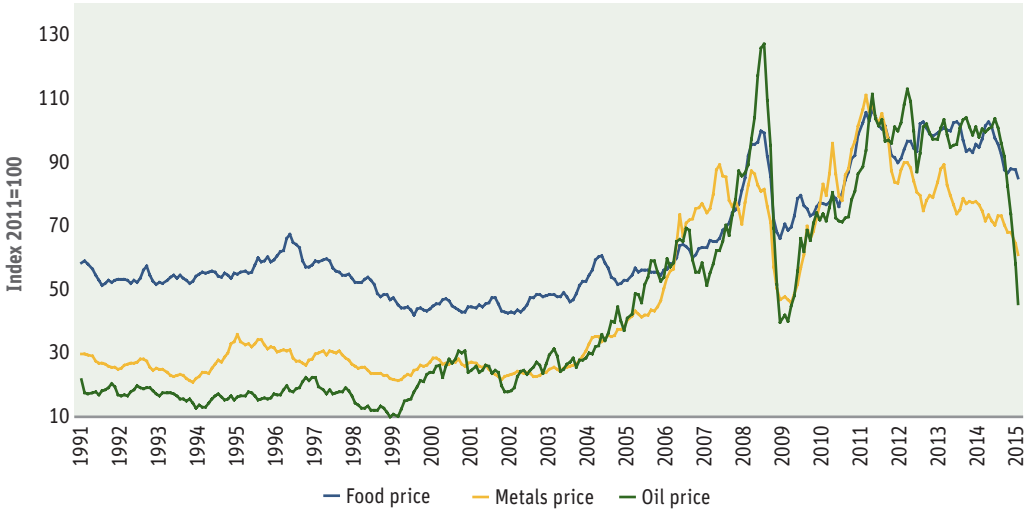
CHAPTER 3

Commodity Prices

As commodity prices rose during the period of the Great Moderation in OECD countries and during the years of China's Great Expansion (2003–08), primary products became increasingly important for Latin America and the Caribbean in terms of exports, fiscal revenues and employment. Indeed, even as the global economic crisis hit, commodity prices were close to record levels and in particular there was considerable concern about a "food crisis" and the negative impacts of high prices on importing countries and vulnerable groups. Figure 3.1 plots indices for metals, food prices and oil.

The debate rages over whether the boom in prices represented a bubble, was exacerbated by low world interest rates or reflected the advent and growth of large dedicated commodity funds. However, it is hard to distinguish between these hypotheses and a simpler story of supply and demand with rational stockholding and the non-linear price responses that are suggested by commodity price theory.[1]

FIGURE 3.1 RECENT MOVEMENTS IN COMMODITY PRICES



Source: IMF Primary Commodity Price Indices.

[1] See the review in Powell (2012) on commodity price theory. See for example Deaton and Laroque (1996) on non-linear commodity price dynamics and see Frankel (2014) for a recent discussion of commodity prices and

As in previous price booms, high prices spurred increased supply. In agriculture, yields rose as farmers invested more heavily in new seed technologies and harvests increased as the areas under cultivation expanded.[2] In oil, incentives to invest in new technologies including horizontal drilling and high pressure drilling to extract oil from shale reserves were enhanced and paid off in higher production. And in metals, several large new projects commenced but with the longer lead times generally associated with mining.[3]

In Powell (2012) the risk of substantial declines in commodity prices were highlighted given the behavior of long-term commodity markets and particularly a potential slowdown in China. It was argued that the recent high prices were substantially above previous established equilibria and history suggested that, as demand (particularly from China) waned, prices might at least return to the previously established relation to the prices of other goods.[4]

Following the Great Recession, OECD demand stagnated and finally China's growth rate began to fall. Metal prices were the first to fall from their peaks in the first quarter of 2011 and have now fallen by some 38%. Food prices started to slip in the second quarter of 2011 and have now fallen by about 18%. And finally, oil prices have collapsed. On top of the significant innovations in production for oil, new supplies from Iraq and Libya and what appears to be a new policy stance from Saudi Arabia to not cut production to support prices as they fell, have accentuated the decline in price. By year-end 2014, oil prices had plummeted by some 58% from their peak in 2012 Q1.

One way to think about these abrupt declines is indeed as a return to the previously established equilibrium in real prices. This might be thought of as the demand curve returning to previous levels with an unchanged supply curve. However, if significant innovations have pushed out supply curves (perhaps most relevant in the case of oil) then this might even imply declines in prices below a previously established equilibrium, in line with the experience after the two largest previous commodity booms of the 20th century (namely 1920–21 and in the 1970s).

There are several ways to model commodity prices employing different techniques and with different purposes in mind. The objective here is to develop relatively simple models with common structures that will then allow for the development of projections based on different scenarios for global growth and other assumed independent variables and then consider the potential impact

monetary policy. In fact during much of the boom, commodity futures prices were in backwardation (futures prices were below current spot prices) indicating that prices were expected to fall, which is more in line with a story of supply and demand and rather counts against bubble-type explanations.

[2] Please see USDA's (2014) World Agricultural Supply and Demand Estimates Report of December 10, 2014, which states that, "Global wheat supplies for 2014–15 are raised 1.9 million tons with increased production offsetting lower beginning stocks. World wheat production remains record high and is raised 2.3 million tons led by a 1.8-million-ton increase for Canada…", and "Global coarse grain supplies for 2014–15 are projected 1.1 million tons higher. Higher corn production for China and EU, higher rye production for Russia, and higher oats production for Canada, more than offset lower expected corn and barley output for Argentina..", and finally "Global oilseed production for 2014–15 is projected at a record 530.7 million tons, up 1.8 million tons from last month."

[3] For further details on the supply response in oil and in copper, see, for example, the discussion in the January edition of the Commodity Markets Outlook published by World Bank (2015).

[4] See also Mariscal and Powell (2014).

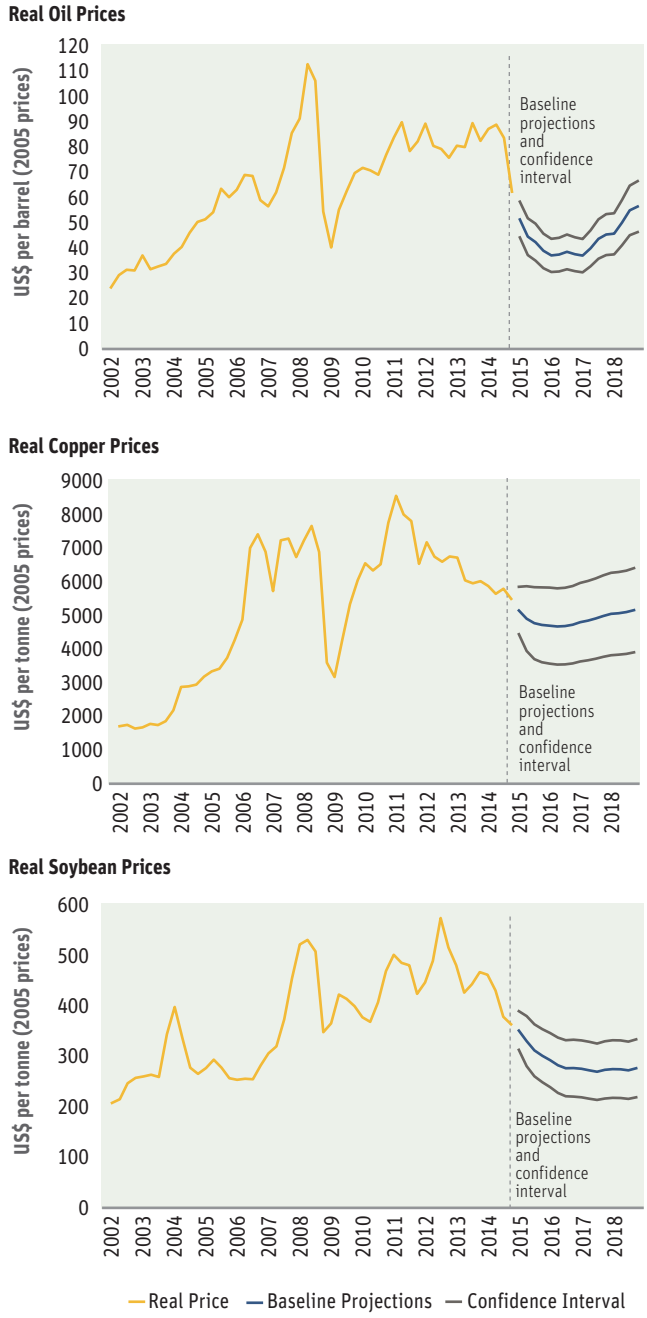
of these scenarios on Latin America and the Caribbean.

Simple Models for Commodity Markets

A set of econometric models for commodity prices were developed and then employed to generate price projections and to estimate potential forecast errors. Appendix A details the econometric specifications of each of the models employed. Figure 3.2 illustrates the actual prices of the five commodities modelled (oil, copper, soya, corn, and wheat) over the estimation period and projections based on the baseline economic projections employed in the previous chapter. The models fit the actual data relatively well including the recent declines in commodity prices from their peaks, although the severity of some of the collapses (notably in oil prices) is only captured by introducing a break in the series.[5]

The projections indicate that real commodity prices will not rebound to

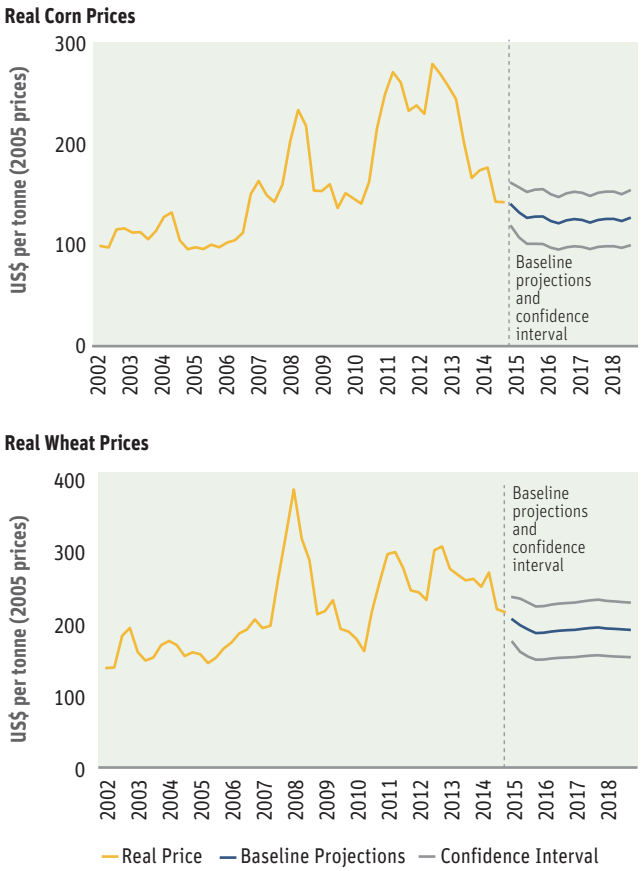
FIGURE 3.2 REAL COMMODITY PRICES AND BASELINE PROJECTIONS



(continued on next page)

[5] Tests indicated a break in the long-run equilibrium for oil. However, with breaks toward the end of such a series, the power of such tests is rather weak.

FIGURE 3.2 REAL COMMODITY PRICES AND BASELINE PROJECTIONS *(continued)*



Source: World Bank Commodity Prices Data (Pink Sheet) and IDB staff estimates.

previous price levels. Oil prices and to a lesser extent copper prices do show that some partial rebound may occur, although both are expected to continue to fall in the near term.[6] Food prices are projected to continue to decline from current levels in the years ahead. These baseline projections are reasonably close to those of other sources. In the case of oil, several organizations have published oil price projections with higher prices for 2015 (i.e., a faster rebound) but considering the medium term, the projections here are similar.

It should be noted, however, that the error bands are very wide indeed. So while the central projection for copper prices, for example, is for $5,867/tonne in 2016, the forecast confidence interval (illustrated in the figures as the gray lines) implies prices ranging from $4,450/tonne to $7,280/tonne.[7] The error bands for oil are such that the central projection is $46/barrel and the confidence interval ranges from $38/barrel to $55/barrel. These are consistent with the high implicit volatilities that can be calculated from commodity option prices.[8] Indeed, it should be stressed that all commodity price projections are subject to large potential errors. The purpose here is not to provide a specific price forecast but rather to explore what different scenarios for world growth might mean for commodity prices. The error bands around those projections also

[6] Comparing these projections with those from the IMF, the projections for oil are initially lower but then rise to similar levels.

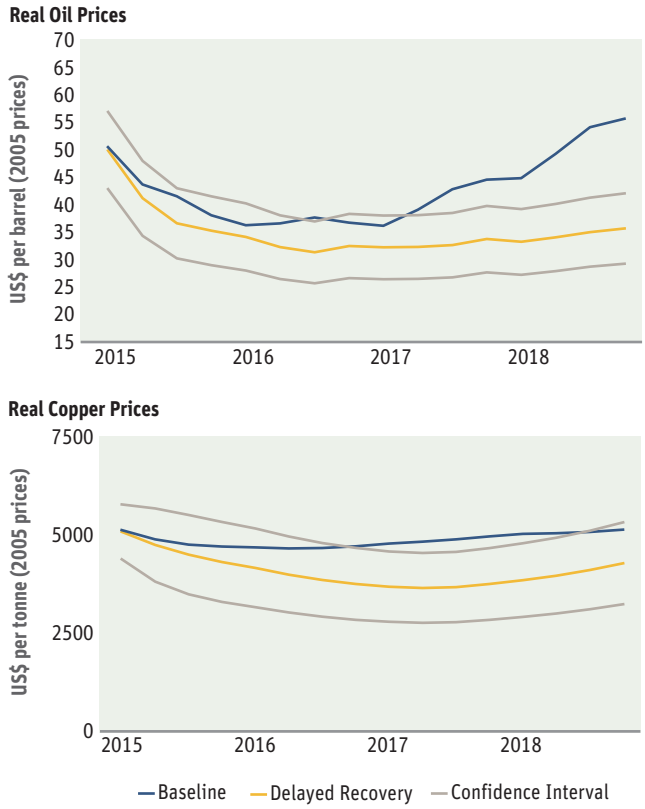
[7] Copper prices are often expressed in terms of dollars for each metric tonne.

[8] Options are contingent contracts traded on commodity futures exchanges. Employing a standard theoretical pricing model, the market's view of the future volatility of the commodity in question may be calculated.

provide an idea of the uncertainty in prices that should be managed. The policy implications are discussed further below.

Using the estimated models it is also possible to simulate what might happen to commodity prices given different assumptions regarding the path of the independent variables employed in the model. In particular, consider the case of world growth below the baseline due to lower growth in Europe, Japan and China as per the Delayed Recovery Scenario of the previous chapter. Figure 3.3 contrasts the central projections of the Baseline Scenario and the Delayed Recovery Scenario for oil and for copper. As expected, this implies lower commodity prices than those in the Baseline Scenario. Oil prices in the Delayed Recovery Scenario are significantly lower, as are copper prices at the end of the period. For the three food products, however, there is no statistical difference between the baseline and this more negative scenario.

FIGURE 3.3 COMPARISON OF BASELINE AND DELAYED RECOVERY SCENARIO



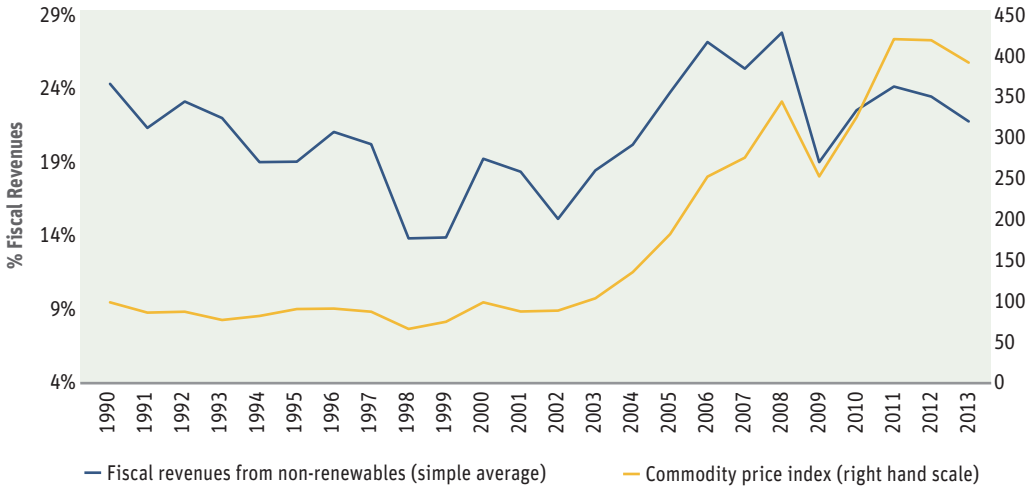
Source: World Bank Commodity Prices Data (Pink Sheet) and IDB staff estimates.

Implications of Lower Commodity Prices for Latin American and Caribbean Exporters

Lower commodity prices may significantly impact Latin American and Caribbean commodity exporters. The impacts will be felt in fiscal accounts, trade and FDI inflows.

Figure 3.4 illustrates how fiscal revenues from non-renewable commodities (as a percentage of total current fiscal revenues) for the average of 9 countries with a high dependence on non-renewables have varied over time, alongside the average of a country specific commodity price index for the same countries. While volatile commodity revenues as a proportion of total

FIGURE 3.4 FISCAL REVENUES AND COMMODITY PRICES



Source: IDB staff estimates based on national sources.
Note: The nine countries are Bolivia, Chile, Colombia, Ecuador, Guyana, Mexico, Peru, Trinidad & Tobago, Venezuela.

current revenues declined from 1990 to the early 2000s, they then started to rise strongly as commodity prices boomed. The 2008–09 global financial crisis provoked a steep decline in overall fiscal revenues, due in large part to the sharp fall in commodity revenues, but they swiftly recovered as commodity prices rebounded. Given current price declines, commodity revenues are now shrinking.

There is considerable variation in the proportion of fiscal revenues obtained from non-renewables even for these nine more commodity dependent countries. Revenues from non-renewable commodities as a percentage of total current fiscal revenues are as high as 43% for Venezuela and over 11% of GDP in the case of Trinidad and Tobago (see Figure 3.5). Average figures for these nine countries are 22% for revenues from non-renewables as a percentage of total current fiscal revenues and over 5% of GDP considering the last two years.

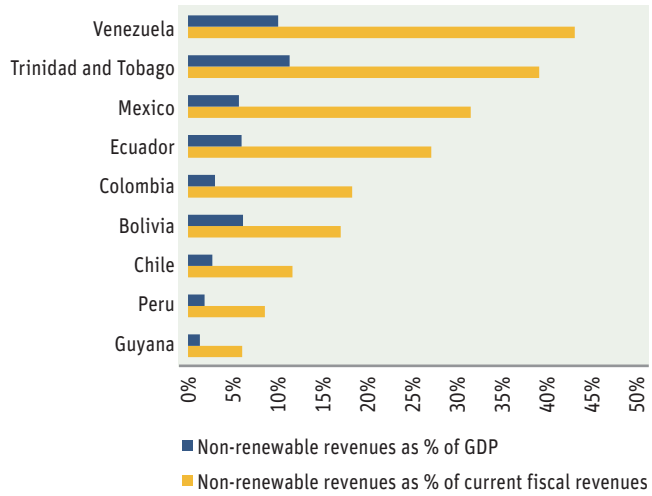
Given the extent of the actual and projected declines in commodity prices, the falls in fiscal revenues for some countries will be substantial. Comparing 2015–16 against 2012–13 averages, these baseline projections suggest oil prices may be some 50% lower and baseline copper prices are projected to be some 26% lower. The effects on fiscal revenues may be significant.

The average impact for this group of countries would be just under 9% of fiscal revenues for the Baseline and almost 10% for the Delayed Recovery Scenario. They range from an estimated decline of some 2% of total fiscal revenues in the case of Peru to over 10% for Trinidad and Tobago, Ecuador, and Venezuela. However, many caveats are required in considering these figures. An important caveat is that they do not take into account the potential use of hedging instruments or stabilization funds. Indeed, the estimated impact underlines the importance of these

mechanisms to reduce budgetary uncertainty.[9]

There may also be significant fiscal impacts for those countries that receive concessionary financing for oil imports through *Petrocaribe*.[10] In general, these countries purchase oil from Venezuela at market prices but receive financing in the form of a loan for a significant part of the costs at low interest rates and long maturities. With lower oil prices, the country is better off from a solvency point of view but may lose a part of the loan, which may then damage liquidity and put substantial pressure on the current budget. The estimated financing for the typical country of four countries (listed in footnote 10) receiving *Petrocaribe* financing is some 3.7% of GDP; this may fall to some 2.1% of GDP given current oil prices.

FIGURE 3.5 FISCAL REVENUES FROM NON-RENEWABLE COMMODITIES



Source: IDB staff estimates based on national sources.

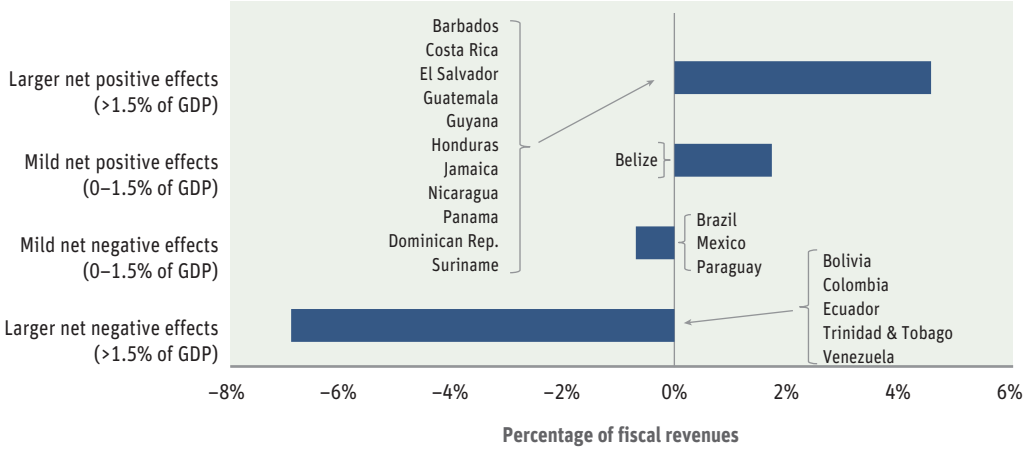
Implications for Trade and FDI Flows

The sharp declines in commodity prices will have a substantial impact on the trade balances of many countries in the region. Those countries that are commodity, and in particular oil, importers will gain while those that are exporters will see trade balances shrink or become more negative. Figure 3.6 illustrates the potential effects considering the prices of January 2015 against 2013 prices for four groups of countries, assuming that import and export quantities remain constant. As illustrated, the positive impacts for countries in Central America and the Caribbean are very significant indeed—and in fact are almost 7% of GDP for Jamaica and Honduras. They are

[9] The estimates also assume that fiscal revenues are a linear and proportional function of prices, that quantities remain constant and that the country in question obtains all commodity revenues from its most important commodity export. The calculations also assume that exchange rates remain constant; if the local–U.S. dollar exchange rate depreciates as the price of a commodity export falls, then this may cushion fiscal impacts. On the other hand such depreciations may jeopardize inflation targets.

[10] *Petrocaribe* is an oil purchasing agreement between Venezuela and a group of countries including Guyana, Haiti, Jamaica and Nicaragua, enshrined in a set of bilateral treaties. In some countries, *Petrocaribe* financing is to a decentralized agency and budgetary impacts, if any, would be indirect.

FIGURE 3.6 THE IMPACT OF COMMODITY PRICE DECLINES ON THE TRADE BALANCE (% OF GDP)



Source: IDB staff estimates based on national sources.

also very negative for some of the oil exporting countries—in excess of 5% of GDP for Ecuador, Trinidad and Tobago, and Venezuela.

Moreover, recent FDI inflows to the commodity sectors have been very strong indeed to Latin America and the Caribbean. In Chile, Colombia and Argentina, FDI to commodity producing sectors has exceeded 40% of total FDI in recent years. In Brazil, FDI to commodity sectors represented about 25% of total FDI inflows. Figures for FDI in commodity sectors are illustrated in Table 3.1.

TABLE 3.1 FOREIGN DIRECT INVESTMENT (FDI), % OF GDP (2013)

Sector	Argentina	Brazil	Chile	Colombia	Mexico	Peru
Agriculture and food industry	0.07%	0.21%	0.01%	0.08%	0.01%	0.00%
Mining related activities	0.60%	0.21%	0.80%	0.78%	0.33%	2.25%
Energy extraction and production	0.57%	0.53%	1.75%	1.44%	0.00%	0.62%
Others	1.27%	2.01%	3.93%	1.94%	3.00%	1.72%
TOTAL	2.51%	2.95%	6.49%	4.24%	3.34%	4.59%

Sources: For Peru, non-public data from the Central Bank. For other countries, Central Banks' websites and IDB staff estimates.

Conclusions

Recent declines in commodity prices from their peaks in 2012 have been severe and have been provoked by waning demand and increased production. There is little evidence that such price declines will be reversed and if the global recovery is delayed further, prices will more likely fall further rather than rebound. Exporting countries should then expect the recent falls to persist and adjust accordingly. Current price levels imply significant changes to trade, capital flows and fiscal accounts, compared to 2009–10.

Having said this, commodity prices are highly volatile and all projections, including those by the market encapsulated in futures prices, are subject to very large errors. The volatility in commodity prices underlines the need to seek mechanisms to manage the uncertainty. Some countries have used financial hedging techniques to gain greater security over prices assumed in the context of annual budgets. While prices have fallen, the simulations here illustrate that prices may fall even further; thus, hedging may still prove valuable for exporters. Commodity importers may also wish to hedge against a potential rebound in prices. Other techniques include the use of stabilization funds to smooth volatile revenue flows from commodities. The recent declines in prices have underlined the critical importance of these techniques within the policy toolkit for Latin America and the Caribbean.

CHAPTER 4

Diverging Monetary Policies in the U.S. and Europe

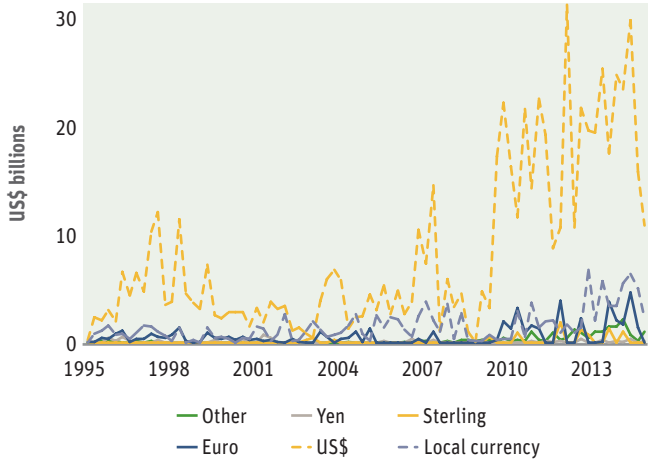
The stark differences in growth performance between the United States and Europe, as reviewed in Chapter 1, are calling for increasingly divergent monetary policies in the United States and Euro-area countries. As discussed in last year's Latin American and Caribbean Macroeconomic Report, the rise in U.S. policy interest rates is a chronicle foretold with some analysts suggesting that a first increase may occur in June or September, 2015. There are considerable differences among members of the Federal Reserve's Open Market Committee (the FOMC), and between the median FOMC forecast and those of the market. Some suggest the short-term rate may reach 2.5% by the end of 2016. Longer-term rates have already edged up and spreads on emerging market debt have also moved upwards (the general EMBI spread rose from around 290 to 400 basis points, and the Latin American and Caribbean EMBI spread rose from around 340 to 500 in the last 2 years).

A very different stance is revealed from recent policy announcements by the European Central Bank (ECB) and comments by its chairman, Mario Draghi. The ECB has recently announced a program to buy up to 60 billion euros per month of European assets (including government bonds and private sector securities), up to a total in excess of 1 trillion euros. In announcing this policy, Chairman Draghi stated that the program will be "conducted until we see a sustained adjustment in the path of inflation which is consistent with our aim of achieving inflation rates below, but close to, 2% over the medium term."[1]

This unprecedented financial landscape raises several important questions for the global economy and particularly for Latin America and the Caribbean. Will the expected rise in policy interest rates by the U.S. Federal Reserve lead to a fall in bond issuance and to an increase in the cost of financing for Latin America and the Caribbean, or will this impact be dampened by lower Euro-area interest rates? While Latin American and Caribbean governments have issued bonds in dollars, euros and other currencies on various occasions, less is known about the region's firms. How will the cost of capital for firms change as U.S. interest rates rise? To what extent will Latin American and Caribbean issuers substitute euro issuance for dollar issuance? Have they done so in the past as interest rates and currencies have varied?

[1] Press conference on Jan. 22, 2015 European Central Bank available at https://www.ecb.europa.eu/press/pressconf/2015/html/is150122.en.html.

FIGURE 4.1 LATIN AMERICAN AND CARIBBEAN INTERNATIONAL BOND ISSUANCE BY CURRENCY



Source: Dealogic and IDB staff estimates.

Recent Developments for Firms' Bond Issuance

Total bond issuance for Latin American and Caribbean firms has fallen from a peak of US$33 billion in Q2–2014 to only US$8 billion for the last quarter of 2014 (see Figure 4.1).[2] However, the decline appears to be proportionately starker for LAC-5 banks, as the share of issuance of banks within all companies has fallen from 20% of issuance by end-Q2 2013 to just 2% by end-Q4 2014. Declining issuance is consistent with recent data indicating capital outflows from bond portfolios in most countries of the region, signaling a potential change in risk appetite, but also suggests that slower growth among Latin American and Caribbean economies and relatively high liquidity of banks and firms in the region may have depressed demand for bond issuance. An analysis of firms' balance sheets is discussed further in Chapter 5.[3] Whether driven by the increases in longer U.S. rates, higher spreads, or weakening demand, the current environment has indeed led to a significant fall in firms' bond issuance and there seems little reason to suppose that this will change in the coming months.

Currency Composition of International Bond and Syndicated Loan Issuance

Considering quarterly data on firms' bond issuances, some 70% of all issuances between 1995 to date and 80% at the most recent peak of issuance (which corresponds to Q2 2014) have been in U.S. dollars.[4] On the other hand, euro issuance has been on average only 6%—and only about 5% in Q2 2014. Issuance in domestic currency accounts for 17% on average across the whole period and 5%

[2] Data on international bond issuance from private companies (financial and non-financial) are from Dealogic. Latin American and Caribbean firms are those resident in the region. The countries with available data include Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela.

[3] As discussed in Chapter 5, the strong dollar issuance coupled with the appreciation in the U.S. currency is a particular concern at present for firms that are not hedged naturally or through financial contracts.

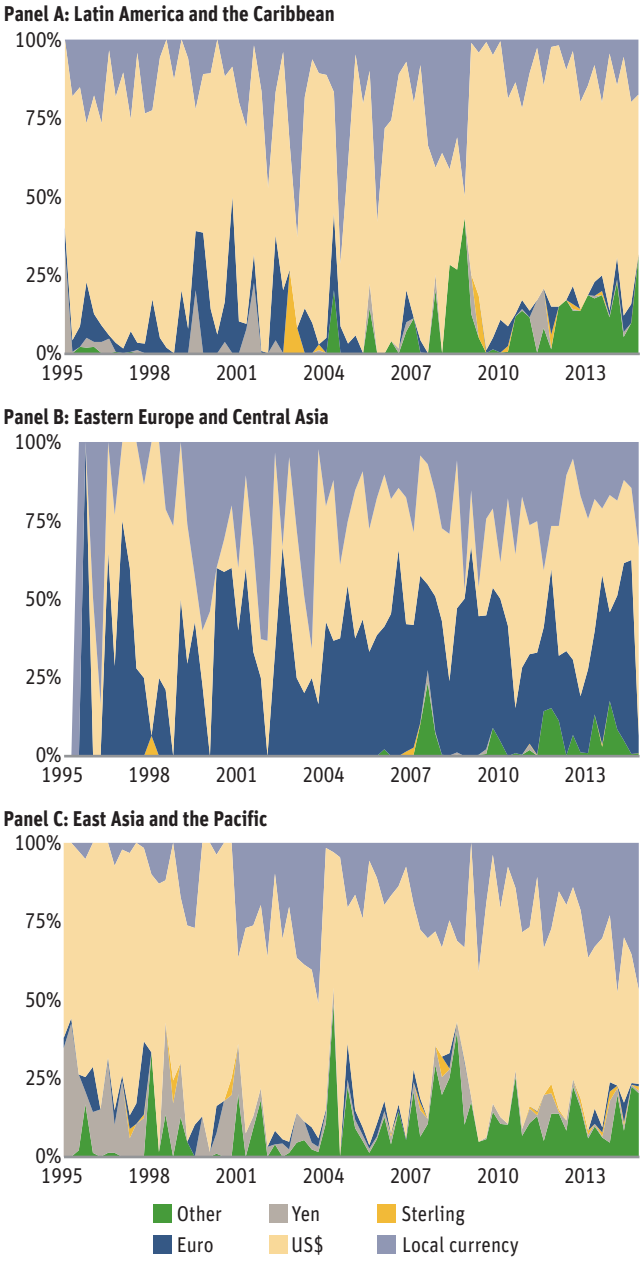
[4] Shares are first computed at the country level, and average Latin American and Caribbean shares are then obtained from country-level shares for countries with available information.

by end-Q2 2014. Figure 4.2 panel A shows the average composition of issuance by major currency from 1995 to date.[5]

The currency composition of bond issuance in Eastern Europe and Central Asia, and in East Asia and the Pacific are quite different. In Eastern Europe and Central Asia, issuance in U.S. dollars is only 35% of the total, about the same amount as the issuance in euro, and issuance in domestic currency represents as much as 24% (see Figure 4.2, panel B). In East Asia and the Pacific, U.S. dollar issuance accounts for the bulk of bond issuance (60% on average and 50% in Q2 2014), followed by domestic currency issuance, which used to be limited but amounts to 30% in Q2 2014 (see Figure 4.2, panel C), while euro issuance is negligible.

The panels in Figure 4.2 clearly demonstrate that the currency composition of issuance has changed relatively little in Latin America and the Caribbean, particularly since 2009, when

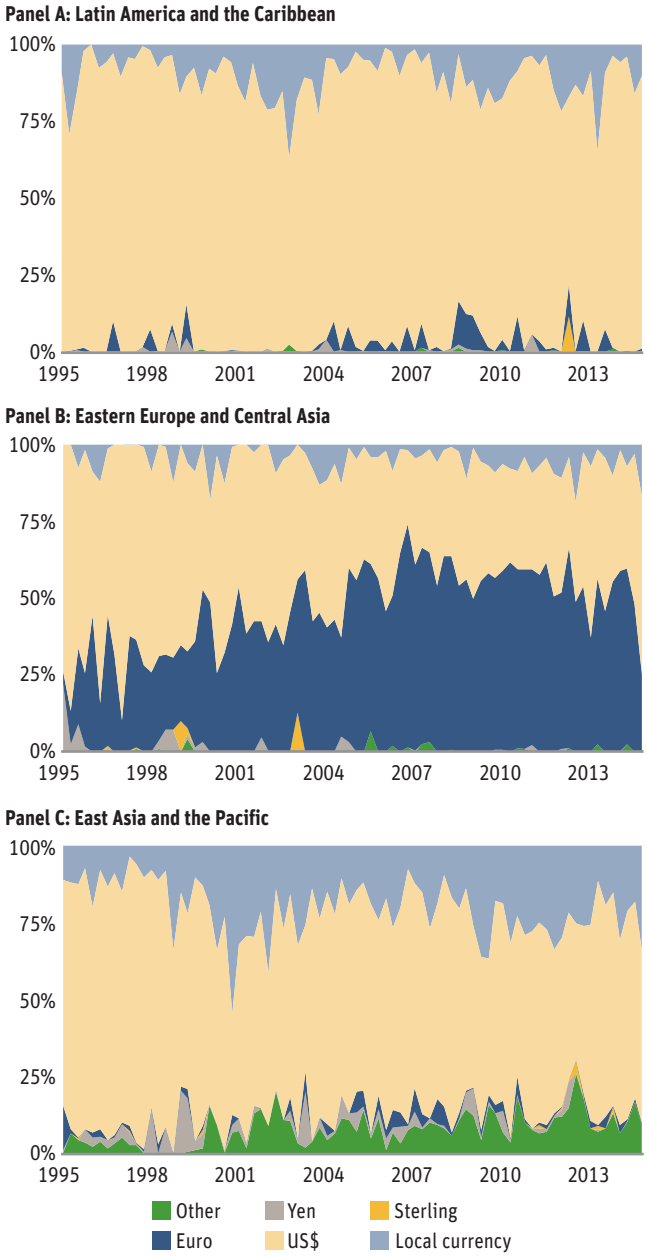
FIGURE 4.2 INTERNATIONAL BOND ISSUANCE: AVERAGE COMPOSITION BY CURRENCY



Source: Dealogic and IDB staff estimates.

[5] While Japan is also pursuing expansionary monetary policy, yen bond issuance is not analyzed specifically in this chapter, as it only amounts to 2% on average over the whole period of analysis.

FIGURE 4.3 SYNDICATED LOANS: AVERAGE COMPOSITION BY CURRENCY



Source: Dealogic and IDB staff estimates.

compared to the other two regions, and illustrate the relatively small number of international bonds issued in domestic currency in most recent years. The U.S. dollar share of Latin American and Caribbean issuance did fall substantially in Q4 2008 (see Figure 4.2, panel A), when most issuance was in domestic currency and in currencies other than the U.S. dollar. However, this reflected the drought faced by private firms in dollar credit markets given the financial crisis that commenced in U.S. markets and a dramatic fall in overall issuance (see Figure 4.1).

While Latin American and Caribbean issuance has not experienced substantial changes in currency composition, Eastern Europe and Central Asia has moved towards larger euro issuance from a low of 18% in Q4 2012 to 60% by end-Q3 2014, and East Asia and the Pacific has shifted towards issuance in domestic currency, from a low of 14% in Q3 2012 to 35% in Q3 2014.

Data on syndicated loans appear to reinforce these patterns. Most loan issuance in Latin America and the Caribbean is denominated in U.S. dollars (84% by Q3 2014), and there are practically no loans denominated in euros (see Figure 4.3, panel A). These results contrast with those in Eastern Europe

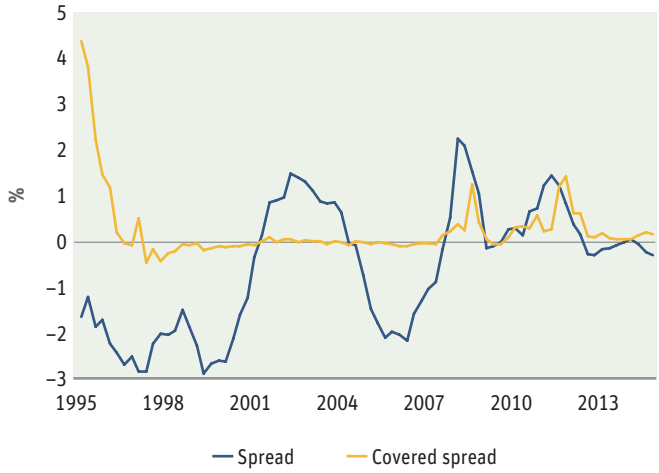
and Central Asia, where only 49% of loans were extended in U.S. dollars by Q3 2014, and about 48% in euros (see Figure 4.3, panel B). The share of dollar lending is 64% in East Asia and the Pacific by Q3 2014, but that region has also diversified more into local currency (18%) and other currencies (17%) (see Figure 4.3, panel C).

Sensitivity of Bond and Loan Issuance to Euro-Dollar Spreads

What determines the currency composition of bond issuance? Assuming interest rate parity (where any difference between the interest rate in two different currencies is compensated by the ex post movements in the value of the two currencies), other factors such as trade links, financial ties, liquidity considerations and/or the ability to issue in domestic currency would govern the choice of currency for borrowing. However, in general interest rate parity does not appear to hold in currency markets and certain market frictions may even prevent so-called covered interest parity to be maintained (where the spread between the spot and forward rates between two currencies reflect any interest rate differential). In this case, it seems likely that differences in interest rates relative to the movements or expected movements in currencies would be the main factor driving currency choice.

Figure 4.4 depicts the evolution of the euro-dollar spread in 1-year interbank interest rates for the period 1995–2014. Spreads have oscillated between 2.3% and –3%, with the two largest peaks in spreads in 2008 and 2011. However, borrowers may not be looking only at simple spreads, but also at covered spreads, that is, euro-dollar spreads adjusted for depreciation covered in forward markets. Figure 4.4 also shows the 1-year interbank rate spread, but this time adjusted for implicit depreciation between the euro and the U.S. dollar.[6] In contrast to the spread, the covered spread is smaller throughout the analyzed period and hovers close to zero—suggesting that in general the covered interest parity condition holds, although

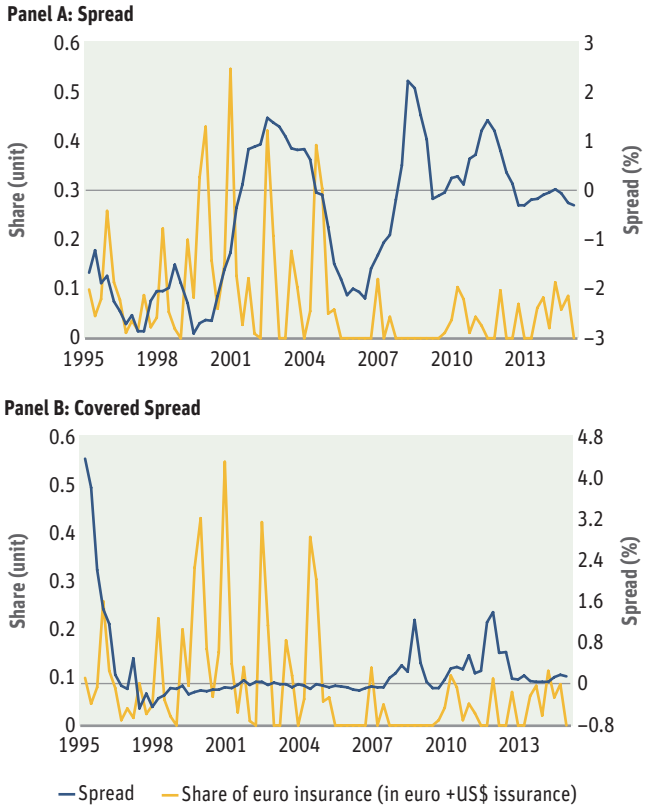
FIGURE 4.4 INTERBANK RATES SPREADS



Sources: Bloomberg and IDB staff estimates.

[6] Implicit depreciation is obtained by the percentage difference between the 1-year forward rate and the spot rate.

FIGURE 4.5 INTERNATIONAL BONDS: SHARE OF EURO ISSUANCE IN EURO + U.S. DOLLAR ISSUANCE AND SPREADS



Sources: Bloomberg, Dealogic and IDB staff estimates.

two peaks in 2008 and 2011 do indicate deviations from this condition during periods of financial turmoil.[7]

The trajectory of the euro-dollar spreads contrasts with the share of euros in total euro plus dollar bond issuance in Latin America and the Caribbean in Figure 4.5, panels A and B. There appears to be no clear pattern in the behavior of euro-dollar spreads and the share of euro issuance, except for the periods of financial turmoil of 2008 and 2011 and large differences in euro interbank rates over U.S. rates (about 220 basis points for standard spreads, or 140 basis points for forward adjusted spreads, when bond issuance in euro was practically nil). This raises the question of whether spreads need to be high enough for firms to react to the currency composition of bond issuance. Having said this, the overall sample correlation between euro shares and euro-dollar standard spreads is −0.16, while that for covered spreads is almost zero. When looking at syndicated loans, these correlations are practically zero as well.

Even if the correlation between currency shares and spreads is low, firms may decide to issue in dollars or in euros depending simply on whether the spread is positive or negative. If the share of dollar issuance falls when the euro-dollar spread is positive and rises when it is negative, then this would indicate sensitivity to interest rates. In the case of Latin America and the Caribbean, this rule is met roughly half of the time, thus providing no conclusive evidence in favor of a strong link between bond issuance composition and the sign of spreads.[8]

[7] See, for example, Baba and Packer (2009) for evidence on deviations from the covered interest parity condition during the onset of the global financial crisis, driven by concerns over risk posed by counterparties to banks and financial institutions in Europe and the United States in the foreign exchange swap market.

[8] These results are for both standard and covered spreads. Similar results are obtained for syndicated loans.

Looking in more detail at the sensitivity between euro shares and euro-dollar spreads and expanding coverage to other regions as well, simple regressions were run of log changes in euro shares against log changes in interest rate spreads, controlling for country fixed effects and seasonal effects, in order to obtain euro-share elasticities to euro-dollar spreads (standard and covered). These regressions include 68 countries, covering the period Q1 2000–Q4 2014 (see Appendix B). Spreads were interacted with regional dummies in order to assess different sensitivities across regions (Latin America and the Caribbean, EAP, ECA and OECD). Results are significant for Eastern Europe and Central Asia—a finding that is consistent with the volatility in currency shares presented above—and also for the OECD, but not for Latin America and the Caribbean.[9] These results may indicate that there is more sensitivity in regions that are more tightly linked to the Euro-area—as is the case of Eastern Europe and Central Asia—or where firms are larger and more sophisticated—as is the case in the OECD.

One possible factor behind low sensitivity in Latin America and the Caribbean could be firms' reliance on specific underwriters to issue bonds internationally who, in turn, may issue in specific currencies. For the case of Latin America and the Caribbean, for example, perhaps U.S. banks are dominant and hence most issuance is in dollars. This hypothesis is explored in Appendix B but the results indicate that there actually is no strong bias toward underwriting in the home currency of the underwriting bank.

Conclusions

While bond issuance has been falling, there appears to be little euro-dollar substitution thus far in Latin American and Caribbean countries, where most issuance has taken place in U.S. dollars and sensitivity to euro-U.S. dollar spreads seems to be low, both for international bonds and syndicated loans. Although the past may not necessarily explain behavior in the future, current evidence suggests that other factors have affected firms' decisions on the currency composition of bond and loan issuance during the period analyzed. However, it could be argued that firms may react only to large spreads, and indeed results in this chapter have shown that euro issuance came to a halt when the euro-dollar spread was at its highest point. Nonetheless, these stops occurred in times of heavy financial turmoil, when issuance declined strongly, offering little room for analysis of currency substitution in that period. The future may be different in that large interest rate spreads may remain stable in a period without a crisis, which may open the door for larger currency substitution. Having said this, current evidence suggests that currency substitution in bond issuance in the region may remain low.[10] In this case, and given the

[9] Results are significant when using 3-month covered spreads (see Appendix B).

[10] Another issue that needs to be analyzed is whether large firms or particular sectors, such as banks, may be more sensitive to spreads than average firms, in which case the impact of the increase in interest rates in the U.S. may be different across firms.

large appetite in Latin America and the Caribbean for U.S. dollar issuance, and relatively low use of issuance in domestic currency in recent years, higher interest rates in the United States may have a major impact, not only because sensitivity to euro-dollar spreads is low, but also because capital may begin to flow out of Latin America and the Caribbean and into the United States as U.S. interest rates rise.

CHAPTER 5

Monetary and Financial Developments

Latin America and the Caribbean survived the 2007–08 global financial crisis relatively well due in no small degree to the strength of local financial systems, the existence of significant external buffers and, for the larger economies, the flexibility afforded by floating exchange rates. In the context of the lackluster outlook for global growth and the expected rise in U.S. interest rates, this chapter considers the region's strengths including external buffers and the financial sector, the changes in firms' balance sheets, and the trade-offs for monetary policy. The final section discusses the relation between these elements and draws conclusions for policy.

External Buffers

International reserves provide perhaps the most important buffer for a country to withstand a wide range of external shocks. While the level of reserves in the larger economies of the region has remained relatively constant at substantial levels over recent years as a share of GDP (Figure 5.1, panel a), it has decreased with respect to other measures. Relative to the stock of short-term debt, for example, reserves have declined quite significantly. Indeed, the estimated probability of a Sudden Stop has risen and, while still below the level of 1997, it has steadily increased in the last three years and is considerably higher than in 2007 (see Table 5.1, panel c). Estimated optimal reserve levels have also risen, driven by changes in the determinants of the probability and potential severity of a Sudden Stop in capital flows (see Table 5.1, panel d). In particular, fiscal balances have deteriorated (as discussed more extensively in the next chapter) and liability dollarization has increased.[1]

Monetary Policy Tradeoffs

Countries in the region are very heterogeneous, with monetary policy regimes ranging from full dollarization to countries with floating exchange rates. Figure 5.1 divides countries into three groups and illustrates how exchange rate flexibility was used by some as a shock absorber during

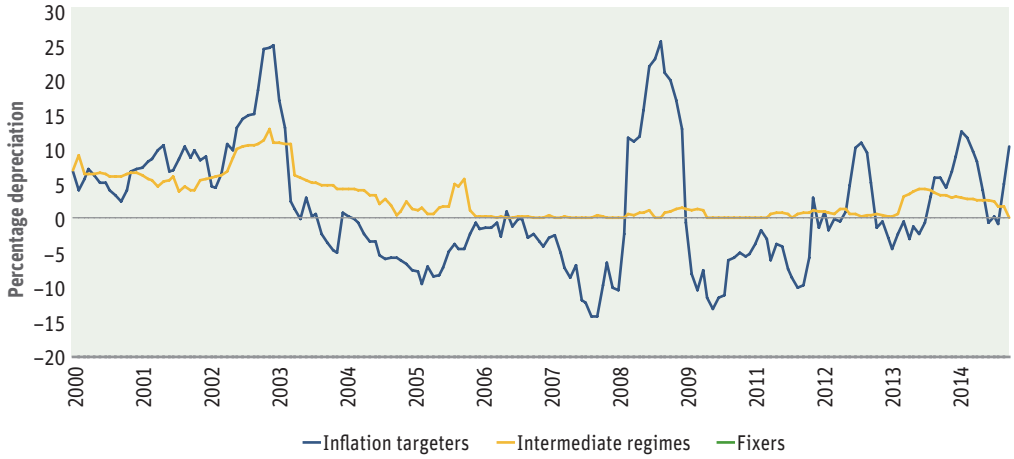
[1] The probability of a Sudden Stop is modelled as a function of the fiscal balance, the current account balance, and the amount of liability dollarization (see Calvo, Izquierdo, and Loo-Kung [2013] and last year's Latin American and Caribbean Macroeconomic Report, Appendix G in Powell [2014] for further details).

TABLE 5.1 RESERVE LEVELS IN LATIN AMERICA AND THE CARIBBEAN

	(a) Reserves as a share of GDP		(b) Reserves/Short Term Debt		(c) Probability of a Sudden Stop in recent years relative to that of 2007		(d) Optimal reserves as a share of GDP	
	LAC-7 Median	LAC-5 Median	LAC-7 Median	LAC-5 Median	LAC-7 Median	LAC-5 Median	LAC-7 Median	LAC-5 Median
2012	15.6%	16.4%	1.96	1.78	1.16	1.11	26.8%	26.8%
2013	14.8%	15.9%	2.16	2.60	1.26	1.24	30.8%	30.8%
2014	15.1%	16.6%	1.50	2.20	1.38	1.05	32.3%	33.7%

Source: IMF (IFS) and IDB staff estimates following Calvo, Izquierdo, and Loo-Kung (2013).
* (Probability in each year)/(Probability in 2007).

FIGURE 5.1 NOMINAL EXCHANGE RATE DEPRECIATION IN LATIN AMERICA AND THE CARIBBEAN



Source: International Financial Statistics (IMF).
Note: The annual depreciation is computed as the annual growth rate of the nominal exchange rate.
Inflation targeters include Brazil, Chile, Colombia, Guatemala, Mexico, Paraguay, Peru, and Uruguay.
Intermediate regimes include Argentina, Bolivia, Costa Rica, the Dominican Republic, Guyana, Haiti, Honduras, Jamaica, Suriname, Trinidad and Tobago, and Venezuela.
Fixers include The Bahamas, Barbados, Belize, Ecuador, El Salvador, Nicaragua, and Panama.

times of stress. During the global financial crisis exchange rates depreciated on average by 25% in one year for the group of inflation targeters.

However, the use of the exchange rate in the future may prove to be more limited. While output gaps have fallen, inflation gaps have risen—see table 5.2 and Appendix C that details inflation gaps for a set of inflation targeters.[2] A common driving force across countries appears to be higher pass-through from the large depreciations of nominal exchange rates against the

[2] Given the lack of an explicit inflation target for most of the fixers and intermediate countries, inflation gaps for these two groups are computed as the difference between observed annual inflation and the median inflation rate since 2005.

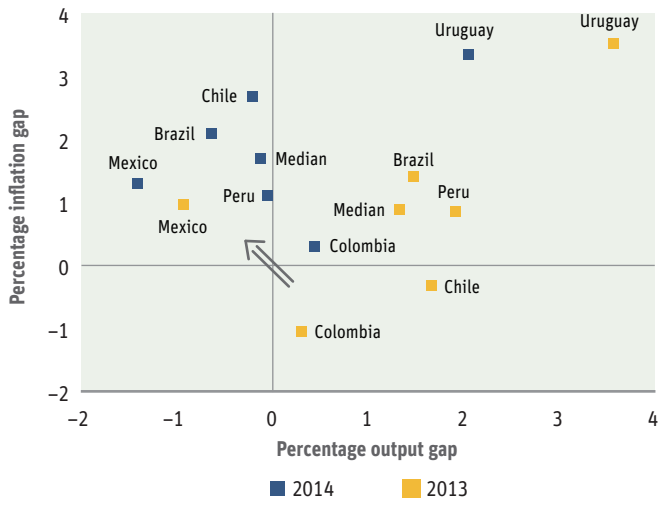
TABLE 5.2 OUTPUT AND INFLATION GAPS IN LATIN AMERICA AND THE CARIBBEAN

	Output gap			Inflation gap		
Regimes	2014	2013	Difference	2014	2013	Difference
Inflation targeters	0.26	1.37	−1.11	1.81	0.91	0.90
Intermediate regimes	−0.17	0.50	−0.67	4.00	1.85	2.14
Fixers	−0.32	−0.10	−0.22	−1.15	−1.56	0.42

Source: IMF (2014b) and Latin Macro Watch (IDB).
Note: The output gap is computed as the log deviation from the Hodrick-Prescott filter (lambda = 100). The inflation gap is computed as the difference between the observed inflation and historical median of the variable from 2005 for the intermediate regimes and the fixers. For inflation targeters, the inflation gap is computed as the difference between the observed inflation and the inflation target. Columns 2014 and 2013 report the last inflation gap observation of 2014 and 2013, respectively.

dollar.[3] Indeed, during the second half of 2014 several economies recorded annualized depreciation rates of 10% or higher. Moreover, activity has slowed. Indeed the output gap (defined as the difference between observed real GDP and an estimated long-term trend) is more negative for the inflation targeters than the average of the other monetary regimes.

FIGURE 5.2 THE INFLATION AND OUTPUT GAP TRADE-OFF



Source: IMF (2014b) and Latin Macro Watch (IDB).
Note: Output gap is computed as the output's log deviation from the Hodrick-Prescott filter (lambda = 100). Inflation gap is computed as the difference between the observed annual inflation and the inflation target.

It is widely accepted that an inflation targeting-type monetary policy has the dual objective of reducing both output and inflation gaps (see Svensson, 2010). Consequently, an interest rate policy rule should react to these two gaps simultaneously. If both gaps are positive, interest rates should be raised and vice versa. However, if the gaps have different signs, then there is a clear trade-off. Figure 5.2 compares the 2013 and 2014 inflation and output gaps for six inflation targeters. There has been a general movement towards the upper-left quadrant of positive inflation gaps and negative output gaps. A more aggressive stance to combat inflation may then

[3] Appendix C presents evidence that the correlation between current inflation and past devaluation rates, a proxy for pass-through levels, increased during the second half of 2014 for inflation targeters.

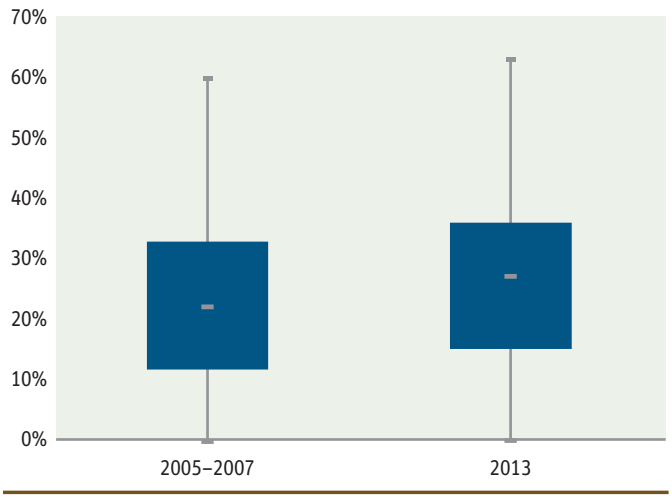
exacerbate negative output gaps. In contrast, if policy rates are lowered to close output gaps then inflation may rise.

How constrained is monetary policy? One way to consider this question is to simulate how interest rates may change if inflation rates decline. Simulations suggest that if the inflation rate falls by 1% then there would be space to reduce policy rates by nearly 100 basis points from current levels. Appendix C gives further details regarding these estimations. This suggests that monetary policy is indeed constrained and may continue to be so unless inflation rates fall. Moreover, inflation may not be the only factor restraining monetary policy in the future; in the next section the state of firms' balance sheets is considered.

Firms' Balance Sheets[4]

After several years of robust economic growth and booming credit growth, by the end of 2013 there were signs of deterioration in firms' balance sheets across the region. Since the mid-2000s, the ratio of corporate debt to total assets has deteriorated in the five countries with the most active capital markets. The debt to assets ratio of the typical Latin American and Caribbean firm rose by 23%.[5] However, the data for the typical firm mask a more marked deterioration in the balance sheets of weaker firms. As shown in Figure 5.3, the distribution of the ratio of debt to assets has not only shifted up in recent years, indicating a higher level of leverage of the typical firm, but the distribution has also extended

FIGURE 5.3 DISTRIBUTION OF DEBT TO ASSETS RATIO



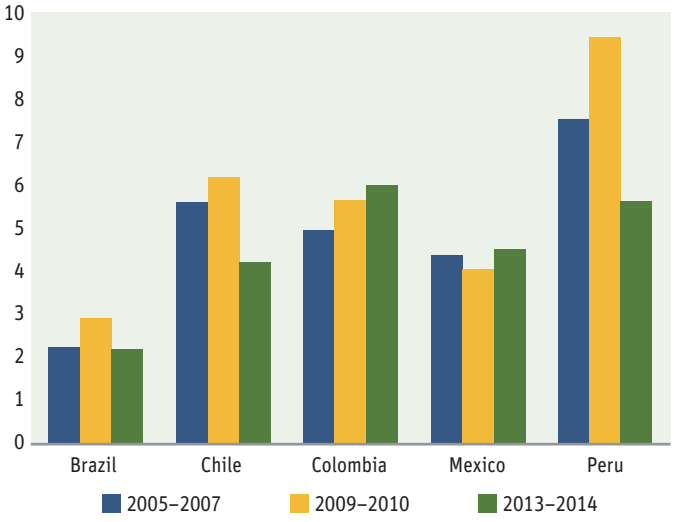
Source: IDB staff estimates and Worldscope (Thomson-Reuters).
Note: Outliers in both periods removed.

[4] This chapter employs data on balance sheets from a sample of 757 non-financial firms. The source of the data is Thomson-Reuters' Worldscope database, accessed on January 20, 2015. The sample is composed of 314 firms in Brazil, 173 in Chile, 47 in Colombia, 110 in Mexico, and 113 in Peru. Firms that were not listed as of December 2012 were not considered in the analysis, as well as firms classified by Thomson-Reuters as "Financials."

[5] An earlier analysis by González-Miranda (2012) based on similar balance sheet data up to the end of 2011 suggests that some vulnerabilities have grown among Latin American and Caribbean firms due to rising leverage and increased foreign-currency exposure. The recent analysis by Rodrigues Bastos, Kamil, and Sutton (2015) also finds balance sheet leverage ratios across the region have increased over recent years.

further. This implies that more highly leveraged firms are making up a larger portion of all firms.[6] Moreover, if economic growth and large capital inflows boosted higher asset prices, debt-to-assets ratios as measured may mask greater underlying vulnerabilities.[7]

FIGURE 5.4 RATIO OF GROSS EARNINGS TO INTEREST EXPENSES (TYPICAL FIRM IN EACH COUNTRY)



Source: IDB staff estimates and Worldscope (Thomson-Reuters).

Firms' Capacity to Service Their Debts Has Deteriorated

The capacity of firms to service their debts has also deteriorated. The interest coverage ratio (the ratio of earnings before interest and taxes to interest expenses) has fallen most strongly for the typical firm in Brazil, Chile and Peru; see Figure 5.4. Furthermore, the proportion of firms in the sample that have an interest coverage ratio below one, in which case gross earnings are insufficient to cover interest expenses, has steadily increased, reaching 23% in 2013 (up from 13% in 2005–2007).

A criticism of using this ratio as a measure of balance sheet health is that it assumes short-term debt will be rolled over (Rajan and Zingales, 1995). An alternative, and a measure of exposure of a firm to roll-over-risk, is the ratio of earnings or cash flows to short-term debt. Firms with a ratio of less than one may be at risk in case of a sudden stop in funding. In all countries considered, except Peru, there has been an increase in the share of firms with ratios of less than one, as shown in Table 5.3.

[6] These figures are based on the reported balance sheets of firms and may exclude debt acquired through offshore subsidiaries. Close to 30% of all issuance of Latin American and Caribbean firms in 2013 and 2014 was through offshore subsidiaries, with Brazilian firms being the most active. Shin (2013), Powell (2014), and Turner (2014) further discuss these issues. Assets held in offshore subsidiaries may also be excluded.

[7] Given differences in corporate structures across countries, sectors, and firms, the literature does not offer a benchmark or threshold to define what would be a risky level of leverage by a given firm. Having said this, current average debt to asset ratios do not appear to be outside international benchmarks; the G7 average for 1991 was 26% as reported in Rajan and Zingales, 1995 and the average for U.S.-listed firms stayed within a band of 20–25% during 2000–2010, see Graham. Leary, and Roberts (forthcoming).

TABLE 5.3 PROPORTION OF FIRMS WITH EARNINGS BELOW THEIR SHORT-TERM DEBT OBLIGATIONS (%)

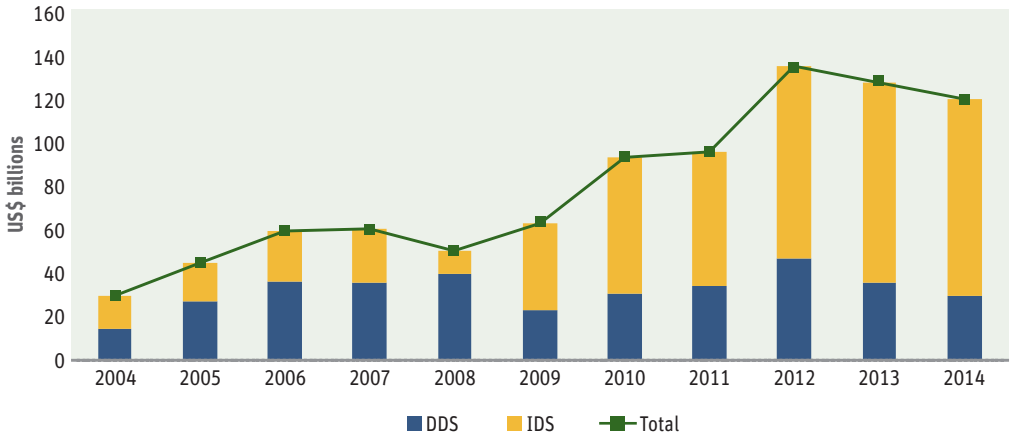
	2005/2007	2013/2014
Brazil	24	33
Chile	8	18
Colombia	6	19
Mexico	14	18
Peru	9	27
All countries	*16*	*26*

Source: IDB staff estimates and Worldscope (Thomson-Reuters).

Corporate Debt Issuance

As detailed in last year's Latin American and Caribbean Macroeconomic Report (Powell, 2014), corporate debt issuance has increased significantly in the last decade. Low interest rates and high global liquidity allowed firms to issue record amounts of international debt securities (see Figure 5.5).[8] International debt securities by Latin American and Caribbean firms reached a record US$91 billion, over four times the levels observed in 2007. As noted in Chapter 4, issuance has fallen in recent months and the majority of international bond issuance is in U.S. dollars. As highlighted in Powell (2014), international issuance in foreign currency has been meaningful not only in sectors with a natural currency hedge—such as commodity

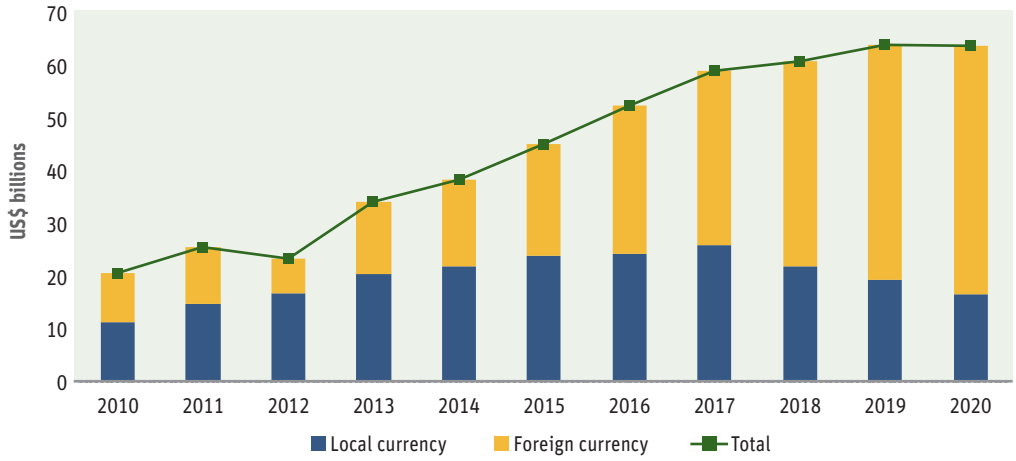
FIGURE 5.5 CORPORATE BOND ISSUANCE IN LATIN AMERICA (BILLIONS OF U.S. DOLLARS)



Source: IDB staff estimates and Dealogic.
Notes: DDS refers to Domestic Debt Securities; IDS refers to International Debt Securities.

[8] Data on bond issuance used in this report were obtained from Dealogic on January 9, 2015. A security is classified as an international debt security (IDS) if it has been listed in a country different from that of the parent company of the issuer or if its governing law is different from its nationality (for a detailed explanation, see Appendix D of Powell, 2014). Figures on bond issuance include issuance by government-owned companies (such as utility firms, energy firms, etc.), but exclude issuance by central and subnational governments. Issuance includes securities issued by the parent company and any subsidiary, regardless of the jurisdiction where the security was issued.

FIGURE 5.6 AMORTIZATION SCHEDULE (BILLIONS OF U.S. DOLLARS)



Source: IDB staff estimates and Dealogic.

and export-oriented sectors—but also among firms oriented to the domestic sector, with financial institutions playing a large role.[9]

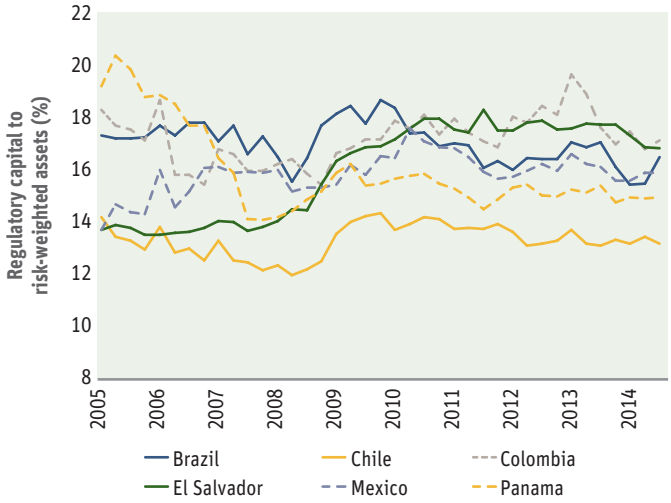
Bond Amortizations on the Rise for Latin American and Caribbean Firms

The face value of maturing bonds will jump from US$38 billion in 2014 to over US$60 billion in 2020 and thereafter (see Figure 5.6). A large proportion of these maturing bonds are in dollars. Indeed, given the divergent global monetary policies reviewed in Chapter 4, a concern is that amortizations for bonds denominated in the U.S. currency will rise from US$16 billion in 2014 to US$47 billion by 2020 in parallel with strong dollar appreciation. Furthermore, as reviewed in Chapter 4 and indicated in Figure 5.7, issuance has also declined recently, a trend that is likely to continue as U.S. interest rates rise and capital flows decline. While issuance has then been comfortably above the amount required for refinancing, that ratio will likely deteriorate in the years ahead.

A number of dimensions of firms' balance sheets have then deteriorated. Debt ratios have risen, bond issuance in foreign currency has increased and interest coverage ratios have declined. A particular feature is the forthcoming amortization schedule in dollars especially if the U.S. currency appreciates and new issuance declines. Apart from being a concern in itself, weak firms' balance sheets may also constrain monetary policy as raising interest rates to combat higher inflation may harm firms with higher debts. Moreover, firms are also the clients of financial systems, both in

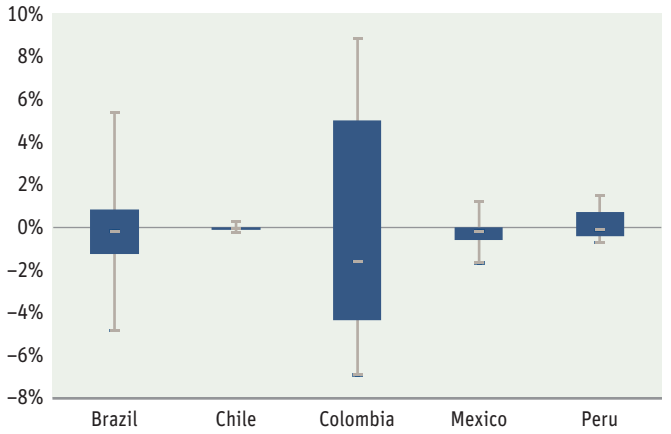
[9] Anecdotal evidence suggests that international debt issuance by some banks in the region was a key component of their internationalization strategy. Rodrigues Bastos, Kamil, and Sutton (2015) argue that, in general, bond issuance across the region was mostly aimed at refinancing rather than funding investment projects.

FIGURE 5.7 EVOLUTION OF BANK CAPITAL RATIOS



Source: IDB staff estimates and Financial Soundness Indicators (IMF).

FIGURE 5.8 CHANGE IN CAPITAL RATIOS, 2013 VS. 2011 (DISTRIBUTION OF INDIVIDUAL BANKS)



Source: IDB staff estimates an Bankscope.
Notes : The figure shows the distribution of changes in bank-level capital ratios between 2013 and 2011 for a sample of 112 commercial banks with available data. The shaded box shows values between the 25th and 75th percentiles and the thin lines show changes up to 1.5 times the interquartile range from the upper and lower quartiles (the figure omits larger changes).

terms of deposits and loans. If firms' financial strength declines, then this may also affect financial stability. The following section considers select developments in the financial sector.

Developments in the Financial Sector

Credit provision by banks grew strongly across the region during the boom years of the late 2000s. Given the relatively low levels of credit penetration in the region, this can be seen as a welcome and natural process of increasing the availability of loans both to firms and to households. In 2005 the stock of credit to the private sector as a percentage of GDP for the typical Latin American and Caribbean country was 29%; by 2013 this ratio had grown to 40%.[10] For some countries—especially for the commodity exporters of the Andean region, the Southern Cone, and Mexico—this ratio expanded at a much faster pace. In several countries

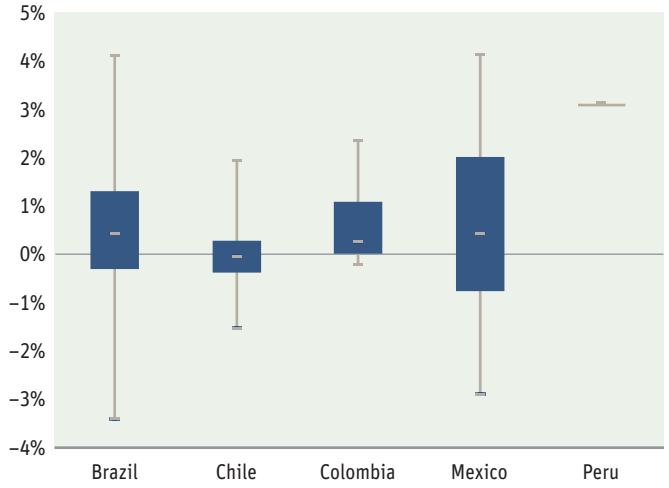
[10] A common measure of financial depth is the provision of credit to the private sector by banks expressed as a percentage of GDP (Cihák et al., 2013). These figures are computed based on data from the Latin Macro Watch (LMW) database. Similar figures are obtained if data from the World Development Indicators of the World Bank is employed.

the size of the banking sector relative to the economy more than doubled in less than a decade. Private banks and government-owned (or public) banks alike participated in credit expansion during the boom years. In response to the recent deceleration in growth across the region, banks have started to reduce the provision of credit. This is due to lower demand, as firms reduce their needs for finance, and because banks started to adjust to a less favorable environment, private banks are adjusting the fastest.[11]

Banking systems across the region have relatively high, stable solvency ratios. The banking system of the typical Latin American country had a ratio of total regulatory capital to risk-weighted assets of 15.6% in the second half of 2014 and average common equity tier 1 capital is 12.7% of risk-weighted assets, exceeding the new Basel III minimum guidelines of 7% to be implemented by 2019.[12] Average capital ratios are not only relatively high, but also remarkably stable (see Figure 5.7). The typical bank of the region has a relatively stable buffer of more than 7 points over the minimum 8% suggested by Basel II rules. Remarkably, banks across the region were able to maintain these relatively large capital buffers even during times of distress and recession such as in 2008–09.

A key question is how banks are positioned to endure potential shocks stemming from the deceleration in growth rates and potential strains in over-indebted firms and households. There is evidence that solvency ratios have worsened in recent years in many countries, as shown in Figure 5.8. The ratio of non-performing loans to total loans (net of provisions) also increased in many of the largest commercial banks across the region (Figure 5.9). Nonetheless, banks' capital buffers remain significant and the increase in non-performing loans has been offset by robust provisioning in many countries.

FIGURE 5.9 CHANGE IN RATIO OF NON-PERFORMING LOANS, 2013 VS. 2011 (DISTRIBUTION OF INDIVIDUAL BANKS)



Source: IDB staff estimates and Bankscope.
Note: The figure shows the distribution of changes in bank-level non-performing loans between 2013 and 2011 for a sample of 122 commercial banks with available data. The shaded box shows values between the 25th and 75th percentiles and the thin lines show changes up to 1.5 times the interquartile range from the upper and lower quartiles (the figure omits larger changes).

11 For example, in Brazil, the stock of loans of private banks shrank in the final months of 2014. See Bonomo, Brito, and Martins (2015) on the role of public banks in Brazil.

12 This does not, however, necessarily mean that all banks satisfy these more stringent requirements. Moreover, given the strong credit growth in the region the counter-cyclical capital buffer of Basel III would have added a further tier 1 regulatory requirement if it had been implemented.

Figures as of end of 2013 indicate high average loss absorbing capital buffers of banks across the region (IMF, 2014a).[13]

The question remains, though, of how banks will maintain a desired level of capital buffers in harder times. Appendix C details how banks maintained such stable capital ratios despite rapid credit growth and economic volatility and draws lessons. As banks may have lower retained earnings, may face higher provisioning against non-performing loans and may face tougher conditions for raising capital, it is likely that loan growth will slow or the riskiness of loans will decline in order to maintain strong capital to risk-weighted-asset ratios. Moreover, now that financial systems are of a significant size relative to GDP, this naturally pro-cyclical behavior by banks, which helps protect capital buffers, may imply a reduction in the supply of loans, especially to riskier markets, and hence have a negative feedback effect on economic activity.

A further issue to be monitored going forward relates to bank funding. The average ratio of deposits to total loans across banking systems in the region stood at 1.01 by mid-2014, suggesting a solid business model in which the totality of assets are funded through deposits. However, this ratio has fallen from 1.13 in 2005–07 and, as noted in Powell (2014), corporate deposits rose strongly in recent years alongside international non-financial corporate issuance. Large corporate deposits tend to be the least stable in the face of shocks and, if U.S. interest rates rise and corporate issuance declines, this may imply greater pressure on bank funding.

Conclusion

Developments in the monetary and financial sector reflect the region's real economy as it moves to a phase of lower growth. External buffers remain strong by most measures but have weakened of late as estimated optimal reserve levels, reflecting risks, have risen. The trade-offs for monetary policy have become harsher as inflation gaps have increased even as output gaps have moved into negative territory. While the larger economies have been able to use the exchange rate as a shock absorber, seen as a significant achievement during the 2008–09 crisis, given the current state of the trade-off with inflation it is not clear if that experience can be repeated to the same degree. Moreover, there is mounting evidence that firms' balance sheets are in worse shape. While within international norms, debt ratios have increased and interest coverage ratios have declined and the rising amortization schedule for bonds, particularly those denominated in an appreciating U.S. dollar, may soon outstrip issuance. To meet liquidity needs, firms may need to access their savings, built up in local financial systems. There is only imperfect information on

[13] Computations shown in IMF (2014a: 31) with 2013 data indicate that both tier 1 ratios and loss absorbing capital buffers of banks in Brazil, Chile, Colombia, Mexico and Peru are above the recommended minimum guidelines of Basel III. Loss absorbing capital buffers are computed as tier 1 capital plus loan loss reserves minus nonperforming loans, all divided by risk-weighted assets.

firms' currency mismatches but if they are significant, then this may further constrain monetary policy. Finally, while bank solvency and liquidity ratios remain strong there is now some evidence of capital ratios starting to decline. Banks have maintained high and stable capital ratios through considerable economic volatility by adjusting other variables. It seems likely that in the upcoming years of moderate growth, banks will restrain loan growth and lower risk to ensure risk-adjusted regulatory capital ratios maintain a substantial cushion above requirements. Now that financial systems are of a significant size, this natural pro-cyclical behavior may well have significant negative feedback effects on economic activity.

Given these developments, an important task is to ensure that systemic financial risks are properly identified and assessed. These risks include those related to non-financial firms' balance sheets as such risks may impact financial intermediaries and may even become systemic. The information on firms' currency hedging activities remains partial and enhancing information on all the linkages between the corporate and the banking sector may have a substantial pay-off. These linkages include hedging or other derivative activities, and they include the liquid assets of firms held in the local financial system as well as credit outstanding. A key risk is that with a rise in U.S. interest rates and an appreciating dollar, and the trends in firms' balance sheets outlined above, firms will withdraw liquid assets from local financial systems to meet external payment obligations putting funding pressure on banks. Having good information systems to provide early warning of this and other risks may be critical to formulating an appropriate response.

CHAPTER 6

Fiscal Positions and Policy Alternatives

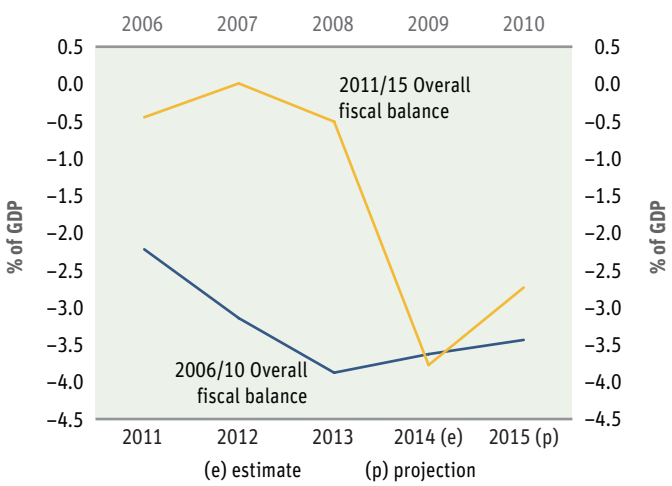
Fiscal balances have continued to deteriorate in most Latin American and Caribbean countries. Observed primary and overall balances worsened in most countries and public debt ratios continued to rise. Several factors contributed to these results: slower rates of growth across the region, lower commodity prices that negatively affected most countries (although some oil importers benefited) and the continued impact of expansionary fiscal policies implemented by most countries during 2009–10 in response to the Great Recession. Given these developments, countries are facing more difficult policy choices. This chapter reviews the fiscal position for the region and suggests policy ideas for different countries.

Initial Conditions: Comparing the Pre-Crisis Position in 2008–09 to Today

Fiscal positions in the region prior to the 2008–09 crisis were significantly stronger than they are today. The primary fiscal surplus for the typical Latin American and Caribbean country was about 2% of GDP in 2008 and the overall fiscal position was roughly in balance. In contrast, the average country in the region recorded an overall deficit of 3.8% and a primary deficit of 1.5% of GDP in 2013–14. Figures 6.1 and 6.2 compare the trajectory of fiscal balances from 2006 to 2010 against those of 2011 to projected 2015 values.

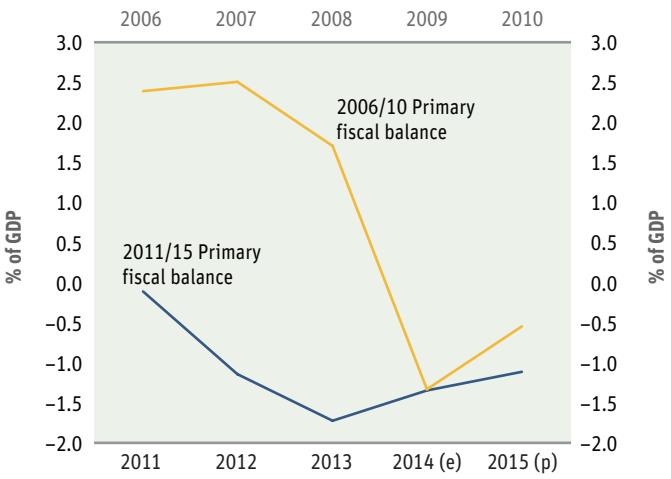
The continued deterioration in fiscal aggregates in recent years resulted largely from a sustained increase

FIGURE 6.1 OVERALL FISCAL BALANCES



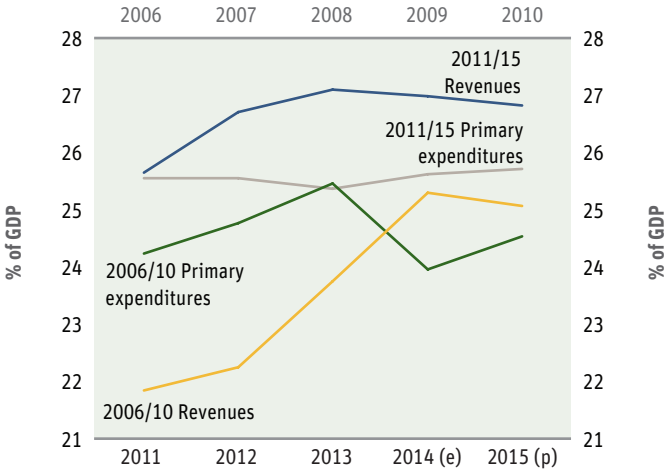
Source: IMF (2014b) and IDB staff estimates.

FIGURE 6.2 PRIMARY FISCAL BALANCES



Source: IMF (2014b).

FIGURE 6.3 FISCAL REVENUES AND PRIMARY EXPENDITURES



Source: IMF (2014b) and IDB staff estimates.

in primary expenditures, abating slightly in 2014. Primary expenditures rose by almost 5% of GDP between 2008 and 2014, while fiscal revenues increased by only 1.5% of GDP. Figure 6.3 compares fiscal revenues and expenditures across the same two periods (2006 to 2010 and 2011 to 2015).

The Evolution of Structural Fiscal Balances

Estimated structural primary deficits widened substantially in 2013 and estimates suggest further increases in 2014 (see Figure 6.4). Output levels remained close to estimates of potential, although the typical country posted a negative 2014 estimated output gap (see Figure 6.5).

Using 2010 as a starting point (the last year in which structural balances strengthened for the typical country), the structural primary fiscal balance improved in only six of the 20 countries with available information, and by 2014, it remained in surplus or at balance in just five (see Figure 6.6).

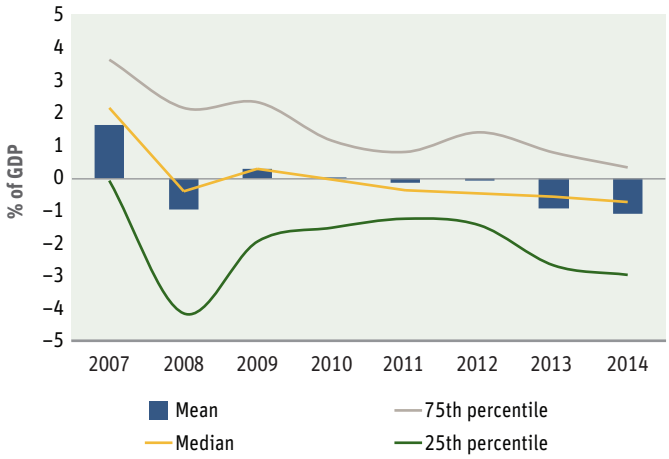
Public Expenditure Dynamics and Composition

The strong increase in primary expenditures is largely explained by a rise in wages and salaries, current transfers, and subsidies (see Figure 6.7). Spending on wages and salaries as a percentage

of GDP rose in 19 countries in the region, and in eight countries, the proportion of capital expenditures to GDP actually fell. The proportion of current expenditures to GDP declined in only two countries in the region, giving more space for public investment.

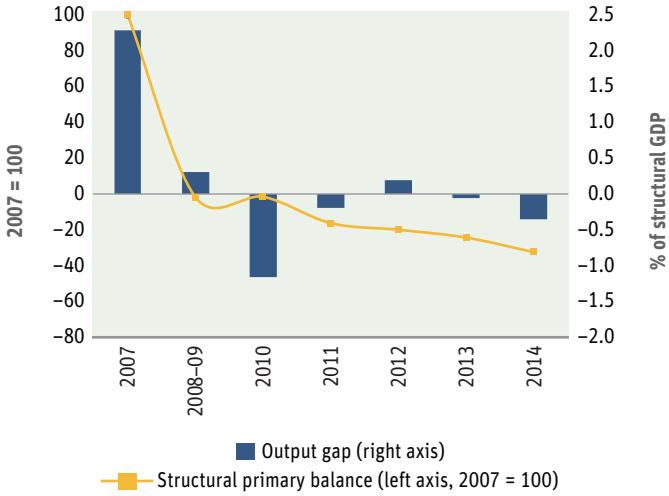
There is room to improve the expenditure mix in many countries. Public investment, required to boost potential growth and productivity, is low and has fallen as more rigid and inflexible expenditure items have soared. At the same time, the region still has an infrastructure gap, which would require a significant increase in infrastructure investment rates for a prolonged period of time, to catch up with the level of infrastructure of the median East Asian country.[1]

FIGURE 6.4 STRUCTURAL PRIMARY BALANCES 2007–14 (% OF GDP)



Source: IDB staff estimates based on national sources.

FIGURE 6.5 OUTPUT GAP AND STRUCTURAL PRIMARY BALANCE IN THE TYPICAL LATIN AMERICAN AND CARIBBEAN COUNTRY



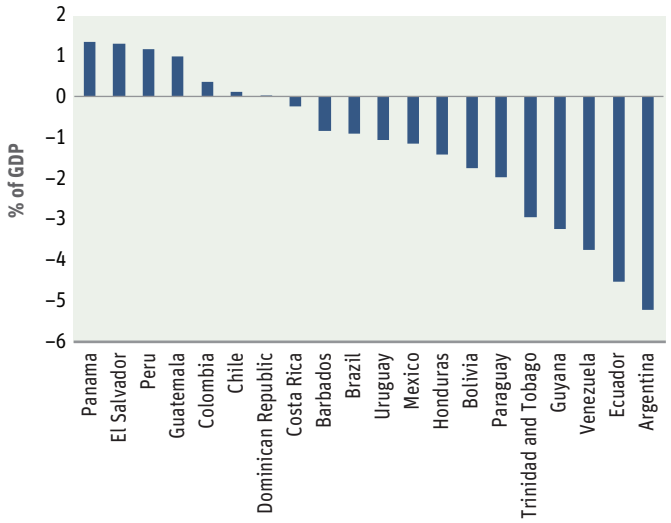
Source: IDB staff estimates based on national sources and World Economic Outlook, IMF (2014b).

Fiscal Policy Alternatives

At least four key elements determine an appropriate fiscal policy stance: i) the size and the sign of the output gap; ii) the size and the sign of the structural fiscal balance; iii) the level of debt to GDP; and iv) the speed at which that debt is increasing (or decreasing), as measured by the required adjustment in the

[1] See Chapter 7 in Powell (2013).

FIGURE 6.6 CHANGE IN STRUCTURAL PRIMARY BALANCE, 2010–14 (% OF GDP)



Source: IDB staff estimates based on national sources.

primary fiscal balance, in order to keep the debt to GDP level constant.[2] The first two elements are related to shorter term macro-fiscal policy management and may determine a priori whether a discretionary counter-cyclical policy may be appropriate, especially given the limitations of automatic fiscal stabilizers in the region. The third and fourth elements are related to whether a country has fiscal space to implement such a discretionary counter-cyclical policy.[3]

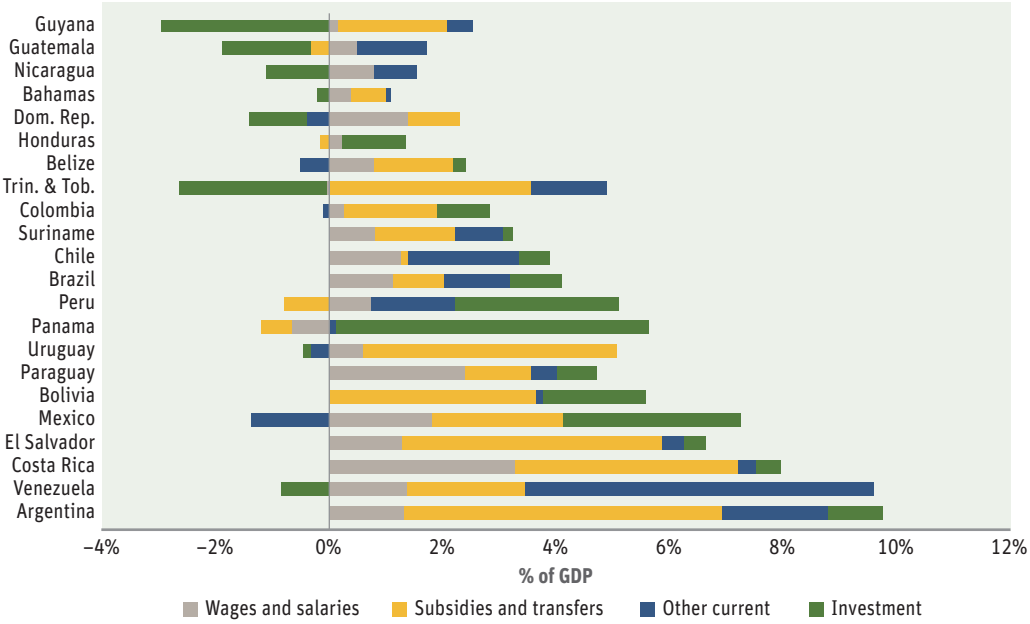
Figure 6.8 plots estimates of the output gap against the estimated structural fiscal balance for 20 countries in Latin America and the Caribbean. Those countries with a positive structural fiscal balance and a positive output gap—in the top-right quadrant—are growing faster than their potential GDP growth and fiscal policy is somewhat restrictive: an appropriate policy stance. Countries with a positive output gap and a structural fiscal deficit (bottom right) are growing above their potential and fiscal policy is expansionary, implying a danger of overheating. Moreover, the debt to GDP ratio is likely to be increasing, especially in the medium term once economic growth returns to potential. An appropriate policy for these cases would be toward a more restrictive fiscal policy stance.

Countries with positive structural fiscal balances and a negative output gap (top left quadrant) currently have a restrictive fiscal policy stance but may wish to consider implementing a counter-cyclical policy. Only one country (Peru) appears in this quadrant. Indeed, most countries are located in the bottom left quadrant, with negative output gaps (growth is below potential) and with structural fiscal deficits. Some countries have only moderate structural fiscal deficits and small output gaps and, if debt is low, they might consider pursuing a moderate counter-cyclical fiscal policy. In such cases, care should be taken to ensure that such policies are truly counter-cyclical. Chile and

[2] The required fiscal adjustment is defined here as the difference between the average primary balance for 2014–15 (observed for 2014 and the IMF's WEO estimate for 2015), and the required primary balance to maintain a constant debt to GDP, assuming growth is equal to potential. A negative sign indicates debt is increasing and a fiscal adjustment is required to maintain a constant debt ratio, while a positive sign indicates that debt is decreasing.

[3] A further important element is the existence of a sovereign wealth or stabilization fund, particularly for commodity exporting countries. This element is mentioned below in considering policy alternatives.

FIGURE 6.7 CHANGE IN PRIMARY PUBLIC SPENDING 2007–14, BY EXPENDITURE CATEGORY (% OF GDP)

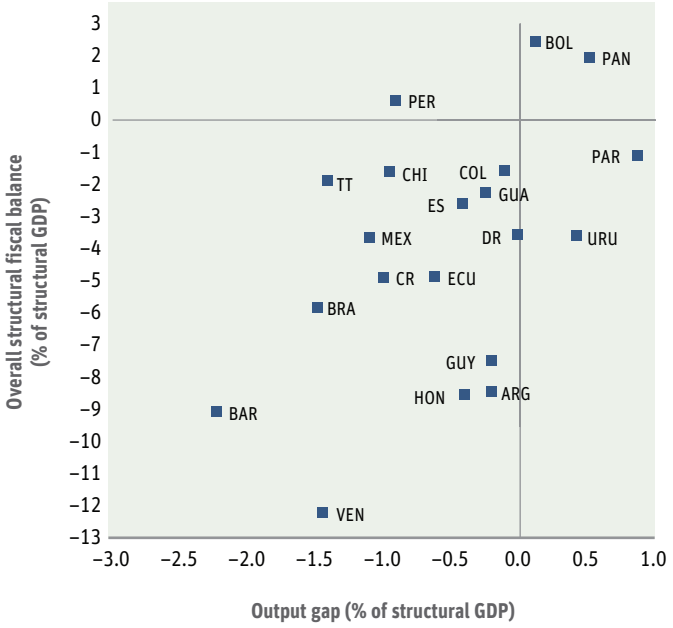


Source: IDB staff estimates based on national sources.

Trinidad and Tobago are two countries in this category and both have stabilization funds that might be used to finance such policies. However, several countries in this quadrant have larger structural fiscal deficits and significant negative output gaps; in these cases, a more detailed analysis of fiscal space is warranted.

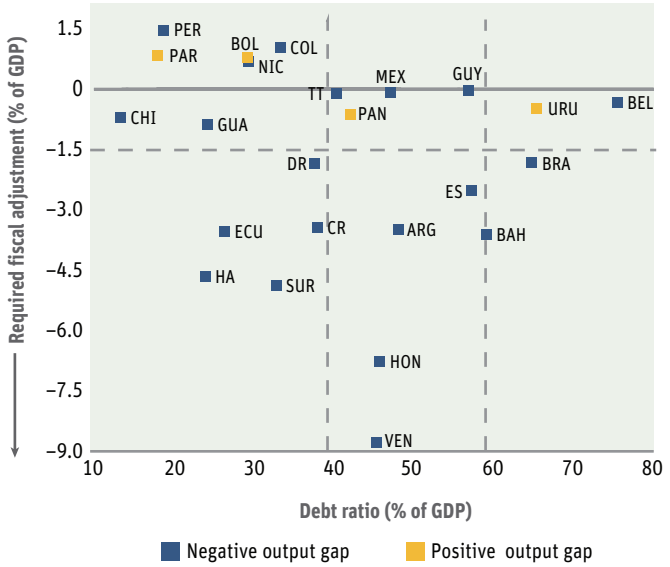
Figure 6.9 plots the current debt burden and the inverse of the required adjustment in the fiscal balance to maintain the debt ratio to GDP constant; as explained in footnote 2 of this chapter, this can be thought

FIGURE 6.8 OUTPUT GAP AND STRUCTURAL FISCAL BALANCE



Sources: IDB staff estimates based on national sources and World Economic Outlook, IMF (2014b).
Note: Estimates of structural fiscal deficits depend on a set of assumptions (see Ardánaz et al., forthcoming).

FIGURE 6.9 DEBT BURDEN AND FISCAL SPACE WITH GDP AT ITS POTENTIAL GROWTH



Sources: IDB staff estimates and World Economic Outlook, IMF (2014b).

of as a measure of fiscal space. A country located in the upper left quadrant has relatively low debt and the debt ratio is decreasing (as there is a negative required fiscal adjustment to maintain debt constant). If the output gap is negative, then these countries may wish to consider counter-cyclical policies and may have room to do so without jeopardizing debt sustainability in the medium term. However, there is no universally accepted threshold for a safe level of debt, and such a concept likely depends on a set of more explicit country-specific variables. For the purposes of illustration, the figure defines the left quadrants as either those countries with less than 60% of debt to GDP or less than 40% of debt to GDP.

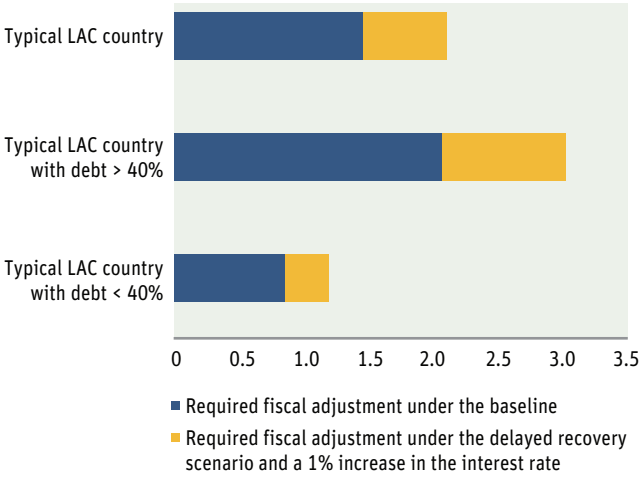
Countries towards the bottom left quadrant have relatively low debt levels, yet still require a positive fiscal adjustment to ensure those debt levels do not increase. If debt is sufficiently low and the required adjustment is not too large, then there may be space to implement some type of counter-cyclical policy. However, for the majority of countries in this quadrant, the combination of debt levels and required fiscal adjustment severely restricts fiscal space. A danger is that increasing debt and perceptions of risk may push interest rates up, making any counter-cyclical fiscal policy self-defeating. Given the aforementioned trends in fiscal spending, these risks are heightened if the policy is not very clearly and credibly temporary in nature. Moreover, as discussed further below, a prudent policy is likely to be more appropriate in the current economic climate, given the risks of a further delay in the global recovery and a likely rise in international interest rates.

Countries that require a fiscal adjustment to keep the debt ratio constant and have higher debt burdens are located towards the bottom right quadrant of Figure 6.9. Attempts to pursue "counter-cyclical" policies would be inappropriate and likely self-defeating in such cases.

In the preceding analysis, the required fiscal adjustment is calculated at an estimate of potential growth but, as noted, most countries are growing below potential—they have a negative output gap. If the required fiscal adjustment is calculated using the 2015–18 baseline

growth projections, then, on average, the required fiscal adjustment is about 1.9% of GDP for the typical country. If Europe, China, and Japan were to face a "delayed recovery," the Latin American and Caribbean growth rate would be reduced and the required fiscal adjustment would be higher. Moreover, if real interest rates also rise, say by 1%, then an additional fiscal adjustment would be required; the typical country would then require an adjustment of over 2.5% of GDP just to maintain the debt ratio constant. However, there is considerable heterogeneity in the region. For a typical country with debt to GDP greater than 40%, the required fiscal adjustments are considerably higher, over 2.5% of GDP in the baseline and almost 4% of GDP in the negative scenario (see Figure 6.10).

FIGURE 6.10 REQUIRED FISCAL ADJUSTMENT UNDER ALTERNATIVE GROWTH SCENARIOS



Sources: IDB staff estimates based on national sources and World Economic Outlook, IMF (2014b, 2015).

Thus, countries with a positive output gap would not require counter-cyclical policies since they are growing above their potential, and if they currently have structural fiscal deficits, they should tighten to avoid overheating. The more difficult trade-off, however, is when output gaps are negative and a fiscal adjustment is required to ensure the debt ratio remains constant. In these cases, an adjustment is required over time but a valid question is, how and when should this take place? This question is addressed later in this chapter. Countries with a negative output gap and a structural fiscal surplus (or small deficit), and with a relatively low debt burden and close to a primary surplus that would maintain the debt level constant, may be able to consider counter-cyclical fiscal policy. Under these circumstances, it is critical to ensure that policies are indeed counter-cyclical and do not include measures that permanently increase expenditures. But what type of policies should be considered?

Counter-cyclical Fiscal Policy

The main challenges when considering a counter-cyclical response are: (i) the magnitude of the fiscal impulse; (ii) the duration of the measures; (iii) the implementation lags; and (iv) the institutions or measures needed to keep temporary policies from becoming permanent. Maintenance and repair of productive infrastructure (such as highways, roads, ports, hospitals, and schools)

and temporary on-the-job-training employment programs are two examples of potential policy measures. A third might be a temporary VAT rate reduction. However, tax rate adjustments often require parliamentary approval and may be difficult to reverse.

Fiscal Adjustment: How?

Still, most Latin American and Caribbean economies are not in a position to contemplate counter-cyclical policies and are now considering how to reduce fiscal deficits. But how can they reduce deficits without sacrificing growth and successfully convert a fiscal adjustment to an actual reduction in debt?[4]

The composition of an appropriate fiscal adjustment program depends on several country characteristics, including the structure and size of the tax burden and the level and composition of public spending. In countries with large tax burdens and where the tax system may already distort incentives, further increases in tax rates would likely be counter-productive, as private investment and competitiveness would be damaged. Widening the tax base or reducing less efficient expenditure items would surely be more effective in reducing debt ratios. On the other hand, countries with low tax burdens and low levels of public spending, such as several countries in Central America, may find it difficult to reduce expenditures further.

There are also opportunities in the region to enhance revenues by improving tax administration (see Corbacho, Fretes Cibils, and Lora, 2013). The share of registered taxpayers that do not file is as high as one-third of all active taxpayers, both for VAT and for income taxed (personal and corporate), and the percentage of taxpayers that are inspected and audited are a small proportion of active taxpayers. The countries in the region that have implemented electronic invoicing are the exception rather than the rule and, in most of those cases, only a small proportion of taxpayers are required to use them. Thus, tax evasion remains high. Greater use of electronic invoicing would reduce evasion, particularly in relation to the VAT.[5]

The composition of any fiscal adjustment program may also depend on the composition of spending in terms of the level of government. In some cases, the central government may have the opportunity to enhance the efficiency of spending and, in other cases, these opportunities may be concentrated more in subnational governments, social security systems (including pensions), state-owned enterprises, or other decentralized government entities. Many countries in the region may be able to focus a fiscal adjustment in a more specific candidate area while minimizing the impact on growth. As discussed in detail in Corbacho, Fretes Cibils, and Lora (2013), total tax expenditures in the region are between 2% and 8% of GDP, and there may be

[4] There is a growing debate about the consequences of fiscal consolidation in advanced economies. See Alesina, Favero, and Giavazzi (forthcoming) and Alesina and de Rugy (2013) for a review and references therein.
[5] Please refer to IDB, CAPTAC-DR, and CIAT (2013).

several opportunities to realize fiscal gains without sacrificing growth by rationalizing exceptions and other tax subsidies.

A second area is to improve targeting, including of social expenditures. In the Central American region alone, restricting social assistance benefits to those in the bottom 40% of the income distribution would create fiscal savings of approximately 0.5% of GDP (Izquierdo, Loo-Kung, and Navajas, 2013). Reforms to the parameters of social security systems, if accompanied by improved targeting, may also reduce required central government transfers to pension funds. Social spending is discussed further in the next chapter. Furthermore, opportunities exist to realize fiscal savings by rationalizing the system of transfers between different levels of government and by exerting better monitoring and control.[6]

Finally, the current context of lower oil prices offers a unique opportunity to reduce reliance on energy subsidies whose benefits accrue disproportionately to higher-income households and also to pursue environmental goals. Preliminary estimates among a sample of 16 oil-importing countries in the region indicate that if liquid fuel prices are maintained at the reference price of $1.01/liter—rather than being reduced when the oil price falls—by levying an average tax rate of $0.33/liter, they could enjoy average additional revenues of about 1.3% of GDP.[7] If a group of four oil exporters brought their domestic prices up to that same international benchmark, then fiscal savings would amount to about 3.2% of GDP (ranging from 0.7% of GDP for Mexico to 6.4% of GDP for Venezuela). A simulation for Central America, Panama, and the Dominican Republic indicates potential fiscal savings of an additional 0.3% of GDP, given declines in fuel prices and assuming domestic electricity prices are left unchanged.

When designing a fiscal adjustment program, investment in productive infrastructure should be protected as much as possible to safeguard growth. However, improving the efficiency of those programs might allow for cost savings or further investment to boost economic output.

Clearly, there is no standardized or "one-size-fits-all" program. Moreover, fiscal adjustment programs may be less contractionary (or even growth-enhancing) when accompanied by more fundamental reforms (such as lowering taxes on labor or on capital), and by other structural reforms that promote competitiveness, trade, and labor market flexibility.

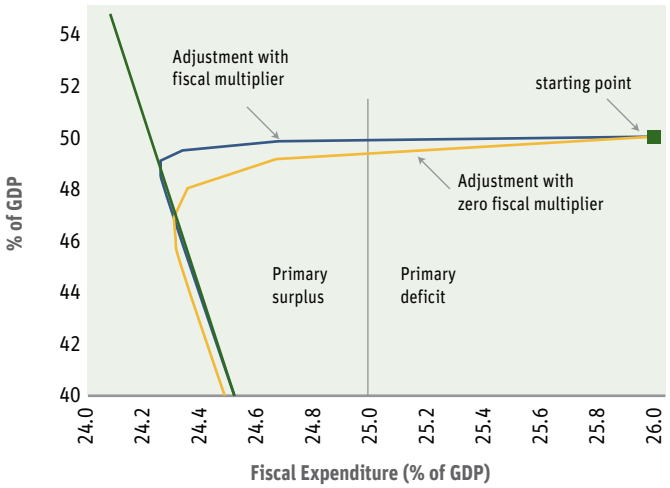
Fiscal Adjustment: When?

What is the appropriate timing and speed of a fiscal adjustment? In a country that has no output gap (growth is at potential) but has a high structural fiscal deficit and is paying high interest rates on a significant debt level, the answer is clear. Adjustment should be immediate and relatively fast, as

[6] An example is the 2013 centralization of teachers' pay for all levels of government in Mexico.

[7] The U.S. reference price for 2013 is $1.01/liter. For estimates of the current levels of energy subsidies, please refer to Clements et al. (2013) and Parry et al. (2014). Note that if there are no subsidies and there is an ad valorem tax on sales, then with no tax change and a falling oil price, fiscal revenues would fall.

FIGURE 6.11 PATHS FOR FISCAL ADJUSTMENT



Source: IDB staff estimates based on Miller and Zhang (2013).

saving interest expenditure implies the country will have to make a smaller adjustment and, with a zero output gap, the multiplier effects of adjustment on growth should be limited. On the other hand, if a country has a significant, negative output gap and pays relatively low interest rates but needs to adjust, then that adjustment should be more gradual, as the interest savings are less and the multiplier effects may be larger. A more complicated case is a country that needs to adjust but has a negative output gap, and pays a relatively high rate of interest on debt. The appropriate speed of adjustment is, then, a delicate trade-off between fiscal adjustment and, hence, lowering debt and hence interest expenditures, versus the negative impact on growth that such an adjustment may have.

Consider a typical country in the region that requires a fiscal adjustment, has debt to GDP of 48%, potential growth of 3% per annum and pays a real interest rate of 3.5% on debt, obtains 25% of GDP in tax revenues but has primary expenditures of 26% of GDP and a primary deficit of 1%. Assuming a zero multiplier, this country could, for example, achieve a 40% of debt to potential GDP ratio within 10 years through a fiscal adjustment program.[8] During the transition, the debt to GDP ratio falls each year and the country must generate a primary fiscal surplus. In turn, expenditures must fall well below the level of revenues for several years, but can then increase again as debt falls.

If there is a multiplier effect on fiscal spending, then the adjustment process may take longer. For example, suppose the fiscal multiplier is 0.5; then, under similar assumptions, including the speed of the fiscal adjustment process, achieving a 40% to potential GDP ratio would take 14 years rather than 10. In order to achieve a debt ratio of 40% within 10 years, a sharper fiscal adjustment would be required—specifically, simulations suggest 1.9% of GDP in the first year rather than 1.7% of GDP. Figure 6.11 illustrates possible adjustment paths.

[8] For these simulations, we use the model outlined in Miller and Zhang (2013). Appendix C outlines the model in more detail. Note that the version of the model employed abstracts from other revenues and only fiscal revenues are considered. The fiscal multiplier is defined as the response of GDP to expenditure shocks (see Blanchard and Perotti [2002] for a discussion).

However, suppose interest rates rise by 1% and growth falls to 2.5%, reflecting a more negative scenario. In the case of a zero fiscal multiplier, the original fiscal adjustment program would achieve a debt ratio of 40% in 12 years rather than 10. And, in the case of a fiscal multiplier of 0.5, for the original program a 40% debt ratio would only be achieved in 22 years. Moreover, if the fiscal multiplier was 1.25, debt would not converge at all. A much more aggressive fiscal adjustment policy would be required to ensure that debt to GDP converges at a lower level.

These simulations illustrate some of the trade-offs and dangers of fiscal adjustment and suggest that the typical country that requires a fiscal adjustment program may enter into risky territory if action is not taken quickly. The bottom line is that countries may wish to consider fiscal adjustment programs earlier rather than later, and faster rather than more gradually, to reduce the risk of unpleasant debt arithmetic taking hold.

Conclusions

Countries are facing more difficult policy choices. For a country at or close to potential growth but with a high structural fiscal deficit and increasing debt, the policy recommendation is clear; fiscal adjustment is in order. For those few countries with a negative output gap and a strong fiscal position, then some type of counter-cyclical policy might be considered, but that policy should indeed be counter-cyclical and not simply expansionary, as the response to the Great Recession in the region proved to be. Cases of countries with a negative output gap but a structural fiscal deficit, and relatively high debt, are more complex. A critical factor is gauging the market reaction to each policy choice. A prudent fiscal policy may well be the appropriate course of action to ensure lower interest rates and to avoid escalating debt, particularly in the context of risks to global growth and rising U.S. interest rates, and especially for countries facing substantially lower revenue from commodities.

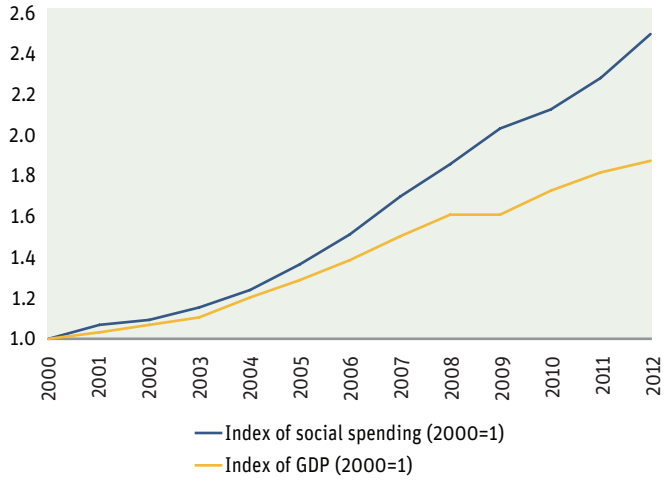
CHAPTER 7

Macroeconomic Challenges for Social Policy

Over the last decade and a half, Latin America and the Caribbean has made notable advances in reducing poverty and improving social outcomes. Extreme poverty fell by more than a third from 19.3% in 2002 to 12.0% in 2014;[1] and inequality, as measured by the Gini coefficient, fell from 0.56 to 0.51.[2] In parallel, child mortality fell from 32 to 18 deaths per 100,000 children from 2000 to 2013 (see UN IGME, 2014). By 2013, school attendance rates among 6–11 year olds reached 98%, and among 12–17 year olds, rose to 87%.[3] Although gaps remain across income and demographic groups, the greatest advances in reducing chronic malnutrition and improving school age attendance profiles occurred for children from the lowest socioeconomic groups.

Many of these gains were fueled by the substantive increase in public expenditure discussed in the previous chapter. As can be seen in Figure 7.1, from 2000 to 2012 overall social spending increased at a much faster rate than GDP; indeed, over this period the share of social spending in GDP rose from 14% to almost 19% of GDP. Rapid increases in GDP per capita also directly contributed to improving social outcomes. Decompositions of the reduction in inequality

FIGURE 7.1 LATIN AMERICAN AND CARIBBEAN SOCIAL SPENDING AND GDP, 2000–2012



Sources: ECLAC (2014) and World Economic Outlook, IMF(2014b). All calculations are population weighted using the same 11 countries for which social expenditure data are available in ECLAC (2014).

1 ECLAC (2014). The poverty rate for 2014 is predicted.
2 Population-weighted calculations from IDB harmonized household surveys for the period 2003–13.
3 IDB/SCL harmonized household surveys—16 countries with 2000–13 data, weighted population average.

attribute between a third and a half to the higher labor income of the poor associated with faster growth (Levy and Schady, 2013). This report suggests that these two channels for improved social outcomes—rapid increases in social expenditures and high rates of growth—may be less favorable in the coming years. The increasingly constrained fiscal space faced by most countries, combined with a possible protracted period of lower growth, indicates that the recent pace of increases in social spending is unlikely to be sustainable in the coming years. While there is heterogeneity across countries, many are likely to face pressure to accomplish more with similar or lower levels of resources.

In this context, it is essential to avoid undercutting recent gains in social outcomes. In fact, it appears that progress in reducing poverty has already stalled. Deploying policies to consolidate and increase social gains is of the essence. More precisely, the region faces two challenges: (i) ensuring that the less favorable macroeconomic environment does not translate into increased inequality and poverty; and (ii) designing social policies that help raise productivity and accelerate medium-term growth. Despite their best intentions, social policies that are not aligned with productivity will set Latin America and the Caribbean on a path to lower welfare. Smarter social spending needs to be a key response to the challenging scenario of protracted low growth—by promoting better-functioning labor markets, encouraging human capital accumulation, helping workers to be more effective in their jobs, and ultimately, as considered in Chapter 2, closing productivity gaps with other regions.

This chapter addresses how aspects of social policy in the areas of labor markets and social insurance, poverty programs, health, and education can be designed to protect the important social gains achieved, and better position the region for long-run growth. The discussion focuses on three areas:

- improve efficiency with a focus on quality,
- promote income stability and protection without distorting workers' incentives,
- exercise caution with respect to creating potentially costly and irreversible commitments.

Improve Efficiency with a Focus on Quality

In Latin America and the Caribbean, there is ample space to improve the efficiency of spending and accomplish more with a similar amount of resources. In sectors such as health, social protection, labor training, and education, service quality remains the key challenge to be addressed.

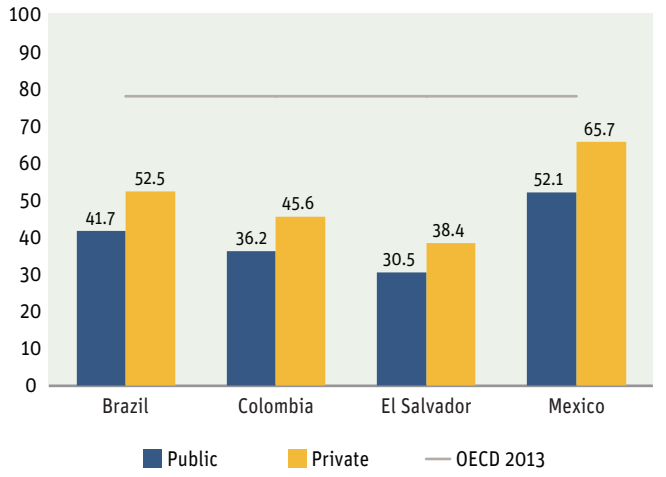
Health

Health systems in the region face pressure from population aging, rising chronic diseases, demand to expand coverage and adoption of technological advances. In a fiscally constrained scenario, the priority is to adopt policies to increase technical and allocative efficiency without

sacrificing coverage and quality. Policies should focus on two areas: (i) spending better; and (ii) shifting more resources toward preventive services.

An analysis of 191 countries found that Latin America and the Caribbean is between 12 and 44 percentage points below the most efficient countries in producing healthy life expectancy—Evans et al. (2000). Marinho, de Souza Cardoso, and de Almeida (2012) reveal large discrepancies in returns on investment in the countries of the region expressed in indicators such as life expectancy, infant survival rate, and years of life recovered from communicable and non-communicable diseases and external causes. Inefficiencies relate to human resources, health technology and drugs, organization of providers, misuse of resources, and inappropriate intervention packages.

FIGURE 7.2 PERCENTAGE OF POPULATION UP TO DATE IN PREVENTIVE HEALTH MEASURES



Source: Guanais, et al. (forthcoming).
Note: OECD is the average of 11 OECD countries in the International Health Policy Survey.

Measures for improving efficiency include: (i) closing gaps between planning and budget allocation by implementing strategic purchasing or value for money approaches, in which health financing decisions are based on explicit prioritization criteria, evidence of the cost effectiveness of interventions and provider quality and efficiency; and (ii) providing incentives for productivity, quality, and innovation through payment mechanisms, such as results-based financing.

On the other hand, implementation of preventive services—key to reducing the rate of growth of health spending and containing the increasing incidence of chronic diseases—is at an incipient stage in the region. An IDB survey of regional users, which replicates a methodology applied in OECD countries, found that only 31% to 52% of users of public health services in countries surveyed reported being up to date on a minimum set of preventive health measures, in contrast to an average of 80% in OECD countries (see Figure 7.2 and Guanais et al. [forthcoming]). In seven countries in the region, it was estimated that 20% of hospitalizations could be avoided with good primary care (Guanais, Gómez-Suárez, and Pinzón, 2012). Strengthening the response capacity and quality of early care levels, as a gateway to the health system, can reduce the need for complex and expensive services (OECD, 2010; Smith, 2012).

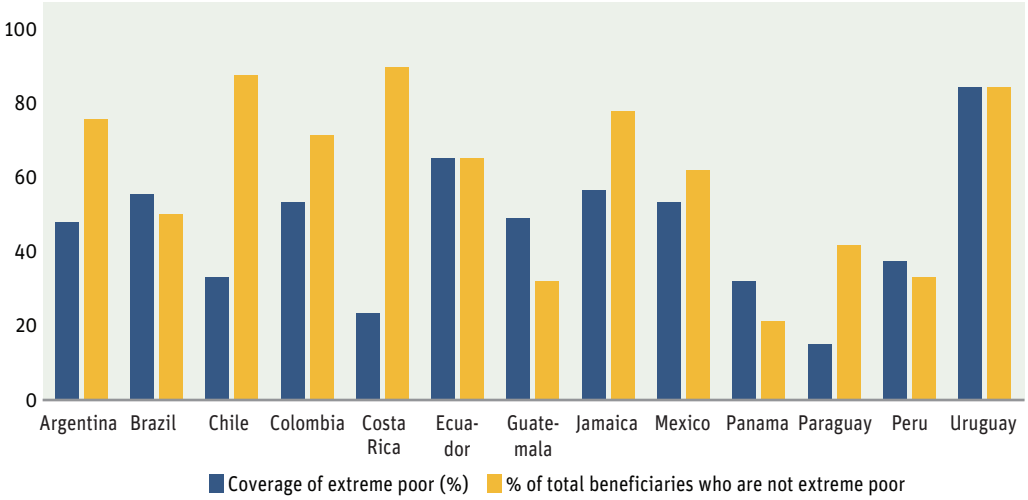
Social Protection: Conditional Cash Transfer Programs (CCTs)

Since the 1990s, when cash transfers were complemented with co-responsibility mechanisms to encourage human capital accumulation, CCTs have expanded rapidly in the region. In 2010, approximately 129 million individuals in 18 countries in Latin America and the Caribbean—24% of the population—were receiving transfers that represented, on average, 20–25% of family income. CCTs have been effective in reducing the incidence and especially the intensity of poverty. They have also improved school attendance and reduced child labor, contributing to school progression (see Levy, 2009; Fiszbein and Schady, 2009; Saavedra and García, 2012). And they have promoted the use of health services and reduced mortality for specific age groups (Gaarder, Glassman, and Todd, 2010).

However, at least three issues need to be addressed. First, expansion of coverage has led to more benefits being received by the extreme non-poor, while the coverage of the extreme poor is below universal. Thus, although in general CCTs have achieved better targeting than previous programs, there are ongoing challenges of program leakage and under-coverage, as shown in Figure 7.3 and Stampini and Tornarolli (2012). To maintain their effectiveness as a tool to combat poverty, CCTs should prioritize targeting the poorest groups, particularly in rural areas where poverty is chronic.

Second, in several countries the real value of transfers, measured as a percentage of household income beneficiaries, has increased to 40% of household income (Stampini and Tornarolli, 2012; Levy and Schady, 2013. Transfer levels should be reasonably modest in magnitude (no higher than 20–25% of average household income of beneficiaries before the transfer). Increases in transfer levels should be carefully considered in the context of the potential for negative incentives for

FIGURE 7.3 CONDITIONAL CASH TRANSFER PROGRAMS IN LATIN AMERICA AND THE CARIBBEAN



Source: Stampini and Tornarolli (2012).
Note: CCTs are conditional cash transfers.

labor supply. Finally, in some countries benefits have been made contingent on the form of workers' participation in the labor market, in particular on their informal status. This has led to incentives to remain informal, which is detrimental to workers' own income and the economy's productivity.

Training

Labor productivity is partly determined by the skills that an employee brings to the job and how these skills are used by the firm. Decades of poor educational policies have left the region with a stock of workers with relatively low skills, a major bottleneck both for the adoption of new technologies and the productive use of existing ones. Investing in workers can raise labor productivity and with it the potential for economic growth (Bassanini et al., 2005). Training may be particularly relevant during economic slowdowns, when the opportunity cost is lower.

All countries in the region implement labor taxes to finance training for workers, ranging from 0.25% in Uruguay to 3% of the total payroll in Jamaica. However, in many cases, there is little or no information on returns and accountability is lacking. A recent IDB study finds that on-the-job training appears to raise productivity, but only in the case of large firms. A one-percentage-point increase in the proportion of trained employees raises productivity by 0.8% in firms of more than 100 employees (Flores-Lima, González-Velosa, and Rosas-Shady, 2014). The study also shows that the vast majority of firms self-finance their training rather than use public resources. Only 14–19% of firms reported using public funds for training purposes in the last three years, while 78–94% reported using self-financing.[4] This underscores the need to revise the coverage, targeting, and relevance of the public tools that support on-the-job training in the region.

A greater impact could be achieved by investing these resources in: (i) developing mechanisms to align training with the needs of companies and workers; (ii) improving the quality of training offered; and (iii) establishing systems for monitoring and evaluation. An improvement in the quality of training would promote productivity gains, and potentially reduce job loss.

Education

During the last three decades, Latin America and the Caribbean has achieved enormous progress in school enrollment. Some countries in the region also saw modest progress in student learning. However, students from Latin America and the Caribbean continue to perform in the bottom quartile in the distribution of student test scores in most international assessments, notably the most recent Programme of International Student Assessment (PISA). In PISA 2012, the performance of students in the seven countries participating from the Latin American and Caribbean region was among the bottom 14 out of 65 countries (Bos, Ganimian, and Vegas, 2014).

[4] The range represents the difference between the average of small and large firms. In other words, 14% of small firms reported using public resources for training activities compared to 19% of large firms.

Poor performance in terms of quality contrasts with budgetary outlays. Spending on education has risen from 4.2% of GDP in 2000 to 5.6% in 2013 (ECLAC, 2014). Yet there is no consistent evidence that spending on inputs such as physical infrastructure, classroom technology, flexible education funding grants, or smaller class sizes improves students' learning outcomes. The effectiveness of teachers is the main lever to improve student learning and mounting evidence indicates that the performance of teachers in classrooms and the quality of teacher-student interactions determine learning outcomes (Hamre et al., 2014; Araujo et al., 2014). To improve the quality of teaching, the region may wish to consider: (i) introducing selective processes to recruit the most talented individuals into the teaching profession; and (ii) strengthening mechanisms to motivate teachers to perform at their best, including ongoing professional development and support, as well as instruments to reward teacher excellence. These factors need not imply more spending, but rather better-targeted spending.

In parallel, demographic trends in relation to students and teachers present an opportunity for efficiency gains. On the one hand, the overall composition of students will continue to shift away from primary school; on the other, approximately one-sixth of the teaching force will reach retirement age over the next five years. It will be important to monitor population shifts to plan appropriate class sizes, and deploy newly recruited teachers where needed and with the right skills. Given these changes, opportunities exist in some countries to reallocate spending more efficiently by merging classes, schools, and/or school districts.

In order to identify these opportunities, prospective expenditure monitoring requires strengthening various education data management systems (including censuses of students, teachers, schools, and student learning assessments). In turn, this will require institutional strengthening of education offices at all levels.

Promote Income Stability and Protection without Distorting Workers' Incentives

There are understandable incentives, particularly during economic downturns to extend the coverage of social insurance, and to protect workers against income loss. However, some such policies may inadvertently become permanent and be detrimental to long-run growth. This section discusses policy options that are compatible with promoting income stability while maintaining incentives for participation in the formal sector, to increase long-run productivity.

Improve protection for job loss

In general, the region has a precarious and truncated system of protection against job loss that increases the costs of downturns and impedes automatic income stabilization. Almost all countries in Latin America and the Caribbean have mandatory severance pay, but only eight provide unemployment insurance (11, if those including obligatory individual savings accounts are included). However, these instruments are only available to a select group of formal salaried

workers, which constitute only 42% of the workforce.[5] So, for most workers, there is no pre-established unemployment protection mechanism.

Under a severance system, the lump sum payment paid to a dismissed formal worker accumulates over time, and is only due in case of unjust dismissal, providing firms with incentives to shorten job tenure below optimal levels or enter into litigation regarding the cause for separation. A severance pay scheme may also generate distortions by encouraging firms to hire permanent workers under temporary contracts, which has been shown to reduce productivity (Dolado and Stucchi, 2008). There is considerable scope to improve the coverage and design of employment protection instruments toward those that enhance long-run productivity, such as unemployment insurance, and away from those like severance pay, which can inadvertently hinder productivity and discourage the creation of formal employment.

Unemployment insurance can help families smooth income loss while providing consistent incentives for workers and firms with respect to on-the-job training and the retention of experienced, productive workers. A reform of severance policies would lower the labor cost associated with uncertainty arising from the high degree of litigiousness which, in turn, would promote more formal employment of longer duration. The increase in formal employment contracts of indefinite duration would have the added benefit of improving the coverage of contributory pension and health programs, providing more fiscal space in the long run. In turn, more formality and a lower degree of temporary employment would generate productivity gains.

For formal workers, there are advantages to moving away from a standard severance pay instrument to a mixed instrument that includes compensation, in case of dismissal or layoff as well as individual accounts, funded by companies (and possibly workers) that would be available to the worker in case of voluntary resignation or dismissal. The pre-savings will improve the effectiveness of the instrument, particularly in economic downturns.

A complementary action would be to strengthen public employment services so that unemployment insurance and severance pay/individual accounts can be linked with active policies for training and job placement. Programs can be integrated through "single windows," which consolidate services and provide synergies to job seekers with the ultimate objective of achieving rapid and effective reintegration of workers.

In the event of a crisis, temporary employment programs (TEP) or public works are often aimed at workers without certification and/or very low skills. These can be effective in providing protection for income loss for informal workers, but they should be careful not to detract from laying the groundwork for effective systems of protection in the long term; that is, from promoting formality. It is also important to learn from past experience with TEPs: design projects that are straightforward to implement, minimizing administrative costs so that the bulk of the resources reaches the workers, and set a low transfer level that incentivizes the self-targeting of labor supply (entry and exit of work).

5 Mean for 19 countries in 2013, from the IDB Labor Market and Social Security System of Indicators. The figure represents the proportion of formal salaried workers in relation to the total active population (employed and unemployed workers).

Reduce labor taxes to promote formal sector jobs

As reviewed in the previous chapter, raising taxes may not be the most appropriate form of fiscal adjustment. This is particularly true for labor taxes that tend to promote informality. Indeed, there is a negative relationship between the cost of labor and the rate of formal job creation, and while this elasticity varies from country to country, it is clear that higher taxes on labor can lead to a destruction of formal employment (Bosch, Melguizo, and Pagés, 2013). As reviewed in the 2014 Latin American and Caribbean Macroeconomic Report, lowering labor taxes may enhance productivity and medium-term growth, in part by reducing informality.

Promote female labor force participation

Enhancing female participation in the labor force may also enhance productivity, as well as promote gender equality and increase income per capita. Estimates from the region indicate that the loss from low female participation ranges from 3.4% of GDP in the case of Mexico to 17% of GDP for Honduras (Mateo Díaz and Rodríguez-Chamussy, 2015). Estimates for OECD countries include 5% of GDP for the U.S. and 9% of GDP for Japan (Elborgh et al., 2013). Although Latin America and the Caribbean is the region experiencing the highest growth in female labor force participation in the world (increasing from 49% in 2000 to 54% in 2013), participation levels for women still lag behind those in East Asia and the Pacific (54% against 63% for 2013). Younger cohorts of women are achieving similar or higher levels of educational attainment than men in most countries of the region. Investing in quality childcare and after-school programs, promoting flexible job arrangements, and revising labor and social insurance legislation to ensure equal treatment of women can lower barriers and, in turn, further promote labor insertion.

Exercise Caution with Respect to Creating Potentially Costly and Irreversible Commitments

As discussed in the previous chapter, measures considered by policymakers as temporary may, due to political economy reasons, become very difficult to change, thus creating irreversible commitments. Moreover, some such policies may be extremely costly, especially considering the demographic changes facing the region. This section discusses some selected policies that are particularly vulnerable in this regard.

Minimum wage policies

Minimum wages continue to grow in real terms in Latin America and the Caribbean, generating important gains for some workers. However, minimum wages also generate losers: those who cannot find formal employment, or any employment, given the higher labor costs associated

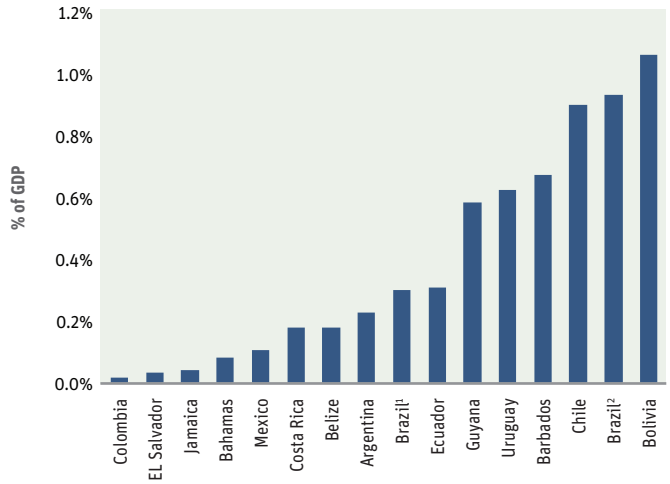
with the minimum wage. A substantial proportion of the salaried workforce receives wages below the minimum in the region, ranging from 15–17% in Mexico and Uruguay, respectively, to 61% in Guatemala and 74% in Honduras. These figures increase as the level of the minimum wage increases in relation to the average wage. As such, it is important to exercise caution before raising the level of the minimum wage to avoid increasing unemployment and reducing formal employment, both of which hurt long-term growth and productivity, to the detriment of workers themselves.

Adjustment mechanisms and levels for non-contributory pensions

Only four in 10 adults aged 65 and older receive a contributory pension in Latin America and the Caribbean. Low coverage of contributory pensions has led to a rapid expansion of so-called non-contributory pensions (NCPs), even though, of course, in the end somebody must pay. This has allowed coverage of older adults receiving a pension to expand. All countries have instituted some form or other of a non-contributory pension (NCP) to address poverty in old age. Taking both together, the proportion of older adults who receive a pension increases from 4 to 6 out of 10, and the number of people receiving an NCP continues to increase rapidly in the region.

While this is positive from the point of view of poverty reduction, if appropriate measures are not taken, NCPs may become unsustainable from a fiscal and economic perspective. This reflects both the weight of demographic trends and the incentives to refrain from contributing to pensions that NCPs can generate. In the next 35 years, the proportion of adults aged 65 and over will increase from 7% to 20% of the total population. In light of this change in the age structure, fiscal costs of NCPs will triple. It is therefore important to establish measures to safeguard their sustainability. As can be seen in Figure 7.4, considerable heterogeneity currently exists across countries in the transfer level of NCP. While among eight countries the total cost of NCPs is currently less than 0.5% of GDP, in Bolivia expenditures are more than double that at over 1% of GDP. If the current

FIGURE 7.4 PUBLIC SPENDING ON NON-CONTRIBUTORY PENSIONS IN 2012 (PERCENTAGE OF GDP)



Source: Bosch, Melguizo, and Pagés (2013).
[1] Brazil's Workers Continuation Pension Scheme (Benefício de Prestação Continuada).
[2] Brazil's Rural Pension Scheme.

pension is adjusted in real terms, current spending on NCPs will go from approximately 1% in Bolivia and rural Brazil to over 2% or 3% of GDP by 2050 (Bosch, Melguizo, and Pagés, 2013). In this context, it is critical to design automatic adjustment mechanisms and strong institutions capable of safeguarding the amount of pensions against short-term pressures associated with the political process.

In addition, if they are not designed correctly, NCPs can produce undesirable incentives. This is particularly the case when eligibility for an NCP is limited to individuals who do not have a contributory pension; this can provide a disincentive to participate in contributory pensions, and increase informality, which is clearly undesirable from the point of view of productivity. More broadly, it is important to integrate the non-contributory and contributory pension pillars and seek to increase the coverage of the contributory system. *Mutatis mutandis*, similar remarks can be made of non-contributory health insurance programs.

CHAPTER 8

Conclusions and Policy Suggestions

While the global economy, boosted by recent stronger growth in the United States, is expected to recover, Latin America and the Caribbean will enjoy only a moderate recovery in growth, to rates well below those for 2003–08. The recent fall in oil prices may help but is not expected to boost growth enough to fundamentally change this outlook. Moreover, there are risks of further delays in recovery particularly in Europe and in Japan, while growth in China may be slower than expected.

Latin America and the Caribbean, then, faces several years of relatively low growth, coupled with some potentially serious related challenges. The analogy employed in this report is that of a labyrinth complicated by a set of global economic obstacles that the region must successfully navigate to find an appropriate exit and realize stronger economic prospects.

The first obstacle is the anticipated rise in U.S. interest rates. However, this will be accompanied by expansionary conventional and unconventional monetary policy in Europe. Divergent global monetary policies may provide some opportunity for continued low-cost financing by switching from dollars to euros, although historical patterns suggest that for Latin American and Caribbean firms, this is likely to be limited and unsystematic, implying that higher U.S. rates are indeed likely to raise the cost of finance.

A second set of obstacles relates to firms' balance sheets and the financial sector. Weaker balance sheets, increased bond issuance, and growing amortizations in U.S. dollars—just as the dollar is expected to appreciate—may indicate greater risks and should be monitored carefully. Moreover, as these firms are the clients of local financial systems, there may be knock-on effects for financial stability. Moreover, as U.S. interest rates rise firms may withdraw liquid assets to pay external obligations creating funding pressures for banks. Bank solvency ratios, however, are solid and have been remarkably stable but as banks adjust to ensure capital buffers are maintained, a feedback effect onto the real economy is likely. There remains imperfect information on firms' currency mismatches and on the impacts of bank pro-cyclicality and, as credit markets have now grown to be a significant size, these are important areas for future monitoring and research.

These risks also have potential repercussions for monetary policy. The ability of the larger economies of the region to use exchange rate depreciation to react to negative shocks has been a significant achievement. However, inflation is above targets in several cases and the

aforementioned balance sheets may constrain this response in the future. As output gaps have fallen, monetary policy is in a delicate balance and the trade-offs have become tougher. Central banks will wish to maintain valuable and hard-won credibility in the face of rising prices, in order to be able to deploy monetary policy effectively in the future.

A third obstacle is the region's fiscal position, as actual and structural fiscal balances have weakened. This has been due largely to rising fiscal expenditures in areas that have proven to be inflexible. The region has witnessed a prolonged period of fiscal expansion, driven in part by the response to the global financial crisis, and perhaps by lower financing costs and higher commodity revenues in some countries. For countries at or close to potential output with relatively large structural fiscal deficits, it is clearly time to adjust and, indeed, some have begun to do so. And for those with negative output gaps but where debt is relatively high and rising, fiscal adjustment is also in order. Only those countries with negative output gaps and relatively little debt that is not rising quickly should consider counter-cyclical fiscal policy. In this latter small group of countries, careful analysis is required to ensure that truly counter-cyclical policies are being contemplated.

For the majority of countries in the region, fiscal adjustment is required. The precise composition of such an adjustment will depend on a set of country characteristics. For many countries with high tax revenues, raising taxes that tend to distort economic incentives may be counter-productive and only lowering expenditures may be successful in reducing debt. In some countries, however, where public spending is low, widening the tax base or improving the efficiency of tax administration may be the first appropriate policies to consider. In many countries, there is room to improve the efficiency of public spending, including through better targeting. The recent declines in commodity prices may also offer potential opportunities. In some countries, fuel subsidies are large; thus, lower oil prices provide an opportunity to cut those expenditures and address the regressivity that usually characterizes those programs. In other countries, there are no subsidies as such, but there is an opportunity to introduce or increase taxes such that the fall in the oil price is only partially passed through to households and firms. This could yield substantial fiscal revenues and may also advance environmental goals by providing incentives to develop cleaner energy. However, for those countries that rely on commodities for fiscal revenues, the net effect of the recent price decline is likely to underline the need for adjustment.

The timing and speed of fiscal adjustment are also important considerations. In a country where adjustment is required but where there is no negative output gap, fiscal multipliers are likely to be low; if interest rates are high, adjustment should be swift to minimize the amount of adjustment actually needed. But for a country with a negative output gap and a higher fiscal multiplier, it may be advisable to wait to minimize the impact on growth; if interest rates are relatively low, then the size of the adjustment required may not increase by too much. However, several countries in the region combine a negative output gap with higher interest rates. Here, the appropriate speed is finely balanced: too fast and growth may be threatened, but too slow

and higher interest rates imply more required adjustment. Maximizing the predictability and credibility of the adjustment process would help, as this would likely imply lower interest rates and, hence, reduce the amount of adjustment needed.

While fiscal adjustment is needed in many countries and may be viewed as a considerable obstacle, measures exist to protect the important social gains of recent years and enhance productivity. There is considerable space to improve the efficiency of social spending in many sectors including health, education, training, and anti-poverty programs. Compared to other regions, Latin America and the Caribbean lags in terms of the efficiency of spending in these areas, and outcomes can be improved for similar expenditure levels by improving targeting and enhancing monitoring, control, and evaluation. There are also opportunities to provide better income stability for workers at the same time while reducing disincentives for participation in the more productive, formal labor market. Appropriate reforms could then actually boost income and growth. Finally, there is a set of policies for which extreme caution should be exercised. Some of these policies may seem attractive in the short term, but they could prove very difficult to reverse politically. Consequently, they may become extremely costly, particularly given demographic changes under way in the region.

This report has focused on a number of obstacles facing the region. In order to continue to support adequate growth, improve living standards, and preserve social gains, the region must navigate these challenges and pursue more fundamental reforms. The region needs to boost underlying productivity to obtain medium-term growth rates on a par with other successful regions. Evidence suggests that there is ample space to improve policies, obtain a greater impact with the same amount of resources, and enact reform measures that have significant effects on growth.

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APPENDIX A

Econometric Models for Commodity Prices

There are many ways to model commodity prices. In this report, a set of error correction models are developed for real prices for five commodities. These models allow for the detection of long-run determinants, as well as analysis of short-run dynamics. The results of the estimated models are reported, the main features of the econometric specification are described, and the assumptions for the price projections included in Chapter 3 are detailed.

Econometric Specifications

The error correction models (ECM) estimated for projections were obtained following a general-to-specific approach. An advantage of ECMs is that they provide a natural way to consider both long-run and short-run behavior. Moreover, in this context they may incorporate the impact of changes in supply, demand, and the effects of changes in inventories and financial variables. The ECM approach allows for variables to be specified in levels and/or in changes depending on the level of integration of the variable and the cointegrating (equilibrium) relationships.[1] Table A1 gives the in-sample, coefficient estimates of equations for each real commodity price.

The data are quarterly and all variables are expressed in logs and in real terms. The estimated models are theory consistent and pass all diagnostic tests at traditional levels.[2] The data sources and definitions are provided in Table A2.

For the variables that entered the models as part of the long-run relationship, a system was also estimated following the approach of Johansen (1996). These results indicated that there is one co-integration vector in which commodity prices adjust to deviations from the long run. Note that weak exogeneity of the levels of production and of inventories was not rejected.[3]

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[1] The significance of the error correction adjustment coefficients were tested by using non-standard critical values from Ericsson and MacKinnon (2002) and see Ahumada, Cornejo and Powell (unpublished).

[2] The reported long-run coefficients correspond to the solved solution of the unrestricted level estimates. Insignificant auto-regressive terms are left due to autocorrelation.

[3] Weak exogeneity is required to obtain valid coefficient estimates in single conditional models, which are then used for conditional projections of commodity prices.

TABLE A1 IN-SAMPLE QUARTERLY ESTIMATIONS OF THE ERROR CORRECTION MODELS

Commodity: (dependent variable: Δ pie: change in real price)	Copper	Oil	Corn	Soya	Wheat
Constant	−4.26**	21.71**	9.38**	0.25**	6.54**
Speed of adjustment	−0.24**	−0.37**	−0.31**	−0.26**	−0.42**
Long-run effects					
U.S. real exchange rate, e_{t-1}	−4.62**	−1.87**	−3.94**		−3.11**
OECD's Gross Domestic Product, GDP_{t-1}^{OECD}	4.19**				1.14**
Production, Q_{t-1}	−2.19**	−2.50**	−1.73**		−1.74**
Stock-to-production ratio, S/Q_{t-1}	−0.12**				
Inventories, inv_{t-1}		−6.93**			
U.S. credits, FOF_{t-1}		3.74**			
China's Gross Domestic Product, GDP_{t-1}^{CHINA}			0.54**		
Real corn price, p_{t-1}^{CORN}				0.95**	
Short-run effects					
Δp_{t-1}	0.26**			0.37**	0.13**
Δp_{t-2}				−0.17**	
Δp_{t-5}				0.12**	
Δp_{t}^{CORN}				0.47**	
Δp_{t-1}^{CORN}				−0.37**	
U.S. real exchange rate growth, Δet	−1.82**				−1.02**
U.S. monetary base annual growth, $\Delta 4mb_{t-1}$	0.17**				
OECD's GDP annual growth, $\Delta 4GDP_{t}^{OECD}$	1.69**				
China's investment annual growth, $\Delta 4I_{t}^{CHINA}$	0.72**				
World oil reserves annual growth, $\Delta 4R_{t-1}$		−0.73**			
U.S. fuel ethanol production growth, $\Delta Q_{t-k}^{ethanol(a)}$		−0.25**	0.18**		
Real 3-month interest rate growth, Δi^{3m}_{t}		−0.09**			
Real 3-month interest rate annual growth, $\Delta 4i^{3m}_{t}$			−0.08**		−0.08**
Inventories growth, Δinv_{t}			−0.77**		
U.S. credits growth, ΔFOF_{t}			3.07**		
Production growth, ΔQ_{t}					−2.28**
$\hat{\sigma}$	0.068	0.070	0.083	0.043	0.076
Sample period	1995Q1–2014Q4	1996Q1–2014Q4	1994Q1–2014Q4	1994Q1–2014Q4	1994Q1–2014Q4

(continued on next page)

TABLE A1 IN-SAMPLE QUARTERLY ESTIMATIONS OF THE ERROR CORRECTION MODELS *(continued)*

Commodity: (dependent variable: Δ pie: change in real price)	Copper	Oil	Corn	Soya	Wheat
Diagnostic tests (p-values are reported)					
Autocorrelation	0.85	0.24	0.67		0.60
Normality	0.65	0.76	0.51		0.42
Heteroskedasticity	0.14	0.74	0.68		0.52

Notes: ** p<.01, *p<.05.
[a] k=2 for crude oil and k=5 for corn.

Given the observed cross-dependence between corn and soya prices, their individual ECMs were enriched by estimating a simultaneous ECM that considered the interactions between them (see Ahumada and Cornejo [forthcoming] for further discussion).

There have been large recent changes in commodity prices, outside standard bounds. Analysis was then conducted to determine the appropriate introduction of impulse and step dummies (see Hendry, 2006). In the case of crude oil prices, a step dummy since 2014Q4 was included; a step dummy in the change in corn prices was included since 2013Q3; and an impulse dummy (2014Q1) was included for the growth rates of soya prices.

TABLE A2 DATA DEFINITION AND SOURCES

Symbol	Description	Source
P	Real commodity price	Pink Sheet, World Bank
Q	World production	USGS, USDA
inv	Inventories	Comisión Chilena de Cobre, USDA, EIA
R	World oil reserves	EIA
$Q^{ethanol}$	U.S. fuel ethanol production	EIA
GDP^{CHINA}	China's real GDP	National Bureau Statistics of China
GDP^{OECD}	OECD's real GDP	OECD Statistics
I^{CHINA}	China's Gross Fixed Capital Formation	IMF-IFS
i^{3m}	3-month Treasury constant maturity rate	U.S. Federal Reserve Board
e	U.S. real exchange rate	U.S. Federal Reserve Board
FOF	U.S. total credits from flow of funds	U.S. St. Louis Federal Reserve Bank
mb	U.S. monetary base	U.S. Federal Reserve Board
CPI^{US}	U.S. consumer price index, 2005 = 100	IMF-IFS
CPI^{CHINA}	China's consumer price index, 1993 = 100	IMF-IFS

Macroeconomic and Commodity Market Assumptions

The projections for commodity prices are conditional on a set of assumptions for the macroeconomic and commodity market variables that enter each model. The estimated or forecasted values of the main determinants of commodity prices are obtained from official or international institutes when available (e.g., IMF's WEO, OECD, FAO) for a baseline scenario. Table A3 summarizes these assumptions. If these variables turn out to be different, then the projected commodity prices will change.

The growth in the U.S. monetary base and in the U.S. real total credits (from the U.S. flow of funds) are assumed to follow projected U.S. GDP growth; that is, the ratio of the monetary base to U.S. GDP and the ratio of total credit to U.S. GDP are assumed constant. Perhaps the most important assumption, given the coefficient estimates, is for the U.S. real broad exchange rate. It is assumed that during 2015, it will stay at its 2014Q4 level and starting in 2016, it will follow the consensus forecast, as reported in Bloomberg. Commodity prices measured in dollars are highly sensitive to movements in the U.S. exchange rate.

TABLE A3 MACROECONOMIC AND COMMODITY MARKET ASSUMPTIONS

Variable (annual growth, %)	2015	2016	2017	2018	Source
Crude oil inventories	2.44	0.57	–1.05	–0.09	EIA + Model since 2017
Crude oil production	0.87	0.58	–0.56	0.10	EIA + UC since 2017
Crude oil reserves	2.78	2.78	2.78	2.78	UC
Copper production	2.34	3.40	3.40	3.40	Mean reversion to avg. growth rate
Copper stock-to-production	0.00	0.00	0.00	0.00	No annual growth
Corn production	0.09	1.00	1.97	1.83	USDA + FAO since 2016
Soya production	9.89	2.14	1.84	2.11	USDA + FAO since 2016
Wheat production	1.71	0.53	0.40	0.77	USDA + FAO since 2016
OECD's GDP	2.80	2.33	2.86	2.15	OECD + WEO since 2016
China's GDP	6.80	6.30	6.63	6.42	WEO
China's I	5.98	5.22	5.57	5.41	WEO
Fuel ethanol production	–5.75	0.00	1.22	0.00	EIA
RER	3.01	–0.27	–0.43	–0.43	Assumption
Real 3M interest rate	1.40	0.00	0.00	0.00	Assumption
Credits—FOF	3.60	3.30	2.95	2.73	WEO (= U.S. GDP growth)
U.S. monetary base	3.60	3.30	2.95	2.73	WEO (= U.S. GDP growth)
U.S. CPI	2.13	2.14	2.21	2.12	WEO

Notes: For China's Investment (annual growth): $\Delta 4\ln(I) = \Delta 4\ln(I/GDP) + \Delta 4\ln(GDP)$.

For world copper production, it is assumed that the annual growth rate will revert to its historical average by 2016 after the low growth rate of 2014, and the world's stock-to-production ratio is assumed to remain constant.

For U.S. fuel ethanol production, forecast values from the U.S. Energy Information Administration (EIA), reported in the Annual Energy Outlook 2014, were used. As regards oil inventories, the forecast values of OECD countries reported to 2016 Q4 in the Short-Term Energy Outlook of January 2015 by EIA, were employed. From 2017, projected values from an estimated model of crude oil inventories were used; this secondary estimated model is not reported.

A linear trend estimated by Unobserved Components (Harvey, 1985) was employed for the projections of oil reserves. For crude oil production, the projected values by EIA until 2016 were used and a linear trend thereafter.

For corn, soya, and wheat production, the USDA's estimated values for 2014–15 were used along with OECD-FAO projections since 2016, which correspond to the Agricultural Outlook 2014–2023 report of July 2014. A model was developed to estimate corn inventories; again, this secondary estimated model is not reported.

The commodity price projections were compared with those from other organizations (see Table A4). All values are expressed in nominal price annual changes. The cumulative changes from 2014–18 are comparable in most cases, although *The Economist* is more optimistic, and the baseline projections in this report are the most pessimistic for soya and corn. In some cases, the time path is different; for example, in the case of oil, some other organizations project a sharper rebound in prices, although in the end the cumulative change to 2018 is comparable. The cumulative changes in the Delayed Recovery Scenario (a one-half negative standard deviation growth shock for Europe, Japan, and China) are the most pessimistic of all the projections considered.

TABLE A4 BENCHMARK PROJECTIONS 2015–2018

Commodity	Forecaster	2015	2016	2017	2018	Cumulative 14'/18'
Crude oil	*The Economist*	–45.9%	32.3%	21.1%	9.2%	–5.3%
	World Bank	–44.7%	5.2%	5.1%	5.0%	–35.8%
	IMF	–41.1%	12.6%	6.4%	4.4%	–26.3%
	A – Baseline	**–44.4%**	**–13.5%**	**12.7%**	**28.0%**	**–30.6%**
	B – Delayed Recovery	**–47.9%**	**–18.3%**	**2.7%**	**7.7%**	**–53.0%**
Copper	*The Economist*	–2.0%	6.7%	1.4%	0.6%	6.7%
	World Bank	–5.1%	–1.4%	–1.2%	–1.1%	–8.6%
	IMF	–9.1%	–0.8%	–0.4%	–0.4%	–10.6%
	A – Baseline	**–12.7%**	**–2.0%**	**6.2%**	**6.5%**	**–3.2%**
	B – Delayed Recovery	**–16.5%**	**–13.7%**	**–4.3%**	**12.2%**	**–22.7%**
Soya	*The Economist*	–16.5%	0.9%	1.8%	12.8%	–3.3%
	World Bank	–8.2%	–0.5%	–0.2%	0.0%	–8.8%
	IMF	–19.1%	–0.9%	–1.0%	0.0%	–20.7%
	A – Baseline	**–19.3%**	**–11.1%**	**–1.2%**	**2.9%**	**–27.0%**
	B – Delayed Recovery	**–17.1%**	**–11.0%**	**–7.1%**	**–4.8%**	**–34.7%**
Corn	*The Economist*	–11.4%	4.8%	4.5%	7.5%	4.4%
	World Bank	–6.5%	0.1%	0.4%	0.5%	–5.6%
	IMF	–16.7%	4.9%	–0.6%	0.0%	–13.2%
	A – Baseline	**–15.5%**	**–3.6%**	**2.1%**	**3.1%**	**–14.3%**
	B – Delayed Recovery	**–10.9%**	**–6.8%**	**–6.3%**	**–4.1%**	**–25.3%**
Wheat	*The Economist*	–6.7%	3.5%	6.0%	0.6%	3.1%
	World Bank	–1.5%	–2.0%	–1.8%	–1.8%	–6.9%
	IMF	–23.7%	2.5%	–0.2%	–0.8%	–22.6%
	A – Baseline	**–16.9%**	**–1.3%**	**4.2%**	**1.8%**	**–13.0%**
	B – Delayed Recovery	**–18.9%**	**–6.0%**	**–1.1%**	**–0.8%**	**–25.2%**

APPENDIX B

Currency Substitution: Regression Analysis and the Role of Underwriters

Regressions to Analyze Currency Substitution in Bond Issuance

In order to obtain a measure of the elasticity of the euro share of bond issuance to euro-dollar spreads, regressions of the following type were run:

$$\Delta \ln (1+share_t) = \alpha \Delta ln\,(1+spread_{t-1}) + \beta LAC * \Delta ln\,(1+spread_{t-1}) + \vartheta ECA * \Delta ln\,(1+spread_{t-1}) + \delta EAP * \Delta ln\,(1+spread_{t-1}) + \gamma OECD * \Delta ln\,(1+spread_{t-1}) + \in_t$$

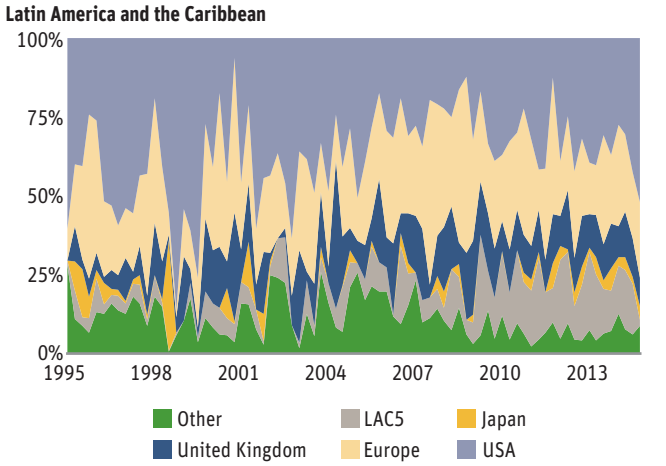
Where: $share_t$ = share of euro bond issuance over euro plus U.S. dollar bond issuance, and $spread_{t-1}$ can be expressed alternatively as:

- Standard Spread = euro one-year (three-months) interbank rates net of U.S. dollar one-year (three months) interbank rates, or
- Covered Spread = euro one-year (three months) interbank rates net of U.S. dollar one-year (three months) interbank rates and currency depreciation (stemming from the difference between forward and spot exchange rates)

Given that euro shares can be zero in a particular quarter, a value of 1 was added to the share value to avoid cases where the log of zero might be needed. Whenever the spread is negative, the log of the gross spread, i.e. ln(1+spread), is replaced by the negative value of ln(1-spread) to avoid cases of natural logs of negative numbers without altering the nature of the exercise. Changes in the spread are taken as the difference between spreads at the beginning of the present period vis-à-vis those prevailing at the beginning of the previous period. Country and quarter fixed effects were included as controls. For each regression, the corresponding spread is also interacted with regional dummies in order to capture potentially different responses across regions.

Currency Choice in Bond Issuance: The Role of Underwriters

FIGURE B.1 INTERNATIONAL BONDS: SHARES BY LOCATION OF UNDERWRITER



Source: Dealogic and IDB staff estimates.
LAC5: Brazil, Chile, Colombia, Mexico, and Peru

At the end of 2013, roughly 40% of total issuance was underwritten by U.S. banks, 20% by euro-area banks, 15% by U.K. banks and 12% by LAC-5 banks, with smaller shares by Japanese and other banks (see Figure B.1).[1,2] The three panels in Figure B.2 illustrate the currency composition of issuance for each group of banks given their location (U.S. banks, Euro-area banks and U.K. banks).[3] Panel A indicates that U.S.-based banks underwrote issues mostly in U.S. dollars, with very small issuance in euro or Latin American and Caribbean currencies. Indeed, the argument that banks in one location will naturally underwrite issues in the currency of that country or area does appear to hold for U.S. banks, but does not hold for the other underwriters. For example, Panel B shows that Euro-area banks also issue mostly in U.S. dollars, although euro issuance is proportionately larger than for U.S. banks. The same goes for U.K. banks that underwrote largely in U.S. dollars. These figures do not suggest a strong bias towards underwriting in the home currency of underwriting banks.[4] It could also be argued that Euro-area banks may be more sensitive to Euro-dollar spreads, but the correlations between currency shares and standard spreads for U.S. banks vis-à-vis those of Euro-area banks are similar to those reported in Chapter 4. They do not appear to depend on the location of the underwriter.[5]

1 LAC-5 banks represent the 5 countries in Latin America and the Caribbean with the largest shares in total underwriting (Brazil, Chile, Colombia, Mexico and Peru), which account for more than 90% of total issuance in the reion.

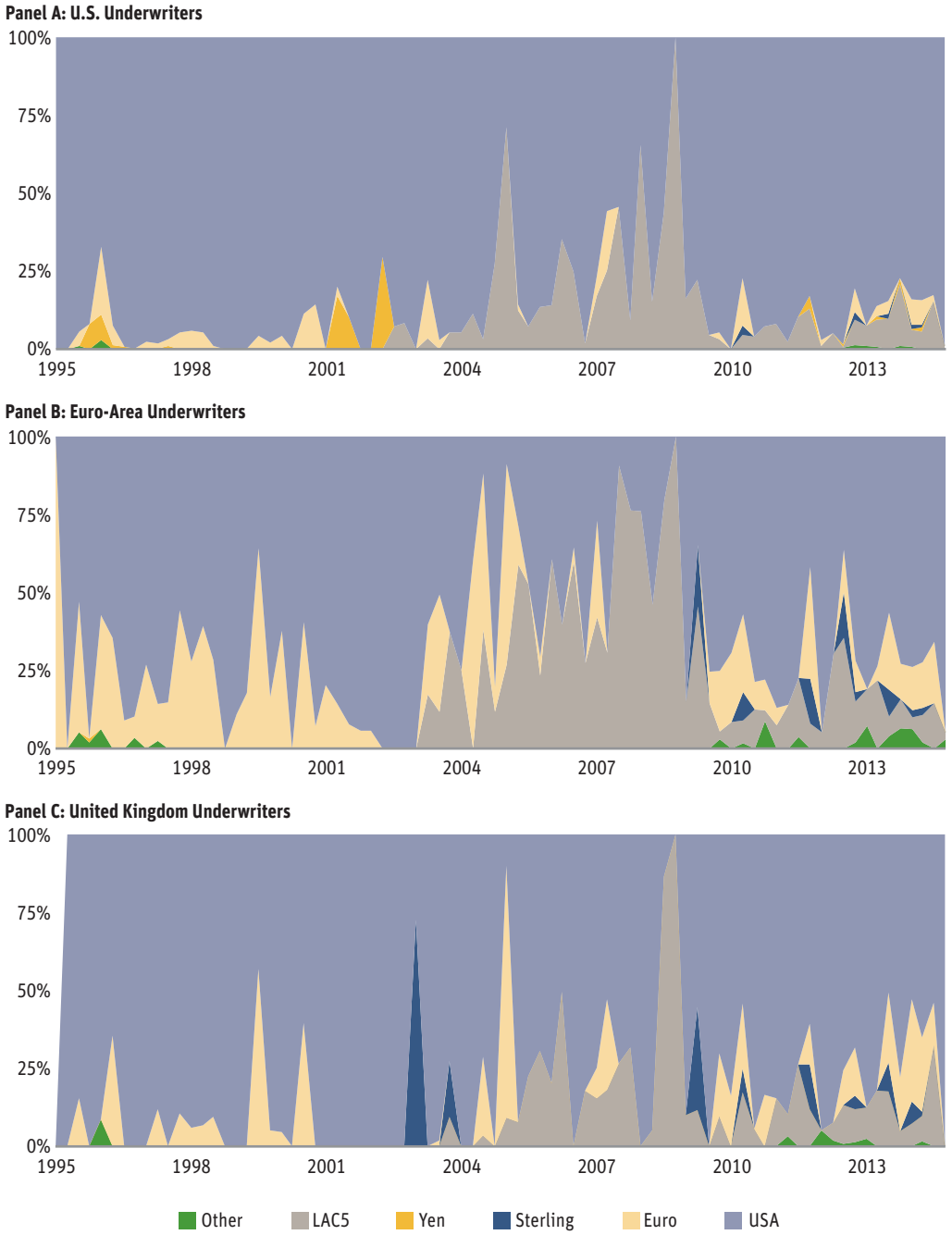
2 In the case of syndicated loans, Euro-area banks have the largest participation (30% of total issuance), followed by LAC-5 banks (18% of issuance), and U.S. banks (15% of issuance).

3 Banks are allocated to a particular area (U.S., Euro-area, etc.) based on the location of that bank's parent (i.e., for the case of a bank resident in Brazil, but whose parent is located in the U.S., the bank is considered U.S.-based).

4 Similar results are obtained for syndicated loans, as most issuance also takes place in dollars, independently of underwriter location.

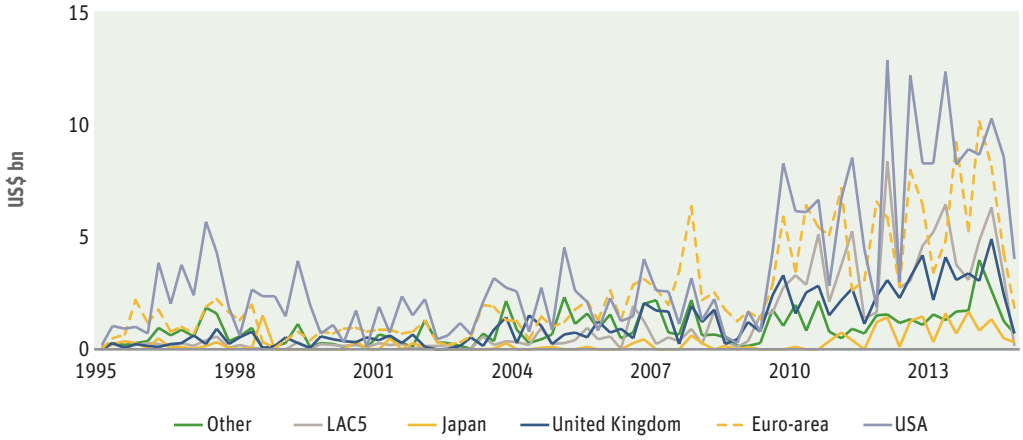
5 When using standard spreads, the correlation for U.S. banks is –0.15, while that for Euro-area banks is –0.28. When using covered spreads, the correlation is -0.4 for U.S.-based banks, and it even turns positive for European-based banks.

FIGURE B.2 INTERNATIONAL BONDS: CURRENCY COMPOSITION FOR U.S., EURO-AREA, AND U.K. UNDERWRITERS



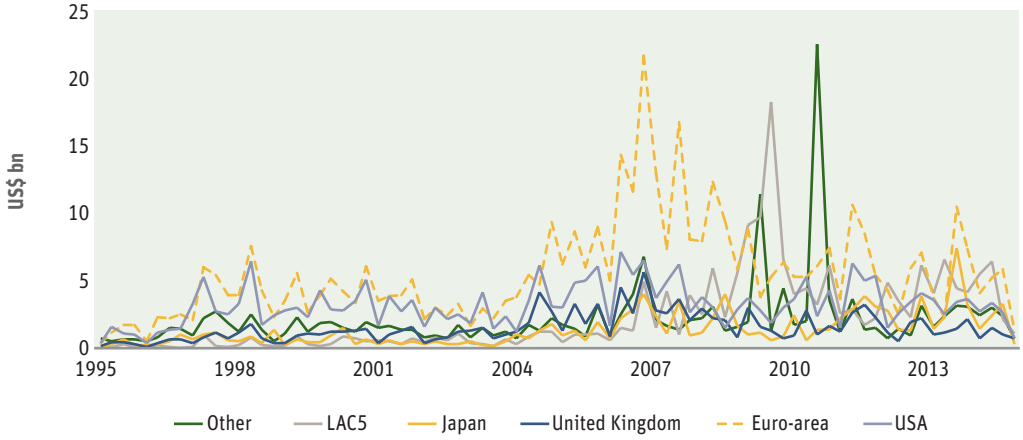
Source: Dealogic and IDB staff estimates.
LAC5: Brazil, Chile, Colombia, Mexico, and Peru

FIGURE B.3 INTERNATIONAL BONDS: ISSUANCE BY LOCATION OF UNDERWRITER



Source: Dealogic and IDB staff estimates.
LAC5: Brazil, Chile, Colombia, Mexico, and Peru

FIGURE B.4 SYNDICATED LOANS: ISSUANCE BY LOCATION OF UNDERWRITER



Source: Dealogic and IDB staff estimates.
LAC5: Brazil, Chile, Colombia, Mexico, and Peru

APPENDIX C

Inflation Gaps, Taylor Rules and Bank Capital

This appendix provides further background for Chapter 5. The first part contains an analysis of inflation and inflation expectations in the region. The second presents estimates of the pass-through from nominal exchange rates to domestic inflation. In the third section, estimates of a Taylor-type monetary policy rule for five inflation targeters in Latin America and the Caribbean are presented and employed to consider scenarios for the path of policy rates in 2015. In the fourth section, further background on firms' balance sheets is provided and in the fifth and final section, the way in which banks have maintained stable capital ratios in different countries is analyzed.

Inflation and Inflation Expectations in Latin America

Figure C.1 details the actual inflation rate and target bands centered around the actual target for inflation. As can be appreciated from the graph, actual inflation has trended higher in several cases and is close to or even above the upper band.

Table C.1 documents inflation expectations in the region based on the survey of inflation forecasts available in *Revela* for eight

FIGURE C.1 INFLATION GAPS IN SELECT INFLATION TARGETERS

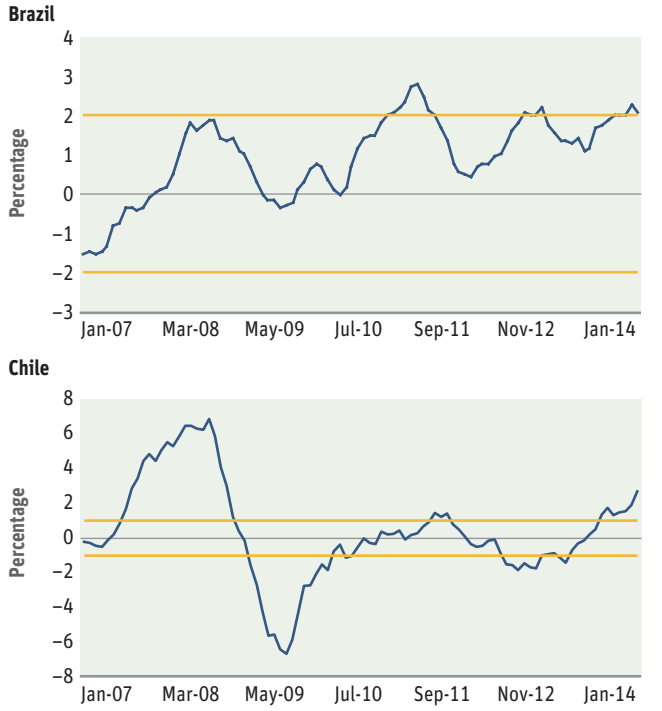


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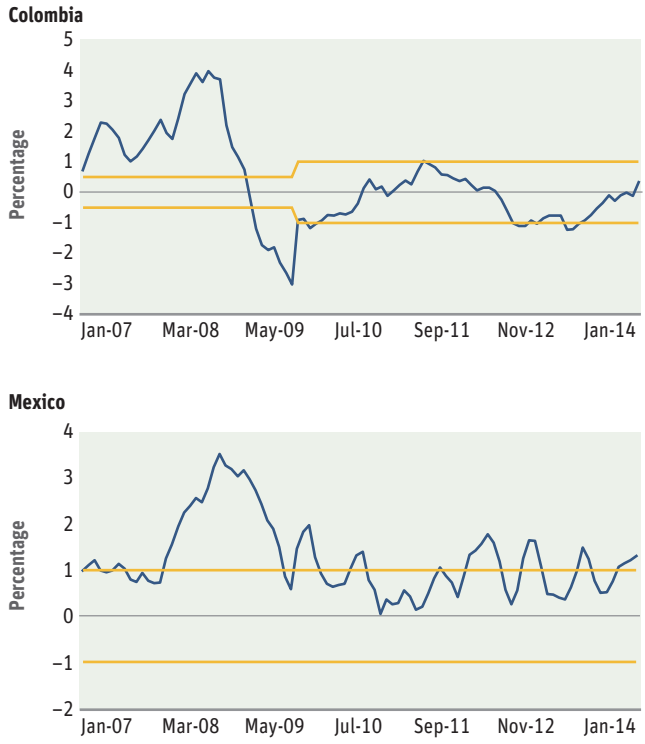
FIGURE C.1 INFLATION GAPS IN SELECT INFLATION TARGETERS



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countries.[1] The column "Target" corresponds to the inflation target fixed by every Central Bank in each country. The other columns in the table report average expectations in January and August of 2014, for inflation in 2014 and 2015.

In most countries (the exceptions are Guatemala and Mexico), inflation expectations for 2014 rose between January and August of that year. However, in many cases 2015 inflation expectations are lower than those of 2014, indicating that inflation expectations remain anchored in the medium term. Mariscal, Powell, and Tavella (2014) suggest

TABLE C.1 INFLATION EXPECTATIONS IN LATIN AMERICA

	2014 Inflation Expectations			2015 Inflation Expectations		
Country	Target	Expectations Jan-2014	Expectations Aug-2014	Target	Expectations Jan-2014	Expectations Aug-2014
Brazil	4.5	5.6	6.2	4.5	6	6.2
Chile	3	3	3.8	3	3	3
Colombia	3	2.8	3.3	3	2.9	3.2
Guatemala	4	4.7	4.0	4	5.0	4.3
Mexico	3	4.1	3.8	3	3.6	3.4
Peru	2	2.8	3	2	2.6	2.8
Paraguay	5	5	5.3	4.5	5.3	5.2
Uruguay	5	8.2	8.5	5	7.7	8.2

Source: *Revela* (Revelation of Expectations Database) and Central Banks.

[1] *Revela* documents inflation and growth expectations from inflation targeting countries in the region and is available at *www.iadb.org/revela*.

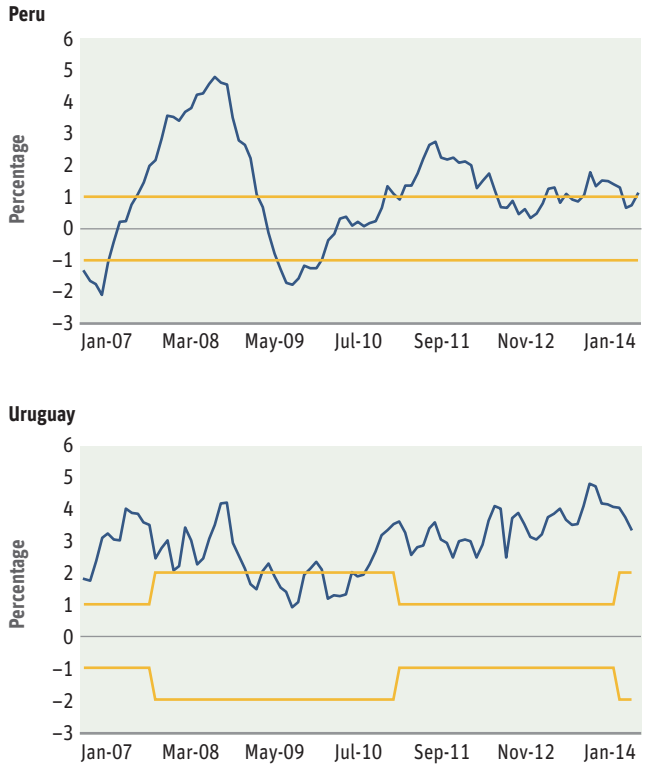
that inflation targeting has become more credible in Latin America as medium-term inflation expectations are less affected by shocks to current inflation. However, at the same time, in instances where inflation targets are breached, there is a cost in the sense that inflation expectations may become less anchored. Table C.1 is consistent with these findings.

Pass-Through in Latin America

One reason why inflation gaps have risen may be that as exchange rates have depreciated there has been greater pass-through to prices. Figure C.2 illustrates the pass-through over time from

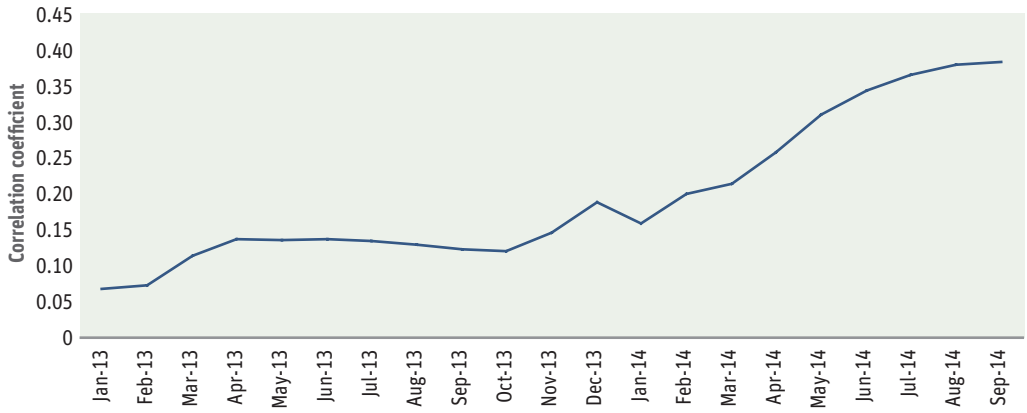
(continued)

FIGURE C.1 INFLATION GAPS IN SELECT INFLATION TARGETERS



Source: Latin Macro Watch (IDB).
Note: The observed inflation gap is the difference between observed inflation and the inflation target at the end of the year. Figures are centered around the target taken to be the mid-point of any band.

FIGURE C.2 PASS-THROUGH IN LATIN AMERICA AND THE CARIBBEAN



Source: Latin Macro Watch (IDB) and International Financial Statistics (IMF).

nominal exchange rate depreciations to domestic inflation by reporting the correlation between current inflation and the currency depreciation in the previous year, using a rolling-window of 24 months; i.e. every point in the figure represents the average of the correlation coefficient between the inflation from period *t*-23 to *t* and the depreciation in *t*-47 and *t*-24 for Brazil, Chile, Colombia, Mexico, Peru and Uruguay. Thus, every point in the figure was computed using 24 observations for inflation and 24 observations for depreciation.

There has been a remarkable increase in the correlation coefficient between inflation and depreciation. It has increased from close to 0.05 in January 2013 to almost 0.4 by September 2014. The upswing in inflation documented in Chapter 5 may indeed be related to the increase in pass-through.

Estimating Taylor-type Monetary Policy Rules in Inflation Targeters

The previous edition of the Latin American and Caribbean Macroeconomic Report and Barajas et.al. (2014) include estimations of the following Taylor type rule as a way to summarize the reaction function of central banks under an inflation targeting regime:

$$i_t = \alpha + \beta_{i-1} i_{t-1} + \beta_{\pi_{gap}} (E_t \pi_{t+1} - \pi_t^T) + \varepsilon_t$$

This policy rule postulates that the monetary authority adjusts the policy rate in period *t*, i_t, in response to the differential in the expected inflation rate $E_t \pi_{t+1}$ over the inflation target π_t^T—i.e. "the inflation gap" and the output gap x_t. In addition, since costs may be involved in introducing too much variability in the policy rate, interest rate smoothing is incorporated through the lagged values of the interest rate.

As in Barajas et.al. (2014), and Powell (2014), the output gap (x_t) is calculated against using the cyclical component of output estimated using a Hodrick-Prescott filter and the inflation gap is measured as the difference between inflation expectations and the inflation target. All policy rules are estimated separately using a monthly dataset for each country that starts at either the date when the inflation targeting regime was adopted or when all data is available, whichever is later.

Monthly output data are as follows: the monthly IPEA index from the Banco Central do Brasil (Índice de Atividade Econômica do Banco Central), available from January 2003 to September 2014; the monthly IMACEC (indicador mensual de actividad económica) from the Banco Central de Chile (from January 1990 to October 2014); the monthly IPIR (Indice de Producción Industrial) is taken from Banco de la República de Colombia (from January 1980 to September 2014); the monthly IGAE (índice global de actividad económica) is obtained from the Central Bank of Mexico (January 1993 to September 2014); the monthly GDP index from the Banco Central de Reserva del Perú (January 2003 to August 2014).[2] Monthly inflation expectations are taken from Latin

[2] All series of output were seasonally adjusted using the X-13 ARIMA-SEATS filter included in the R library "Seasonal".

TABLE C.2 ESTIMATED POLICY RULES IN LATIN AMERICA

	Brazil	Chile	Colombia	Mexico	Peru
Constant	0.18 (0.00)***	0.59 (0.00)***,	0.15 (0.04)**	–0.04 (0.42)	0.22 (0.00)***
β_{t-1}	1.79 (0.00)***	0.94 (0.00)***	1.37 (0.00)***	1.43 (0.00)***	1.39 (0.00)***
β_{t-2}	–0.91 (0.00)***	–0.2 (0.05)*	–0.33 (0.01)**	–0.55 (0.01)**	–0.21 (0.17)
β_{t-3}	0.17 (0.33)	–0.11 (0.29)	0.06 (0.65)	0.01 (0.98)	–0.28 (0.06)
β_{t-4}	–0.07 (0.4)	0.21 (0.00)***	–0.12 (0.12)	0.1 (0.3)	0.03 (0.69)
$\beta\pi_{gap}$	–0.03 (0.18)	0.57 (0.01)**	–0.02 (0.68)	0.1 (0.01)**	0.05 (0.16)
β_x	0.04 (0.00)***	0.19 (0.00)***	0.04 (0.35)	0.07 (0.00)***	0.04 (0.00)***
Sample	2003-Jan to 2014-Sep	1999-Sep to 2014-Oct	2000-Feb to 2014-Sep	2007-Jan to 2014-Sep	2003-Jan to 2014-Aug
Number of observations	141	182	176	93	140

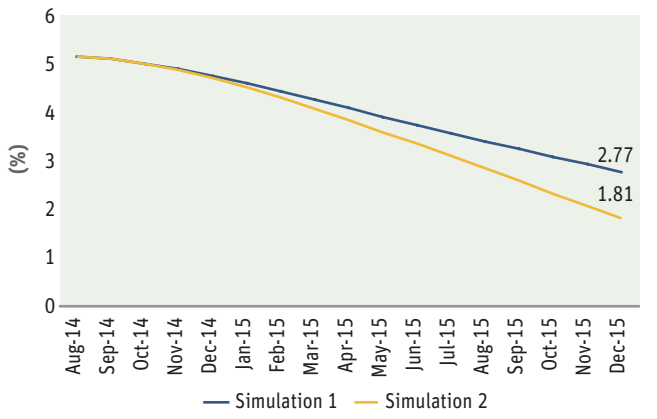
Source: IDB staff estimates.
* significant at the 10% level, ** at the 5% and *** at the 1%.

Focus Consensus Forecast until November 2013 and from *Revela* from this date on.[3] Four lags of the relevant variables were included to estimate the policy rate rule. The Ordinary Least Squares estimated coefficients are reported in Table C.2. The sample, including the number of observations, is reported for each country.

Using the estimated coefficients from the Taylor rules, two paths of the policy rate were simulated for every country for the period 2014.M11 to 2015M.12. Figure C.3 reports the average path of the interest rate across the countries in the sample. For all the countries, the simulation commences with the last observation of inflation and the output gap and it is assumed that the output gap decreases linearly (i.e.: equal changes in adjacent periods) until December 2015 when it is then 1 full percentage point below its starting value, i.e 1% below the last actual observation. In simulation 1, it was also assumed that the inflation gap remained constant at the same level of the last observation. In simulation 2, in contrast, it was assumed that the inflation gap followed a similar process to that of the output gap decreasing linearly until December 2015 when again it is 1 percent below its starting point. The difference between the two simulated paths for interest

[3] The monthly *Revela* database includes inflation expectations to December of the current year and for the following year. As in Barajas et al (2014), for the months of January to April, the expectation for inflation of the current year is used and for the months of May to December, the expectation of inflation in the following year is employed. *Revela* was augmented by the Latin Focus Consensus Forecasts in most countries except for the case of Mexico where only *Revela* data from January 2007 was employed.

FIGURE C.3 TAYLOR RULE BASED SIMULATIONS



Source: IDB staff estimates based on Revelations of Expectations in Latin America (IDB).

rates quantifies the extent to which having positive inflation gap may constrain central banks from reacting more vigorously to the deterioration in output gaps. The results indicate that monetary authorities may be constrained in reducing interest rates by as much as one percentage point (i.e., they may have reduced the policy rate by one full percent) if inflation does not decrease.

Banks' Capital Ratios: Channels of Adjustment

Bank regulatory capital ratios have remained remarkably stable despite significant increases in credit, the global financial crisis, recession in most countries and economic growth. How did banks achieve this feat and what might their behavior imply looking forward? Following Cohen and Scatigna (2014), the change in a bank's risk-adjusted capital ratio can be disaggregated into the change in total assets, the change in the ratio of risk-weighted assets to total assets (i.e., risk) and the change in capital itself as follows:

$$\frac{K_1/RWA_1}{K_0/RWA_0} = \frac{K_1/K_0}{\left(\frac{T_1}{T_0}\right)\left(\frac{RWA_1/T_1}{RWA_0/T_0}\right)}$$

where K_t is capital, RWA_t is risk-weighted assets, and T_t is total assets at time t. This equation decomposes the changes in the risk-weighted capital ratio between periods 0 and 1 into changes to capital, changes to total assets, and changes to the ratio of risk-weighted assets to total assets. Taking logs on both sides of the equation and then multiplying both sides by the normalizing factor

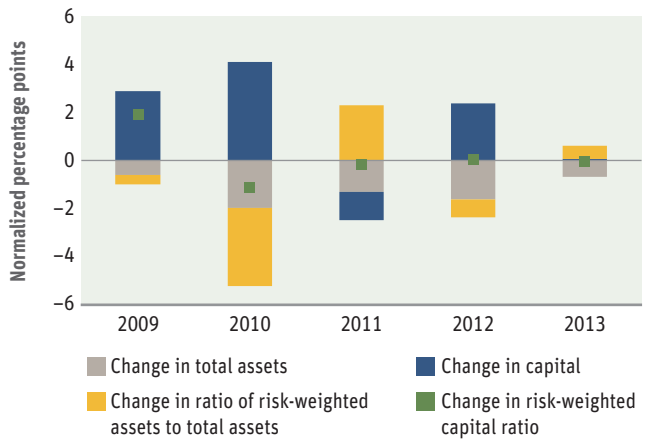
$$F = \frac{K_1/RWA_1 - K_0/RWA_0}{\ln(K_1/RWA_1) - \ln(K_0/RWA_0)}$$

the following equation is then obtained:

$$\frac{K_1}{RWA_1} - \frac{K_0}{RWA_0} = F\left\{\ln\left(\frac{K_1}{K_0}\right) - \ln\left(\frac{T_1}{T_0}\right) - \ln\left(\frac{RWA_1/T_1}{RWA_0/T_0}\right)\right\}$$

This last equation expresses the changes in risk-weighted capital ratios as percentage points of the base year risk-weighted assets. Figure C.4 shows regional weighted averages for this decomposition for a sample of Latin American and Caribbean banks.

FIGURE C.4 SOURCES OF ANNUAL CHANGES IN CAPITAL RATIOS (NORMALIZED PERCENTAGE POINTS)



Source: IDB staff estimates, Bankscope and methodology of Cohen and Scatigna (2014). The figure shows the decomposition of changes in capital ratios (total regulatory capital to risk-weighted assets) into its additive components. Changes are normalized to percentage points of risk-weighted assets of each preceding year. The overall change is shown by the black diamonds. The figure is based on data for 64 large banks in Brazil, Chile, Colombia, Mexico, and Peru. Bank-level changes are computed in constant local currency. Regional figures are then computed as weighted averages using assets in U.S. dollars of each previous year as weights.

Bank assets increased strongly as credit boomed and in 2011 and 2012 there was also a marked increase in risk, particularly for the cases of Brazil, Mexico, and Peru, reflecting strong gains in consumer and credit card lending.[4] These developments would have caused regulatory capital ratios to fall but in fact they remained fairly stable, even rising for some countries and in some years, as banks also increased actual capital. Where did the increase in capital come from?

The change in capital between an initial period (period 0) and a subsequent one (period 1) may stem from either retained earnings RE_t or changes in other capital Oth_t so the following formula maybe written:

$$\frac{K_1}{K_0}-1=\frac{RE_1+Oth_1}{K_0}.$$

Multiplying each side of this equation by the normalized log change in capital the following is obtained

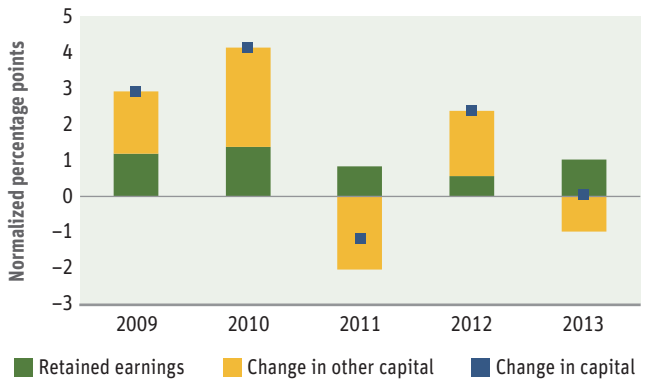
$$F\ln\left(\frac{K_1}{K_0}\right)\left(\frac{K_1}{K_0}-1\right)=F\ln\left(\frac{K_1}{K_0}\right)\left(\frac{RE_1+Oth_1}{K_0}\right).$$

This can then be used to decompose the normalized log change in capital into its components as follows:

$$F\ln\left(\frac{K_1}{K_0}\right)=G\frac{RE_1}{K_0}+G\frac{Oth_1}{K_0}$$

[4] Figures illustrating country by country bank behavior are provided below.

FIGURE C.5 SOURCES OF ANNUAL CHANGE IN CAPITAL (NORMALIZED PERCENTAGE POINTS)



Source: IDB staff estimates, Bankscope and methodology of Cohen and Scatigna (2014). The figure shows the decomposition of changes in capital into its additive components. Changes are normalized to percentage points of risk-weighted assets of each preceding year. The overall change is shown by the red circle. The figure is based on data for 64 large banks in Brazil, Chile, Colombia, Mexico, and Peru. Bank-level changes are computed in constant local currency. Regional figures are then computed as weighted averages using assets in U.S. dollars of each previous year as weights. See explanation of methodology in Appendix B.

where

$$G = F\ln\left(\frac{K_1}{K_0}\right) \Big/ \left(\frac{K_1}{K_0} - 1\right).$$

This last expression decomposes the normalized change in capital into changes in retained earnings and changes in other capital, expressed as percentage points of previous year risk-weighted assets.

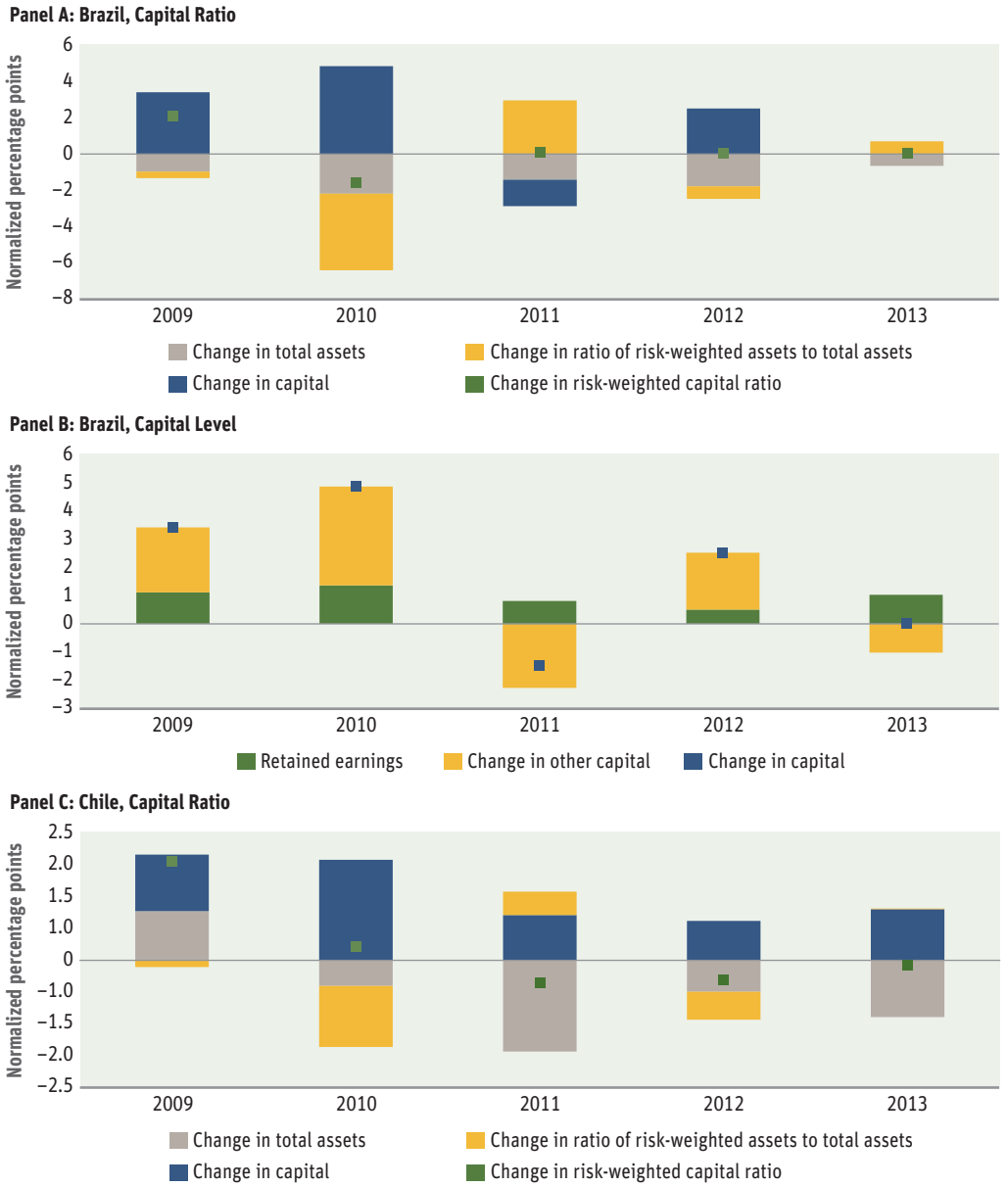
This decomposition for the same sample of Latin American and Caribbean banks is illustrated in Figure C.5. During the boom years, retained earnings were strong but were not sufficient; banks also raised substantial amounts of new capital to maintain their buffers over requirements.

More recently, different patterns have emerged. In Chile and Colombia, during 2011 and 2012, capital ratios started to fall (Figure C.6). In Colombia, average risk fell and in Brazil both risk and lending volumes declined. Most countries saw bank capital ratios deteriorate in 2013, even though lending growth was lower than in previous years.

Given the context of lower economic growth, these new patterns may be accentuated. Profits will likely be slimmer, non-performing loans may grow and banks may find it harder to issue new capital. Banks will then likely maintain capital buffers through lower asset growth and by reducing risk. This pro-cyclical behavior serves to maintain financial stability, but now financial systems are of a significant size so they may produce negative feedbacks to the real economy.

The above figures are derived from a sample of banks across five countries. The same figures but for a sample of banks in each country is provided below in Figure C.6. Overall, somewhat similar patterns are observed, although there are some country specific developments. All countries show a decline in capital ratios for 2013 (with the exception of Brazil which is zero change) and the majority show a fall in credit growth and/or an increase of risk (i.e., banks attempting to maintain capital buffers by reducing lending growth or reducing the increase in risk-taking). In the case of Brazil, asset growth almost fell to zero in 2013 and risk actually fell (i.e., the change in risk weights contributed positively to the change in the capital ratio). While in the cases of Chile and Peru, banks were able to raise capital in 2013, in the case of Brazil, banks

FIGURE C.6 SOURCES OF ANNUAL CHANGES IN CAPITAL RATIOS AND CAPITAL LEVELS BY COUNTRY



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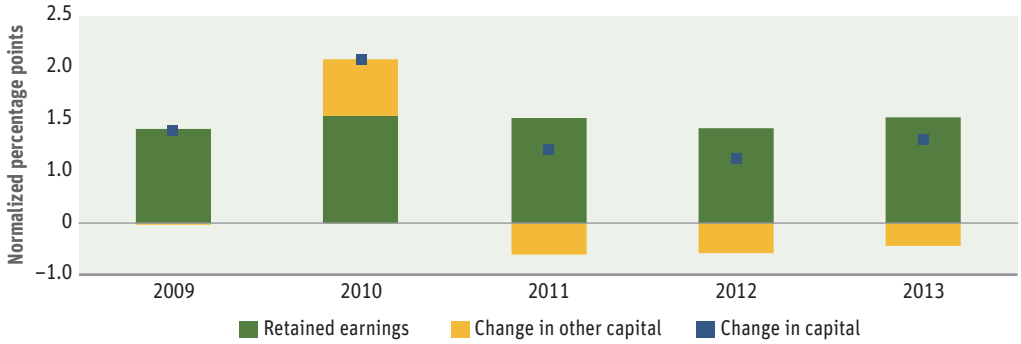
did not raise capital and in the cases of Colombia and Mexico the contribution of the change in capital was actually negative.

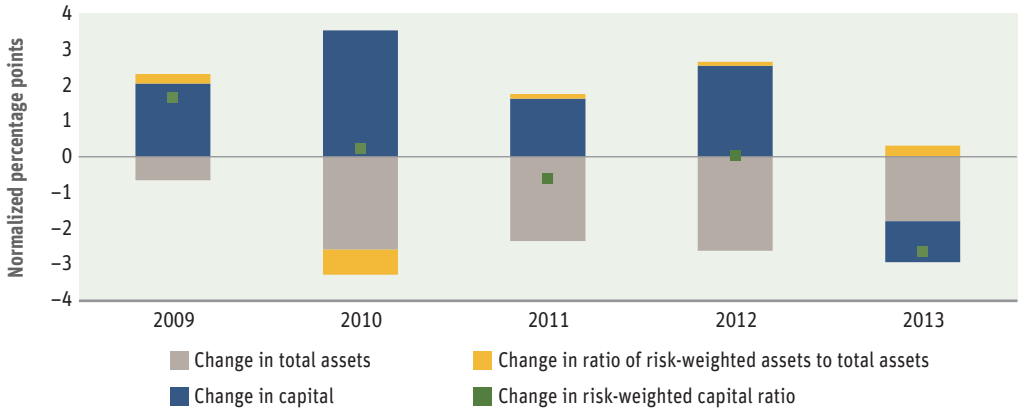
While there are differences across individual countries the overall picture in 2013 (and in some cases 2012) is quite different to that of the preceding years. Anticipating slower economic

FIGURE C.6 SOURCES OF ANNUAL CHANGES IN CAPITAL RATIOS AND CAPITAL LEVELS BY COUNTRY *(continued)*

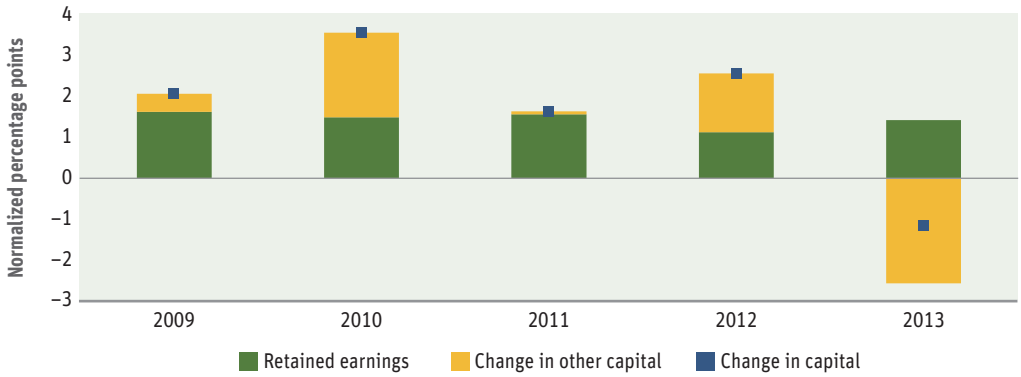
Panel D: Chile, Capital Level



Panel E: Colombia, Capital Ratio



Panel F: Colombia, Capital Level



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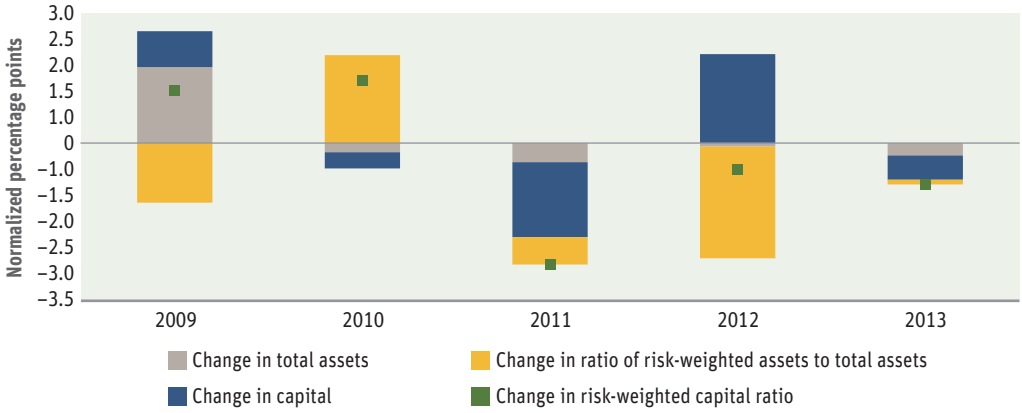
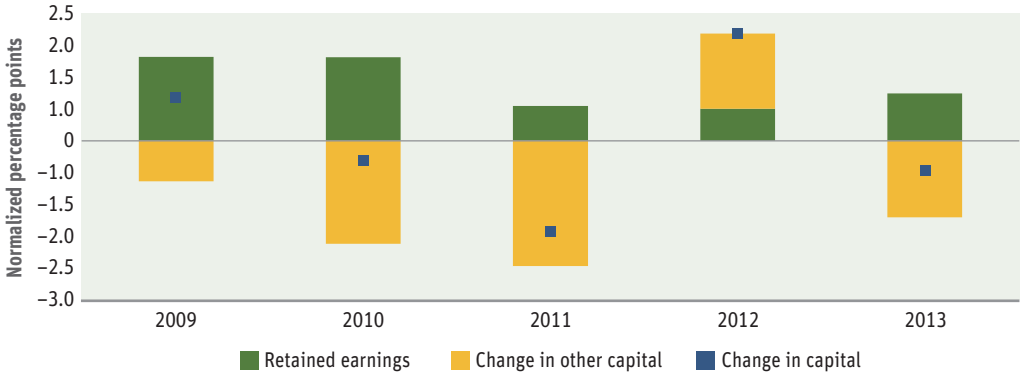
growth, the analysis of individual countries supports the view that banks will likely attempt to maintain capital ratios through slower asset growth and reduced risk-taking rather than by raising new capital.

FIGURE C.6 SOURCES OF ANNUAL CHANGES IN CAPITAL RATIOS AND CAPITAL LEVELS BY COUNTRY *(continued)*

Panel G: Mexico, Capital Ratio



Panel H: Mexico, Capital Level



Panel I: Peru, Capital Ratio

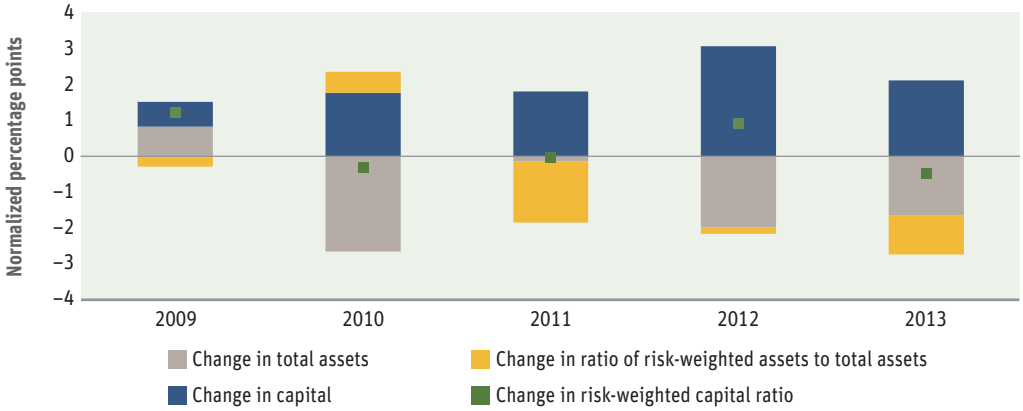


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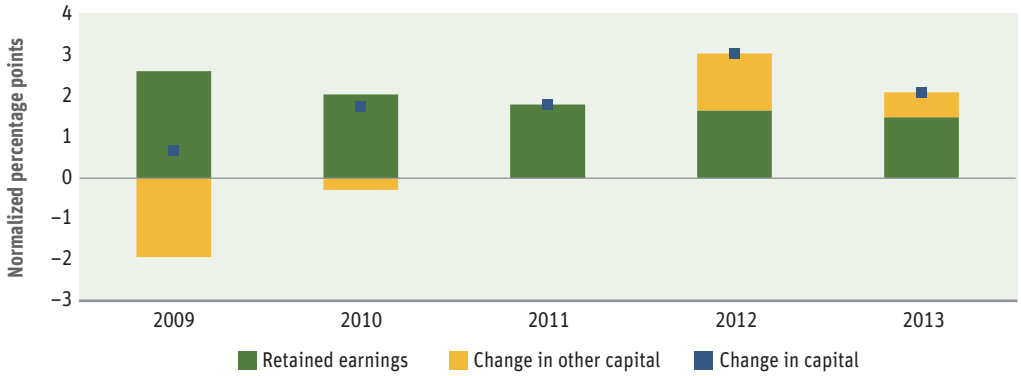
FIGURE C.6 SOURCES OF ANNUAL CHANGES IN CAPITAL RATIOS AND CAPITAL LEVELS BY COUNTRY *(continued)*

Panel J: Peru, Capital Level



Source: IDB staff estimates, Bankscope and methodology of Cohen and Scatigna (2014). Panels A, C, E, G and I show the decomposition of changes in capital ratios (total regulatory capital to risk-weighted assets) into its additive components for each country. Panels B, D, F, H and J show the decomposition of changes in capital into its additive components for each country. Changes are normalized to percentage points of risk-weighted assets of each preceding year. Overall changes are shown by black diamonds for capital ratios and by red circles for capital. The figures are based on data for large banks in Brazil, Chile, Colombia, Mexico and Peru. Bank-level changes are computed in constant local currency. Country figures are then computed as weighted averages using assets in constant local currency of each previous year as weights.

APPENDIX D

On the Timing and Speed of Fiscal Adjustment

For a country that is at, or close to, potential output (i.e., with a zero output gap) but with a structural fiscal deficit and facing high interest rates, the policy advice is relatively clear: a sharp fiscal adjustment is in order. Given output is close to potential, fiscal multipliers are normally considered to be small while lowering debt quickly will bring significant savings in interest payments. On the other hand, if the country has a significant output gap, high growth, and relatively low interest rates, then any fiscal adjustment might be taken at a slower pace. If the output gap is negative then the multiplier effect on a fiscal adjustment may be more severe and if interest rates are low, then a gradual approach is relatedly less costly. However, the gradual approach may put the country at risk of becoming caught in a fiscal consolidation trap.

Miller and Zhang (2013) develop a model that describes the dynamics of debt accumulation and fiscal consolidation. It can be used to explore some of these issues, and centers on two differential equations. The first describes the dynamics of the debt *b,* (the debt to potential output ratio) which is characterized by:

$$\Delta b = (r - \gamma)b + g - \theta$$

Where r is the real interest rate (%), γ is long-term real growth (%), g is the government primary expenditure and θ is the tax revenue (both expressed as a % of potential output). Debt will remain stationary ($\Delta b = 0$), when the primary surplus is just sufficient to cover the cost of the debt service, adjusted for the growth rate.

The second differential equation represents the fiscal consolidation process. The idea here is that it should decrease from a relatively high level so the structural deficit converges to a target (δ^*)[1] at a speed parametrized by α. When that target is reached, expenditure does not change, $\Delta g = 0$.

$$\Delta g = -\alpha(rb + g - \theta - \delta^*)$$

[1] The target is chosen to achieve a desired steady-state debt/output level.

The intersection of these two equations determines a steady-state equilibrium (SS). Depending on parameter values, the convergence path to the SS equilibrium may imply an increase in the debt ratio (when there is no overall fiscal surplus) but then as government expenditure falls and an overall fiscal surplus emerges, and assuming the parameters satisfy a convergence restriction, the debt ratio will fall. But falling debt and lower interest expenditure may allow for a somewhat higher level of expenditure (g) in equilibrium.

In the case of a positive fiscal multiplier, reducing expenditures will result in an income effect and temporarily reduce the tax base. Miller and Zhang (2013) assume that the multiplier does not affect potential output, which simplifies the mathematics considerably. During an adjustment process, tax revenues may fall and debt may once again rise (according to the first differential equation) to smooth the fiscal consolidation process. Assuming convergence, relative to the case of a zero multiplier, a positive fiscal multiplier implies a higher maximum debt level and a lower speed of debt reduction.

In Chapter 5, a base case of a country with a debt ratio of 48%, fiscal expenditure of 26%, tax revenues of 25%, a 3.5% real interest rate, and a 3% real (potential) growth rate is considered (see Powell, Salazni and Mercer-Blackman [unpublished] for further discussion and other calibrations). With a fiscal adjustment program that implies a 1.7% cut in expenditures in the first year and then smaller adjustments in subsequent years, a 40% debt to GDP ratio can be achieved within 10 years when the fiscal multiplier is zero. If the fiscal multiplier is 0.5, then using similar parameter values to reduce debt to 40% of GDP would take 14 years. In the equations above, the magnitude of the fiscal adjustment program is determined by the parameter (the distance that actual expenditure moves towards a target level) and the target level (δ^*). These parameters translate into the actual cuts in expenditures, which are at a maximum in the first year; and this is the value referred to here for the ease of the discussion.

Consider the case that these parameters were set such that the fiscal adjustment was only 0.5% in the first year. With a zero multiplier the reduction in debt to 40% may then take 16 years rather than 10. However, in the case of a multiplier of 1, a debt ratio of 40% would not be reached even within 35 years. A fiscal adjustment is underway, but given the relatively high assumed multiplier, the negative effect on tax revenues neutralizes the reduction in expenditures such that the debt ratio hardly falls. If the multiplier were 0.5 (rather than 1.0), then the level of debt would be reached in 22 years.

However, these estimates assume that the multiplier is active when fiscal expenditures are below the current value of 26% of GDP or, as Miller and Zhang (2013) would say, 26% of GDP is the level of fiscal expenditures that is consistent with potential output. Suppose, instead, that 25% of GDP is the expenditure level consistent with potential output and the multiplier only kicks in when fiscal spending falls below that value. In this scenario, with a multiplier equal to 0.5 and the other base case parameters regarding the adjustment effort, a debt ratio of 40% is attained within 12 years (rather than in 14 years as before). These results illustrate that the

process of fiscal adjustment may be very sensitive to the effect of the fiscal adjustment on output and on tax revenues.

The results are also highly sensitive to the assumed potential growth rate. In the model, the debt ratio is calculated as a percentage of potential growth as often assumed in standard debt sustainability analyses. Suppose the potential growth rate falls to 2.5% rather than 3% as assumed in the base case. In this scenario, for the same parameter values, the adjustment process to attain a debt to GDP ratio of 40% will be 12 years rather than 10 in the case of a zero multiplier, and 15 years (rather than 14) in the case of a multiplier of 0.5. If the multiplier rose to 1.0, then with this lower growth rate a debt to GDP ratio of 40% would only be attained in 20 years with the same parameters for the adjustment program.

IDB