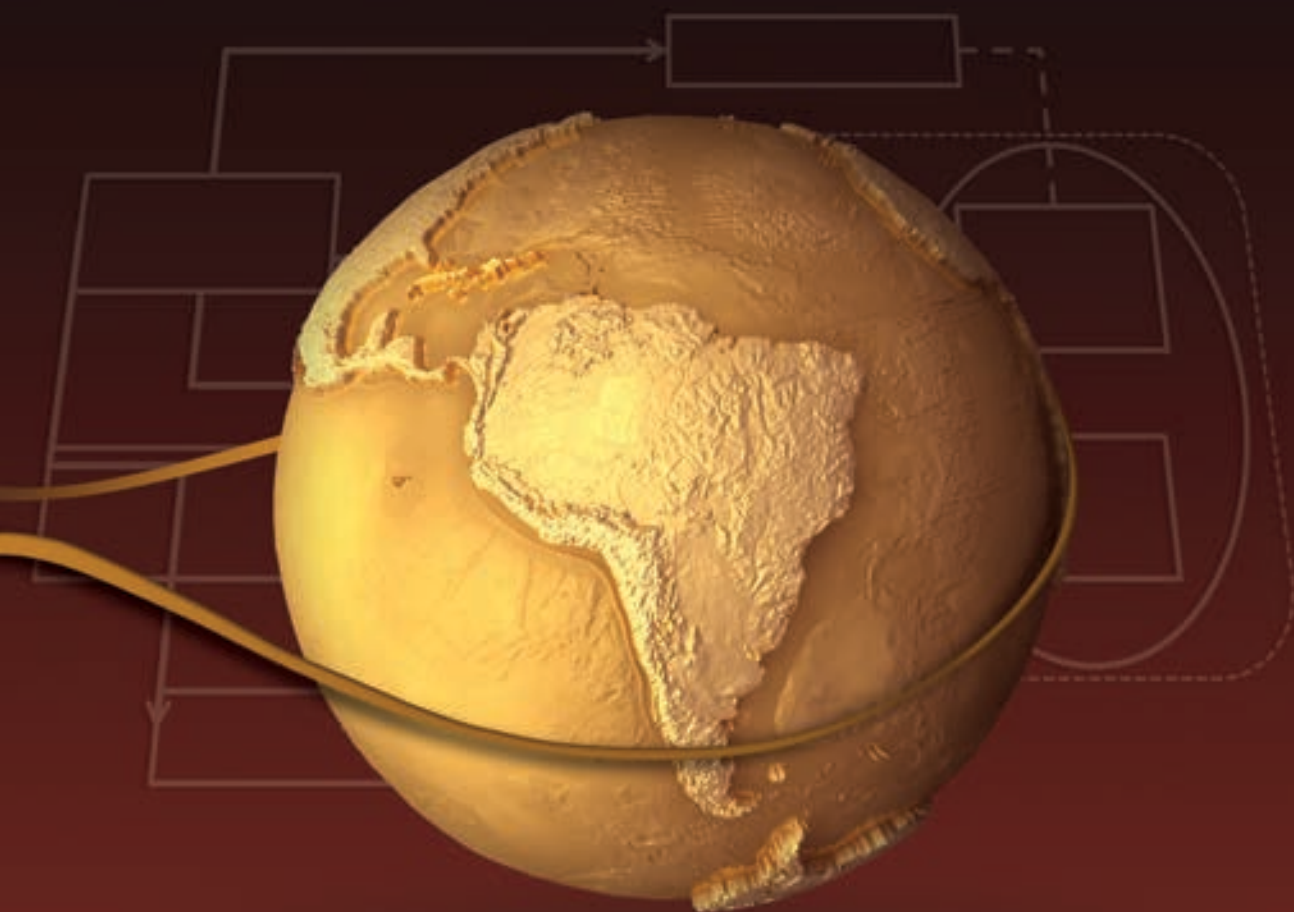


# Global Recovery and Monetary Normalization

## Escaping a Chronicle Foretold?



*Coordinated by*  
**ANDREW POWELL**



# **Global Recovery and Monetary Normalization**

## **Escaping a Chronicle Foretold?**

Andrew Powell  
*Coordinator*

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# Foreword

Last year's Latin American and Caribbean Macroeconomic Report argued that *suppressed* growth in advanced economies would likely lead to lower medium-term growth rates in the region, relative to those enjoyed in the years leading up to the 2008 *Great Recession*. While the outlook for the global economy looks a little brighter, baseline projections for Latin America and the Caribbean have not changed. Growth rates should be commensurate with the region's potential, but potential growth will not be sufficient to meet many social demands. Consequently, how to enhance potential growth remains an important agenda item.

In this report, however, the theme shifts from how to boost expected growth to the potential risks to the global recovery, and the opportunities and vulnerabilities in Latin America and the Caribbean. On the plus side, the global recovery may actually be stronger than expected, and in particular there is upside risk for the U.S. economy. On the other hand, and to paraphrase the famous novel by Gabriel Garcia Márquez, monetary normalization (implying the tapering of asset purchases and, eventually, a rise in short-term interest rates) is a chronicle foretold. In the past, some exits from low U.S. interest rates have been smooth while others have unleashed severe volatility in asset prices and declines in capital flows to Latin America and the Caribbean. How countries in the region may react this time around is the main focus of this year's report.

According to one theory, since monetary normalization is largely anticipated, the impact on asset prices should be "priced in" and the region should simply benefit from the global recovery that is underway. However, the *tapering announcement* of May 2013 appeared to impact asset prices significantly and represented a turning point in capital flows that may have persistent repercussions on growth. The spirit of this report is to consider the good scenarios while raising awareness of the risks. These risks may vary widely across the region. Shocks on the path of global recovery and monetary normalization may generate different impacts depending on individual country fundamentals and other particular vulnerabilities.

The report raises several issues that prompt a number of suggestions in terms of policy. In some cases, the analysis leads to additional questions that require more data and country-specific information to yield a definitive answer and a specific policy recommendation. Monetary normalization may be a chronicle foretold, but countries still have the power to influence the outcome for their own economies.

José Juan Ruíz  
Chief Economist





## CHAPTER 1

# Overview

**R**ecent projections suggest a more positive picture for the global economy with recovery continuing in the United States and, albeit at a somewhat lower pace, in Europe.<sup>1</sup> The Latin American and Caribbean region is expected to grow at levels close to its overall potential growth of around 3% in 2014, rising slightly in subsequent years. However, there are both positive and negative risks to the baseline projections. The focus of this report is on those risks and how countries can reduce vulnerabilities and enhance opportunities.

On the upside, the U.S. recovery may be stronger than expected as fiscal constraints subside, housing prices continue to recover and household balance sheets improve. As reviewed in Chapter 2 below, stronger growth in the United States may have a significant positive impact on growth rates in Latin America and the Caribbean. However, stronger data on the real economy may also prompt a faster than expected tapering of asset purchases by the U.S. Federal Reserve System and faster than expected rises in short-term interest rates. While this process of monetary normalization may proceed smoothly, a risk is that it will prompt abrupt falls in asset prices, and in some cases currency depreciations. The higher returns available in advanced economies may induce further withdrawals of capital from the region.

The region is also exposed to risks from other parts of the world. China has become an increasingly important trade partner and while growth rates have declined, concern remains that they may not be sustainable. In particular, rapid credit growth to finance high investment rates has raised concern over the robustness of the financial system. Lower growth in China is a significant risk but as reviewed in Chapter 2, how that risk manifests itself is again quite different depending on the country.

For the region as a whole, the positive risk of higher U.S. growth and the negative risks of lower asset prices and reduced growth in China may cancel each other out, but countries in the region are exposed to these risks in different ways. As discussed in Chapter 2, Mexico, Central America and the Caribbean may benefit from a scenario of higher growth in the United States and lower growth in China, while South America may face lower growth as a result.

Final outcomes also depend on how well the region is prepared today to respond to the types of shocks considered. Chapter 3 analyzes fiscal and debt positions and the potential use of fiscal policy as a tool of macroeconomic management. The past two editions of the Latin

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<sup>1</sup> See for example the IMF's January 2014 World Economic Outlook.

American and Caribbean Macroeconomic Report noted the deterioration in actual and *structural* fiscal balances since the 2008 Great Recession. A year later they have continued to decline and, as a result, public debt levels (actual and *structural*) have increased in recent years, reversing the previous trend of falling debt ratios; this is an important issue that needs prompt attention. Indeed, given baseline forecasts of close to potential growth, a key priority is to rebuild fiscal buffers. The chapter also reviews how countries are placed to respond to any negative shock to that baseline. Some countries may have limited fiscal space but if used, policies should be carefully designed in order to avoid measures that are simply expansionary rather than truly countercyclical.

One vulnerability that has affected the region's ability to respond to shocks in the past has been poor risk sharing due to the popularity of contracts denominated in foreign currency, sometimes referred to as dollarization. As discussed in Chapter 4, measures of dollarization in domestic financial systems have certainly declined since the 1990s, although evidence suggests that more recently they have been on the rise. However, perhaps of more concern has been the increase in bond issuance in foreign currency from both financial and non-financial institutions. On the one hand, this may be viewed as perfectly natural as companies in the region take advantage of exceptionally low international interest rates. Indeed, there has been a shift from relying more on domestic markets to issuance in international debt securities at fixed interest rates and relatively longer maturities. On the other hand, if firms do not have currency hedges, either natural or otherwise, they may be subject to balance sheet effects given currency movements. Moreover, the issuance from financial institutions may raise some concerns. Overall, currency mismatches on bank balance sheets are tightly regulated in financial institutions in the region but the relatively high rates of issuance may be behind the trend of increasing dollarization; moreover, some of the issuance is through offshore subsidiaries that may not be easily regulated or monitored.

There has also been issuance by non-financial firms, including firms in the non-traded sector. This may also provoke balance sheet issues in the face of currency depreciation. While evidence from some countries shows that such issuance has not increased as a percentage of firms' assets, in the non-traded sector a currency depreciation would reduce the economic value of those assets in dollars while dollar debts would remain constant. A final trend has been the growth in the deposits of non-financial firms in the region's financial system, which make up some 58% of the \$2.2 trillion in deposits in the region. Credit to the non-financial private sector almost doubled from 2009 to 2012. Considering just four large economies in the region, the growth in deposits of non-financial corporations represented 53% of the \$1 trillion growth in credit over that period. The international issuance of non-financial firms appears to be one of the factors behind the strong growth in credit from the domestic financial sector to the non-financial private sector in some countries.

There are at least two possible concerns here. First, if these transactions represent some type of carry trade on the part of non-financial firms, then when conditions change they may

be abruptly reversed, creating liquidity problems in the domestic financial sector. Second, if non-financial firms have borrowed substantial amounts in dollars and these deposits are in local currency, then currency depreciation will provoke balance sheet effects leading to potential solvency issues in those firms. As those firms are also likely the larger borrowers from the domestic financial system, this may lead to knock-on effects in domestic financial systems. More generally, credit has been growing fast and if credit growth diminishes, pressure on financial institutions may intensify. That being said, financial systems in the region currently display relatively strong solvency and liquidity ratios, and regulation and supervision has improved considerably, as evidenced by the relatively good performance through the 2008 global financial crisis.

Turning to monetary policy, and as the title of this report suggests, the expectation is for a process of monetary normalization as the U.S. economy continues to recover. Two previous exits from periods of low U.S. interest rates occurred in 1994 and 2004 with quite different results. While the experience of 1994 produced significant volatility with strong impacts on asset prices, the 2004 period passed relatively smoothly. The 2004 exit was largely anticipated and fundamentals in the region were clearly stronger with greater capacity to respond. Still, the *tapering* announcement of May 2013 also produced considerable volatility in asset prices and capital flows have fallen substantially since that date. The impact of monetary normalization may then be quite different depending on how smooth is the process and what tools countries have to counter any unforeseen effects. Changes to the expected path of short-term U.S. interest rates could affect capital inflows that have strong and persistent effects on growth in some countries. The full impact of the reduction in inflows in the second half of 2013 may not be felt until the second half of 2015. At the same time, floating exchange rates and monetary policy flexibility may ameliorate the impacts and many of those countries without flexibility will benefit from strong trade links with the United States.

A final vulnerability considered in Chapter 6 is the likelihood of a more extreme event involving capital flows, namely, a Sudden Stop. Investors may not only consider fundamentals when making investment decisions but may also take into account the opinions and actions of other investors. For example, if an investor thinks others are likely to invest in a particular country then they may foresee an appreciating currency and a higher payoff to their individual investment. The same may happen in reverse; capital flows may be more volatile than expected considering only fundamentals. On occasion there may be a very sharp withdrawal of capital known as a Sudden Stop (normally considered a fall in capital flows of at least two standard deviations), perhaps triggered by some external and frequently financial event.

Analysis suggests that the probability and costs of a Sudden Stop depend on specific country characteristics: namely, an indicator related to the current account, the level of dollarization (net of reserves) and the government's fiscal deficit. These vulnerability factors were high in Latin America and the Caribbean during the 1990s and indeed several countries did suffer from Sudden Stops at that time; but vulnerability fell as fundamentals improved before

the 2008 Great Recession. However, recent estimates suggest that the risks of a Sudden Stop have increased once again as all three indicators have deteriorated in recent years, although the region remains in a better position today than in the 1990s. Moreover, the costs of Sudden Stops if they were to occur may also have increased. The expected cost (the probability multiplied by the economic cost) for a typical LAC-7 economy is estimated to be some 2.5% of GDP compared to just 1.8% of GDP in 2007. In turn, this implies that the optimal level of international reserves has risen. In fact, calibrating a recent model for optimal reserve holdings indicates that while actual reserves have risen in dollar terms, they are now below optimal levels in most countries.

One important caveat to these results is that the nature of capital flows appears to have changed. In particular, as financial integration has proceeded, net capital flows have become more stable as the capital flows of residents (normally referred to as outflows) tend to offset the flows of non-residents (normally referred to as inflows). However, a Sudden Stop in gross inflows may still be costly, and may be associated with less financial intermediation and deleveraging, even if it does not require an adjustment in the real exchange rate.

Although the region is expected to grow faster in the next two years than it did in the previous three, projected growth rates are on the order of only 3% to 3.5%, close to estimates of potential growth, and well below growth rates achieved prior to the Great Recession (4.9% in 2003–2007). These growth rates will not allow the region to address many still unmet social needs and are substantially lower than those of some other emerging regions of the world, particularly East Asia. In parallel to the analysis of opportunities and vulnerabilities considered in this report, it is essential to address the reasons for the region's low potential growth (see Box 1.1 and Appendix A).

While U.S. monetary normalization and higher world interest rates are indeed a chronicle foretold, there is no reason to suppose that this will necessarily imply economic problems in Latin America and the Caribbean. Indeed, baseline projections are for a moderate recovery in the region and assuming the process goes smoothly and as anticipated, then the negative impacts on asset prices may already be priced-in and countries should benefit from the recovery in growth in the United States and Europe. However, there are risks and the region appears somewhat more vulnerable to certain shocks now compared to prior to the Great Recession. Perhaps of most concern is the deterioration in fiscal positions, coupled with the strong growth in credit financed in part by higher issuance in foreign currency by banks and non-financial firms that has reversed the trend of relying on domestic markets in local currency. At the same time, the region has advanced in strengthening financial systems and developing its capacity to respond to negative shocks. The spirit of this report is to discuss the risks and potential vulnerabilities as well as opportunities. The final chapter draws together the main policy suggestions given the analysis in each chapter.

**Box 1.1 Declining Relative Productivity in Latin America and the Caribbean**

Economic output and, hence, income earned depends on both the amount of the factors employed (capital and labor) and the productivity of those inputs, known as *total factor productivity (TFP)*. Growth in income is normally considered sustainable if backed by growth in underlying TFP. The typical country in the region has actually had faster factor accumulation relative to the advanced economies (both the physical and human capital gaps were reduced) but the relative productivity of those factors declined from 78% to 53%, again relative to advanced economies. Since 1960, income per capita of the typical country in the region declined by 16% relative to the rest of the world and relative productivity declined by 18%. Latin American and Caribbean total factor productivity halved relative to the typical East Asian country.

In terms of income per capita, the region did bounce back in the 2000s but subsequently growth slowed again. In Chile, Colombia, Mexico, and Uruguay the engine of growth appeared to be labor although an expansion of the capital stock played a substantial role in Chile and Mexico. In other countries, productivity does appear to have played a role. However, for some countries that were in recession in the early 2000s, unused capacity probably played a role in the subsequent apparent growth in productivity (see further discussion in Appendix A). As argued in last year's Latin American and Caribbean Macroeconomic Report, the medium-term prospect for the region is for growth at close to the region's potential, commensurate with the underlying lower growth in productivity. To achieve higher sustainable growth rates, higher growth in productivity remains critical.







## CHAPTER 2

# Global Opportunities and Risks

**R**ecent data suggests a somewhat brighter outlook for the world economy, which is expected to grow at an average 3.8% in the next two years, well above the 3% average for the last two years. Growth in emerging economies slowed to 4.7% in 2013 but is expected to pick up to 5.1% in 2014 and 5.4% in 2015. The Latin American and Caribbean region is projected to grow 3% in 2014 and 3.3% in 2015, close to potential growth. Growth in much of the advanced world remains suppressed below potential; emerging economies continue to be buoyant and as discussed in the previous report, Latin America and the Caribbean's economic performance is expected to return to normal.

The slowdown in emerging economies has been one of the most notable features of the global economy in recent years. For example, Brazil, China, India, Mexico, and South Africa grew an average 6.5% annually between 2004 and 2008 but for the next 5 years are expected to grow 4.7% annually. This slowdown is sometimes attributed to autonomous factors in each country but this remains an open question and an important one to guide appropriate policy. The influence of domestic factors on slower growth is the first question tackled in this chapter.

There is uncertainty around any baseline projection for global growth and asset prices particularly given developments in the United States.<sup>2</sup> Risks may be both positive and negative. There are also risks stemming from China. The second question tackled in this chapter is how such risks may impact the region as a whole, and individual countries, specifically. A Global-Vector Auto-Regression Model or G-VAR is employed.<sup>3</sup> The baseline projection for this exercise come from the IMF's January World Economic Outlook and the model is used to estimate a set of alternative scenarios. Appendix B provides a discussion of the methodology and the performance of the model.

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<sup>2</sup> The Bloomberg survey of forecasters indicates an average growth projection for the U.S. economy of some 2.85% for 2014 and 3.01% for 2015. However, two standard deviations of the distribution are 0.68% for 2014 and 0.90% for 2015.

<sup>3</sup> The G-VAR methodology was proposed in Pesaran, Schuermann, and Weiner (2004). See di Mauro and Pesaran (2013) for more details and Cesa-Bianchi et al. (2012) for an application modeling shocks from China to Latin America.

## The Emerging Market Slowdown

The larger emerging economies suffered a marked slowdown in growth from 2010 to 2013. If autonomous features within the respective economies were to blame, then policies should clearly consider those particular constraints. Moreover, if there is evidence that certain domestic frictions pushed growth rates below potential growth, then there may be an argument to employ tools of macroeconomic demand management. On the other hand, if the slowdowns were due to suppressed growth in advanced economies, then given the global recovery under way growth would be expected to rebound to potential growth. In that case, policies should focus on enhancing potential growth (as mentioned in Chapter 1 and discussed in Appendix A) and not necessarily on policies to stimulate aggregate demand.

Using the G-VAR methodology as described in Appendix B, the observed growth rates from 2010–2013 for each country were compared to growth rates that would have been predicted if the major advanced economies had actually recorded growth rates close to the unconditional

**FIGURE 2.1 COUNTERFACTUAL VS ACTUAL GROWTH FOR BRAZIL, CHINA, INDIA AND MEXICO**



Source: Authors' calculations based on national sources and World Economic Outlook IMF (2013).

forecasts of the model and not actual *lower* growth.<sup>4</sup> For example, in the case of the United States, the observed growth rate is 0.9% below the forecasts of the model for 2010–2011 and 1.2% below the model forecasts for 2011–2012, reflecting continued suppressed growth.<sup>5</sup> The model is then used to predict the growth rate in a set of major emerging economies had the United States (and other advanced economies) actually grown at the higher model forecast rate.

The results for Brazil and Mexico indicate that, conditional on lower growth in the United States and advanced economies, the counterfactual is actually close to the observed growth rates. In other words, the slowdown in Brazil and Mexico is essentially explained by suppressed growth in the advanced economies. Indeed, Mexico even fared somewhat better than might have been expected during 2010 and 2011.<sup>6</sup> However, this is not the case for China or India. In these cases, the model cannot explain the slowdown as a function of suppressed growth in advanced economies; autonomous factors appear to be more at play.

Assuming global recovery, growth should indeed come back to close to potential in Brazil and Mexico, meaning policymakers may wish to focus on enhancing potential growth rather than demand management. However, the cases of China and India appear to be more complex. Suffice it to say that particular constraints may have limited growth in these economies over the period of analysis.

## Scenarios for Latin America and the Caribbean

The baseline projection is for the United States to grow from 1.9% last year to 2.8% in 2014 and 3.5% in 2016, as fiscal constraints subside and the housing market and household balance sheets improve. The German economy is projected to grow 1.6% in 2014 and the Euro area as a whole should expand 1.0% on the back of more optimistic expectations, particularly regarding Spain and Italy.<sup>7</sup> Japanese growth rose to 1.7% in 2013 and may continue at that rate in 2014 before receding to 1% growth in 2015. Growth in China is expected to be 7.5% in 2014, falling to 7% by 2016.

One positive risk to this baseline would be stronger than expected growth in the United States. A first alternative scenario envisions U.S. growth rising to 4% by 2015. However, at the same time a risk exists that positive data on the U.S. economy would lead to a faster tapering of asset purchases and an earlier increase in interest rates, which in turn might cause asset prices to fall.<sup>8</sup> The second risk considered is then a fall in U.S. equity prices. The shock is modeled as

<sup>4</sup> Appendix B notes that the unconditional forecasts of the model are actually very close to the baseline projections.

<sup>5</sup> Powell (2013) discussed the suppressed growth of the advanced economies in more detail.

<sup>6</sup> Autonomous factors may have explained this strong performance in 2010 and 2011 and then the weaker one in 2013.

<sup>7</sup> Italy and Spain grew at –1.8% and –1.2% during 2013 but are expected to both grow at 0.6% for 2014.

<sup>8</sup> A caveat of the G-VAR model is that it does not capture the effects of asset tapering or a change in the expected path of interest rates. This is not surprising given the truly exceptional conventional and unconventional monetary policy in the United States since the Great Recession. However, the model does capture the impacts of changing asset prices.

a lower level of equity returns.<sup>9</sup> A third risk is a shock to Chinese growth rates such that China grows 5.3% in 2015 and then 6.5% from 2017 onwards.

As would be expected, higher growth in the United States leads to higher growth in Latin America and the Caribbean while a negative shock to U.S. asset prices or a negative shock to Chinese growth leads to a fall in growth. Table 2.1 provides the assumptions of the scenario analysis and Figure 2.2 illustrates the results for the region. If U.S. growth rises to 4% by 2015, and the normalization of monetary policy goes smoothly, then growth in the region is estimated to rise to 6% in 2015. On the other hand, if Chinese growth falls to 5.3% in 2015, regional growth would likely fall to as low as 1.5% in the same year. The shock to U.S. asset prices would drag regional growth down to 2% in 2014.

The impact on individual countries is detailed in Table 2.2. The size of the individual shocks are such that a scenario in which all three shocks occur simultaneously (labelled the combined shock in Figure 2.2 and Table 2.2) is initially net negative but then growth in the region bounces back to close to the baseline forecasts. However, the effect on different countries in the region varies significantly. Mexico gains more from higher U.S. growth and is less affected by a negative shock in China; hence, for Mexico the joint shock scenario is net positive. Brazil is affected more by the negative China shock, meaning the joint shock scenario is net negative. The estimated magnitudes of the impacts of the individual shocks are much higher for some countries than for others. For example, Colombian growth rates are quite sensitive to these shocks while El Salvador remains largely unaffected.<sup>10</sup>

## Conclusions

A baseline projection indicates growth rates close to potential for Latin America and the Caribbean. However, risks to this scenario include a positive risk to U.S. growth and negative risks to Chinese growth and financial asset prices. Any of these shocks individually would impact the region but depending on the magnitude of the individual shocks, for the region as a whole they may more or less balance each other out. However, even if they have little impact on the region as a whole, they may affect individual countries significantly. Countries in South America are more exposed to a negative shock to Chinese growth and would benefit less from higher U.S. growth. Mexico, Central America and some Caribbean nations would benefit more from U.S. growth than they would suffer from a negative shock to China.

<sup>9</sup> The baseline growth in the U.S. stock market is the unconditional forecast of the model but what matters here is the shock. In other words, considering a favored baseline for U.S. stocks, the negative shock scenario is then a 5.3% lower rate of return for 2014 relative to that view.

<sup>10</sup> Naturally, the magnitude of the shocks may be quite different to the ones modeled here. As noted in Powell (2012), there are an infinite number of scenarios or “forking paths” that could be considered.

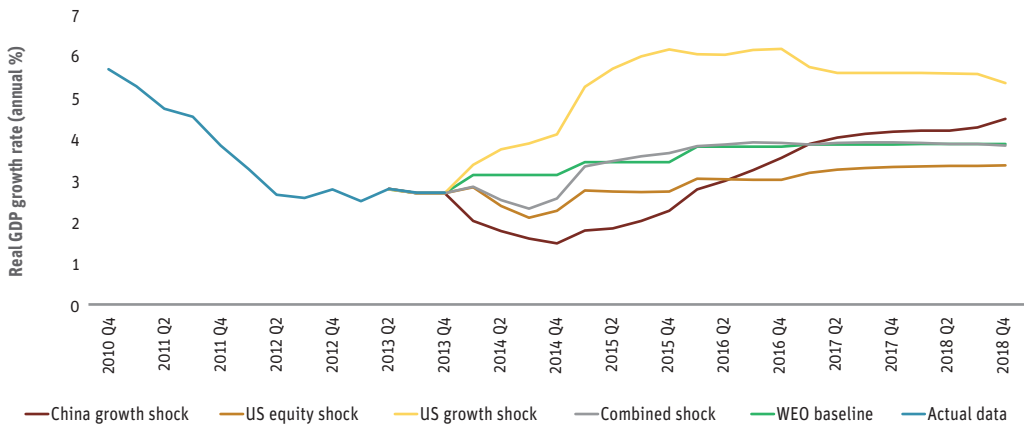
**TABLE 2.1** BASELINE AND SCENARIO ASSUMPTIONS

Country	Variable	Scenario	Actual				Projected		
			2010	2011	2012	2013	2014	2015	2016
United States	Real GDP growth	Baseline <sup>a</sup>	2.5	1.8	2.8	1.9	2.8	3.0	3.5
		Positive shock					3.3	4.0	4.0
	Real equity return	Baseline <sup>b</sup>	18.2	9.8	5.9	9.9	9.0	6.7	4.9
		Negative shock					3.7	4.0	3.2
China	Real GDP growth	Baseline <sup>a</sup>	10.4	9.3	7.7	7.7	7.5	7.3	7.0
		Negative shock					6.0	5.3	5.5

Source: Authors' calculations.

<sup>a</sup> World Economic Outlook, IMF (January 2014).

<sup>b</sup> Unconditional forecast of the model.

**FIGURE 2.2** EFFECT OF ALTERNATIVE SCENARIOS ON LATIN AMERICAN AND CARIBBEAN GROWTH

Source: Authors' calculations and WEO, IMF (January 2014).

The modeling exercise indicates that the slowdown commencing in 2010 in the region's two largest economies, Brazil and Mexico, can be explained by the suppressed growth in advanced economies. On the other hand, in China or India, autonomous factors may be more at play. Consequently, growth in Brazil and Mexico should improve as the global economy recovers and expansionary demand-management type policies may be inappropriate at the current time.

**TABLE 2.2** REAL GDP GROWTH, BASELINE AND JOINT SHOCK SCENARIO (%)

Country	Scenario	2012	2013	Projected
				2014–2016
Argentina	Baseline <sup>a</sup>	1.6	3.5	2.8
	Combined Shock			2.1
Bolivia	Baseline <sup>a</sup>	5.0	5.4	5.0
	Combined Shock			4.9
Brazil	Baseline <sup>a</sup>	1.0	2.3	2.8
	Combined Shock			2.4
Chile	Baseline <sup>a</sup>	5.3	4.4	4.5
	Combined Shock			4.1
Colombia	Baseline <sup>a</sup>	4.0	3.7	4.4
	Combined Shock			4.0
Costa Rica	Baseline <sup>a</sup>	5.2	3.5	4.1
	Combined Shock			4.5
Ecuador	Baseline <sup>a</sup>	5.2	4.0	4.0
	Combined Shock			4.3
El Salvador	Baseline <sup>a</sup>	1.9	1.6	1.7
	Combined Shock			1.7
Jamaica	Baseline <sup>a</sup>	–0.5	0.4	1.7
	Combined Shock			1.6
Mexico	Baseline <sup>a</sup>	3.8	1.2	3.4
	Combined Shock			3.7
Nicaragua	Baseline <sup>a</sup>	4.2	4.2	4.0
	Combined Shock			4.4
Paraguay	Baseline <sup>a</sup>	–0.4	12.0	4.7
	Combined Shock			3.9
Peru	Baseline <sup>a</sup>	6.3	5.4	5.8
	Combined Shock			5.7
Trinidad and Tobago	Baseline <sup>a</sup>	0.1	1.6	2.2
	Combined Shock			2.1
Weighted average	Baseline <sup>a</sup>	2.7	2.6	3.3
	Combined Shock			3.2

Source: Authors' calculations.

<sup>a</sup> World Economic Outlook, IMF (January 2014).



## CHAPTER 3

# Fiscal Balances, Debt and Cyclicity

**T**he 2013 Latin American and Caribbean Macroeconomic Report expressed concern about the expansionary fiscal policy in the context of lower output gaps and relatively easy financing conditions. The report argued that in several countries fiscal normalization was overdue and that it was critical to regain fiscal space. One year later, fiscal balances have continued to deteriorate, and tighter fiscal management and restoring policy buffers remain key policy priorities.<sup>11</sup>

Estimates suggest that, while some countries were able to pursue expansionary fiscal policy during the 2008–2009 crisis, fiscal impulses were not eliminated as output gaps closed. Moreover, policies appeared to favor inflexible spending rather than increased spending that could subsequently be reversed.

Given the current state of the business cycle and fiscal positions, consolidation efforts appear warranted in many countries. At the same time, countries may wish to consider measures that facilitate countercyclical policies in case of future shocks. Developing automatic fiscal stabilizers and institutions that favor carefully designed discretionary policies—which can then be reversed when output gaps close—would help the region to become truly countercyclical.

### Fiscal Policy

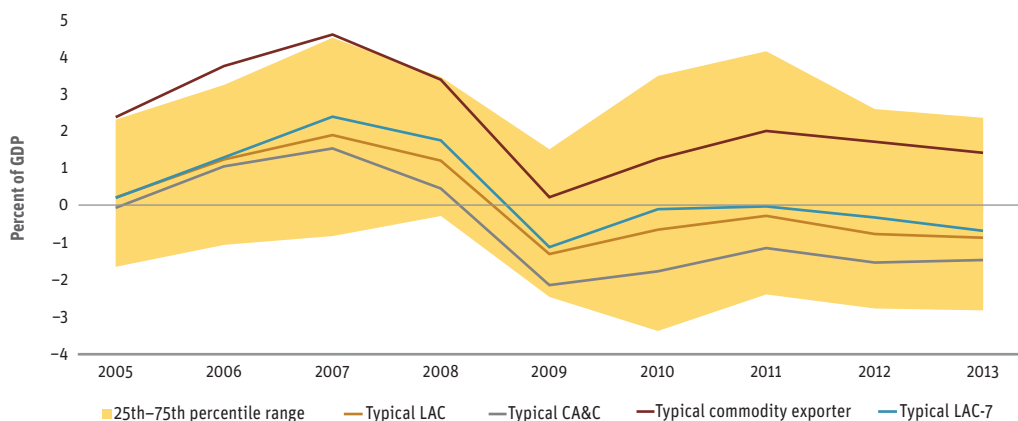
Public finances continued to deteriorate during 2013, and for the typical country in the region overall fiscal balances remain 3 percentage points of GDP below pre-crisis levels (Figure 3.1). Compared to 2012, only 3 out of 21 countries analyzed have stronger primary balances (Figure 3.2).

### Assessing Fiscal Performance: Estimates of Structural Primary Balances

Observed fiscal balances move in response to both discretionary policy instruments (e.g., a change in the tax code) and non-discretionary or “automatic” factors induced by changes in the macroeconomic environment; factors such as strong output growth or a commodity price boom are associated with sharp increases in fiscal revenues, generally leading to improved fiscal positions.

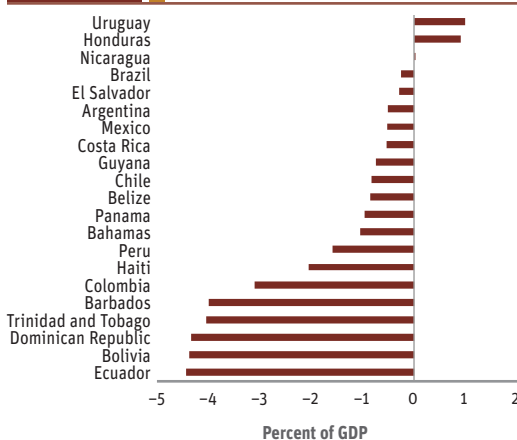
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<sup>11</sup> See also IMF (2013a, 2013b) and ECLAC (2014).

**FIGURE 3.1** OVERALL FISCAL BALANCES (% GDP)

Source: Authors' calculations based on national sources and World Economic Outlook IMF (2013).

Note: *Typical LAC*: average of all 20 regional countries with available information. *Typical LAC-7*: average of Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. *Typical Central America and Caribbean (CA&C)*: average of Costa Rica, Honduras, El Salvador, Guatemala, Panama, Barbados, Dominican Republic, Guyana, Trinidad and Tobago. *Typical commodity exporter* is the group of countries in which non-renewable resources represent a critical source of fiscal revenues: Bolivia, Chile, Colombia, Ecuador, Guyana, Mexico, Peru, Trinidad and Tobago, and Venezuela.

**FIGURE 3.2** CHANGE IN PRIMARY FISCAL BALANCE (2012–2013), % OF GDP

Source: Authors' calculations based on national sources and IMF World Economic Outlook (2013).

Conversely, when commodity prices fall or economic activity slows, fiscal revenues are negatively affected and certain expenditure categories may rise automatically, resulting in a deterioration of the fiscal balance. The observed fiscal position is then in part a reflection of the automatic response of fiscal variables to the macroeconomic environment as well as the underlying discretionary fiscal stance. To isolate this latter component, the effects of cyclical (temporary) fluctuations on fiscal accounts must be extracted.

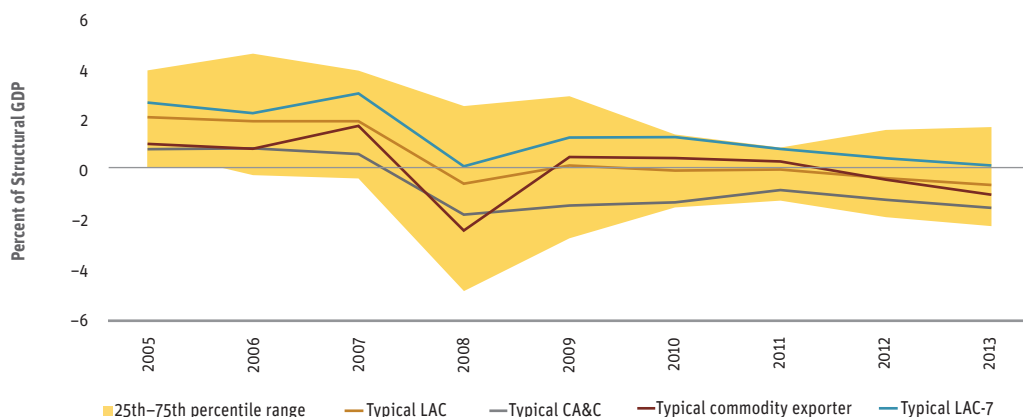
One method of characterizing the “underlying” fiscal stance is to calculate cyclically adjusted or Structural Primary Balances (SPB).<sup>12</sup> The SPB is a government’s

actual fiscal position (net of interest payments) controlling for the budgetary consequences of the business cycle and other exogenous factors such as commodity price movements.<sup>13</sup> Computing

<sup>12</sup> Izquierdo and Talvi (2008) and Powell (2012). See also Daude and Fernández-Arias (2010) and Vladkova-Hollar and Zettelmeyer (2008).

<sup>13</sup> Specifically, the SPB equals structural revenues minus primary expenditures. See Bornhorst et al. (2011) for a complete list of alternatives regarding adjustment options (asset prices, “one off” fiscal operations, etc.)



**FIGURE 3.3** STRUCTURAL PRIMARY BALANCES (% OF POTENTIAL GDP)

Source: Authors' calculations based on national sources.

Note: *Typical LAC*: average of all 20 regional countries with available information. *Typical LAC-7*: average of Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. *Typical Central America and Caribbean (CA&C)*: average of Costa Rica, Honduras, El Salvador, Guatemala, Panama, Barbados, Dominican Republic, Guyana, Trinidad and Tobago. *Typical commodity exporter* is the group of countries in which non-renewable resources represent a critical source of fiscal revenues: Bolivia, Chile, Colombia, Ecuador, Guyana, Mexico, Peru, Trinidad and Tobago, and Venezuela.

the SPB involves three steps: i) an estimation of potential output and the corresponding *output gap* (defined as the difference between observed and potential output); ii) estimation of tax and expenditure *elasticities* relative to the output gap; and iii) adjustments that go beyond the business cycle, such as controlling for the effects of *commodity prices* on fiscal revenues.<sup>14</sup>

### *Deterioration of the Fiscal Stance Continues...*

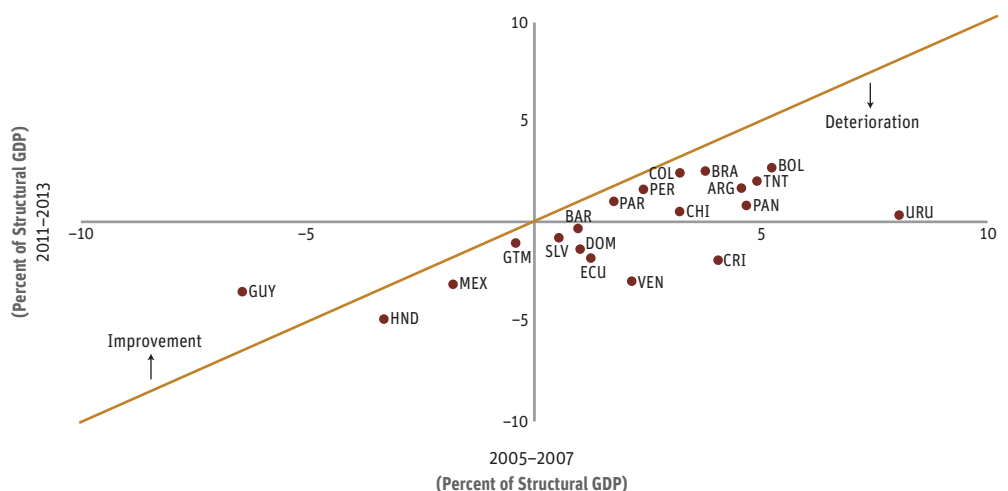
In the typical country, the fall in the SPB was more than 1 percentage point of structural GDP in the period 2012–13 (Figure 3.3).<sup>15</sup> Comparing levels of SPB both before and after the Great Recession, in only one of the 20 countries analyzed did the SPB improve (Figure 3.4). In addition, while all but six countries' structural balances were in surplus or at least not negative in 2007, it is projected that in 2013 the number of countries with structural balance deficits will outnumber those with structural budget surpluses.<sup>16</sup>

The structural fiscal measures indicate that the fiscal position of the region has deteriorated significantly since 2007: the structural primary fiscal deficit is in excess of 0.5% of structural GDP and the overall structural balance is more than 3% in deficit (see Figure 3.5).

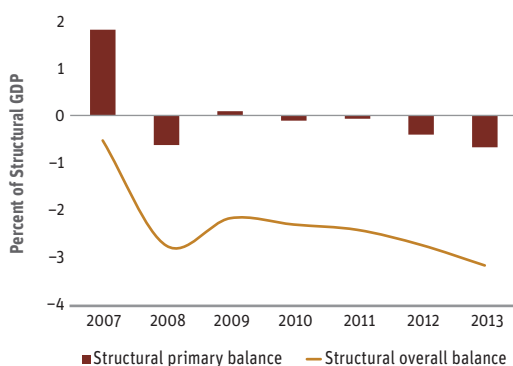
<sup>14</sup> See Appendix C for details on the methodology and sample.

<sup>15</sup> Some Caribbean nations, not included in the 20 Latin American and Caribbean countries analyzed here, continued fiscal consolidation efforts during 2013.

<sup>16</sup> See Appendix C for further details.

**FIGURE 3.4** CHANGE IN STRUCTURAL PRIMARY BALANCES (% OF POTENTIAL GDP)

Source: Authors' calculations based on national sources.

**FIGURE 3.5** STRUCTURAL FISCAL BALANCES: TYPICAL COUNTRY IN LATIN AMERICA AND THE CARIBBEAN

Source: Authors' calculations based on national sources.

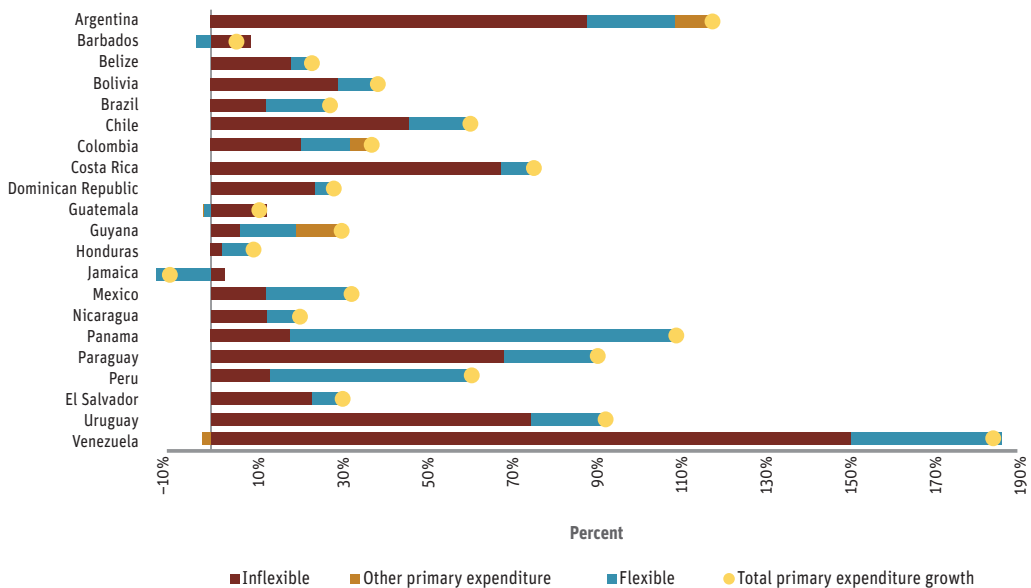
### *...Slowdown in Revenues and Expansion of Largely Inflexible Public Expenditures*

The deterioration of the structural fiscal balance may be a result of a fall in (structural) revenues, an increase in public spending, or both. While before the Great Recession the growth in real expenditures was fully or partly offset by continued revenue growth, this trend was reversed in 2011 when real expenditure growth started to outpace the increase in structural revenues. In addition, a decomposition of primary spending growth into different

categories indicates that, on average, more than two-thirds of the increase stems from items that might be labelled as relatively inflexible (e.g., wages and salaries and current transfers) that are difficult to scale back (see Figure 3.6).

### *...and a Mostly Procyclical Fiscal Response*

In addition to observing the evolution of SPB in *levels*, it is key to assess *changes* in the structural primary balance, as they define the fiscal stance which can then be compared to the cyclical

**FIGURE 3.6** CHANGE IN REAL PRIMARY EXPENDITURE (2007–2013)

Source: Authors' calculations based on national sources and ECLAC (2013).

position of the economy: an increase in the structural primary balance at a time of economic upturn would signal a countercyclical and thus stabilizing role for fiscal policy. As noted in the 2012 Latin American and Caribbean Macroeconomic Report, many countries in the region were able to pursue countercyclical fiscal policy during the Great Recession, representing a milestone in the process of “graduating” from the “pro-cyclicality trap” that had characterized the region.<sup>17</sup>

However, if the fiscal stimulus introduced during a recession is not unwound as a recovery unfolds, fiscal policy would return to be pro-cyclical, reducing (perhaps limited) fiscal space. Considering Latin America and the Caribbean, out of 80 country-year observations, in the period 2010–2013, overall the response of fiscal policy was pro-cyclical with fiscal expansions in the context of economic upturns (60% of upturn observations) and fiscal contractions in the context of downturns (58% of total deceleration episodes).

In spite of these general trends, there are significant differences across countries. Depending on the average responses of the structural primary balance to changes in output gaps across a wide period of time (2000 to 2013), countries can be divided into those that are the most pro-cyclical and those that are the least pro-cyclical.<sup>18</sup> For the typical country in the more pro-cyclical

<sup>17</sup> See Frankel, Végh, and Vuletin (2013) for evidence on the process of “graduation” from fiscal pro-cyclicality across the developing world over the last decade.

<sup>18</sup> The 10 countries in the more pro-cyclical group are those with the most positive correlation coefficients between the structural primary fiscal balance and the output gap, while the 10 least pro-cyclical countries were those with the most negative correlation coefficients.

group, a 1 percentage point increase in the output gap results in a deterioration of 0.3 percentage points of GDP in the structural primary balance.<sup>19</sup> In contrast, the same income shock results in an improvement of more than 0.2 percentage points of GDP in the structural primary balance for the typical country in the least pro-cyclical group.<sup>20</sup>

However, it is also important to assess the degree of “asymmetry” in the conduct of fiscal policy over the cycle. The results of an analysis detailed in Appendix C suggest that those countries that on average are more pro-cyclical both increase structural primary fiscal deficits when output gaps are positive and reduce them when output gaps are negative. That is, for this first group of countries, fiscal policy is *symmetric*; discretionary loosening of fiscal policy in good times exactly matches policy tightening in bad times. On the other hand, for those countries that were the least pro-cyclical, the analysis indicates that they tended to be pro-cyclical when output gaps are increasing and counter-cyclical only when output gaps are falling. In other words, for the latter group fiscal policy is *asymmetric*. In bad times, when output is below potential, a 1 percentage point worsening in the output gap results in a deterioration of the structural primary balance of more than 0.3 percentage point of GDP. However, when output is above potential, changes in the output gap are not accompanied by improvements in the underlying fiscal position.

## Public Debt

Since the mid-1990s public debt ratios in Latin America and the Caribbean have fallen quite significantly. The typical country’s debt is now some 42% of GDP, and that of the median country some 31% of GDP. However, there is considerable variation, as 25% of countries have debt levels that remain above 53% of GDP and a small number of countries have debt levels in excess of 100% of GDP (see Figure 3.7). Moreover, given the deterioration in fiscal balances, debt ratios have risen in recent years. For the typical country the debt ratio was just 36% in 2008 and so has increased by 6 percentage points of GDP since the Great Recession.

Debt levels are calculated at market exchange rates and are considered in relation to current GDP, also measured at market exchange rates. Debt ratios are then affected by movements in exchange rates and by changes in GDP that may be temporary in nature. Just as it is of interest to consider a more structural measure of fiscal flows, it is of equal interest to develop a more structural measure of the stocks of debt liabilities. Therefore, some relatively simple measures of structural debt are presented here. The methodology converts all debt to local currency by using Purchasing Power Parity exchange rates and converts actual GDP to potential GDP in a similar vein to the calculations above for the consideration of structural fiscal balances.

<sup>19</sup> The more pro-cyclical countries are those for which the correlation between the change in the structural primary balance and the change in the output gap is above the median of the region.

<sup>20</sup> See Appendix C for details on the sample and estimation.

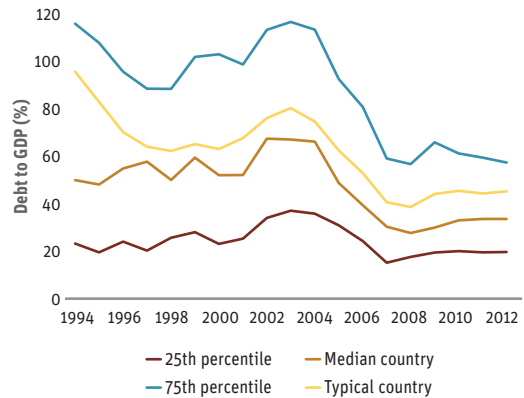
In general, recent structural debt ratios are somewhat lower than actual debt levels. As expected, the series are also more stable over time, as the calculations smooth out several types of temporary shocks. Structural debt for the typical country is some 34% of GDP and a quarter of countries in the region have structural debt ratios in excess of 43% of GDP. Perhaps of most concern is that structural debt for the typical country has increased by over 7% of GDP since 2007—see Figure 3.8.

## Conclusions

In recent years, both actual and structural debt balances have deteriorated, and both actual and structural debt levels have been rising. Real expenditures have been growing rapidly while only moderate economic growth is expected, meaning that fiscal revenues appear unlikely to keep up.<sup>21</sup> Without meaningful policy shifts, deterioration in actual and structural balances seems likely to continue. Expected growth rates reflect potential growth; actual output gaps are close to zero. Therefore, the first conclusion of this chapter is that, given the state of the business cycle and current fiscal balances, rebuilding fiscal buffers by tightening fiscal policy remains a key priority for the region.

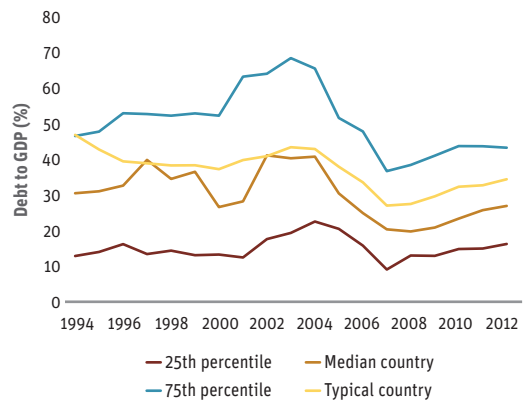
These developments have in large part been due to countries' efforts to escape fiscal pro-cyclicality. Automatic stabilizers<sup>22</sup>

**FIGURE 3.7** PUBLIC SECTOR DEBT RATIOS IN LATIN AMERICA AND THE CARIBBEAN



Source: Historical IDB Debt Dataset (available at [http://www.iadb.org/en/research-and-data/publication-details,3169.html?pub\\_id=dba-007](http://www.iadb.org/en/research-and-data/publication-details,3169.html?pub_id=dba-007)) and LAC Debt Group (available at <http://www.iadb.org/en/topics/finance/lac-debt-group/statistics,6762.html>). Accessed February 2014. Penn World Table 8.0 (2013) and authors' calculations.

**FIGURE 3.8** STRUCTURAL DEBT RATIOS IN LATIN AMERICA AND THE CARIBBEAN



Source: Historical IDB Debt Dataset (available at [http://www.iadb.org/en/research-and-data/publication-details,3169.html?pub\\_id=dba-007](http://www.iadb.org/en/research-and-data/publication-details,3169.html?pub_id=dba-007)) and LAC Debt Group (available at <http://www.iadb.org/en/topics/finance/lac-debt-group/statistics,6762.html>). Accessed February 2014. Penn World Table 8.0 (2013) and authors' calculations.

<sup>21</sup> Real expenditure has been growing in excess of 5% per annum for the typical country.

<sup>22</sup> These include public revenue or expenditure items that adjust automatically (without the intervention of fiscal authorities) in the opposite direction of the cycle to stimulate (reduce) aggregate demand during downturns (upturns). The most common examples are the income tax and unemployment insurance mechanisms. During recessions, income tax payments diminish and payments of unemployment insurance benefits increase, stimulating aggregate

in the region are small due to the small share of income tax within the structure of total public sector revenue<sup>23</sup> and the limited role played by unemployment insurance mechanisms, the latter related to high labor informality.<sup>24,25</sup> It was thus considered a significant advance to be able to employ discretionary fiscal policies during the Great Recession in order to avoid a deeper contraction. However, as the analysis in this chapter reveals, many such policies produced persistent fiscal pressures by either increasing inflexible public expenditure items or reducing revenue in the medium term.<sup>26</sup>

Indeed, relying on discretionary fiscal policies to counter economic cycles has many potential pitfalls.<sup>27</sup> They often require long and complex negotiations among different branches of government, and it is hard to determine the appropriate magnitude, timing and longevity of the required response. Moreover, as the region has amply demonstrated, some such measures are very hard to reverse, which suggests that they should be considered discretionary fiscal expansion measures rather than countercyclical policies.<sup>28</sup> One priority should then be to attempt to deepen automatic stabilizers.

If discretionary fiscal policies are employed in the future they should have significant impacts on growth and they should be easy to reverse.<sup>29</sup> Countries may then wish to strengthen fiscal frameworks in order to make those policies more effective and more likely to be truly countercyclical.<sup>30</sup> Such policies, however, should only be considered to counter a significant negative shock to the baseline considered in this report. Under the baseline with output gaps close to zero, the emphasis should be on restoring fiscal buffers.<sup>31</sup>

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demand. During booms the opposite occurs, as income tax payments increase and payments of unemployment benefits decrease, as workers and employers tend to increase their payments for unemployment insurance, thus reducing aggregate demand.

<sup>23</sup> Particularly considering the high revenues from non-renewable resources.

<sup>24</sup> See Corbacho, Fretes Cibils and Lora (2013) for a description of the automatic stabilizers in the region and a discussion.

<sup>25</sup> See Corbacho and Gonzáles-Castillo (2012); Espino and González-Rozada (2012) and Machado and Zuloeta (2012) for detailed explanations of why automatic stabilizers are small in Latin American and Caribbean countries compared to advanced economies.

<sup>26</sup> Izquierdo and Talvi (2011) and Powell (2012) detail measures adopted in response to the crisis during 2008–2009; see also ECLAC (2009) and IMF (2009).

<sup>27</sup> See Fatás and Mihov (2003, 2008 2012).

<sup>28</sup> In this category should perhaps be included salary increases, increases in conditional cash transfers, reductions in tax rates or extension of exemptions or other types of tax benefits.

<sup>29</sup> Good candidates include certain maintenance and repair programs for public infrastructure; stimulus for temporary youth employment programs; special financing programs for micro, small and medium enterprises; advance procurement programs for public sector goods and services; start-ups for small and medium-size investment programs and pre-defined temporary VAT rate reductions. These types of measures are usually time-bound and subject to less social pressure to keep them in place indefinitely.

<sup>30</sup> Such improvements might include the following: i) structural fiscal rules with quantitative targets for deficit limits but that have specified escape clauses (with sunset provisions) to open the room for discretionary fiscal policies when circumstances dictate; ii) consistent mandatory medium term budget frameworks; and iii) clear, transparent and automatic saving and dissaving mechanisms to ensure that fiscal buffers may finance discretionary anti-cyclical fiscal policies.

<sup>31</sup> As discussed in Appendix A, some policies to enhance growth may require fiscal expenditures, but they should be differentiated from discretionary measures for demand management.

## CHAPTER 4

# Balance Sheets and Credit Growth

Credit has grown strongly across the region in the last few years. Since 2009, credit from domestic financial systems has grown at roughly 18% per annum for the typical country, and by the end of 2012 it was on average some 40% of GDP.<sup>32</sup> Moreover, credit from abroad has boomed, particularly through the issuance of international debt securities. External assets have also grown, indicating increased financial integration. Such financial deepening and integration are natural processes that bring many benefits, especially as credit availability is often considered a limiting factor to growth in emerging economies. Those processes, however, may also create potential vulnerabilities. The objective of this chapter is to examine what underlies the main trends in order to understand the nature of the current credit cycle and to assess whether the opportunities are also accompanied by vulnerabilities that policymakers may wish to address.<sup>33</sup>

Two opposing trends have led to a deterioration of the net financial position of most countries in the last five years. While the public sector has accumulated reserves and public external debt has fallen, there has been a marked deterioration in the external balance sheet of the private sector, driven by a large increase in international debt liabilities.<sup>34</sup> Moreover, this net position masks a substantial increase in financing through foreign currency debt due to sizeable external issuance by financial and non-financial firms, presumably taking advantage of low international interest rates. The region may be at the top of a rather acute credit cycle, and as U.S. interest rates normalize, investors' demand for the region's financial assets are likely to fall and, in some cases, currencies may depreciate rapidly. Currency mismatches on bank balance sheets or on those of their larger clients, including corporates that have issued directly in international markets, may lead to knock-on effects on domestic financial systems. In a context of subdued economic growth, financial systems may be placed under greater stress in the coming years than at any time since the 1990s.

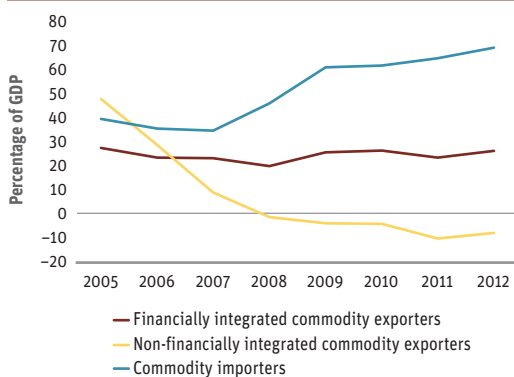
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<sup>32</sup> Credit is measured in US\$; the source of the data is the World Bank.

<sup>33</sup> In the 1990s, relatively high rates of dollarization were considered a vulnerability. In the early 1980s, relatively high external debts combined with rising U.S. interest rates and falling commodity prices contributed to the subsequent debt crisis (see Powell 1989).

<sup>34</sup> It is sometimes thought that external liabilities are not dangerous when they are private sector liabilities, but this idea (sometimes referred to as the Lawson Robicheck doctrine) has been discredited by several crises in emerging markets (e.g., East Asia 1997–98) and in advanced economies (e.g., the United Kingdom, Iceland, Ireland and Spain) when large private sector liabilities prompted currency crises or concerns about the sustainability of the current account under fixed exchange rates.

**FIGURE 4.1** NET FOREIGN LIABILITIES OF COUNTRIES IN LATIN AMERICA AND THE CARIBBEAN



Source: Authors' calculations based on IIP database of IMF and WDI database of World Bank.

Note: Net liabilities are computed by subtracting external assets from the stock of external liabilities of the private sector (excluding assets and liabilities of government and monetary authorities). The figure shows the simple average for each group of countries.

## Deterioration in Net External Financial Positions

The Latin American and Caribbean region is very heterogeneous. A group of financially integrated commodity exporters and a group of commodity importers are both net debtors, while non-financially integrated commodity exporters are net creditors (see Figure 4.1).<sup>35</sup> The first two groups have seen their net external positions worsen in the years following the global financial crisis.<sup>36</sup> By the end of 2012, net liabilities of the average commodity importer as a percentage of GDP increased by 22 percentage points from the ratio achieved in 2008, rising from 45% to 68%.<sup>37</sup> The deterioration in the balance sheet of the group of

financially integrated commodity exporters worsened by 6 percentage points, reaching 25% of GDP in 2012. Interestingly, the balance sheet of non-financially integrated commodity exporters has continued to improve, and with the exception of Paraguay, all countries in this group were net external creditors in 2012.

Net overall positions, however, mask differences in the evolution of the external positions of governments and private sectors. Over the last decade, three policies contributed to a strengthening of the *external* position of the public sector in most countries of the region: i) fiscal consolidation, which reduced public debt from the 1990s;<sup>38</sup> ii) debt management policies, which led to lower foreign public sector borrowing and more reliance on domestic currency debt;<sup>39</sup> iii) accumulation of international reserves, with reserves growing particularly strongly

<sup>35</sup> Dividing countries into three groups based on their integration into global capital markets and the importance of commodity exports results in three relatively homogeneous groups: i) commodity exporters integrated into international capital markets, ii) commodity exporters that are less integrated and iii) commodity importers. The group of financially integrated commodity exporters is composed of Brazil, Chile, Colombia, Mexico, Peru, and Uruguay. The group of non-financially integrated commodity exporters consists of Argentina, Bolivia, Ecuador, Paraguay, and Venezuela. The group of commodity importers is composed of Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, Nicaragua, and Panama.

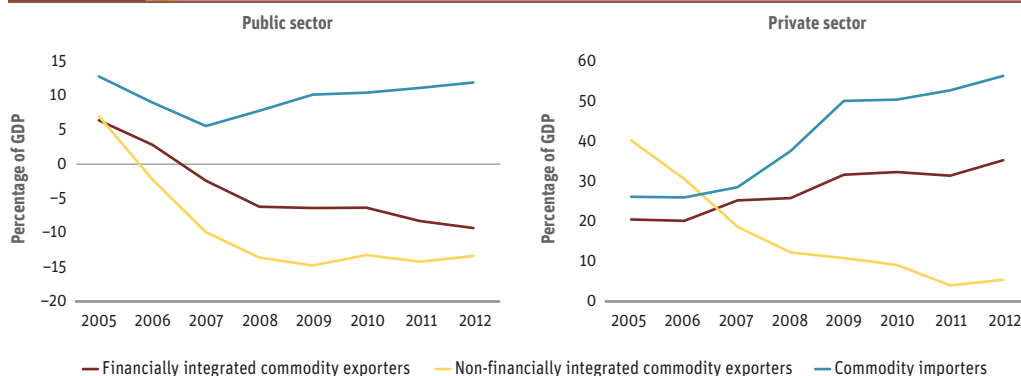
<sup>36</sup> See Powell (2012) for an analysis of external balance sheets up to the global financial crisis.

<sup>37</sup> Excluding Jamaica from the average, which underwent a debt crisis and restructuring in 2010, the increase is 14 percentage points.

<sup>38</sup> Although for the typical country debt ratios have deteriorated recently, as reviewed in the previous chapter.

<sup>39</sup> By 2012, nearly 60% of government debt of the typical Latin American country was issued domestically, and nearly 50% was issued in domestic currency at a fixed rate.



**FIGURE 4.2** NET FOREIGN LIABILITIES OF COUNTRIES IN LATIN AMERICA AND THE CARIBBEAN

Source: Authors calculations, IIP database of IMF and WDI database of World Bank.

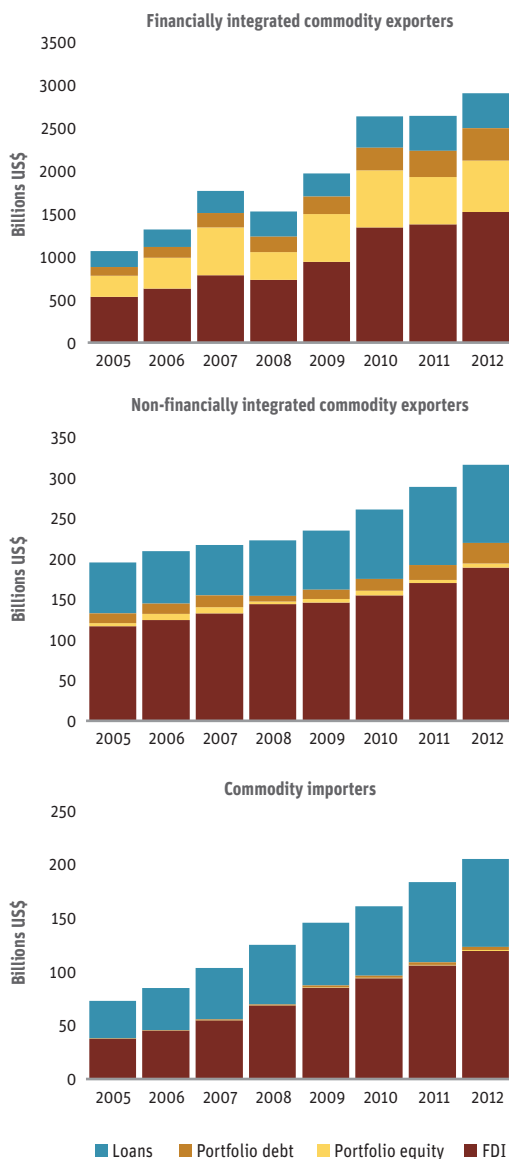
Note: Net liabilities are computed by subtracting external assets from the stock of external liabilities. Public sector includes assets and liabilities of government and monetary authorities. The figure shows the simple average for each group of countries.

in countries that export commodities. In the last five years, however, commodity importers have seen their sovereign net positions worsen. At the same time, there has been a sharp worsening of the net external position of the private sector of financially integrated commodity exporters and of commodity importers. The private sector net external liabilities of the financially integrated commodity exporters have reached 35% of GDP, while for the commodity importers, the figure is as high as 55% of GDP (see Figure 4.2).

The deterioration in the net external position of the private sector was due to the rapid growth of gross liabilities rather than a decline in gross assets (see Figure 4.3). While foreign direct investment liabilities continue to represent the largest share of total gross liabilities, non-FDI liabilities have increased substantially; they grew by 74% between 2008 and 2012 in the financially integrated commodity exporters (increasing from US\$ 796 billion to US\$1.3 trillion).<sup>40</sup> The increase in the same liabilities of non-financially integrated commodity exporters was 60%, and that of commodity importers, 52%. More specifically, over the previous five years, the portfolio debt liabilities of financially integrated commodity exporters increased by some 112% and are now in excess of 48% of all external debt liabilities for this group (compared to 38% in 2008). Similar changes took place in the group of commodity importers, but in this group bank loan liabilities are still the lion's share of all debt liabilities (80%).

The remainder of this chapter focuses on the structure of external debt liabilities of the private sector of the financially integrated commodity exporters (Brazil, Chile, Colombia,

<sup>40</sup> Non-FDI liabilities are composed of portfolio equity securities, portfolio debt securities, and other investment liabilities of the private sector. Other private investment liabilities include mainly bank-originated liabilities such as loans, deposits, and trade credits.

**FIGURE 4.3** COMPOSITION OF PRIVATE SECTOR FOREIGN LIABILITIES

Source: Authors' calculations, IIP database of IMF.

Note: Loans refer to the category of other investments in the IIP database.

Mexico, and Peru, hereafter referred to as LAC-5). These economies have experienced significant changes in the structure of their external debt liabilities, and they are now highly integrated into global capital markets.<sup>41</sup>

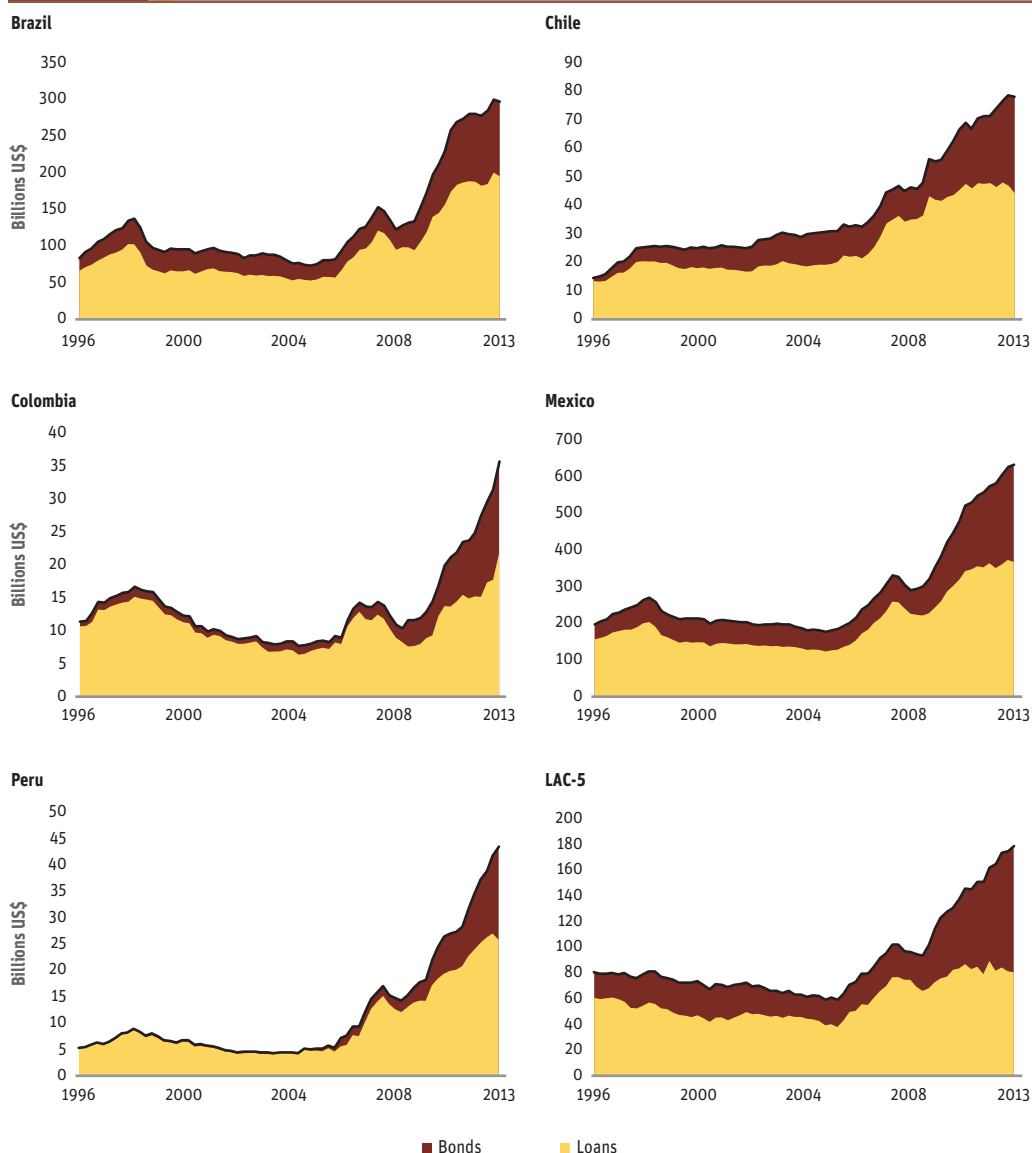
### Corporate International Borrowing Has Risen, with More Reliance on Bonds

Compared with a decade ago, the gross debt of the private sector of LAC-5 has risen significantly. International borrowing both from banks and through international debt securities increased, but there is more reliance now on international bond markets (see Figure 4.4). By mid-2013, the share of bonds in the stock of international corporate debt of the typical LAC-5 country was 43%, while at the turn of the century the stock of bonds represented an average of only 22% of corporate international debt in the typical LAC-5 country.<sup>42</sup>

Debt is frequently reported on a *residence basis*, as in Figure 4.4, which includes debt issued by residents offshore. However, Latin American and Caribbean-owned firms also issue debt through foreign subsidiaries that are not captured in these numbers. For example, a Brazilian firm may have a subsidiary in the United States that issues the debt in London. An alternative is a *nationality basis*; however, that would exclude

<sup>41</sup> Uruguay is excluded from the analysis below because its stock and issuance of international debt securities is relatively small.

<sup>42</sup> The plot for LAC-5 in the bottom left of Figure 4.5 refers to the total of the five countries added. Because of the size of the Brazilian and Mexican bond and loans markets, this plot largely reflects the trend in those two countries.

**FIGURE 4.4** DECOMPOSITION OF STOCK OF PRIVATE SECTOR INTERNATIONAL DEBT (BONDS AND LOANS)

Source: Authors' calculations, BIS Securities and Banking Statistics.

Note: Bonds and loans based on residence.

issuance by the subsidiary of a foreign firm resident in Latin America, such as Banco Santander, Chile. For the remainder of this chapter, a new and innovative definition is adopted, referred to hereafter as Latin American and Caribbean firms' international liabilities. This comprises the liabilities of all firms that are resident in Latin America and the Caribbean plus the liabilities of firms owned by Latin American and Caribbean firms that are not resident (see Appendix D for further discussion).

Moreover, it is useful to consider the *issuance* of bonds and syndicated loans to complement the preceding analysis of stocks.<sup>43</sup> While stocks change slowly and reflect past decisions, issuance captures more recent trends. There has been a sharp increase in the issuance of total debt after the mid-2000s (see Figure 4.5). Total issuance of Latin American and Caribbean firms was US\$845 bn over the period January 2009 to September 2013.<sup>44</sup> In most countries bond issuance has grown relative to that of loans. This represents a shift in the way the region (or LAC-5) is integrated into global capital markets, as in the past loans were the more favored instrument.

## Analyzing Firms' Bond Issuance

Firms in the region (LAC-5) are obtaining more financing, and they are doing so increasingly through bond markets. Since the Great Recession, the structure of corporate bond debt in the major Latin American countries has moved from a market largely dependent on domestic issuance towards a more globally integrated market. During the period 2004 to 2008 (quarter 3), issuance of domestic debt securities by LAC-5 corporations amounted to 66% of the total \$287 billion issued. However, from 2009 to 2013 (quarter 3), issuance of domestic debt securities amounted to only 36% of total issuance by the private sector (a total of \$536 billion), as shown in Figure 4.7.<sup>45</sup>

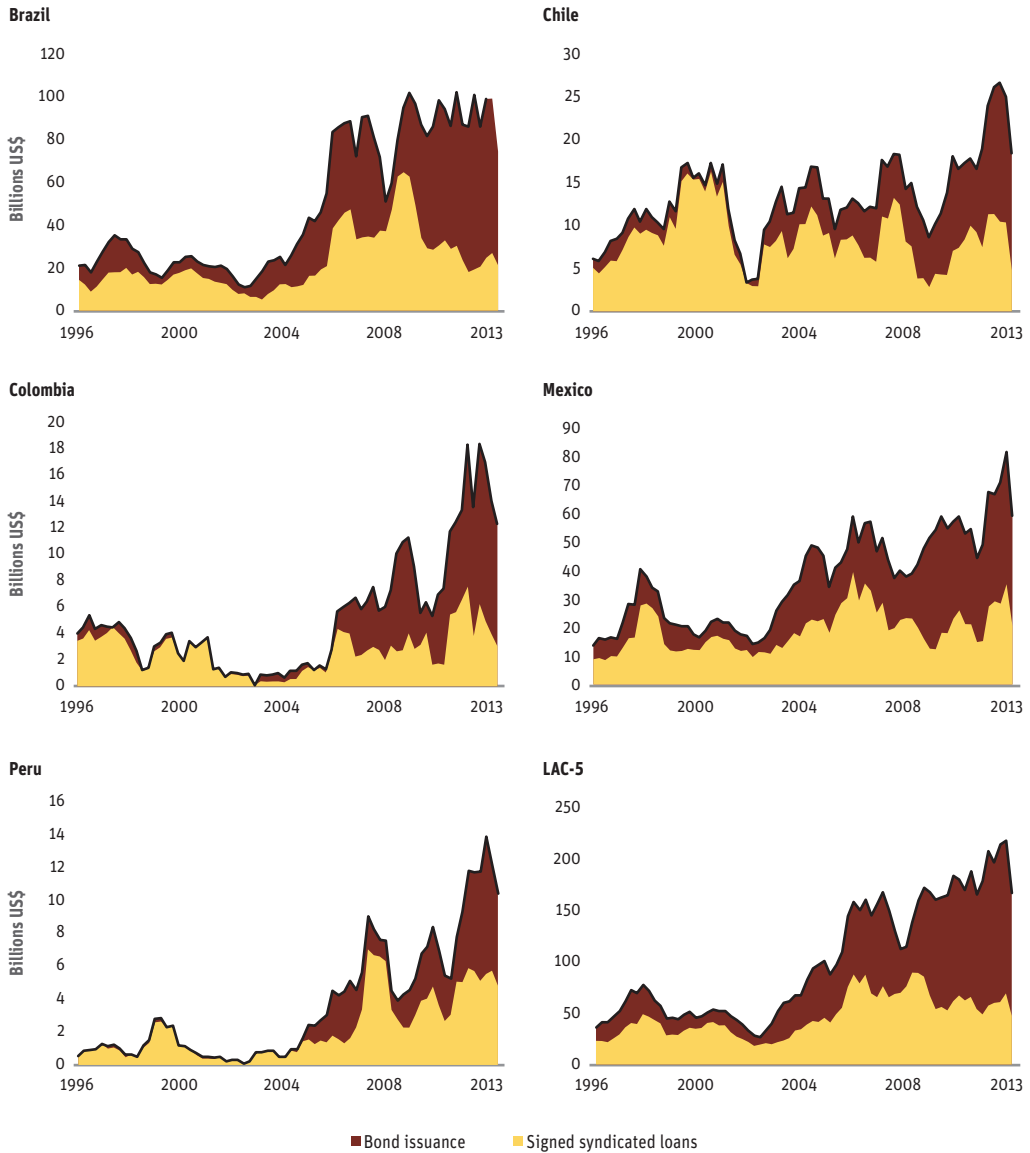
As reviewed above, these statistics include the issuance of firms resident in LAC-5 economies as well as LAC-5 nationality companies that may issue through subsidiaries located outside of the region.<sup>46</sup> In fact, issuance by non-resident nationals is not new. The share of bonds issued by Brazilian corporations through offshore subsidiaries before the Great Recession crisis was some 19% and as high as 25% in Peru (with Mexico and Colombia at 20% and 18%, respectively). The share of issuance by non-resident nationals decreased after the Great Recession in the cases of Colombia, Mexico, and Peru, although that share jumped to 37% for the case of Brazil (see Figure 4.7).

<sup>43</sup> Considering bond issuance at the transaction level implies that residents and non-national residents can be identified. Data of gross issuance of bonds and signed syndicated loans is aggregated for each country to include issuance of debt by both resident and non-resident nationals. The data source is Dealogic. The databases compiled for this report are aggregations of transaction-level data for all bonds and syndicate loans available in Dealogic for the period spanning January 1, 1995 to November 4, 2013. The data include 557,907 bond tranches (424,050 unique bond deals) and 221,993 loan tranches (156,002 unique loan deals).

<sup>44</sup> On a residence basis this number is US\$729 billion. The figures for the pre-crisis period of equal length, spanning January 2004 to September 2008, are US\$560 billion for the preferred definition of Latin American and Caribbean firms and US\$509bn on a residence basis.

<sup>45</sup> Given the definition of total issuance in a country as the sum of issuance by all residents plus issuance of non-resident nationals, the regional figures presented here are adjusted so that there is no double counting of the bonds issued by residents of LAC-5 that are being issued by subsidiaries based in another LAC-5 country. The amounts issued in this fashion were \$1.7 billion in the 2004–2008 period and \$3.9 billion in the 2009–2013 period. The plots for LAC-5 present adjusted figures.

<sup>46</sup> Based on Bank for International Settlements data on international debt securities, Turner (2014) and Shin (2013) have highlighted the phenomenon of issuance abroad by nationals of Brazil and China.

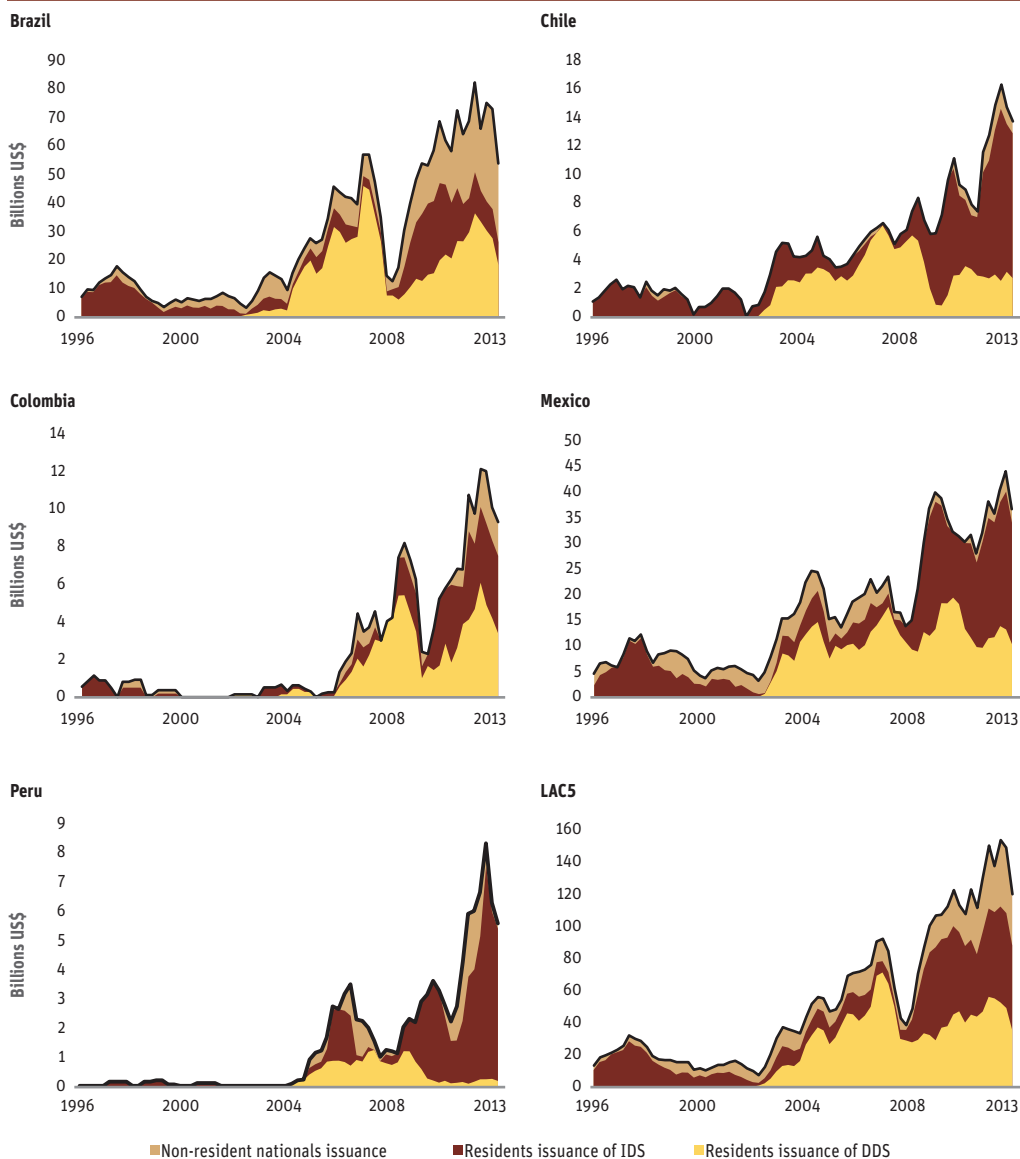
**FIGURE 4.5** BOND ISSUANCE AND SIGNED SYNDICATED LOANS BY CORPORATIONS

Source: Authors' calculations, Dealogic.

Note: The figure presents cumulative 4-quarters gross issuance of bonds and signed syndicated loans of resident firms and of firms that are non-resident nationals.

International debt securities have been issued almost entirely in foreign currency<sup>47</sup> and predominantly in U.S. dollars, and hence the share of total issuance in local currencies has

<sup>47</sup> Hausmann and Panizza (2003) refer to this as "Original Sin." See also Powell (2014) who details the dominance of the dollar in emerging economy international bond issuance and in other markets, and estimates the value to a country of being able to issue in local currency.

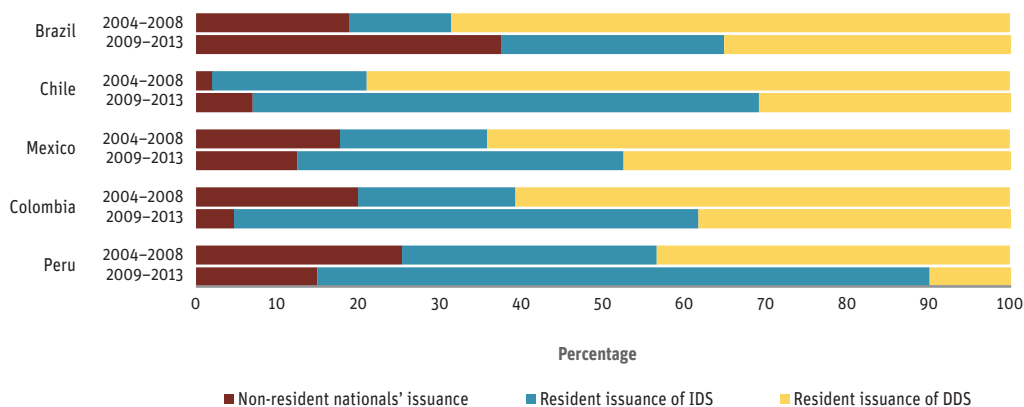
**FIGURE 4.6** ISSUANCE OF DEBT SECURITIES (BONDS) BY CORPORATIONS

Source: Authors' calculations, Dealogic.

Note: The figure presents cumulative 4-quarters gross issuance of bonds of resident firms and of firms that are non-resident nationals. IDS stands for International Debt Securities as defined in Appendix D. DDS stands for Domestic Debt Securities as defined in Appendix D.

fallen—see Figure 4.8.<sup>48</sup> In fact, before the Great Recession in 2008, local currency issuance dominated, but this has receded with the increased use of international securities.

<sup>48</sup> A classification of local currency is assigned to a bond after comparing its currency of denomination with the residence of the issuer. For bonds issued by non-resident nationals, the currency of denomination is compared with

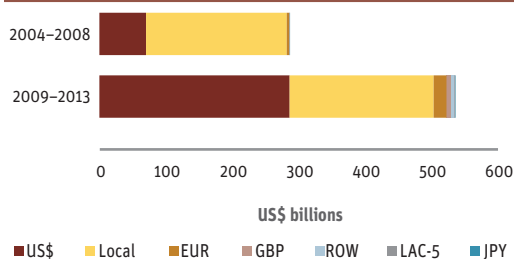
**FIGURE 4.7** GREATER SHARE OF INTERNATIONAL ISSUANCE OF DEBT SECURITIES

Source: Authors' calculations, Dealogic.

Note: The figure presents shares of total bond issuance in two periods. Period 1 spans 2004q1–2008q3, and period 2 spans 2009q1–2013q3. IDS stands for International Debt Securities as defined in Appendix D. DDS stands for Domestic Debt Securities as defined in Appendix D.

Of particular concern would be currency mismatches in the financial sector and in the non-traded sector that did not have a natural hedge of exports.<sup>49</sup> With respect to the financial sector a potential concern is that even though there may be no mismatches on bank balance sheets per se, if liabilities and assets (loans) are in dollars, then the clients of the financial system may be vulnerable to depreciation. Moreover, if large non-financial firms have issued directly in dollars and also borrowed from the local financial system, then vulnerabilities may be transmitted to the financial system even if those local loans are denominated in local currency.

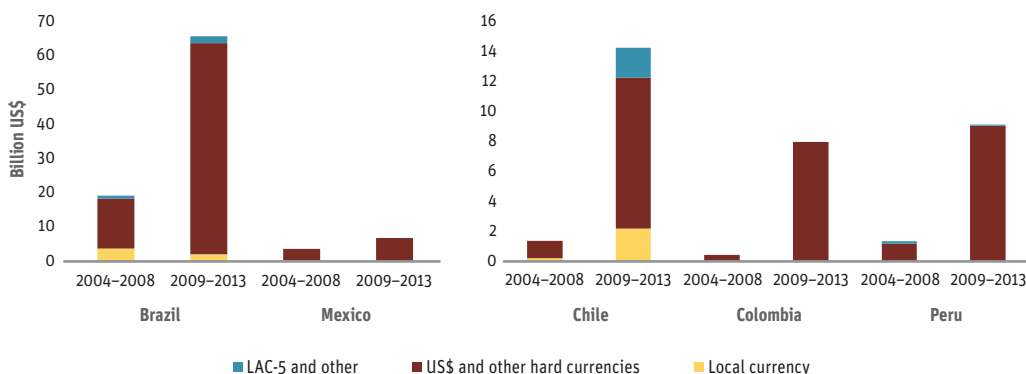
Two trends appear to be a *prima facie* cause for concern. First, there has been substantial international issuance of financial firms, and these issuances have been very largely in dollars. Second, there has also been substantial international

**FIGURE 4.8** ISSUANCE OF DEBT SECURITIES BY CURRENCY

Source: Authors' calculations, Dealogic.

the currency of the country where the parent resides (e.g., bonds issued in Brazilian reais by nationals of Brazil residing abroad are classified as local currency). The currencies US\$, EUR, GBP, and JPY are self-explanatory. The category of LAC-5 includes all bonds denominated in currencies of LAC-5 countries (including inflation-induced instruments). The category ROW stands for currencies from the Rest of the World.

<sup>49</sup> Dollar issuance in the commodity sector may also be worrisome. While revenues may be in dollars, the volatility of commodity prices may nonetheless imply substantial risks from fixed interest rates rather than, say, commodity-contingent contracts; see Anderson, Gilbert, and Powell (1989).

**FIGURE 4.9 CURRENCY COMPOSITION OF INTERNATIONAL BOND ISSUANCE OF FINANCIAL FIRMS**

Source: Authors' calculations, Dealogic.

Note: The figure presents currency composition of total bond issuance in two periods. Period 1 spans 2004q1–2008q3, and period 2 spans 2009q1–2013q3.

Category of Local Currency refers to issuance in domestic currency and includes inflation-indexed instruments.

Category of US\$ and Other Hard Currencies includes issuance in US dollars, Euros, British Pounds, and Japanese Yens.

Category of LAC-5 and Other includes issuance in currency of a LAC-5 country (including inflation-indexed instruments), and issuance in any other currency.

issuance—again virtually entirely in dollars—from non-financial firms in the non-traded sector. These trends are illustrated in Figures 4.10 and 4.11.

## International Issuance and the Credit Cycle

Credit has been growing strongly in the region in all three country groups—see Figure 4.11. To understand the dynamics in more detail it is instructive to consider a simple flow of funds analysis, presented in more detail in Appendix D for four of the larger financially integrated commodity exporters—Brazil, Mexico, Chile and Colombia<sup>50</sup>. Credit to the non-financial private sector almost doubled from 2009 to 2012 in these four economies, amounting to an increase of some US\$ 1.1 trillion.<sup>51</sup> Over the same period, in the same four countries deposits of non-financial corporations in the domestic financial system grew by US\$ 577 billion, while deposits of households grew by about US\$ 350 billion. Non-financial firms have issued international bonds and contracted international loans for about US\$ 180 billion, representing about 16% of the increase in domestic credit. In addition, banks have financed US\$ 162 billion through issuance of international securities and foreign loans over the same period.<sup>52</sup>

There appears to be a statistical relation between the issuance of overseas debt by non-financial firms and domestic credit (Figure 4.12). An empirical analysis using data for 18 emerging

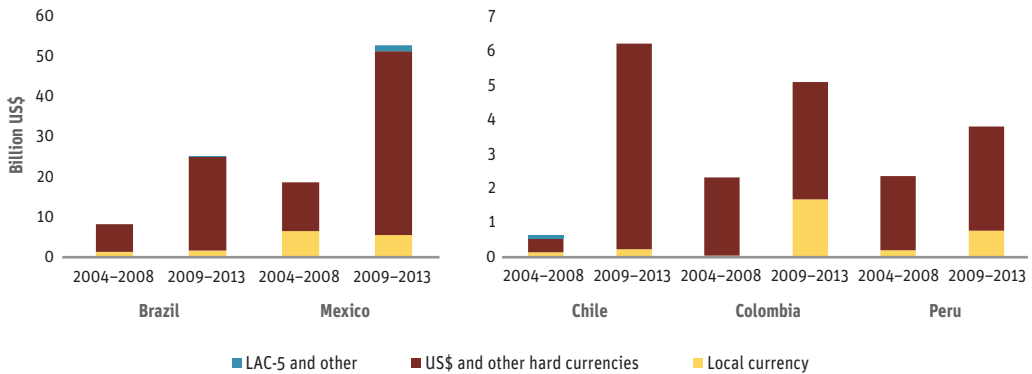
<sup>50</sup> Elena Loukoianova at the IMF kindly assisted with the provision of statistics regarding the growth of the deposits of non-financial firms in Latin America and the Caribbean to effect these calculations.

<sup>51</sup> The total increase in credit to the non-financial private sector for the whole region was some US\$ 1.2 trillion.

<sup>52</sup> This analysis is necessarily partial; for example it does not include debt amortizations.



**FIGURE 4.10** CURRENCY COMPOSITION OF INTERNATIONAL BOND ISSUANCE OF FIRMS IN THE NON-TRADED SECTOR



Source: Authors calculations, Dealogic.

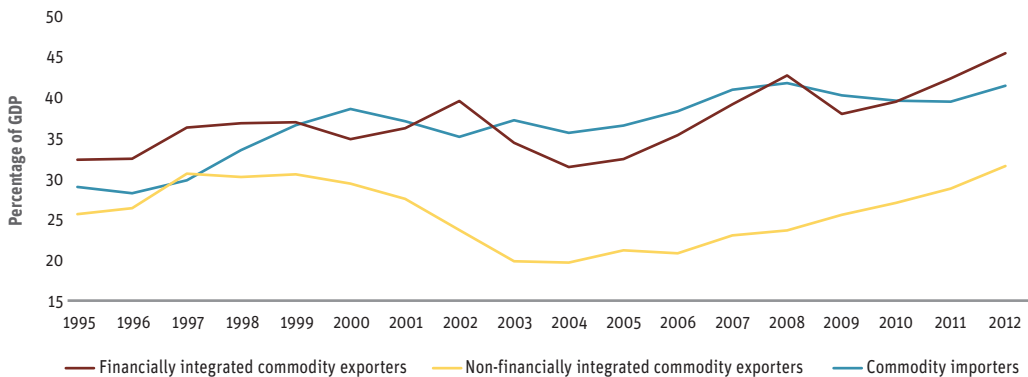
Note: The figure presents currency composition of total bond issuance in two periods. Period 1 spans 2004q1–2008q3, and period 2 spans 2009q1–2013q3.

Category of Local Currency refers to issuance in domestic currency and includes inflation-indexed instruments.

Category of US\$ and Other Hard Currencies includes issuance in US dollars, Euros, British Pounds, and Japanese Yens.

Category of LAC-5 and Other includes issuance in currency of a LAC-5 country (including inflation-indexed instruments), and issuance in any other currency.

**FIGURE 4.11** CREDIT TO THE PRIVATE SECTOR IN LATIN AMERICA AND THE CARIBBEAN

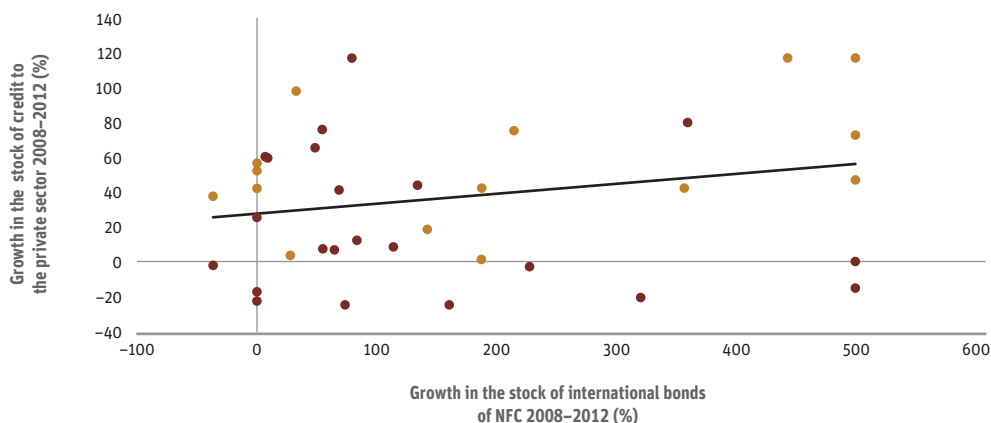


Source: Authors calculations, WDI database of World Bank.

Note: The figure shows the average trend in credit to the private sector relative to GDP for each country group (groups as in footnote 3). The average trend is computed as the predicted time effects from fixed country-and-year effects regressions for credit.

countries over the last decade corroborates this view, at least for the cases of Latin America and East Asia.<sup>53</sup> The details of this analysis are provided in Appendix D. Combining the flow of funds and the empirical analysis, there is indeed some evidence that international borrowing has been one of the factors behind the strong growth in credit.

<sup>53</sup> The sample spans 2002–2012 and includes Brazil, Chile, Colombia, Czech Republic, Hungary, India, Indonesia, Israel, Malaysia, Mexico, Peru, Philippines, Poland, Slovenia, South Africa, Thailand, Turkey, and Ukraine. See details in Appendix D.

**FIGURE 4.12****INTERNATIONAL BOND ISSUANCE BY NON-FINANCIAL CORPORATIONS AND CREDIT 2008–2012**

Source: Authors' calculations, BIS security statistics database, and WDI database of World Bank.

Note: The figure plots the percentage growth in the stock of credit in the period 2008–2012 against the percentage growth in the stock of international bonds of Non-Financial Corporations in 38 countries (15 in Latin America and the Caribbean). The impact of outliers in the growth rates is mitigated by winsorising the data, so that the bottom 5% is replaced with the 5th percentile and the top 95% with the 95th percentile.

One concern here is that, if non-financial firms have been borrowing in dollars and depositing in local currency (a type of carry trade), then when conditions change these trades may be abruptly reversed, creating liquidity problems in the domestic financial sector.<sup>54</sup> A second concern is that currency depreciation could provoke balance sheet effects for those firms, which are also likely the largest borrowers from the domestic financial system.

However, several caveats are in order with respect to this analysis. First and foremost, the assets of both financial and non-financial firms have also increased. In fact, there is evidence from some countries that the ratio of international issuance to assets has not grown.<sup>55</sup> Still, dollar asset values of firms in the non-traded sector may also change in the face of sharp currency depreciations. Second, financial and non-financial firms may be hedging any currency mismatches. Unfortunately there are no systematic data that allow an analysis of hedging patterns in the region. Such activities could mitigate the concerns expressed here, particularly if the risks are being diversified internationally, reducing aggregate risk in the local economy. That said, if the local financial system is hedging the currency risks of the non-financial sector this may actually be increasing risks within the financial sector. However, given improved regulation of financial systems in the region and improved monitoring, at least on onshore balance sheets, these risks should be limited. In fact, in some cases it is the Central Bank itself that offers some currency hedging alternatives.

<sup>54</sup> The deposits of non-financial corporations are generally considered to be the most volatile.

<sup>55</sup> This appears to be the case for Chile for example, as indicated in information kindly provided by the Central Bank.

A further caveat is that increased dollar debt levels might be offset by specific assets. For example, Colombian financial institutions have issued debt in dollars but at the same time acquired banks in Central America. Chilean financial firms have acquired equity shares in financial institutions in Colombia. These assets hedge against the risk of a depreciation of the home country currency but may increase vulnerability to other risks. Moreover, as noted in the first section of this chapter, the net external position of the private sector has deteriorated, suggesting that overall the purchase of such assets has not kept pace with the issuance of liabilities.

To conclude, this chapter has raised a set of issues that provoke further questions and hence deserve deeper analysis. The intention has been to call attention to specific trends that appear relevant to overall financial stability and not necessarily to state that there are impending problems. Moreover, individual countries may face different risks depending on the finer characteristics of financing patterns. Policy makers may wish to investigate further the particular situation of individual countries and make more information available. This would serve to alleviate concerns that risks might be hidden within this recent period of rapid credit growth.



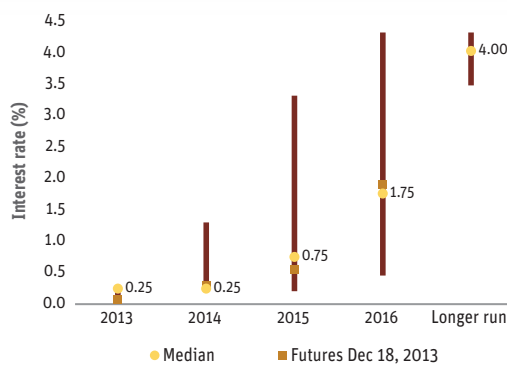
## CHAPTER 5

# Capital Flows and Monetary Policy

As the U.S. economy recovers, the Federal Reserve will reduce its asset purchases (the so-called tapering), and the policy interest rate (the Federal Funds Rate) will increase to more normal levels. Under these circumstances capital flows and asset prices in the region would be expected to fall. This might suggest that a less restrictive monetary policy for Latin America and the Caribbean would be in order. On the other hand, however, the region's output is close to potential, currencies have depreciated and inflation and inflation expectations have crept up. Monetary policy therefore remains finely balanced.

Moreover, policy decisions are complicated by high levels of uncertainty. While futures markets and the median member of the Federal Reserve's Open Market Committee (FOMC) predict a rather similar path for the U.S. policy interest rate, there is considerable dispersion in the predictions of the individual members of the FOMC (see Figure 5.1).<sup>56</sup> Since the May 2013 announcements of then-Governor Bernanke regarding U.S. monetary policy (referred to hereafter as the *taper announcement*), gross capital flows to emerging economies and to Latin America and the Caribbean have fallen by substantial amounts. Figure 5.2 plots the net purchases or withdrawals from emerging market and Latin American and Caribbean bond and equity funds that are available on a timely and high-frequency basis. These funds were receiving as much as US\$ 40 billion of annualized purchases at the start of 2013, but this trend reversed, with annualized withdrawals of almost US\$ 20 billion by the end of the

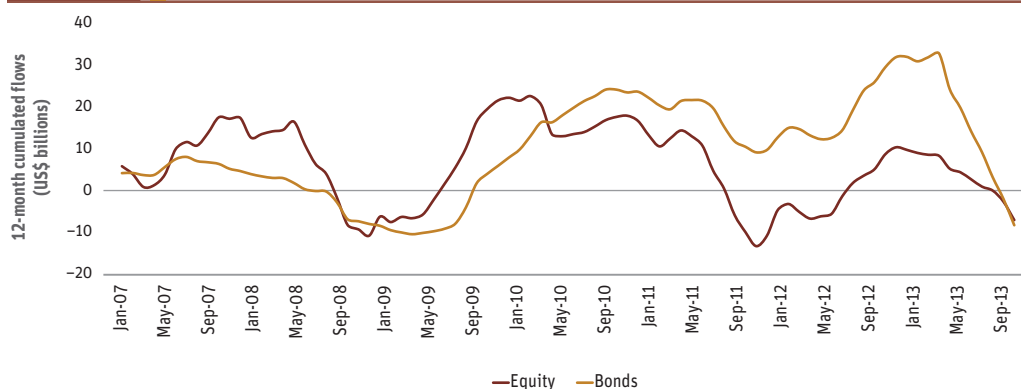
**FIGURE 5.1** EXPECTED RISE IN THE FEDERAL FUNDS TARGET RATE



Sources: Federal Reserve Board (2014) and Bloomberg.

Notes: Median is the median prediction of the members of the Federal Reserve Open Market Committee (FOMC) and the black lines give the minimum and maximum prediction from the FOMC members. Futures is the predicted level given the futures contract of (date).

<sup>56</sup> Dispersion in interest rate forecasts may reflect differences in growth expectations for the underlying economy consistent with the standard deviation of private forecasts for the US economy as reported in Chapter 1.

**FIGURE 5.2** GROSS EQUITY AND BOND FLOWS TO LATIN AMERICA AND THE CARIBBEAN

Source: EPFR Global.

Note: The lines represent the 12-month flows of equity and bonds to Latin America and the Caribbean from 2007 to 2013.

year.<sup>57</sup> It is likely that reductions in those flows will translate into contractions in overall capital inflows and possibly into declines in net capital flows.<sup>58</sup>

Assuming no change in international reserves, a fall in overall net capital inflows would require an adjustment in the current account. As illustrated in Figure 5.3, a one standard deviation decline in net capital inflows would require an adjustment to bring the current deficit levels roughly into balance from current levels in excess of US\$100bn or 3.5% of GDP.<sup>59</sup>

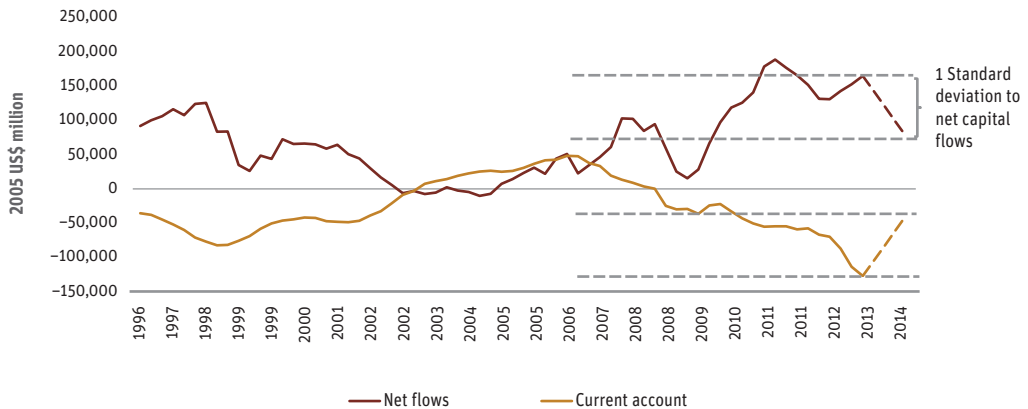
This chapter reviews how the region has responded to past exits from low U.S. interest rates and to the May 2013 *tapering announcement*. Estimates are then presented indicating that changes in the expected path of U.S. interest rates may have significant impacts on capital inflows, and that in turn shifts in capital inflows have significant and persistent impacts on growth.<sup>60</sup> Nonetheless, there is considerable heterogeneity across countries. The chapter concludes noting that some countries in Central America and the Caribbean that tend to have less exchange rate flexibility will benefit more from the stronger economic recovery in the United States, while those with exchange rate flexibility do have monetary policy space to respond to negative shocks if required.

<sup>57</sup> The total stock of equity and bond funds covered by this data was in excess of US\$ 400 billion in May 2013. The average fall in the stock from May to December across the five large economies of the region was about 15%, although for Mexico and Colombia there was an initial fall, followed by an increase towards the end of the year. The \$20 billion figure refers to both equity and bond flows.

<sup>58</sup> Figure 5.2 plots 12 month accumulated net purchases or withdrawals to emerging market equity and bond funds which constitute a part of gross capital inflows—the flows of non-residents. Chapter 6 considers in more detail the differences between gross and net capital flows that include both the flows of non-residents and those of residents. Fratzscher (2012) reports that the flows reported here have a high correlation with overall capital inflows.

<sup>59</sup> This assumes no other financing of the current account deficit is available or that reserves are not depleted.

<sup>60</sup> In the following chapter a more extreme event known as a Sudden Stop is considered.

**FIGURE 5.3** THE POTENTIAL EFFECT OF A FALL IN NET CAPITAL FLOWS TO THE REGION

Source: Authors' calculations based on data from IMF: International Financial Statistics.

Note: Countries Included: Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela.

### The Effects of Previous U.S. Policy Rate Increases: What Does History Tell Us?

The current coincidence of persistent exceptionally low short-term rates and massive asset purchases on the part of the Federal Reserve System is unique in recent history. Still, previous exits from low policy rates and from the more recent announcements regarding the future path of asset purchases may provide useful insights into how the region will be affected in the future.

Two previous episodes are of particular interest. The first commenced in March 1994 when the Federal Reserve increased its policy rate from 3 to 6% over the course of 12 months. The second started in July 2004 and triggered a period of 25 months of sustained increases during which the policy rate went from 1 to 5.25%. Prior to both episodes there had been a period of stable interest rates of 17 and 12 months, respectively. Panel A of Figure 5.4, presents these two episodes in red, and the other panels document the weighted average dynamics of various macroeconomic variables around the time of the two episodes in Latin America and the Caribbean, using relative GDP as weights. The time unit used is a quarter, and period zero signals the quarter in which the policy rate hike started. The plots document the evolution of this variable five quarters before and eight quarters after the beginning of the Federal Reserve's tightening policy in each of the two episodes.

In 1994 there was a Sudden Stop in capital inflows, while in 2004 there was only a temporary slowdown (Figure 5.4, Panel B). While in 1994 the Latin American and Caribbean Emerging Market Bond Index (EMBI) plunged (Figure 5.4 Panel C), in 2004 it actually rose.<sup>61</sup> The differences in real variables were also very marked. While economic growth in 2004 did slow from an average of 6% to 4.5%, in 1994 it collapsed into negative territory; it should be noted, though, that the Mexican Tequila debt and banking crisis and the Argentine banking crisis and the contagion

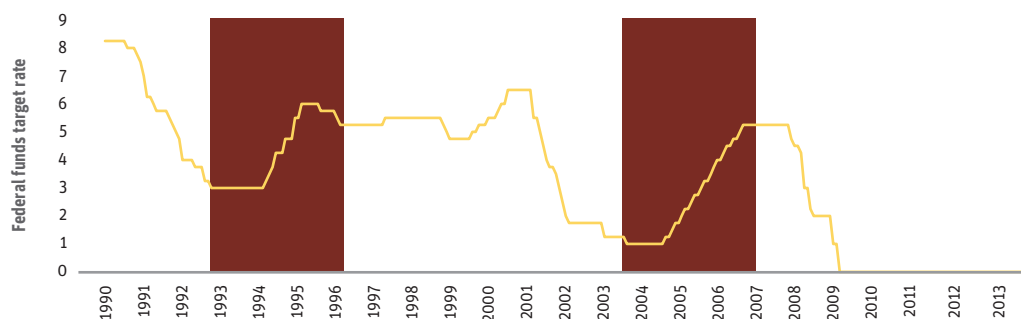
<sup>61</sup> Note this is an index of bond prices rather than the EMBI spread.

from those events were major contributory factors (Figure 5.4, Panel D). The collapse in economic activity was mirrored by an increase in inflation associated with a substantial devaluation, unlike the most recent episode when inflation pressures actually receded (Figure 5.4, Panel E). The conduct of monetary policy was also different in both episodes (Figure 5.4, Panel F) as interest rates rose substantially more in the 1990s than in the 2004 event.

A third notable event was the testimony of Ben Bernanke (then Chairman of the U.S. Federal Reserve Board) at the U.S. Congress on May 22, 2013 regarding the Federal Reserve's increased willingness to begin *tapering* and its consequent impact on the region. Arguably this is more akin to a natural experiment to assess the effects of shocks to the expected path of U.S. monetary policy normalization. The EMBI spread for Latin America and the Caribbean jumped from some

**FIGURE 5.4** PREVIOUS U.S. INTEREST RATE EXITS AND IMPACTS

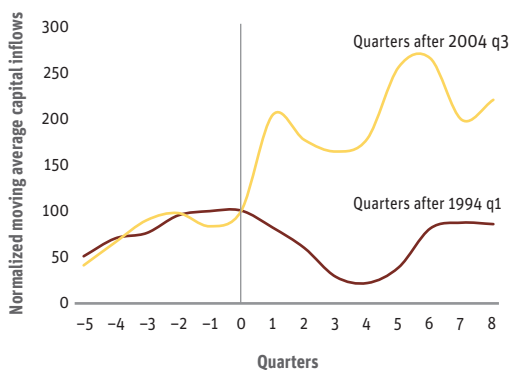
**Panel A: Episodes**



Source: FRED (various years).

Note: Panel A: This figure shows the target federal funds rate from 1990 to May 2013. The shaded areas represent the months of the interest rate exits, starting at the first increase and finishing in the first month in which there is a maximum level.

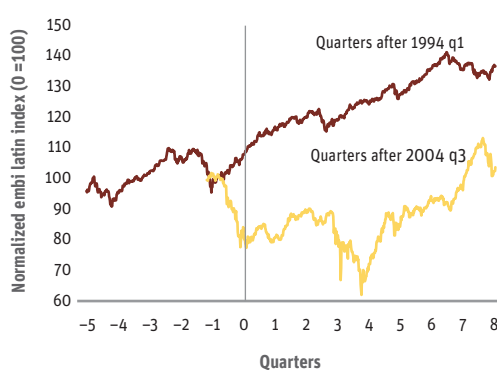
**Panel B: Gross Capital Inflows**



Source: IFS.

Note: Panel B: This figure shows a moving average of the gross capital inflows for the region starting from 5 quarters before the interest rate exit and ending at 8 quarters after. Each episode is normalized to 100 at period 0.

**Panel C: EMBI LAC**



Source: Bloomberg.

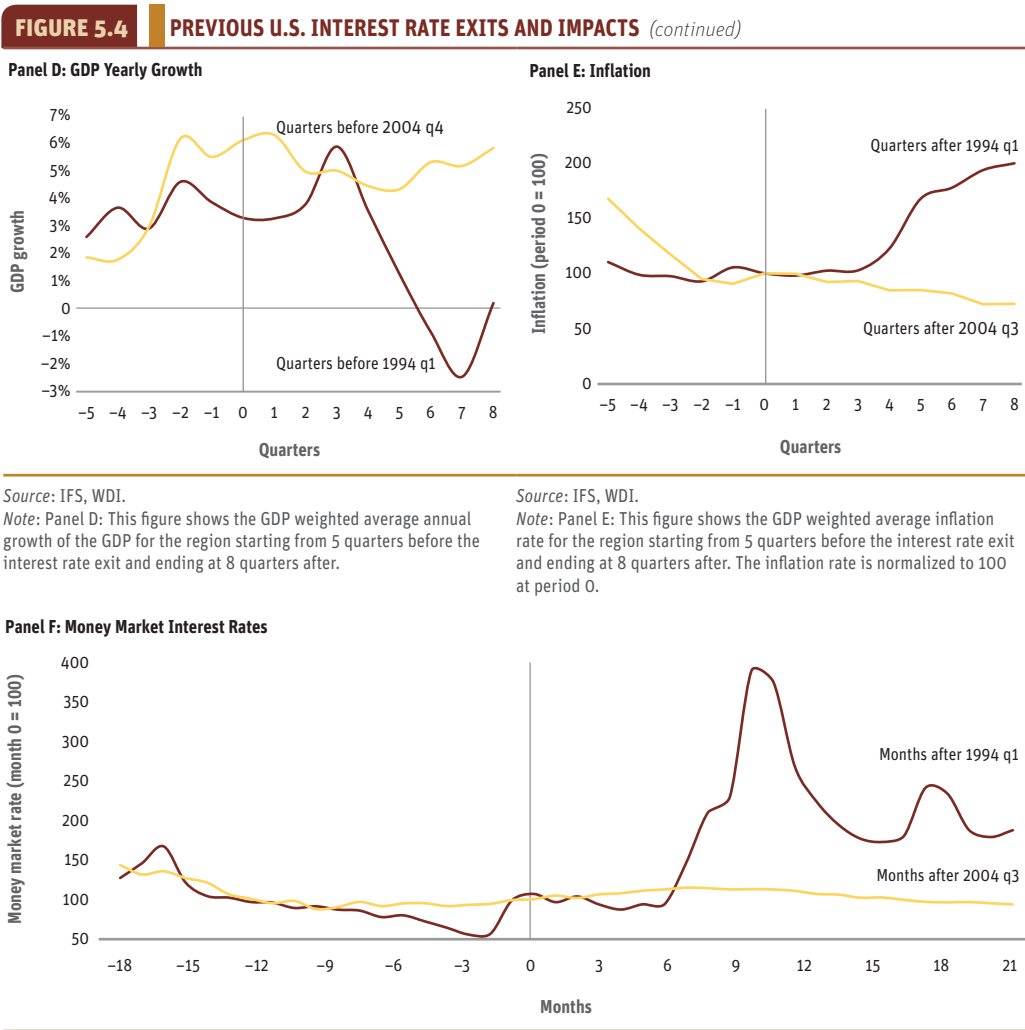
Note: Panel C: This figure shows the EMBI Latin Index starting 5 quarters before the interest rate exit and ending 5 quarters after. Each episode index value is normalized to 100 at period 0.

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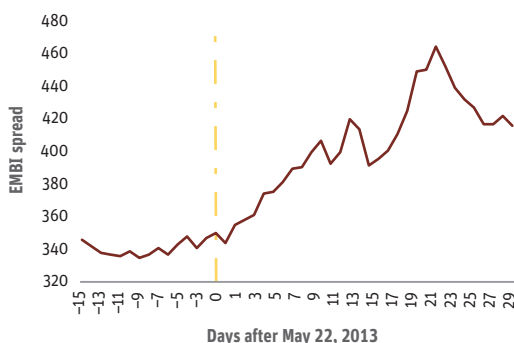
340 basis points before the speech to over 460 basis points following the speech and stabilized at around 420 one week thereafter (see Figure 5.5). Nominal exchange rates depreciated by some 6% in the month following the speech.

What explains these very different reactions to U.S. exits from low interest rates or changes in the expected path of U.S. monetary policy? A first explanation is that the 1994 hikes in U.S. interest rates were largely unanticipated events, as opposed to those in 2004 that were pre-announced and hence largely expected. This also fits with the most recent event of Chairman Bernanke’s speech, which in general was perceived as a surprise and had significant impacts on asset prices. A second explanation relates to fundamentals. In 2004, debt ratios, fiscal balances and financial systems were significantly stronger than in 1994. Indeed, the 1994 shock was



**FIGURE 5.5** REACTIONS TO GOVERNOR BERNANKE'S MAY 22, 2013 SPEECH

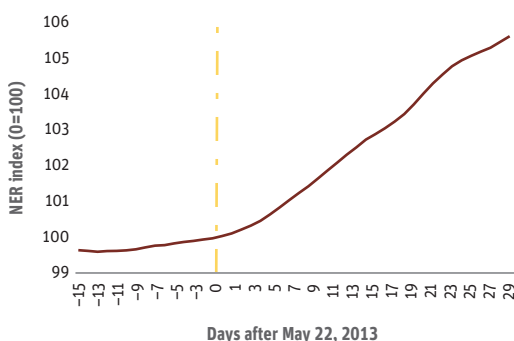
**Panel A: EMBI Latin Spreads**



Source: Bloomberg.

Note: Panel A: EMBI Latin Spread around May 22, 2013 (t=0), represented by the vertical dotted line.

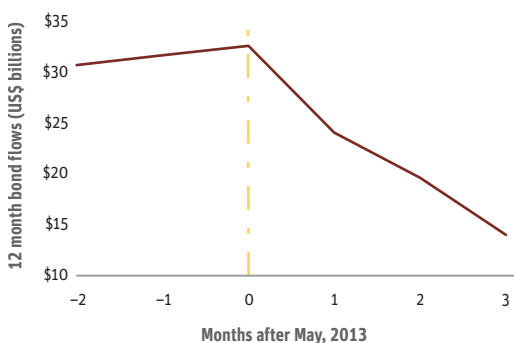
**Panel B: Nominal Exchange Rates**



Source: WDI, Bloomberg.

Note: Panel B: Nominal exchange rate index for Latin America and the Caribbean around May 22, 2013. The NER index is a GDP weighted average of the nominal exchange rates of the region.

**Panel C: Bond Flows**



Source: EPFR.

Note: Panel C: This chart presents the 12 month cumulative bond flow to Latin American and the Caribbean around the end of May, 2013.

compounded by weak banking sectors and financial crises in some countries. A third difference was enhanced ability to use countercyclical monetary policy in 2004, discussed further below.

Considering the May 2013 tapering announcement, the fundamentals of the region were significantly stronger than in 1994, but in some aspects they are weaker today than they were before the global financial crisis. As detailed in Chapters 3 and 4, structural fiscal balances have deteriorated and there may be a growing concern regarding potential balance sheet effects. However, as witnessed in previous episodes during financial shocks, contagion appears to take hold, perhaps driven by liquidity and common investor effects with little regard to individual country fundamentals.<sup>62</sup> The May 2013 incident might be considered a dress rehearsal for potential future shocks along the path of monetary normalization. The region has significant defenses, which may be tested by shocks along the path of unprecedented tightening in world monetary policy, with potential impacts on currencies and asset prices in the coming months.

### Effects of Changes to the Expected Path of U.S. Interest Rates

As suggested by the events of May 2013, there do appear to be risks stemming from changes to the expected path of tapering

<sup>62</sup> See, for example, Forbes and Rigobón (2002), Van Rijckeghem and Weder (2003) and Broner, Gelos, and Reinhart (2006).

and interest rate normalization. The most likely transmission mechanism will be further reductions in capital flows to the region. Indeed, in an econometric analysis, changes to the Federal Funds 12 and 18-month interest rate futures (a good measure of the changing expectations regarding interest rate normalization) have a strong and significant effect on gross capital inflows to the region. These estimates suggest that if there is a rise of 0.5% in the expected level of U.S. short-term interest rates in 18 months, then this would lead to withdrawals of about 5% of the stock of such funds; see Appendix E for a short description of the methodology.<sup>63</sup>

## Monetary Policy Responses

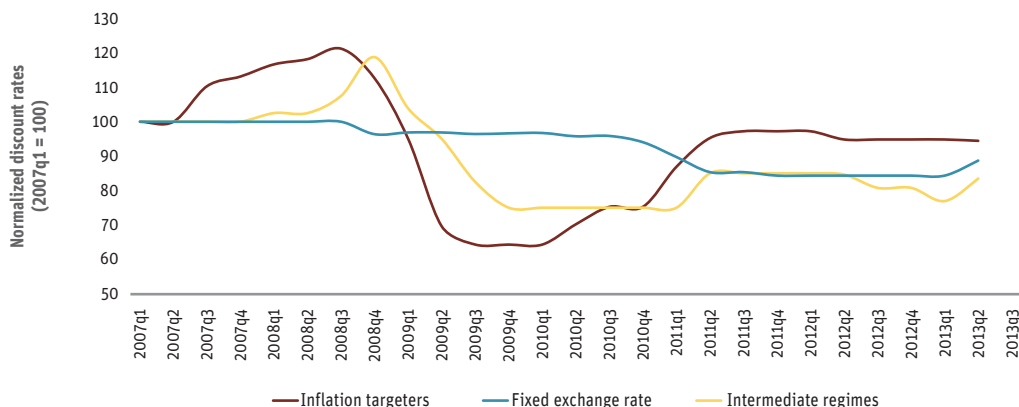
As shown in Figure 5.6, a set of countries in Latin America and the Caribbean with more flexible exchange rates have been able to respond counter-cyclical to the shocks displayed. The figure plots discount rates, inflation rates and output gaps for the median country for each of three groups: i) inflation targeters, ii) countries with fixed exchange rates and iii) intermediate regimes. Inflation targeters have been the most countercyclical, while the median country with fixed exchange rates has displayed slightly lower interest rates. Intermediate countries tend to have slightly higher inflation rates and have been able to be somewhat countercyclical.

How would countries with more flexible regimes respond to a fall in capital flows? An empirical analysis of the interrelations among interest rates, gross capital inflows and growth rates for five inflation targeters in the region finds that gross capital inflows strongly influence growth.<sup>64</sup> The results indicate that a one standard deviation fall in these gross capital inflows may lead to a loss in GDP ranging from 1% in Colombia to almost 5% in Peru, with the other larger Latin American and Caribbean economies in between.<sup>65</sup> Moreover, the effect is persistent or, in other words, the full effect of such a reduction in inflows may not manifest itself for up to two years. The recent falls in capital inflows are then likely to continue to have effects through 2014 and into 2015, and new falls could further impact growth; see Figure 5.7 for an illustration of the results and Appendix E for a discussion of the econometric methodology employed.

<sup>63</sup> Considering the futures price on Jan 31, 2014 of 99.595, this implies a fall to 99.1, the withdrawals in dollar terms would be about US\$18bn from a stock of US\$389bn at the end of 2013. There would also likely be a substantial impact on asset prices. Hanson and Stein (2012), building on Rajan (2005), argue that sharp increases in the U.S. term premium may result from changes in the short-term rate due to the prevalence of yield-oriented investors. Latin American and Caribbean funds have attracted larger amounts of active investors searching for yield that may also have made credit spreads more sensitive to changes in the expected short-term rate.

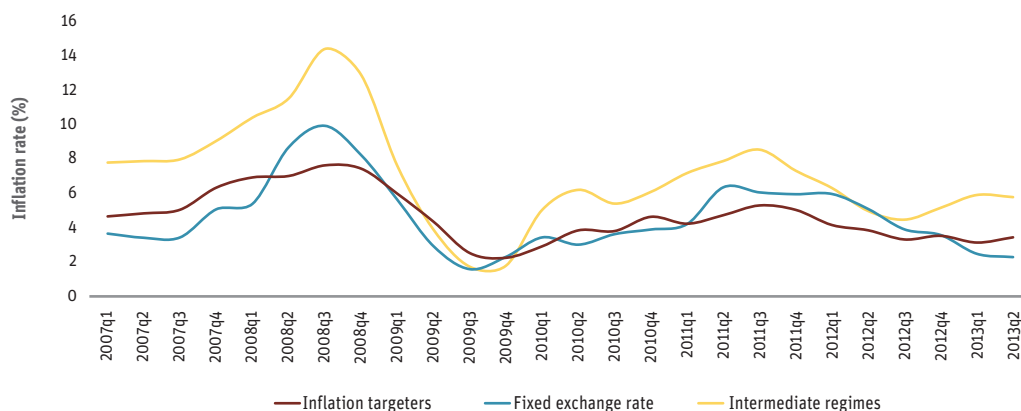
<sup>64</sup> These estimates are for an extended period of time and so consider normal fluctuations in gross capital inflows rather than a more extreme event such as a Sudden Stop, as considered in the following chapter.

<sup>65</sup> The total cumulative loss in GDP is to be understood as a vertical shift in the level of the GDP given a temporary decrease in growth, the economy then recovers to the previous growth rate but the loss in GDP is not recovered.

**FIGURE 5.6** INTEREST RATES, INFLATION RATES AND THE OUTPUT GAP**Panel A: Short Term Interest Rates**

Source: IFS.

Note: The upper panel shows the median of the discount rates for each regime normalized in 2007Q1.

**Panel B: Inflation Rates**

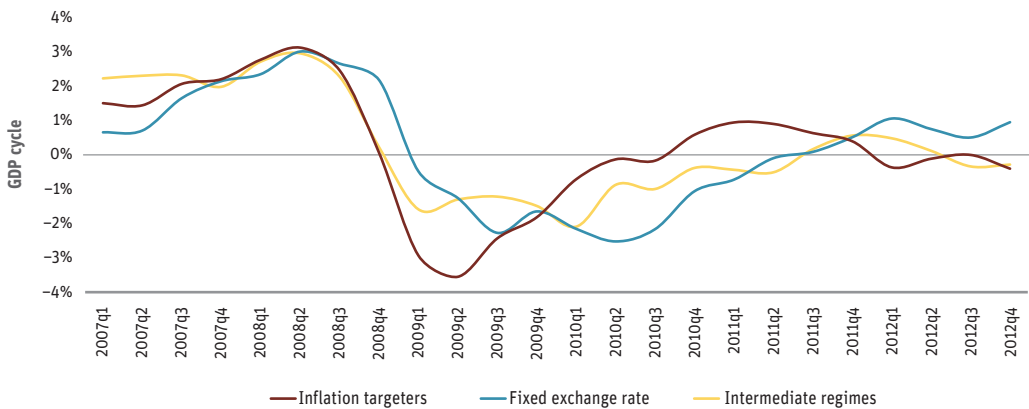
Source: IFS.

Note: This panel shows the median of the inflation rate for each regime.

(continued on next page)

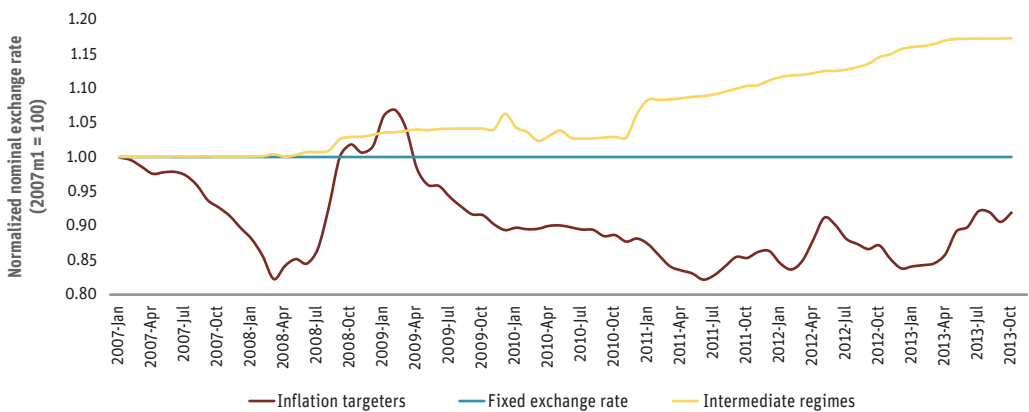
At first glance, these results would suggest that the baseline forecasts presented in Chapter 2 could be at risk, as countries may grow at less than their potential if insufficient capital is available to maintain estimated current account deficits. However, two caveats are in order. First, the changes in gross inflows considered in the analysis are only one component of total inflows.<sup>66</sup> Moreover, while gross capital inflows strongly drove net capital flows in Latin America

<sup>66</sup> As detailed above, the flows considered here are purchases or withdrawals from emerging market equity and bond funds. These form one part of portfolio inflows. Other inflows include foreign direct investment and banking flows.

**FIGURE 5.6** INTEREST RATES, INFLATION RATES AND THE OUTPUT GAP *(continued)***Panel C: GDP Cycle**

Source: LMW.

Note: Panel shows the median of the GDP cycle for each regime using a HP filter.

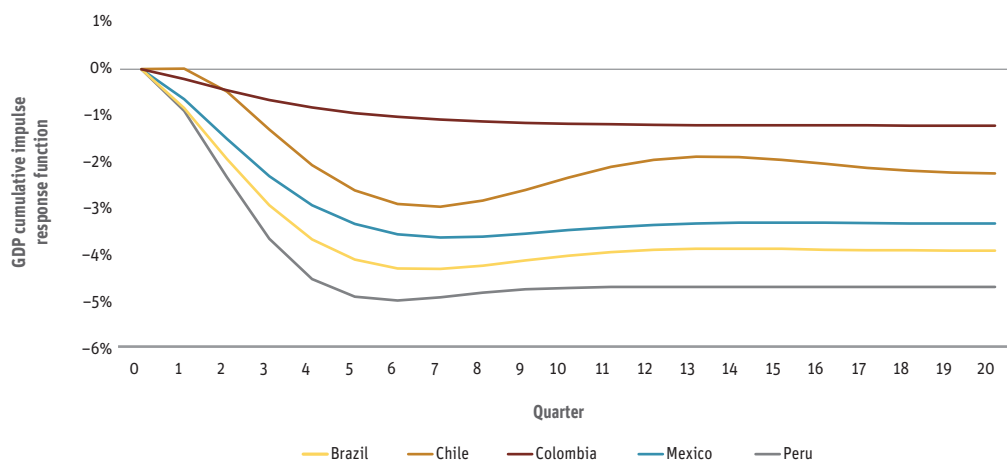
**Panel D: Nominal Exchange Rate**

Source: LMW.

Note: Each line represents the median normalized nominal exchange rate for each regime. We computed it using monthly data and setting the NER of each country equal to 1 on January 2007.

and the Caribbean in the 1990s, as will be discussed further in Chapter 6, in recent years the flows of residents (normally referred to as outflows), have become as important as those of non-residents (inflows). The analysis is then somewhat partial in this respect, and it is possible that falls in the inflows considered might be replaced by other inflows (in particular bank flows) or by repatriation of capital from residents.

How would countries be expected to react to such shocks with monetary policy? One way to answer this question is to estimate a monetary policy rule for each country. The Taylor rule posits that monetary authorities react to output gaps and inflation rates, increasing policy interest rates

**FIGURE 5.7** MEDIUM-TERM RESPONSE TO A ONE STANDARD DEVIATION FALL IN GROSS INFLOWS

Source: EPFR Global (Emerging Portfolio Fund Research).

Note: This figure presents the cumulative impulse response function on GDP of a 1 standard deviation shock to total flows.

if output gaps become more positive and as inflation rises.<sup>67</sup> Estimating such a rule for the five inflation targeters included in Figure 5.7 yields reasonable results; the methodology and coefficient estimates are provided in Appendix E. Interestingly, the exchange rate does not appear in the estimated monetary rule for any of the five countries. This is not to say that the exchange rate is unimportant, but rather that the effects of the exchange rate may be captured either through the output gap or inflation. Estimated current interest rates using the model are very close to actual rates, as shown in Table 5.1. In the case of Brazil and Colombia, the estimates suggest that the interest rate will continue to rise given the current level of inflation relative to the target and output gap.

The column entitled Shock to Output is the interest rate that would be predicted in the event of a one half standard deviation negative shock in capital flows while the inflation rate and inflation target remain constant. For the cases of Brazil and Colombia the interest rate is still predicted to rise. For the other three countries the interest rate would be expected to fall as the output gap falls. The following column shows the estimated interest rate for the same shock while also assuming a 1% rise in inflation. As expected, interest rates rise in all countries. In Brazil and Colombia the net effect is a higher interest rate relative to the actual one, one while in Chile, Mexico and Peru it is lower. The final column shows the estimated rate for the same shock and a 1% fall in inflation. As would be expected, estimated interest rates decline in this column.

Three general observations follow. First, the results indicate that some countries, particularly Brazil, are in a tightening phase while others, depending on shocks received, may see rates fall. Second, the simulated results illustrate how the policy interest rate and monetary policy would expect to behave as a result of output and inflation shocks. For constant or falling

<sup>67</sup> On Taylor rules see, for example, Svensson (2010).

**TABLE 5.1** INTEREST RATE FORECASTS (%)

	Actual Rate	Estimated Rate	Shock to Output	Shock, Higher Inflation	Shock, Lower Inflation
Brazil	10.00	9.77	11.58	12.29	10.87
Chile	4.65	4.63	1.76	3.28	0.23
Colombia	3.25	3.26	3.57	4.51	2.64
Mexico	3.80	3.60	1.94	2.68	1.20
Peru	4.18	4.17	1.69	2.05	1.33

*Note:* The first column shows actual interest rates for each of the five economies at the time of writing. The second column shows the prediction of the Taylor rule for the same date as the first column. The third column shows the Taylor rule forecast for December 2014 if there is a shock of one half a standard deviation in gross capital inflows simulating the impact on the output gap and if inflation remains at current levels. The fourth column shows the forecast for December 2014 with the same shock but assuming inflation rises by 1%. The last column shows the forecast for the same shock, but assuming that inflation is 1% lower.

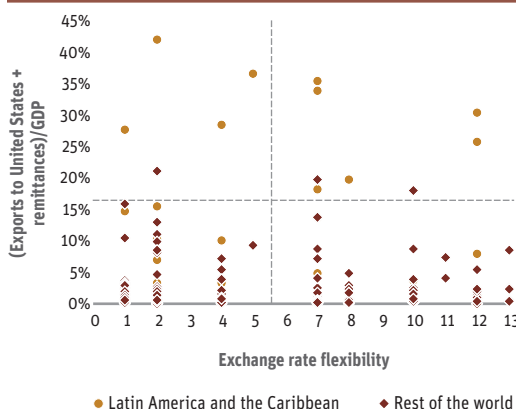
inflation, in general interest rates would be expected to fall given a negative shock to output as countries pursue countercyclical monetary policy. Finally, the results indicate that with the exception of Chile, for the simulated output shock and inflation scenarios, interest rates remain positive and significantly different from zero. This suggests that there is monetary policy space to respond to the shocks modeled here as countries do not hit a zero interest rate—the so-called zero bound.

## The Heterogeneous Macroeconomic Landscape

The discussion in the previous section focused on countries that have monetary flexibility, particularly the larger of the eight countries with inflation targeting regimes. However, six countries in the region are dollarized or have hard exchange rate pegs to the dollar, while 12 have intermediate regimes. Moreover, countries that trade more with the United States will benefit as the U.S. economy recovers. In 2012, exports to the United States from Latin American and Caribbean countries averaged just over 10% of GDP, but that figure ranges from less than 1% for Uruguay to as much as 28% for Nicaragua. Those countries with greater trade with the United States and more flexible exchange rates may benefit from a stronger U.S. recovery while being relatively immune from U.S. monetary policy, while countries that trade least with the United States but have less flexible monetary policy might be more vulnerable. Figure 5.8 plots exports to the United States against an indicator of exchange rate flexibility for 173 individual countries.<sup>68</sup>

<sup>68</sup> The former is approximated by the country's exports to the United States as a share of GDP in 2012. The latter is taken from the de facto exchange rate regimes in Ilzetzki, Reinhart, and Rogoff (2008). This index ranges from 1 to 13, where the closer to 1, the lower is the level of exchange rate flexibility. For example, 1 denotes countries with no separate legal tender, 2 is given to countries with a currency board, etc. An index of 12 is given to countries with a managed floating exchange rate, and 13 is assigned to countries with freely floating exchange rates.

**FIGURE 5.8** **COMMERCIAL LINKS TO THE UNITED STATES AND EXCHANGE RATE FLEXIBILITY**



Source: Ilzetki, Reinhart and Rogoff (2010), DOTS, WEO, Migration & Remittances Data (World Bank).

Note: The x-axis represents the exchange rate flexibility categories stated by Ilzetki, Reinhart and Rogoff (2010). The y-axis represents the ratio of goods exports to the United States plus remittances to GDP (remittances were only included for Latin American and Caribbean countries). Each point represents a country. The dotted lines intersect at the median values for Latin America and the Caribbean. There are six Latin American and Caribbean countries in the northeast quadrant, seven in the northwest quadrant, four in the southwest quadrant and nine in the southeast quadrant.

According to the index employed, the simple average of de facto exchange rate flexibility is 6. Countries in the bottom left quadrant, with relatively low trade with the United States and low exchange rate flexibility, are perhaps the most vulnerable given the current set of risks. However, as can be seen, there are relatively few countries from the region in that quadrant.<sup>69</sup> In fact, most Latin American and Caribbean countries either have higher exchange rate flexibility than average or relatively high trade volumes with the United States.<sup>70</sup>

## Conclusion

There are four main conclusions to draw from the analysis presented in this chapter. First, shocks on the path of monetary normalization in the United States could have substantial impacts on capital flows to

the region. Second, declines in capital flows that have already taken place plus any further falls are likely to have persistent effects on growth. Third, while the impact on the current account appears quite significant, countries with inflation targeting regimes in general have monetary space to respond to such shocks, and exchange rates may provide at least a partial buffer. Fourth, there are a set of countries that do not have monetary flexibility and hence may suffer more from any shocks to interest rate normalization in the United States. However, only a small number of countries combine low trade with the United States with exchange rate inflexibility. The majority of countries in the region either enjoy some degree of exchange rate flexibility or will benefit substantially from a stronger recovery in the United States.

<sup>69</sup> Moreover, they include Panama and The Bahamas. While those two countries may not export large amounts directly to the United States, they earn revenues from US trade (through the Panama Canal) and US-linked tourism and financial services, respectively.

<sup>70</sup> Remittances are added to the figures for exports for LAC countries where significant.





## CHAPTER 6

# The Risks of a Sudden Stop

**T**he baseline scenario for this report is that of a smooth process of monetary normalization as the U.S. economy recovers, with moderate recovery in Europe and continuing growth among the larger emerging economies. It is hoped that this largely anticipated monetary normalization will reflect the exit from low interest rates witnessed in 2004 rather than the volatility suffered in several emerging economies in 1994, as reviewed in the previous chapter. Financial systems have grown stronger in the region, and the Great Recession passed without a major financial crisis in any larger Latin American and Caribbean economy, suggesting that normalization may occur without undue volatility. On the other hand, the *taper announcement* of May 2013 and the analysis presented in the previous chapter do indicate that shocks on the path of monetary normalization may occur and may have quite significant effects.

The estimates in the previous chapter were based on normal fluctuations and average reactions to variables across a fairly long historical sample. However, there is also the possibility of a more extreme event. The literature on capital flows has highlighted the risk that some trigger (normally an external financial event) might spark a rapid withdrawal of capital, which has become known as a Sudden Stop.<sup>71</sup> However, whether an initial spark triggers a full-fledged Sudden Stop or not depends on country-specific vulnerabilities. This chapter focuses on these vulnerabilities and assesses their risks and potential costs.

In the 1990s, Sudden Stops in emerging economies tended to be driven by changes in gross inflows provoking a change in net inflows and painful real exchange rate and current account adjustments. More recently, however, emerging economies have gained large external assets, and changes in those assets (normally labelled gross outflows) have become more important. Indeed, there may be sharp changes in gross inflows and gross outflows that are offsetting such that net flows remain stable, as would be the case of a sharp reduction in gross inflows offset by the repatriation of capital by residents. However, recent research indicates that such gross inflow Sudden Stops may also be painful, perhaps reflecting a process of required deleveraging in the affected economy. This chapter considers different types of Sudden Stops and concludes with a discussion of potential policy options.

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<sup>71</sup> Contagion across investors who invest in similar assets, or who borrow from the same banks, or through mutual funds may explain such a trigger. See Rigobón (2002), Van Rijckeghem and Weder (2003) and Broner, Gelos, and Reinhart (2006) for papers detailing contagion along these lines.

## Initial Conditions

Three variables have been found to be key determinants of the likelihood of Sudden Stops:<sup>72</sup> i) the required real exchange rate adjustment assuming a Sudden Stop occurred, which is a function of the current account deficit as a share of the absorption of tradable goods (CAD); ii) Domestic Liability Dollarization (DLD); and iii) the government's fiscal balance (GFB).<sup>73,74</sup> Considering the simple average of the seven largest countries in the region (the LAC-7 countries), these “fundamentals” improved significantly between the crises of the late 1990s and the Great Recession of 2008.<sup>75</sup> DLD fell from almost 11% of GDP in the 1990s to 6.6% of GDP by 2007, and the current account and fiscal balances turned from deficits into surpluses (0.2% of GDP). Table 6.1 below presents the values of these three key variables as of end-2012 and also for the periods immediately preceding the two previous systemic crises facing the region: i) the crises of 1998 and ii) the aftermath of the Great Recession of 2008. These factors may be one explanation why the region fared relatively well during the crisis triggered by the collapse of investment bank Lehman Brothers. However, these same variables have deteriorated since 2008. As reviewed in Chapter 3, the region is currently running fiscal deficits on the order of 3.5% of GDP, and current account deficits have increased to some 4.7% of the absorption of tradable goods. DLD has increased to about 8% of GDP, mostly as a result of an increase in banks' foreign liabilities, which went up from 3.2% of GDP in 2007 to 4.8% of GDP in 2012, as discussed in both Chapter 4 above and Appendix F.

However, while dollarization has increased, reserves have risen as well. Assuming reserves may be used to back dollar liabilities, Net DLD (defined as DLD minus reserves) may be the more relevant measure, and it yields a somewhat different picture.<sup>76</sup> For example, in the case of Peru, despite high levels of DLD, Net DLD levels are now relatively low (–10.2% of GDP) given large foreign reserve accumulation.<sup>77</sup> On average, regional Net DLD levels have risen with respect to 2007 (from –6.4% of GDP to –6% of GDP), although at levels that are considerably lower than those of 1997 (–1.9% of GDP), on the eve of the Russian crisis.

One set of dollar liabilities excluded from these estimates are international bond issuances of the non-financial private sector discussed in Chapter 4. Netting out reserves but adding these

<sup>72</sup> See Calvo, Izquierdo, and Mejía (2008).

<sup>73</sup> DLD is defined as foreign currency deposits plus foreign liabilities of banks. Assuming bank balance sheets are matched, as is to be expected given bank regulation, this is a good proxy for the share of loans in dollars; see Calvo, Izquierdo, and Mejía (2008).

<sup>74</sup> The first variable represents the potential percentage fall in consumption of tradable goods in the aftermath of a Sudden Stop. The second is a proxy for the potential burden on the domestic banking system given potential bankruptcy of dollarized debtors. The fiscal balance represents a proxy of the ability of the government to respond; see Ortiz et al. (2009) for a discussion.

<sup>75</sup> LAC-7 is the simple average of the seven major Latin American countries, namely Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. These countries represent more than 90% of Latin America's GDP.

<sup>76</sup> See Calvo, Izquierdo, and Loo-Kung (2013).

<sup>77</sup> See Appendix F. DLD is likely one of the key reasons why Peru has accumulated such a high level of reserves. The fact that Net DLD is negative means foreign exchange reserves exceed DLD.

**TABLE 6.1** **FACTORS AFFECTING SUDDEN STOP VULNERABILITY**  
*Improvements relative to the 1990's, but worse than 2007*

Country	1997			2007			2012		
	DLD (% of GDP)	CAD %	GFB (% of GDP)	DLD (% of GDP)	CAD %	GFB (% of GDP)	DLD (% of GDP)	CAD %	GFB (% of GDP)
Argentina	18.1%	12.0%	-2.1%	4.8%	-10.3%	-2.1%	3.0%	-0.1%	-4.3%
Brazil	7.0%	11.2%	-5.7%	6.2%	-0.4%	-2.7%	8.8%	8.8%	-2.7%
Chile	7.1%	10.4%	2.1%	10.1%	-19.5%	7.9%	13.0%	10.0%	0.6%
Colombia	7.1%	11.7%	-3.2%	1.9%	7.5%	-0.8%	5.4%	9.0%	0.2%
Mexico	13.0%	5.2%	-6.6%	3.5%	3.8%	-1.2%	4.9%	2.8%	-3.7%
Peru	23.5%	14.1%	0.1%	19.0%	-4.4%	3.2%	20.0%	10.6%	2.1%
Venezuela	0.3%	-10.0%	2.6%	0.4%	-19.0%	-2.8%	0.1%	-8.4%	-16.6%
Average-LAC7	10.9%	7.8%	-1.8%	6.6%	-6.0%	0.2%	7.9%	4.7%	-3.5%
Average-LAC5	11.5%	10.5%	-2.7%	8.1%	-2.6%	1.3%	10.4%	8.2%	-0.7%

Source: Authors' calculations based on Calvo et al. (2013).

Note: LAC 7: Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. LAC-5 excludes Argentina and Venezuela. DLD: Domestic Liability Dollarization. CAD: Current Account Deficit as a percentage of the Absorption of Tradable Goods. GFB: Government Fiscal Balance.

international private debt stocks indicates a greater deterioration, from -4.7% of GDP in 2007 to -2.6% of GDP by end-2012 (see Appendix F).

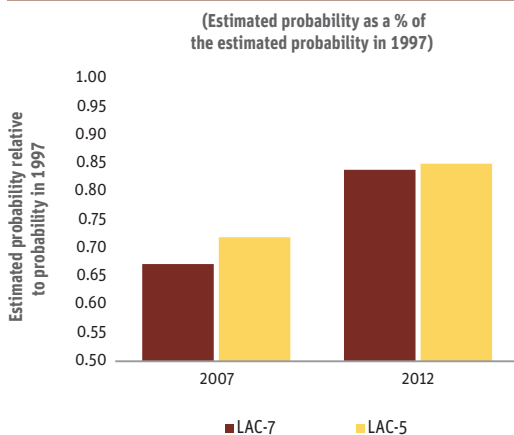
## Probabilities and Costs of a Sudden Stop

How have the changes in these three variables (CAD, Net DLD and GFB) affected the probability and potential cost of a Sudden Stop? Considering a Sudden Stop as a fall of at least two standard deviations in net capital inflows, Calvo, Izquierdo, and Loo-Kung (2013) provide a methodology for estimating the probability of a Sudden Stop and the associated cost if one occurs.<sup>78</sup> The expected cost of a Sudden Stop is then calculated as the probability of occurrence multiplied by the cost if such an event occurs.<sup>79</sup> During the late 1990s, around the time of the Asian financial crisis, several countries in Latin America and the Caribbean experienced Sudden Stops; it is

<sup>78</sup> The approach consists of first estimating the probability of sudden stops (given its abovementioned determinants) and separately estimating a cost function (given the same determinants) for a large set of 110 countries. Output costs are defined as the present discounted sum of any contiguous negative output gaps in the neighborhood of a sudden stop measured as the percentage difference between observed GDP and its corresponding HP trend. With output costs at hand, a simple equation of the determinants of these costs was estimated using Net DLD, the current account deficit (as a share of the absorption of tradables), the change in the EMBI global index (a control for the size of the shock), and the government fiscal balance (as a % of GDP) as explanatory variables.

<sup>79</sup> Pre-crisis values are used for most variables to ameliorate concerns with endogeneity.

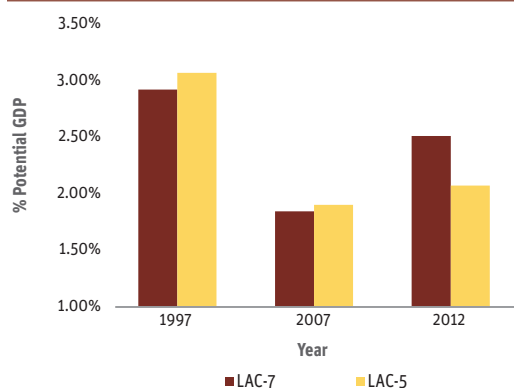
**FIGURE 6.1** THE PROBABILITY OF A SUDDEN STOP IS 85% THE LEVEL OF THE 1990S



Source: Authors' estimates.

Note: LAC-5: Brazil, Chile, Colombia, Mexico, Peru. LAC-7: LAC-5 + Argentina and Venezuela.

**FIGURE 6.2** THE EXPECTED COST OF A SUDDEN STOP HAS INCREASED SINCE 2007



Source: Authors' estimates based on Calvo, Izquierdo, and Loo-Kung (2013).

LAC-5: Brazil, Chile, Colombia, Mexico, Peru.

LAC-7: LAC-5 + Argentina and Venezuela.

therefore of interest to compare estimated probabilities at different dates relative to that period. Given improvements in fundamentals, the results indicate that the average probability of a Sudden Stop in 2007 was significantly lower than that prevailing in 1997 (about 67% of the probability in 1997; see Figure 6.1). However, by 2012 the average probability of a Sudden Stop had increased to 84% of the level prevailing in 1997.

The *expected cost* of Sudden Stops (i.e., the estimated cost of a Sudden Stop times the probability of a Sudden Stop) is on average lower than in the 1990s; however, as of the end of 2012, expected costs were higher than in 2007 (see Figure 6.2). The relatively strong position that the region had prior to the Great Recession led to a significant reduction in *expected costs* of a Sudden Stop (almost one third lower than in 1997), implying that the region was well prepared to withstand the crisis. More recently, given the increase in vulnerability factors (CAD, Net DLD and GFB), expected costs have increased.

### How Well Is the Region Prepared? Reserve Holdings

International reserves provide one way to self-insure against Sudden Stops, and the optimal level might be considered the trade-off between lowering the expected

cost of a Sudden Stop and the cost of holding reserves.<sup>80</sup> Average observed reserves in LAC-7 countries on the eve of the global financial crisis of 2008 were relatively close to optimal reserves, a significant improvement compared to the 1990s, as shown in Panels A and B of Figure 6.3.

<sup>80</sup> See Calvo, Izquierdo, and Loo-kung (2013) for a more detailed discussion.

For the most recent period, actual reserve ratios in LAC fell below optimal levels (with the notable exception of Peru, as shown in Panel C of Figure 6.3). Figure 6.3 also illustrates that these developments are not just confined to Latin America and the Caribbean but have occurred in countries in other regions as well. While actual reserve levels have risen for many countries, due to the higher risks and higher expected costs of a Sudden Stop the level of optimal reserves has actually risen more.

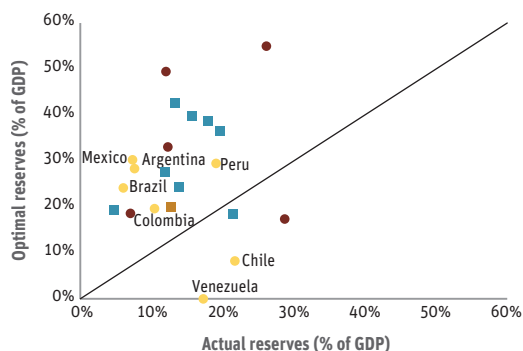
### Sudden Stops in Gross versus Net Capital Flows

While net capital inflows to the region grew substantially over the last decade, gross capital flows have risen much more dramatically (see Figure 6.4).<sup>81</sup> This phenomenon reflects higher levels of financial integration.

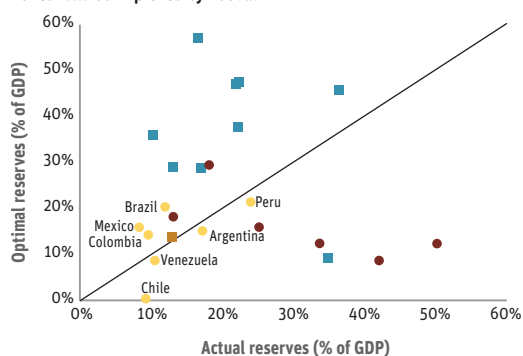
The increase in gross capital outflows has a counterpart in the accumulation of foreign assets by residents. These, in turn, may be repatriated to compensate (offset) a fall in gross capital inflows, thereby potentially resulting in more stable net capital flows.<sup>82</sup> Emerging market economies have more volatile net capital flows than developed economies, but this is not the result of more volatile gross capital inflows. This volatility instead reflects a greater offsetting of gross inflows and gross outflows in developed countries—i.e. there is a stronger

**FIGURE 6.3** FALLING OBSERVED RESERVE LEVELS RELATIVE TO THE OPTIMUM

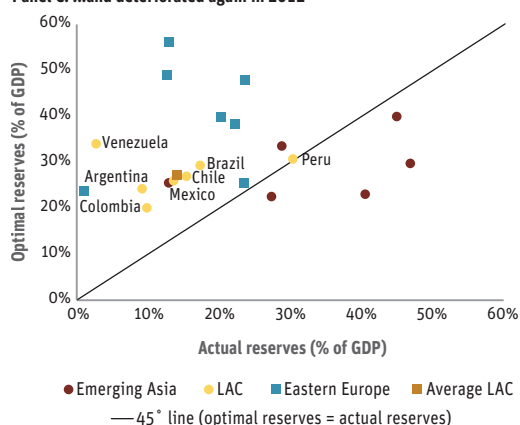
**Panel A: International reserves coverage was low in 1997...**



**Panel B: ...had improved by 2007...**



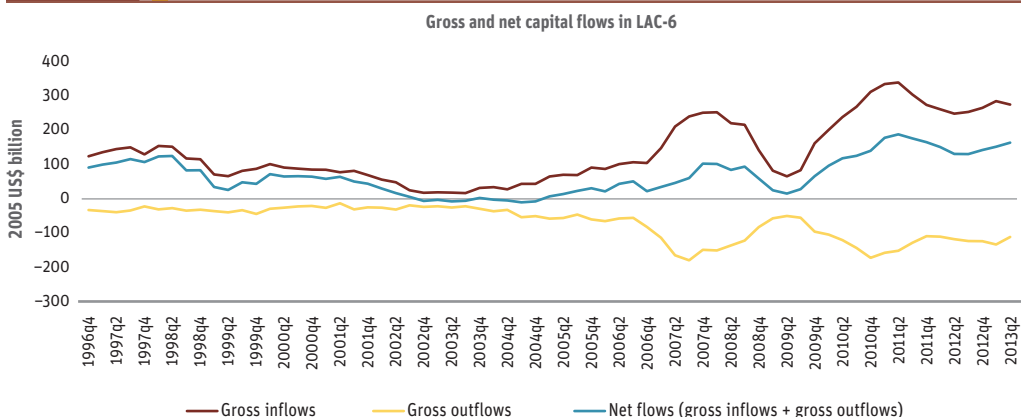
**Panel C: ...and deteriorated again in 2012**



Source: Calvo, Izquierdo & Loo-Kung (2013).

<sup>81</sup> In the balance of payments convention, Gross Capital Inflows are defined as the changes in the stock of international liabilities owed by residents. Similarly, Gross Capital Outflows are defined as changes in the stock of foreign asset holdings of residents.

<sup>82</sup> See Powell, Ratha, and Mohapatra (2002) who argue gross inflows and gross outflows exhibit strong positive correlation.

**FIGURE 6.4** NET CAPITAL FLOWS ARE MORE STABLE THAN GROSS CAPITAL FLOWS

Source: IMF: International Financial Statistics.

Note: LAC: Argentina, Brazil, Chile, Colombia, Peru and Venezuela.

negative correlation between gross capital inflows and gross capital outflows that has stabilizing effects on net flows.<sup>83</sup>

Five factors may enable such offsetting effects: i) a lack of financial repression (to facilitate the interest rate response); ii) an open capital account (international capital mobility); iii) the availability of foreign assets that residents can repatriate; iv) sound and credible macroeconomic frameworks; and v) the protection of property rights to allow capital repatriation during crises. The region has made significant progress in all those dimensions, and this appears to be paying off, as there is evidence of more offsetting and hence greater stability in net flows.

Net capital flows fell less in the 2008 crisis despite a larger reversal in gross inflows compared to the 1994 Tequila crisis and the crisis at the time of the 1998 Russian default (see Figure 6.5). In the latter episode the repatriation of capital by residents (gross outflows) offset the reduction in gross inflows. This may also help to explain why the region was less affected by the 2008 crisis despite the tightening of the external borrowing constraint.<sup>84</sup>

Nonetheless, there are risks associated with the increase in gross capital flows. Gross flows furnish a key conduit through which financial contagion may be transmitted and amplified across countries. Moreover, a high level of financial integration with large external assets, along with large holding of domestic assets by non-residents, may imply greater financial intermediation, more financial transactions, greater leverage and deeper capital markets which, as evidenced in the advanced economies in 2008, may not guarantee financial stability. If a crisis does result,

<sup>83</sup> See Cowan et al. (2008) on this point.

<sup>84</sup> However, as noted in Powell, Ratha, and Mohapatra (2002), in some crises resident flows have been offsetting while in others they have not; there remains further work to be done to understand these dynamics.

under those circumstances a high level of financial integration may significantly amplify the costs.<sup>85</sup>

These developments suggest that there may be different types of Sudden Stops that may have different impacts and different policy implications. One particular type of Sudden Stop, for example, could be a sharp reduction in gross inflows that was not a Sudden Stop in net flows given capital repatriation by residents. This would then not ostensibly require an adjustment in the real exchange rate, but still might imply costs if those gross inflows were financing projects or were intermediated through the domestic financial system, and the repatriation in capital did not exactly substitute, perhaps provoking a sharp reduction in domestic financial intermediation and leverage. Cavallo et al.

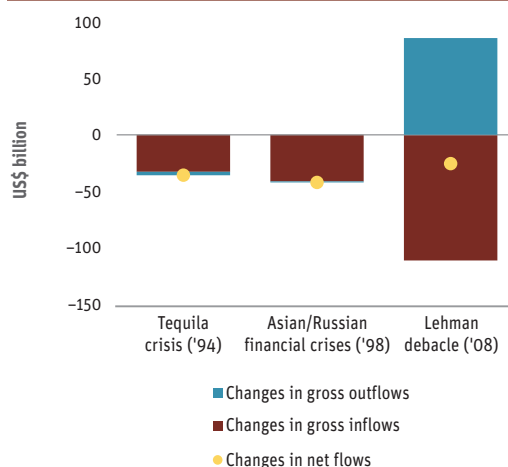
(2013) develop a new taxonomy of Sudden Stops and examine in detail this (and other) such outcomes.

It is indeed found that those countries that suffered gross inflow-type Sudden Stops, that did not require a real exchange rate adjustment, also suffered costs in terms of lost GDP,<sup>86</sup> particularly if the Sudden Stop was associated with a sharp fall in banking flows.<sup>87</sup> Such events have been associated with a cost of almost 4% of GDP for emerging economies (see Appendix G). However, net flow Sudden Stops remain the most costly, with costs of almost 13% of GDP for emerging economies.

## Policy Responses to Prevent and Respond to Sudden Stops

There are several policy actions that would reduce the probability that some external and financial event triggers a full-fledged Sudden Stop.<sup>88</sup> Accumulating international reserves provides

**FIGURE 6.5** OFFSETTING GROSS CAPITAL FLOWS DURING SUDDEN STOPS



Source: IMF: International Financial Statistics.

Note: For each event, we computed the change in gross capital inflows from peak to trough (blue bars). Then, for the same windows, we computed the changes in gross capital outflows (red bars) and the changes in net flows (yellow dots). Countries included: Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela.

<sup>85</sup> Recent papers have emphasized the potential disruptive nature of sudden reversals in gross capital flows (see Bruno and Shin 2013a and 2013b, and Shin (2012). A report from the Committee on International Economic Policy and Reform (2012), underscores the potentially destabilizing role of debt-creating cross-border flows—for example, bank flows—during episodes of forced deleveraging.

<sup>86</sup> Cavallo et al. (2013) develop a new taxonomy of Sudden Stops that differentiates between those that require real exchange rate adjustment and those that do not. They then employ an event-study approach and compute the costs of different types of Sudden Stops.

<sup>87</sup> Banking flows here are actually the “Other Flows” category within the IMF’s International Financial Statistics that is dominated by banking flows.

<sup>88</sup> Also see Cavallo and Izquierdo (2009) for a more in-depth review.

self-insurance against Sudden Stops, particularly by offsetting the perilous effects of domestic liability dollarization (DLD). Reducing gross DLD levels, by regulation in the banking system or by allowing for exchange rate volatility, while avoiding implicit exchange rate insurance, would also facilitate countries' self-insurance efforts. Underlining the conclusion of Chapter 3, strengthening fiscal accounts during good times has also been found to reduce a country's vulnerability. Finally, preventing current account deficits from spiraling over time to limit the size of any required adjustment reduces both the probability of a Sudden Stop and the cost if one does occur. Within the area of trade, increasing openness and particularly boosting the supply of tradable goods, so that the required real exchange rate depreciation to close the current account deficit is smaller if external financing becomes more restrictive, may be particularly important.<sup>89</sup>

If a Sudden Stop cannot be prevented, what can countries do about it? The ability to conduct countercyclical policy is critical, which again reinforces the conclusion that fiscal buffers in the region should be strengthened. There is robust empirical evidence that countries that were able to adopt expansionary fiscal and monetary policies successfully reduced output losses in the aftermath of Sudden Stops.<sup>90</sup> By the same token, *initial conditions are not destiny*. There is evidence based on regional experience that, even during crises, countries still have means at their disposal to weather the storm. For example, a targeted use of international reserves during an international credit crunch—supporting export credit lines—might be a more effective use of available resources than exchange rate market interventions. Similarly, in some cases fiscal devaluations—especially if implemented to ensure revenue neutrality—could help countries regain external competitiveness without large nominal devaluations.<sup>91,92</sup>

Many of the recommended policy actions regarding the likelihood and costs of Sudden Stops underline the more general policy messages of this report. Preventative actions today may have substantial benefits in the future, but policy reactions are also important. The multilateral system can also assist by boosting foreign currency reserves and providing financing to support sustainable fiscal policies. Ex ante insurance mechanisms such as the IMF's Flexible Credit Line (FCL) may also play an important role. In countries without FCL access, seeking external financial assistance sooner rather than later in the face of a shock is also likely to minimize economic disruption.

<sup>89</sup> See Cavallo and Frankel (2008).

<sup>90</sup> Ortiz et al. (2009) find using a sample of emerging markets, that countries that were able to adopt more flexible fiscal and monetary policies in the aftermath of systemic sudden stops had a loss in output of less than 5% (on average), while nations with much less flexibility had output contractions above 10%. The results are consistent with predictions from theoretical models with sticky prices that suggest that countercyclical policies are optimal (i.e., Christiano, Eichenbaum, and Rebelo 2011 and Nakata, 2013).

<sup>91</sup> See, for example: Farhi, Gopinath, and Itskhoki (2011) and Cavallo, Fernández-Arias, and Powell (2013).

<sup>92</sup> Cavallo and Izquierdo (2009) document policy responses to sudden stop episodes of the late 1990s for eight Latin American countries and in a more systematic fashion a wider range of emerging markets. Using both sets of information, the authors distinguish between successful and unsuccessful cases and extract policy recommendations.



## CHAPTER 7

# Conclusions and Policy Suggestions

**T**he global economy is set to recover and assuming monetary normalization runs smoothly, rates of growth in Latin America and the Caribbean should recover to normal levels. While this is certainly welcome news, unfortunately such growth rates are insufficient to meet the many social demands in the region and reflect low underlying productivity growth that will not allow the countries to maintain relative income levels with other emerging economies or close the income-gap with advanced economies. A key priority going forward is to find ways to enhance potential growth.<sup>93</sup>

The baseline forecast is, of course, subject to risks. Indeed there are positive risks, or potentially enhanced opportunities. In particular, the U.S. recovery may well surprise on the upside relative to the baseline, benefiting especially those countries in Central America and the Caribbean with strong trade, financial and tourism ties to the U.S. economy. However, potential negative shocks should also be considered. Higher U.S. growth may be accompanied by accelerated monetary normalization with a faster than expected *tapering* of asset purchases and steeper increases in interest rates. Additionally, Chinese growth may be lower than expected. Different countries will be affected in different ways by these types of shocks.

The capacity to respond to external shocks was heralded as a great advance during the Great Recession of 2008. Given low automatic fiscal stabilizers, several countries deployed discretionary, expansionary fiscal policy measures to attenuate the impact of the crisis. Many of these measures involved an increase in inflexible expenditure items that have to date proven difficult to retract as output gaps closed. As a result, policy was expansionary rather than counter-cyclical and fiscal balances have deteriorated. Indeed, an analysis of the cyclicity of fiscal policy suggests that one group of countries was only counter-cyclical in downturns and in upturns was actually pro-cyclical; a second group was pro-cyclical in both upturns and downturns. This suggests that the region has some way to go before it can be concluded that it has graduated from fiscal pro-cyclicality.

Assuming baseline growth, rebuilding fiscal buffers is a key priority. In the face of a negative shock to that baseline, some countries may be in a position to respond with specific discretionary measures. But it would be critical to ensure that those measures are truly

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<sup>93</sup> See Powell (2013).

counter-cyclical. As recommended in the current IDB flagship report on tax systems as a development tool, countries may wish to introduce institutional reforms to limit the likelihood that such measures would be expansionary rather than counter-cyclical.<sup>94</sup> At the same time, countries may also wish to continue to enhance automatic fiscal stabilizers to improve counter-cyclicality without the need for discretionary policy.

Several countries have experienced large capital inflows, especially portfolio debt flows, and non-financial private firms and financial institutions have issued substantial amounts of debt in dollars. These have been largely at fixed rates and with reasonably long maturities, taking advantage of exceptionally low U.S. interest rates. Direct liquidity and roll-over risks may then be minimized, but such contracts may still provoke balance sheet effects in the face of significant currency depreciation. Domestic credit has grown strongly and the issuance of international debt securities by both financial and non-financial firms (that have substantial deposits in local financial systems) appear to have played an important role in financing that growth. Deposits are generally in local currency and are of shorter maturity and as corporate deposits may be volatile in the face of changing interest and exchange rates, this may generate indirect liquidity risks for the financial system.

However, several caveats are in order with respect to this analysis. Higher levels of credit also bring enhanced opportunities and the region remains under-banked. While firms' dollar liabilities have grown, so have their assets. Moreover, there is no systematic information available as to whether firms have hedged currency risks. These are issues that deserve further analysis and careful monitoring. While financial systems in the region are stronger than in the past, where risks appear relevant there may be a case for prudential actions.

Capital inflows have already fallen since May 2013, and analysis suggests such movements are associated with significant and persistent impacts on growth. While the required current account adjustment in the face of a decrease of just one standard deviation in capital flows appears large, many of the larger economies count on monetary flexibility to respond; in particular flexible exchange rates provide at least a partial buffer. But unexpected increases in asset *tapering* or U.S. interest rates may provoke further falls in capital inflows. Given the worsening in recent years of the current account, of fiscal balances and domestic liability dollarization (perhaps unhedged), the risk of a more extreme event, a Sudden Stop in capital flows, has also risen. Policymakers may wish to consider prudential actions to reduce the probability of a Sudden Stop and to ameliorate the cost if one does occur. Preventative measures include attempting to reduce the vulnerability factors by attempting to enhance the tradable sector, reducing (net) dollarization and, again, by rebuilding fiscal buffers. Other measures may include finding ways to enhance reserves, for example through signing a Flexible Credit Line with the IMF or seeking other contingent financing liquidity arrangements, or to consider ex ante mechanisms to employ reserves to attenuate the impact of a liquidity shock.

<sup>94</sup> See Corbacho, Fretes Cibils, and Lora (2012).

History teaches that exits from extremely low U.S. interest rates may be smooth or bumpy depending critically on expectations, fundamentals and countries' capacity to respond. The upcoming exit is largely anticipated. It has already had effects on asset prices and capital inflows but the full effects on growth may yet take some time to materialize. Although fundamentals in the region have deteriorated since 2008, they remain considerably stronger than the 1990s. Under the baseline scenario, a priority is to restore buffers and improve institutions to boost response capacity for any future negative shock, and, depending on more in-depth, country-specific analysis, there may be room to take prudential actions to insure against particular financial vulnerabilities. Monetary normalization is a chronicle foretold but policy actions today may minimize deleterious effects such that countries gain more from the global recovery



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## APPENDIX A

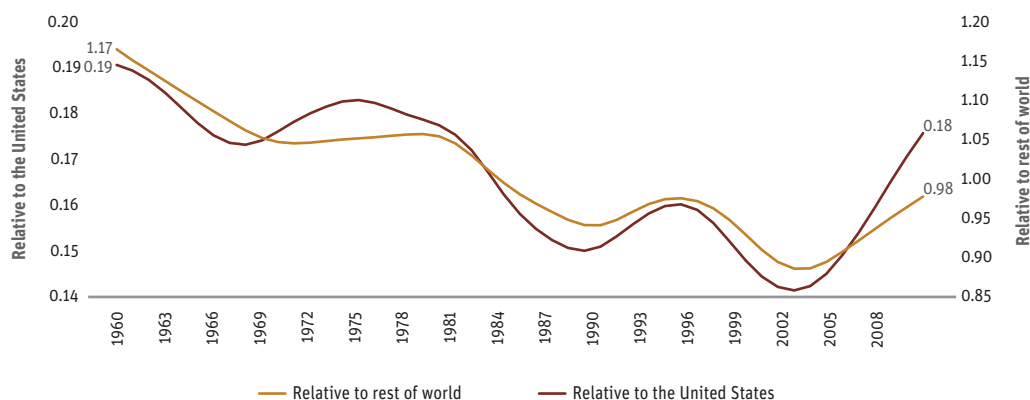
# Productivity and Growth

The typical country in Latin America and the Caribbean has an income per capita roughly comparable to that of the typical country of the rest of the world but 80% below the income per capita of the United States. Considering the last fifty years the relative position of the region has declined. In the 1960s, the typical country in Latin America and the Caribbean was substantially better off than the rest of the world and somewhat closer to the United States—see Figure A.1. The start of the previous decade was a particularly low-point with the typical country in the region having just 88% of the income per capital of the typical country in the rest of the world and 14% of that of the United States. The last decade has seen something of a rebound. Why is the region so much poorer than advanced economies? Why did the region lose ground? Is the recent rebound sustainable? And what can the region do to boost sustainable growth to improve its position?

The region's disappointing income per capita performance is in part attributable to its relatively low productive capacities. In economists' jargon, the region has lower physical and human capital. Important as these factors of production are, however, these shortfalls are not the main driver for the region's disappointing performance. Rather, it is the low productivity with which these factors of production are utilized. The key is, again resorting to the jargon, *total factor productivity* or how these factors are employed to produce goods and services (see Pagés 2010 for a more detailed discussion).

Economic performance over the last 50 years has been driven by declining total factor productivity relative to both the most advanced economies and other successful economies. Figure A.2 shows that, relative to the United States, the typical country in the region had faster factor accumulation (both the physical and human capital gap with advanced economies was reduced) but total factor productivity declined from 78% to 53% (a loss of 29 percentage points). The decline of 16% in Latin American and Caribbean income per capita relative to the rest of the world shown in Figure A.1 is attributable to the 18% decline in relative total factor productivity. Latin American and Caribbean total factor productivity halved relative to the typical East Asian country.

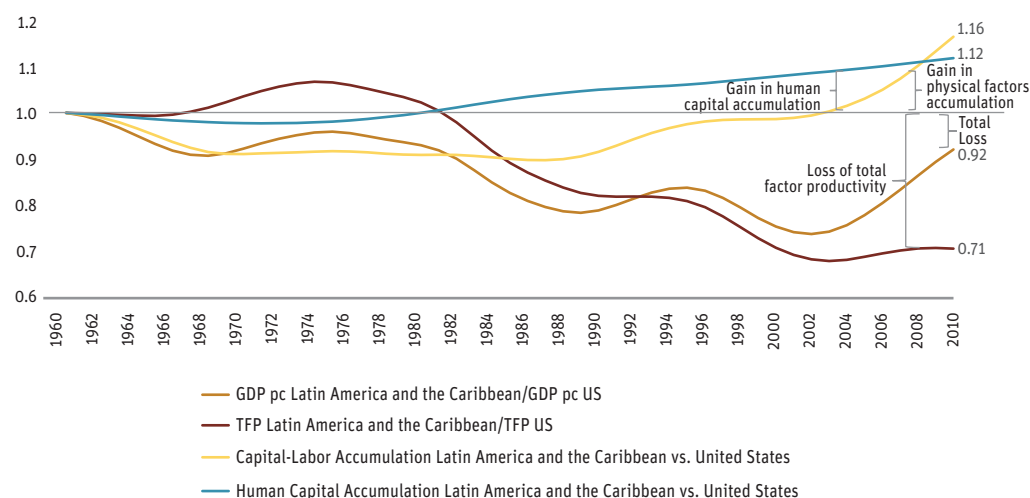
Moreover Figure A.2 indicates that the rebound in growth in the last decade was due to a faster accumulation of the factors of production (labor and capital) rather than an increase in the efficiency of how those factors have been employed (total factor productivity). There are clear limits to the growth in labor due to demographics and a natural limit to the share of the population that is employed—participation rates. The growth in capital must be financed either

**FIGURE A.1** RELATIVE INCOME PER CAPITA OF THE TYPICAL LATIN AMERICAN AND CARIBBEAN COUNTRY

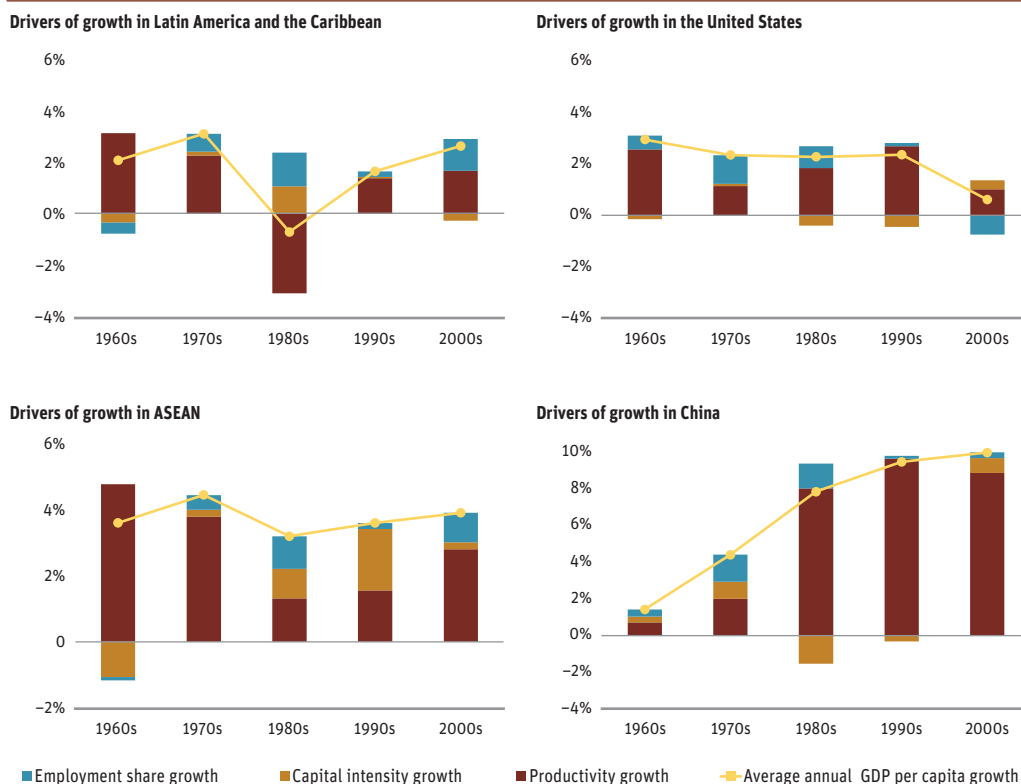
Source: Penn World Table 8.0 (2013), Barro-Lee Dataset (2013) and authors' calculations.

through lower consumption or through higher debt. If higher capital financed through debt is not allocated efficiently then this process will also face a limit. The sustainability of growth in the longer term is then normally associated with the extent that underlying productivity is growing.

Considering the average Latin American country in the last decade (2001–2010), only 58% of per capita GDP growth was derived from the growth in total factor productivity. The rest was fuelled by an expansion of the share of employment in the population (52%) and there was actually a small decrease in capital intensity—see Figure A.3. In the same period, 90% of per capita growth in China and 72% in the Asean 5 countries were explained by increases in productivity suggesting their higher growth rates may also be more sustainable. Figure A.3 also illustrates that

**FIGURE A.2** GDP PER CAPITA GAP DECOMPOSITION: LATIN AMERICA AND THE CARIBBEAN (1960=1)

Source: Penn World Table 8.0 (2013), Barro-Lee Dataset (2013) and authors' calculations.

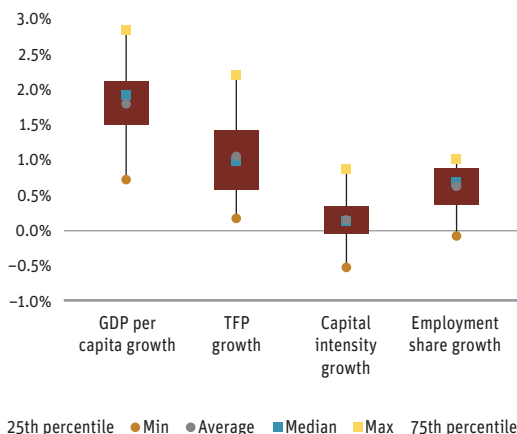
**FIGURE A.3 DRIVERS OF GROWTH IN LATIN AMERICA AND THE CARIBBEAN AND COMPARATOR REGIONS**

Source: Penn World Table 8.0 (2013) and authors' calculations.

productivity growth has varied across different decades. In fact, Latin America and the Caribbean fared reasonably well in the 1960s and 1970s but lost a huge amount of ground in the 1980s. The 1980s was not just a lost decade in terms of growth but one in which productivity fell and sharply reduced *potential growth*; unfortunately the region has never quite recovered that lost ground.

In Latin America and the Caribbean, there is already evidence that some countries' faster growth rates during the 2000s were not sustainable. Average GDP growth in Latin America and the Caribbean slowed in 2012–2013 and the region is growing at around 3%, a level similar to the one observed during the 1990s, and significantly lower than the 6.5% average growth rate for the 2004–2008 period. As argued in last year's Latin American and Caribbean Macroeconomic Report, this recent slowdown cannot be viewed as a temporary deviation from a higher growth trend; rather, it reflects the region's potential or sustainable growth, being commensurate with the underlying lower growth in productivity.

Still, while the recent average growth is relatively low it varies considerably across countries as do the main growth-drivers. Figure A.4 illustrates the distribution of growth rates and the distribution of the drivers of growth across the region. In Chile, Colombia, Mexico, and Uruguay the engine of growth appears to be labor, although an expansion of the capital stock also plays a

**FIGURE A.4** **GROWTH AND GROWTH DRIVERS (1961–2010)**

Source: Penn World Table 8.0 (2013) and authors' calculations.

substantial role in Chile and Mexico. In other countries, productivity does appear to play a role. However, no attempt is made here to control for the quality of labor or capital. If the quality of capital or labor has improved then the contribution of capital to growth will be underestimated and what is pure productivity growth may be overestimated.<sup>1</sup> Also, no account is taken of crises or business cycles. This is particularly important for some countries in the sample that suffered crises and recession. In Argentina, the deep 2002 crisis provoked a dramatic drop in demand and certainly generated substantial over-capacity that is not considered in these figures.<sup>2</sup>

In conclusion, over the last 50 years the region has lost ground with respect to the rest of the world and this poor performance is explained not by the rates of factor accumulation but rather by a disappointing performance in terms of productivity. Regional productivity is not converging to the frontier and has performed poorly relative to more successful peers. Moreover the gains in per capita income made in the last decade do not appear sustainable. For the typical country they have been driven more by factor accumulation than by underlying productivity growth. And even in some countries that did experience faster productivity growth it is likely that this is not estimated correctly due to substantial unused capacity at the start of the decade.

The good news however, is that with appropriate policies this situation can be changed. The objective of increasing productivity need not cost many resources, unlike faster accumulation of physical and human capital that require substantial investments. Increased productivity may be mostly a matter of reorganizing the existing factors of production such that they can be utilized more productively over time, which in itself may not require large investments.<sup>3</sup> On

<sup>1</sup> Another possible reason for higher growth rates that may not be sustainable is higher terms of trade driven by higher commodity prices. However, these statistics are produced employing Purchasing Power Parity (PPP) exchange rates such that direct effects may be eliminated. Moreover if marginal rates of productivity of capital are equalized across sectors, small changes in the composition of production (considering a shift to non-tradeables along a standard Dutch-Disease effect) should not lead to changes in underlying productivity—see Werning (2013) for a discussion. However, errors in the measurement of PPP rates, frictions that prevent the equalization of marginal rates of productivity and large changes in composition could lead to significant effects.

<sup>2</sup> See Neumeyer (2013) for a discussion of the sustainability of growth in Latin America and the Caribbean based on these figures.

<sup>3</sup> A counter-argument is that sector specific capital has been invested in unproductive areas and reallocation of capital would require some costs.

the one hand, the performance has been disappointing but the message is a positive one; there is ample room to increase productivity by catching up with the frontier; after all, total factor productivity in the typical country in Latin America is only about half that of the United States. This implies that the benefit of increasing productivity could be large. Closing one half of the productivity gap with the United States in a decade would basically double income per capita and substantially close the income per capita gap.<sup>4</sup>

Therefore, from a cost/benefit viewpoint, policies concerned with increased productivity should be the highest priority. The identification of the factors behind total factor productivity shortfalls requires a careful diagnosis. First, beyond the technology utilized by firms, there is the more general question of how well markets work for an efficient interaction among firms and whether public goods are provided appropriately. Inefficiency in the provision of public services and inadequate infrastructure may limit productivity of the private sector. Second, apart from a better environment for firms to operate under, improvements in aggregate productivity may result from the reallocation of resources to more productive firms. Many workers and firms in Latin America are informal and informality is associated with low productivity. Third, productivity growth may be related to weak absorption of new technologies in the economy.

In turn, effective policy requires identifying the root failures to be addressed, not simply their symptoms as revealed by a diagnosis of weak areas. While such a diagnosis is a good starting point, it is necessary to go further and identify the underlying market failures and design policies in such a way that they effectively address those failures. Furthermore, government failures in conducting policy may also be present. Institutions with adequate capabilities are required to implement policies effectively.

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<sup>4</sup> See Daude and Fernández-Arias (2010) and Powell (2013) for further estimates.





## APPENDIX B

# G-VAR Methodology

To simulate the scenarios summarized in Chapter 2, a Global Vector Auto Regression model (G-VAR) is employed. A G-VAR is a dynamic econometric model that facilitates the analysis of the international transmission of shocks, taking into account the interdependence among many countries. The G-VAR modeling approach consists of two main steps. First, each country is modeled individually as a small open economy by estimating a country-specific Vector Error-Correction model in which domestic variables are related to country-specific foreign variables and global variables that are common across all countries (such as the price of oil and other commodities). The foreign variables provide the link between the evolution of the domestic economy and the rest of the world and, in estimating the country-specific models, are considered as (weakly) exogenous; this assumption is not rejected in relevant statistical tests. Second, a global model is constructed combining all the estimated country-specific models and linking them with a matrix of predetermined (i.e., not estimated) cross-country linkages based on trade shares.

The G-VAR model actually used includes 35 country-specific models, including all major advanced and emerging economies in the world, accounting for about 90% of world GDP. The Latin American and Caribbean region is represented by the 6 largest economies in the region (Argentina, Brazil, Colombia, Chile, Peru, and Mexico) plus the following other smaller economies: Bolivia, Costa Rica, Ecuador, El Salvador, Jamaica, Nicaragua, Paraguay, Trinidad and Tobago. Data for the smaller countries of the region are taken from Latin Macro Watch, from the IMF, and other national sources. The model is estimated over the period 1994 Q1 to 2013 Q1 and hence may be considered a summary of relevant links and feedbacks between the economic and financial variables included in the model.

To simulate the counterfactual scenarios in the report, unconditional and conditional forecasts are used. Unconditional forecasts use parameter estimates based on historical data to predict the future value of all endogenous variables in the model. Conditional forecasts take into account the path of certain variables whose behavior are assumed to be exogenous, and then predict the other endogenous variables to obtain the counterfactual scenarios.

As an exercise to consider how close the unconditional forecast of the model is to the projections of the World Economic Outlook (WEO), each country's unconditional growth forecast of the model is regressed on each WEO projection for the same country. If the regression coefficient is close to one and the standard deviation of the error is low then the conclusion is that the model forecasts are consistent and close to projections of the World Economic Outlook.

The regression is conducted across all countries, assuming pooling, and with country fixed effects. It turns out that the point estimate of the coefficient is 0.908 and the 95% confidence bands are from 0.8 to 1.1. This implies that the estimate is not extremely precise but that on average the hypothesis that the coefficient is 1.0 cannot be rejected. This implies that there is no evidence that the model is biased or inconsistent.

A good measure of the closeness of fit is the square-root of the mean of the sum of the squared differences (i.e. the root mean squared error) between the model forecasts and the WEO projections. A set of differences between the model forecasts and the WEO projections were generated as follows. The model was estimated to the first quarter of 2008 and the unconditional, out of sample model forecasts were then compared to the WEO projections from April 2008, the model was then estimated to the first quarter of 2009 and the unconditional, out of sample model forecasts were compared to the WEO projections of April 2009 and so on up to the April 2013 WEO forecasts which were compared to the unconditional, out of sample model forecasts from the model estimated to the first quarter of 2013. Considering the one, two and three year ahead forecasts for all countries from all the April World Economic Outlooks from 2008 to 2013 in this manner, the mean squared error is 4.9%. This suggests that the differences between the model and the WEO projections are overall within 5% and hence they are reasonably close.<sup>1</sup> Moreover, focusing only on the one, two and three year WEO projections and the unconditional forecasts of the model estimated to April 2013, the root mean square error was less than 1%.

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<sup>1</sup> As a final note, in a horse-race between the G-VAR and the WEO projections as forecasts of the actual data, the model also performs reasonably well. The root mean square error of the WEO and of the model relative to actual outcomes for one year forecasts is less than 2% in both cases.

## APPENDIX C

# Structural Fiscal Balances and Cyclicity

### Sample and Coverage

The estimates of the structural primary balance were calculated for 20 countries in Latin America and the Caribbean for the period 1990–2012 using an original database constructed on the basis of official data sources (main sources: Central Banks and Ministries of Finance).<sup>1</sup> An important element to clarify about the dataset is the level of institutional coverage of the government. While some countries report data at only the consolidated central government (CG) level, others provide data for the consolidated general government (GG) level. The latter, or its closest approximation, is the preferred level of coverage.<sup>2</sup>

### Methodology

The structural primary balance (SPB) is defined as the fiscal balance that would prevail if the economy were at its potential (or trend) level.<sup>3</sup> In other words, the goal of estimating an SPB is to remove the impact of the business cycle and other exogenous factors (e.g., commodity price movements) from budgetary accounts. Computing the SBB involves basically three stages: i) estimation of potential output and the corresponding output gap; ii) estimation of tax and expenditure elasticities with respect to the output gap, and iii) adjustments that go beyond the business cycle, such as the effects of commodity prices on fiscal revenues.

Following Bornhorst et al. (2011), we define the SPB as follows:

$$SPB = \sum R_i \left( \frac{Y^P}{Y} \right)^{\epsilon_{R,i}} + R_i^{NRR} \left( \frac{P^{LR}}{P} \right)^{\alpha} - G \left( \frac{Y^P}{Y} \right)^{\epsilon_G}$$

---

<sup>1</sup> The sample includes Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Guyana, Honduras, El Salvador, Honduras, Mexico, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela.

<sup>2</sup> This definition includes the central government, subnational (state and local) governments, social security, and other decentralized organizations separate from the central government level. We thus exclude public enterprise operations and financial institutions from our calculus.

<sup>3</sup> See Ardanaz, Corbacho, and Gonz  les-Castillo (forthcoming) for further discussion.

where  $SPB$  is the structural primary balance,  $R_i$  are the different tax revenue categories,  $R^{NRR}$  is the revenue from non-renewable resources,  $Y^p$  is potential GDP,  $Y$  is GDP,  $P$  is the weighted average of the principal commodity price,  $P^{LR}$  is the long-run weighted average price of main commodity prices,  $\varepsilon_{Ri}$  and  $\varepsilon_G$  are the GDP elasticity of each revenue category and primary expenditure, respectively,  $\alpha$  is the elasticity of commodity prices with respect to NRR revenues, and  $G$  is primary expenditure. The method(s) introduced in each stage are as follows:

- i. *Output gaps*: The difference between observed and trend GDP. Trend GDP was estimated using an HP filter with standard smoothing parameter for annual time series ( $\lambda = 100$ ). To address the endpoint problem of the HP filter we used GDP annual time series projections up to 2017 based on the IMF's latest WEO (October 2013).
- ii. *Budget elasticities*: Following the method proposed in Bruce et al. (2006), we estimate long-run fiscal elasticities relying on Dynamic OLS (DOLS) techniques. The elasticities are estimated using data from 1990 to 2010 for 20 countries and consider the following taxes: Corporate Income Tax (CIT), Personal Income Tax (PIT), indirect taxes (valued added tax and excises), Social Security Contributions (SCC) and the aggregation of other taxes. The equation used is as follows:

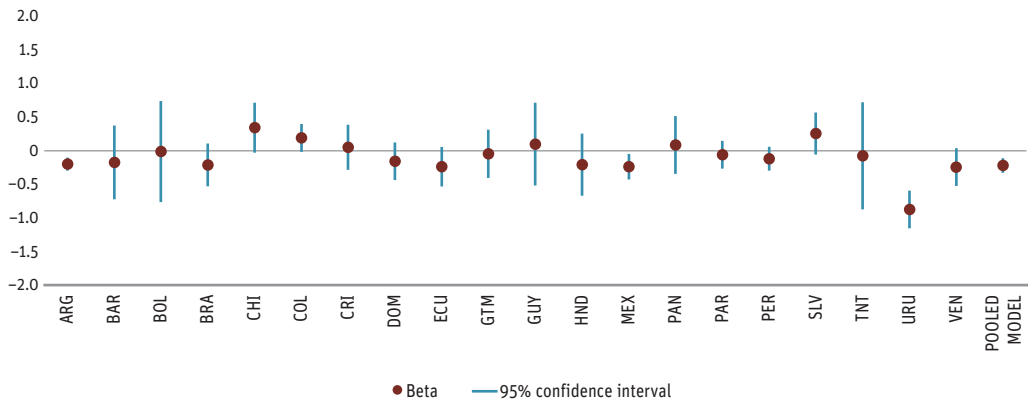
$$\ln T_t^i = \beta_0^i + \beta_1^i \ln Y_t + \sum_{n=0}^j \delta_n^i D_t^n + \varepsilon_t^i$$

where  $T_t^i$  is each tax,  $\beta$  and  $\delta$  are the coefficients estimated,  $Y_t$  is the real GDP,  $D_t^n$  are the tax rates or dummy variable for institutional (or administrative) changes, and  $\varepsilon_t^i$  the error term.

- iii. *Commodity-related fiscal revenues*: Commodity related revenues (e.g., revenues from non-renewable resources, or NRR) play an important role in total fiscal revenues in several countries of the region (see Corbacho et al., 2013). Following the methodology used in Chile, we introduce an adjustment in the fiscal revenues related to the commodity of interest or basket of commodities. This implies defining a structural price ( $P^{LR}$ ) that is not observable and reflects the long-run price. The adjustment is defined as the ratio between the observed price and structural price. For the estimation of structural prices, three alternative scenarios are introduced:

- Moving average 15 years of historical data,
- Forward-looking 5 years (Bloomberg forecast), and
- 12 years of historical data and 4 years of forecast.

The average of the above scenarios constitutes our estimate of  $P^{LR}$ .

**FIGURE C.1** ESTIMATED BETA COEFFICIENTS AND 95% CONFIDENCE INTERVALS

Source: Authors' calculations based on national sources.

## Projections of Structural Primary Balances for 2013

To obtain a measure of the structural primary balance (SPB) for 2013 we use annual data for 20 countries over the period 1990–2013 and estimate the following equation for each country:

$$\Delta spb_{it} = \beta_i gap_{it} + \gamma_i spb_{it-1} + \delta_i W_{it} + \varepsilon_{it}$$

where  $spb$  is the structural primary balance,  $gap$  is the output gap (as defined above), and  $W$  a time trend. Country-level  $\beta$  coefficients and associated confidence intervals are reported in Figure C.1. Rather than pooling the data in a fixed effects model (and thus gaining efficiency), we decided to run separate country-by-country regressions since the latter option produced lower values of the root mean squared error measure  $\sqrt{\text{var}_i(\varepsilon_{it})}$ .<sup>4</sup>

## Sensitivity Analysis of the Structural Primary Balance to the Output Gap

In order to measure the cyclicality and degree of asymmetry of fiscal policy, a set of *fixed effects* estimations were performed consisting of changes in the structural primary balance against the output gap for the 2000–2013 period, disentangling between years when output is above (positive) and below (negative) potential GDP (as in Balassone and Kumar, 2007). These estimations were performed on separate samples of countries: a country is defined as mostly pro-cyclical

<sup>4</sup> To deal with reverse causality considerations, we also estimated  $\beta_i$  by instrumental variables, instrumenting the output gap of country  $i$  with the output gap of the country's major trading partners. Again, this model produced higher values of  $\sqrt{\text{var}_i(\varepsilon_{it})}$  and thus only the OLS coefficients were used in the analysis.

(least pro-cyclical) if the correlation between the change in the structural primary balance and the change in the output gap is above (below) the regional average (see Table C.1).

**TABLE C.1** **FISCAL PRO-CYCLICALITY**

	Most Procyclical		Least Procyclical	
Dependent variable	Δ structural primary balance ( <i>spb</i> )			
Output gap	−0.277***		0.214**	
	−0.063		(0.077)	
Positive output gap		−0.163*		−0.045
		(0.081)		(0.168)
Negative output gap		−0.338**		0.355**
		(0.106)		(0.143)
Lagged <i>spb</i>	−0.653***	−0.653***	−0.566***	−0.561***
	(0.122)	(0.124)	(0.057)	(0.058)
Constant	0.888	0.676	0.082	0.505
	(0.556)	(0.584)	(0.272)	(0.431)
Observations	130	130	130	130
R-squared	0.579	0.583	0.454	0.476
Number of countries	10	10	10	10

Note: Robust standard errors (clustered by country) in parentheses.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## APPENDIX D

# Credit and the Issuance of International Debt Securities

### The Liabilities of Latin American and Caribbean Firms: A New Definition

In this report, an innovative definition of the liabilities of Latin American and Caribbean firms is adopted. This definition mixes two standard definitions, one by residence and one by nationality. Statistics on external liabilities from the balance of payments are calculated on a *residence* basis and hence miss the liabilities of a country's firms that have been issued through subsidiaries located outside of the country. On the other hand, considering the *liabilities* of firms on a *nationality* basis includes those liabilities but excludes the liabilities of firms located in Latin America and the Caribbean but owned by foreign firms. In general, liabilities on a residence basis exceed the liabilities on a nationality basis—see Figure D.1.

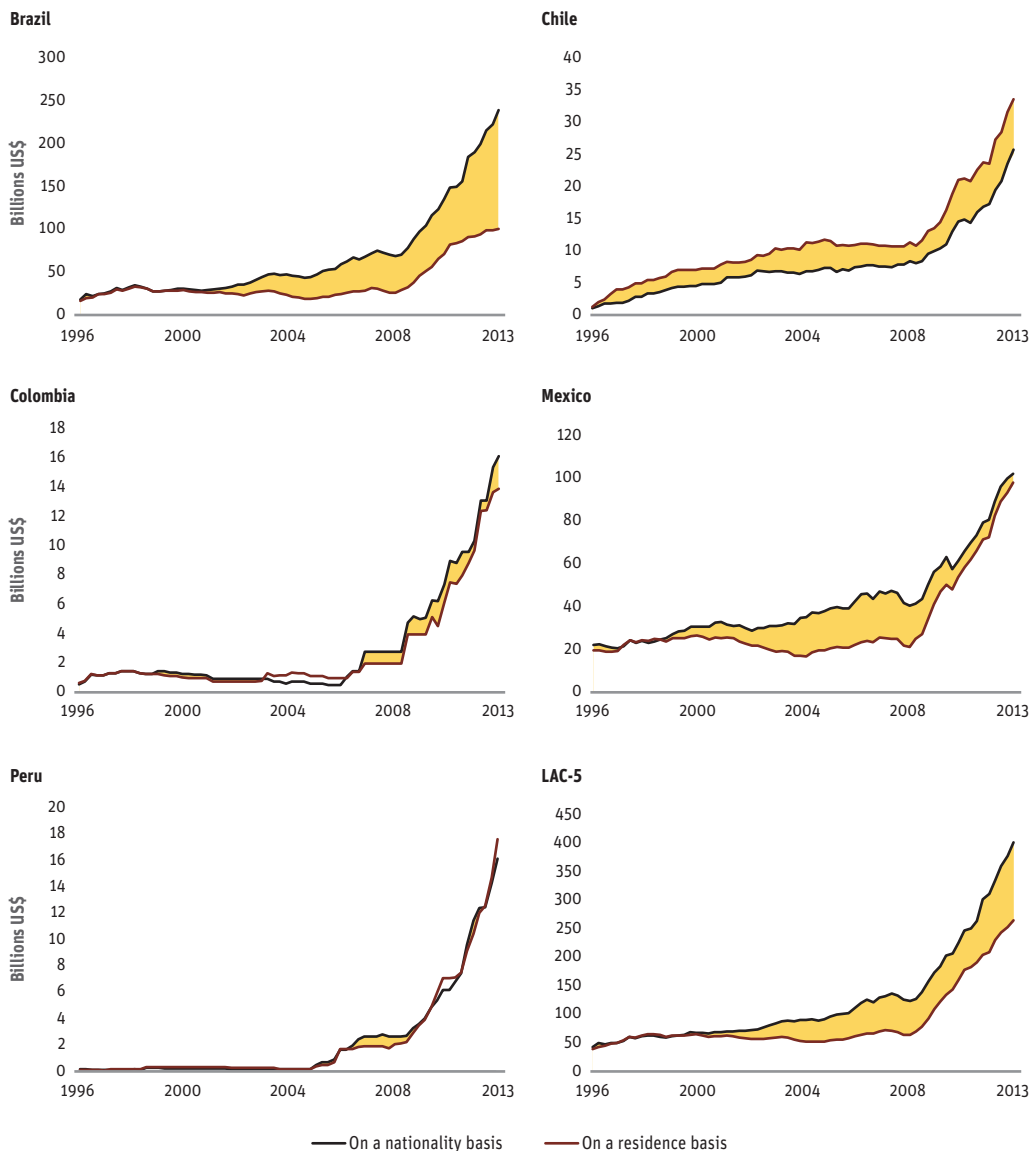
For example, in June 2013, the stock of Brazil's international debt securities on a *nationality* basis was 137% larger than on a *residence* basis—and 16% and 4% larger in Colombia and Mexico, respectively. Interestingly, considering Chile, switching to a *nationality* basis actually reduces its liabilities, as the amounts issued by firms resident in Chile and owned by foreign corporations exceed the amounts issued by the subsidiaries of Chilean firms that are not resident.

The difference between the issuance on a nationality and on a residence basis for the years analyzed is mostly due to the issuance of financial corporations (Figure D.2). This highlights the importance of considering these offshore liabilities, especially for supervisors from countries where regulations do not require financial firms to report on a consolidated basis.

Thus, to better reflect the recent trends in foreign liabilities, the analysis in Chapter 4 focuses on a measure of total liabilities computed by adding to the liabilities of all residents the liabilities of non-resident nationals (i.e., companies that issue bonds through subsidiaries located outside the country of nationality). Considering the liabilities of all residents of a country is important for financial stability, as external shocks affecting residents may have a deleterious impact on the country's asset prices and banks' balance sheets, even if those residents are not nationals. Considering the liabilities of non-resident nationals is also important, as the consolidated balance sheet of the firm is a better proxy for the liabilities for which a country's firms are ultimately responsible.

Measures of liabilities taking into account national non-residents are significantly higher for several countries in the region relative to liabilities measured on the basis of residency. For

**FIGURE D.1** STOCK OF PRIVATE SECTOR INTERNATIONAL DEBT SECURITIES (BONDS)  
BY RESIDENCE AND NATIONALITY OF ISSUER



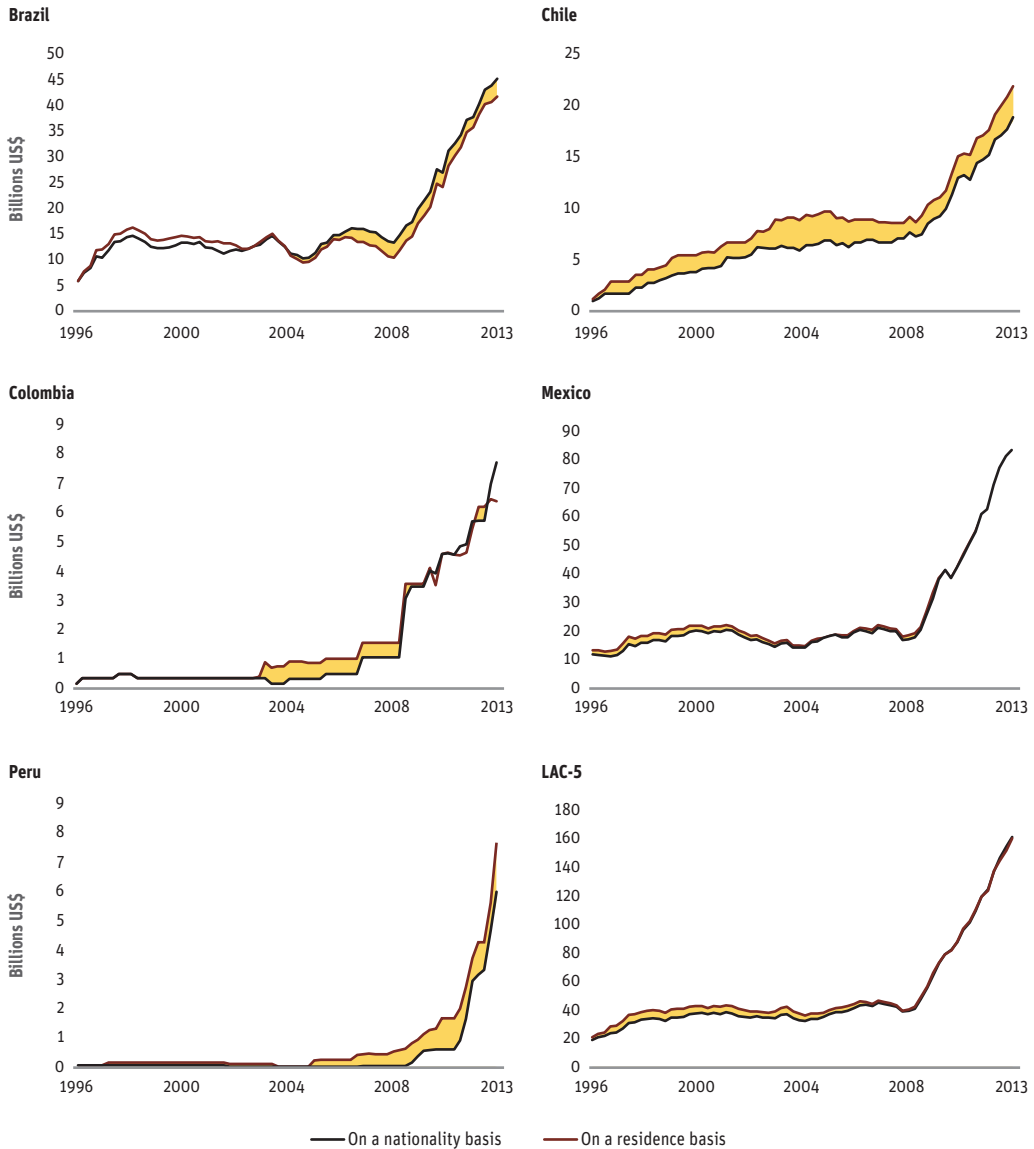
Source: Authors' calculations, BIS Securities and Banking Statistics, Tables 11, 12 and 7.

Note: LAC5 refers to the sum of all countries.

example, total issuance of international debt securities (IDS) in Brazil in the period after the Great Recession on a residence basis yields a total amount of US\$74bn, while including the issuance of non-resident nationals yields the much larger figure of US\$175 bn (i.e. 137% larger). This phenomenon is not exclusive for Brazil. Including issuance of IDS by non-resident nationals



**FIGURE D.2** STOCK OF INTERNATIONAL DEBT SECURITIES (BONDS) OF NON-FINANCIAL CORPORATIONS BY RESIDENCE AND NATIONALITY OF ISSUER



Source: Authors' calculations, BIS Securities and Banking Statistics, Tables 11, 12 and 7.

Note: LAC-5 refers to the sum of Brazil, Chile, Colombia, Mexico and Peru.

yields figures of issuance 31%, 20% and 11% larger in the cases of Colombia, Peru and Chile, respectively. Considering issuance by non-resident nationals appears important to have a more complete picture of the liabilities corporations have issued.

## On the Definition of International and Domestic Debt Securities

The definition of an international debt security (IDS) used in this report follows the new methodology implemented by the Bank of International Settlements, which takes information on the location the bond is issued and compares it with the residence of the issuer (Gruic and Wooldridge, 2012). Following the *Handbook on Securities Statistics* (BIS, ECB, and IMF, 2012), the place of residence of a firm is considered to be the jurisdiction where it is incorporated. To identify the place where the bond is issued, information on the country where the security (or securities as a bond may be composed of multiple individual securities) is listed, the ISIN number (or numbers) assigned to the security (or securities), and the governing law.

A bond is classified as an IDS if it is listed in multiple countries, or if it is listed with an international central depository, or if it includes securities that have been issued ISIN numbers in multiple countries. A security is also considered an IDS if the residence of the issuer is different from the country where the security is issued an ISIN, or if it is different from the security's governing law.<sup>1</sup> Bonds with incomplete information on listing place, ISIN number, and governing laws are classified as international securities if the data provider classifies the bond as foreign.<sup>2</sup>

## International Issuance and the Credit Cycle

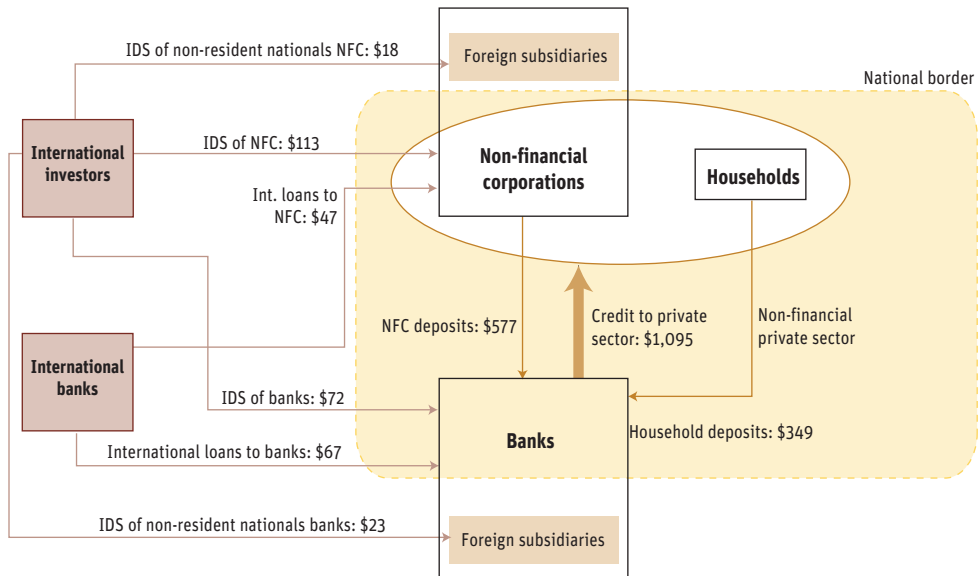
In recent work, Shin (2013) and Chung et al (2013) focus on the role of non-financial corporations in terms of their issuance of external debt and in financing credit growth around the world. Focusing on four larger economies in the region (Brazil, Chile, Colombia and Mexico, LAC-4 hereafter), Figure D.3 presents a flow of funds analysis to explore these links.<sup>3</sup> As shown in the diagram, the change in the stock of credit in LAC-4 between end-2008 and June-2013 was US\$1.1 trillion,

<sup>1</sup> These rules reflect those of the new BIS methodology, which is different from the previous approach of considering a bond as an international security depending on the targeted investor base. This approach would classify a security as international if the targeted investor base was foreign. This distinction, however, has little effect on the classification of bonds issued by Latin American and Caribbean firms. Only 0.5% of all issuance by value of Latin American and Caribbean firms in the period 1995 to 2013 is reclassified based on the new methodology (compared to 15% of issuance worldwide); as reported in BIS (2012), significant changes in the classification of securities occur mainly in developed economies.

<sup>2</sup> The data provider is *Dealogic*. Similar rules are applied to classify a security as domestic for cases in which the residence of the issuer is the same as governing law, or the same as the ISIN nationality, or the same as the listing place, or all three conditions apply at once (and given no contradiction with classification as international security, and a unique listing place and/or unique ISIN nationality). Given lack of information on ISIN number, listing place, and governing law, the bond is classified as domestic if the vendor *Dealogic* classifies it as domestic by market type. Applying these rules, we are able to correctly classify all but 79 bonds in the United States and Canada, out of a total of 557,907 bond tranches in the database. These bonds are then classified as domestic, after manually checking that these are transactions in local currencies of domestic issuers.

<sup>3</sup> The stock of credit in LAC-4 countries as of June 2013 amounted to US\$ 2.1 trillion and represented 92% of the stock of credit to the private sector from deposit money banks in the region. Similarly, the stock of deposits in LAC-4 countries represented 91% of the total stock of deposits in the region (amounting to US\$ 2.0 trillion). See Chung et al. (2014) for further details on the data on deposits.

**FIGURE D.3** EXPLAINING THE GROWTH IN CREDIT CHANGE IN STOCKS OF CREDIT, DEPOSITS, AND INTERNATIONAL DEBT 2008–2013 IN LAC-4 (BN USD)



Source: Authors' calculations, based on IMF, BIS Securities and Bank Locational Statistics, and Dealogic.

Note: The figure shows the change in stocks between end of 2008 and June 2013 for credit, deposits, international debt securities (IDS) of residents, and international loans. The figure of issuance of IDS by non-resident nationals is gross issuance in the period January 2009 to June 2013. LAC-4 refers to Brazil, Chile, Colombia, and Mexico.

equivalent to a nominal increase of 116%. Total deposits rose \$935 billion (or 85%) during the same period with deposits of NFCs increasing relatively more, rising 93% (\$577 billion) versus an increase of 76% (\$349 billion) in the deposits of households. In addition, banks received direct financing by issuing international debt securities and acquiring international loans for a total of US\$162 billion over the same period.<sup>4</sup>

How did non-financial firms finance such a large increase in deposits? In part, this was financed by issuing foreign debt and contracting international loans for about US\$180 billion (16% of the increase in domestic credit). Presumably, the other 84% was financed through domestic debt, equity, and retained profits.<sup>5</sup> In the case of the Latin American countries considered, this analysis reveals that non-financial firms may play some role in the increase in credit but it is clearly not the whole story. Banks' direct issuance of foreign liabilities also plays a significant

<sup>4</sup> The diagram does not aim to offer an exhaustive representation of all funding sources of banks, or of all inter-linkages of banks and NFCs with the broad economy. The diagram omits important actors in the global and domestic economies, such as governments and domestic investors, and inter-linkages between international investors/banks with foreign subsidiaries of domestic firms. As such, the sums of all funding of banks represented in the figure do not necessarily equal the size of credit.

<sup>5</sup> There may have been an increase or decrease in other assets. These figures don't necessarily have to sum exactly.

role as does the increase in household deposits. Figure 4.12 in Chapter 4 further illustrates the point. While the figure does indicate a correlation between the growth in credit and the change in the stock of non-financial firms' international debt securities, the correlation is not close to unity; there are many other factors involved.

To investigate the relationship between the issuance of international debt securities by non-financial corporations and the growth in credit, an empirical strategy using panel regression analysis was developed. The log of the stock of domestic credit (from the local financial system) to the non-financial private sector was used as the dependent variable, and the stock of international loans to financial institutions (*FIN Loans*), the stock of international debt securities of financial companies (*FIN IDS*), and the stock of international debt securities of non-financial corporations (*NFC IDS*) were included as explanatory variables. Data was collected on 18 emerging countries over the period 2002–2012.

A simplified version of the estimated model can be written as follows:

$$Credit_{i,t} = \alpha_i + \alpha_t + \beta_1 FIN\ Loans_{i,t} + \beta_2 FIN\ IDS_{i,t} + \beta_3 NFC\ IDS_{i,t} + \varepsilon_{i,t}$$

This regression models the stock of domestic credit in a given country (*i*) and in a given year (*t*) as a function of the stock of international loans of financial corporations and debt securities of both financial and non-financial corporations, plus an error term. All variables in the model are transformed to logarithms.<sup>6</sup> The idea of this regression is to explore statistically what were the main funding-drivers of credit growth in emerging economies. If all funding sources were included, then the model would be an identity. Here, one variable missing is the deposits of households and clearly the growth in non-financial corporations' debt securities could only affect credit growth indirectly, if they then deposited the proceeds in domestic financial systems. The model includes country fixed effects and time fixed effects to capture any omitted variables. Moreover, the fixed time effects eliminate any issues regarding time trends or spurious correlation. A lagged dependent variable is included in the model and is found to be significant.<sup>7</sup>

The results are presented in Table D.1. Two specifications of the model are presented. The first considers the overall effect on all emerging economies assuming that the effect is the same and can be pooled. The second specification includes a set of interaction terms for different regions in the world. The Latin American and Caribbean region is the excluded region while ECA stands for Eastern Europe and Central Asia and EAP stands for East Asia and Pacific and Other

<sup>6</sup> The model is estimated with a set of country and year fixed effects ( $\alpha_i$  and  $\alpha_t$ ). The time fixed effects capture all factors that may affect credit in all countries in a given year (e.g., global factors such as monetary policy in the United States), while the country fixed effects capture all time-invariant idiosyncratic factors that may affect credit in a given country. The sources of variation not captured are time-varying country-level factors. The errors are clustered at the country level (thus, allowing for correlation of the errors across time for a given country). Since for some countries the stock of some explanatory variables may be zero for a given year, the actual variables used in the regression are computed as  $\log(1 + x)$ .

<sup>7</sup> A dynamic panel estimator is not employed as the panel is thin but fairly long (18 countries by 11 years) reducing problems of bias in coefficient estimates.

includes all other (non-LAC) countries. These variables are dummy variables taking the value of 1 if the country is in the region named and zero otherwise and so the whole term is an interaction effect between a regional dummy and the change in the stock of international debt securities.

The results of the first column regressions indicate that for all countries, and assuming pooling, the issuance of international debt securities by non-financial companies has no significant impact. However, in the second column when different regional impacts are allowed, the variable NFC IDS becomes significant at the 5% level, indicating that there is a significant effect for Latin America (which is the excluded region) and the interaction effects for ECA and for Other are also significant, with negative coefficients, while the EAP interaction effect is not significantly different from zero. This suggests that the issuance by non-financial corporations impacts credit in Latin America and the Caribbean and in EAP, but considering the coefficients for ECA and OTHER there is essentially no impact on countries in these regions as the positive coefficient on the variable NFC IDS and on each of ECA and Other cancel each other out.

As the regression is in logs the coefficient is an elasticity. So the coefficient on NFC IDS which refers to Latin America and the Caribbean (as Latin America and the Caribbean is the excluded region) implies that for each US\$1bn of additional issuance, credit in Latin America and the Caribbean would be expected to increase by about US\$100mn or 10%.

**TABLE D.1****RESULTS OF REGRESSION MODEL OF CREDIT ON INTERNATIONAL LOANS AND DEBT SECURITIES OF FINANCIAL AND NON-FINANCIAL CORPORATIONS**

	(1)	(2)
FIN Loans	0.083 [0.046]*	0.043 [0.045]
FIN IDS	0.004 [0.031]	0.026 [0.033]
NFC IDS	0.020 [0.032]	0.110 [0.040]**
Lagged Credit	0.737 [0.071]***	0.765 [0.060]***
ECA × NFC IDS		-0.180 [0.077]**
EAP × NFC IDS		-0.004 [0.036]
OTHER × NFC IDS		-0.121 [0.033]***
Country FE	Yes	Yes
Time FE	Yes	Yes
Observations	198	198
R-squared	0.990	0.991

Omitted group dummy is for Latin America and the Caribbean. Omitted country dummy is for Brazil.

Country-clustered robust standard errors in brackets.

\*\*\* indicates significance at 10 percent level, \*\* indicates significance at 5 percent level, and \* indicates significance at 1 percent level.



## APPENDIX E

# Models to Analyze Capital Flows and Monetary Policy

This appendix describes the technical details of the three quantitative exercises performed in chapter 5. In the first exercise the focus is on the effect of changing expectations on U.S. interest rates on capital flows to emerging market economies. In the second exercise the impact of capital flows on growth in five Latin American and Caribbean economies is analyzed using a structural vector auto regressive model. And in the third exercise Taylor-type monetary policy rules for five Inflation Targeters in Latin America and the Caribbean are estimated and employed to consider scenarios for the path of policy rates in 2014.

### The Effect of Changing Expectations on U.S. Interest Rates on Capital Flows

Federal fund futures contracts provide a proxy for the market expectation of the future level of the federal funds target interest rate. Hence, considering how capital flows react to changes in these futures prices indicates how U.S. monetary policy shocks may affect capital flows to emerging economies. To quantify this effect the following panel regression was estimated:

$$FS_{i,t} = \beta_0 + \beta_1 FS_{i,t-1} + \beta_2 USMonPol_t + \beta_3 X_{i,t} + \epsilon_{i,t}$$

Where  $FS_{i,t}$  is the ratio of equity and bond flows to equity and bond stocks for country  $i$  in month  $t$ , and  $USMonPol_t$  is a proxy for U.S. monetary policy shocks measured as the first difference of the log of the 18-month federal funds future rate.<sup>1</sup>  $X_{i,t}$  is a vector of control variables including country  $i$ 's sovereign spread, the VIX index and a measure of U.S. high yield corporate spreads (all of these variables are specified in log differences).

The regression was estimated using fixed-effects and robust standard errors. The dataset corresponds to an unbalanced panel of monthly observations covering the period 2007:12–2013:12 for 39 emerging economies (7 African economies, 7 from Emerging Asia, 10 from Emerging Europe, 11 from Latin America and the Caribbean, and 4 from the Middle East). Given monthly data and some 60 observations in the time dimension, the bias in the coefficients is likely to be

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<sup>1</sup> The data on equity and bond flows and stocks comes from EPFR (Emerging Portfolio Fund Research).

very small for this dynamic panel with a lagged dependent variable. The preferred specification gave the following results:

$$FS_{i,t} = 0.001*** + 0.604***FS_{i,t-1} - 0.018***USMonPol_t \\ - 0.011**EMBI_{i,t} - 0.037***VIX_{i,t} - 0.041***HYS_{i,t} + \varepsilon_{i,t}$$

Where \*\*\*/\*\*/\* denote statistical significance level at 1/5/10%.

## The Impact of Normal Fluctuations of Capital flows on Growth: A Structural Vector Auto Regressive (S-VAR) Approach

An S-VAR model is a flexible way to consider how shocks may affect outcome variables allowing the researcher to place a limited amount of structure on the model employed. In this application the following SVAR model is estimated for each country  $i$  in order to quantify the impact of capital flows on growth:

$$AY_{i,t} = A_0 + A_1Y_{i,t-1} + \dots + A_pY_{i,t-p} + \varepsilon_{i,t}$$

where

$$Y_{i,t} = [Eq_{i,t}, Gr_{i,t}, R_t^*]'$$

and  $Eq_{i,t}$  is the change in the stock of equity funds allocated to country  $i$ ,  $Gr_{i,t}$  is the country's annualized GDP growth rate, and  $R_t^*$  is the 3-month U.S. TBill rate. We quantify the effects of capital flows by computing the 20-quarter cumulative impulse response function (IRF) of GDP growth following a one standard deviation shock to  $Eq_{i,t}$ . When identifying the shock we make the following two assumptions: (i)  $R_t^*$  follows an independent process which, in turn, implies setting to zero the coefficients in the first and second columns of the lower rows of matrices  $A_0, A_1, \dots, A_p$ ; and (ii)  $Eq_{i,t}$  responds contemporaneously to  $Gr_{i,t}$  and  $R_t^*$  but not vice versa, which in turn implies estimating the coefficients in the upper row of matrix and setting all the other off-diagonal elements in that matrix equal to zero.

A separate S-VAR model with quarterly observations was estimated for each of the following five Latin American countries: Brazil (1997.Q1–2011.Q4), Chile (1997.Q3–2013.Q3), Colombia (2005.Q1–2013.Q1), Mexico (1997.Q1–2013.Q3), and Peru (1997.Q1–2012.Q4). The number of lags was selected according to the Schwarz criteria.<sup>2</sup> The one standard deviation negative shock used when computing the IRF in each of the five countries amounts to a drop in the stock of portfolio equity of US\$15bn in Brazil, US\$1.5bn in Chile, US\$0.2bn in Colombia, US\$4.9bn in Mexico, and US\$1bn in Peru.

<sup>2</sup> The exception was the S-VAR of Colombia where the limited number of observations forced us to consider only one lag.



**TABLE E.1 CUMULATIVE IMPULSE RESPONSE FUNCTION AND CONFIDENCE INTERVALS**

Country	Sample	Cumulative Effect on GDP growth	95% Conf. Interval	Lags
Brazil	1997.Q1–2011.Q4	–0.039	[–0.0652, –0.0237]	1
Chile	1997.Q3–2013.Q3	–0.022	[–0.0412, –0.0108]	2
Colombia	2005.Q1–2013.Q1	–0.012	[–0.0372, –0.0024]	1
Mexico	1997.Q1–2013.Q3	–0.033	[–0.0498, –0.0195]	1
Peru	1997.Q1–2012.Q4	–0.047	[–0.0825, –0.0197]	2

Source: Authors' calculations.

Data on flows and stocks comes from EPFR<sup>3</sup>; GDP series were downloaded from IFS; and the U.S. interest rate was downloaded from the Federal Reserve Board's database.

The results of the exercise are presented in Figure 5.6 where the cumulative IRF is displayed for each of the five countries considered. For purposes of clarity, confidence intervals are not illustrated in that figure; but in Table E.1 above, we report the 95 confidence interval for the 20<sup>th</sup> quarter-cumulative response in each country.

### Estimating Taylor-type Monetary Policy Rules in Inflation Targeters in Latin America and the Caribbean

The third and final quantitative exercise that is included in Chapter 5 is the estimation of Taylor-type rules for five Latin American countries: Brazil, Chile, Colombia, Mexico and Peru. This section builds on Barajas et.al. (2014) who estimated the following Taylor rule as a way to summarize the reaction function of central banks under an Inflation Targeting regime:

$$i_t = \alpha + \beta_1 i_{t-1} + \beta_2 x_t + \beta_3 (E_t \pi_{t+1} - \pi_t^T) + \varepsilon_t$$

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  $\pi_t^T$ —i.e., “the inflation gap”—and to 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 interest rate term  $i_{t-1}$ .

As in Barajas et.al. (2014),  $x_t$  is estimated by the Hodrick-Prescott cyclical component of output and the inflation gap is measured as the difference between inflation expectations and the inflation target. Each policy rule is estimated on a monthly dataset for each country, covering the period 2000.M2 to 2013.M11. For output in Brazil, monthly GDP at constant 2008 prices is obtained from the Banco Central do Brasil; in Chile the monthly IMACEC (*indicador mensual de*

<sup>3</sup> EPFR is Emerging Portfolio Fund Research.

**TABLE E.2** ESTIMATED POLICY RULES

Country	Brazil	Chile	Colombia	Mexico	Peru
Sum of Lags (4)	0.978***	0.908***	0.983***	0.981***	0.908***
Output Gap	0.072**	0.071***	0.013*	0.090***	0.072***
Inflation Gap	0.065*	0.193**	0.111*	0.114***	0.063
Intercept	0.243*	0.351***	0.078	-0.042	0.333***

Where \*\*\*/\*\*/\* denote statistical significance level at 1/5/10 percentage.

*actividad económica*) in 1990 constant prices is taken from Banco Central de Chile; in Colombia the monthly IPIR (Índice de Producción Industrial) is taken from Banco de la República at 1990 constant prices; in Mexico the monthly IGAE (índice global de actividad económica) is obtained from the Central Bank of Mexico; and in Peru the monthly GDP at constant 2008 prices is taken from the Banco Central de la Reserva.<sup>4</sup> Monthly inflation expectations are taken from Latin Focus Consensus Forecast.<sup>5</sup> Finally, we also considered four lags in the policy rate rule. The OLS estimated coefficients are reported in Table E.2.

Assuming that the output gap declines by half the amount of the fall in GDP presented in Table E.1, and employing the estimated coefficients in Table E.2, the path of policy rates for the period 2013.M12 to 2014.M12 is simulated for each of the five countries. The assumption on the output gap is plausible given that most of the fall in the cumulative IRF occurs within the first eight quarters (see Figure 5.6). Furthermore, it is assumed that this fall occurs linearly within the simulation period considered. Finally, three scenarios for the path of the inflation gap are considered. In a benchmark case, the assumption is that the inflation gap remains constant and equals the one observed at the end of the sample (November, 2013). Two alternative scenarios are considered where the inflation gap is 1% higher and then 1% lower, relative to the observed inflation gap for the last observation.

<sup>4</sup> All series of output were seasonally adjusted using the X-12 filter built in Matlab, with the exception of the IGAE series that are already seasonally adjusted by the Central Bank of Mexico.

<sup>5</sup> This is the longest inflation expectations survey available. Unfortunately, it only includes expectations for end December of the current and following year. We followed Barajas et.al. (2014) in establishing the month of April as the cutoff point: expectations for January-March of year  $t$  are those of December year  $t$ , whereas expectations for April-December of year  $t$  are those of December year  $t+1$ . Inflation expectations for Mexico come from Revela and start only in December 2006 which limits the sample for this country only.

## APPENDIX F

# Dissecting Domestic Liability Dollarization

As shown in chapter 6, domestic liability dollarization (DLD) has increased on average in the region since 2007. However, countries have also been accumulating foreign reserves, in part for precautionary reasons, in order to offset the effects of DLD. Recent academic work indicates that a measure of DLD net of foreign reserves (Net DLD) is the most relevant one for estimating the probability of a Sudden Stop and associated output costs.<sup>1</sup> Table F.1 shows figures for net DLD (as a % of GDP) once reserves are subtracted from DLD. This measure provides some stark contrasts with DLD for cases such as that of Peru, where, despite high levels of DLD, Net DLD levels are actually the lowest in the group given large foreign reserve accumulation in the past decade (–10.2% of GDP).<sup>2</sup> However, on average, Net DLD levels have increased with respect to 2007 (from –6.4% of GDP to –6% of GDP). But levels of Net DLD are significantly lower today (i.e. more negative) than those prevailing in 1997 (–1.9% of GDP) on the eve of the Russian crisis.

As argued in Chapter 4 and Appendix D, there may be a link between the issuance of debt securities on the part of non-financial firms and the growth of deposits in and credit from local financial systems. Reserves may then also be used to provide liquidity for private sector debt payments or to the financial system if such issuance raises risks for the local financial system, in which case non-financial private sector debt and not just bank debt could take resources away from Net DLD levels. In recent years, the accumulation of private sector debt in foreign currency increased substantially for the typical LAC-7 country to 3.5% of GDP by 2012. This introduces an additional layer of vulnerability—assuming these private sector debt stocks were contracted in foreign currency.<sup>3</sup> Table F.1 shows a measure of DLD netting out reserves but adding private debt stocks. In this case, the deterioration would be greater, from –4.7% of GDP in 2007 to –2.6% of GDP by end-2012.

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<sup>1</sup> See Calvo, Izquierdo and Loo-Kung (2013).

<sup>2</sup> Dollarization is likely one important reason why Peru has accumulated a high level of reserves. The fact that Net DLD is negative means foreign exchange reserves exceed DLD.

<sup>3</sup> These figures refer to stocks of national non-bank private sector companies as published by the Bank of International Settlements (BIS). As detailed in Chapter 4 the vast majority of such issuance was indeed in dollars.

It is also interesting to explore why gross DLD has increased since 2007. The source of the increase in DLD has been banks' foreign liabilities and the increase in debt by non-financial corporations, rather than an increase in foreign currency deposits. Banks' foreign liabilities rose from 3.2% of GDP in 2007 to 4.8% of GDP in 2012 (see Table F.2); on the other hand, deposits in dollars have remained broadly stable.

**TABLE F1 DOMESTIC LIABILITY DOLLARIZATION (DLD) NET OF INTERNATIONAL RESERVES (% GDP)**

	1997										2007										2012									
	DLD (% GDP)					International Debt					International Debt					International Debt					International Debt					International Debt				
	A	B	C	D=A-B	E=D+C	A	B	C	D=A-B	E=D+C	A	B	C	D=A-B	E=D+C	A	B	C	D=A-B	E=D+C	A	B	C	D=A-B	E=D+C	A	B	C	D=A-B	E=D+C
Argentina	18.1%	7.6%	3.1%	10.5%	13.5%	4.8%	17.2%	1.6%	-12.4%	-10.8%	3.0%	9.0%	0.8%	-6.0%	-5.2%															
Brazil	7.0%	6.0%	1.6%	1.0%	2.6%	6.2%	11.9%	1.1%	-5.7%	-4.7%	8.8%	17.2%	2.0%	-8.4%	-6.4%															
Chile	7.1%	21.7%	2.9%	-14.7%	-11.8%	10.1%	9.2%	3.7%	0.9%	4.6%	13.0%	15.3%	6.3%	-2.2%	4.0%															
Colombia	7.1%	10.4%	0.5%	-3.4%	-2.8%	1.9%	9.6%	0.5%	-7.7%	-7.2%	5.4%	9.7%	1.5%	-4.3%	-2.8%															
Mexico	13.0%	7.3%	3.7%	5.7%	9.4%	3.5%	8.3%	2.0%	-4.8%	-2.8%	4.9%	13.5%	6.4%	-8.5%	-2.1%															
Peru	23.5%	19.1%	0.1%	4.5%	4.6%	19.0%	24.0%	0.0%	-4.9%	-4.9%	20.0%	30.2%	1.6%	-10.2%	-8.6%															
Venezuela	0.3%	17.3%	1.4%	-17.0%	-15.6%	0.4%	10.5%	3.3%	-10.1%	-6.9%	0.1%	2.6%	5.6%	-2.5%	3.2%															
Average-LAC7	10.9%	12.8%	1.9%	-1.9%	0.0%	6.6%	13.0%	1.7%	-6.4%	-4.7%	7.9%	13.9%	3.5%	-6.0%	-2.6%															
Average-LAC5	11.5%	12.9%	1.8%	-1.4%	0.4%	8.1%	12.6%	1.4%	-4.5%	-3.0%	10.4%	17.2%	3.6%	-6.7%	-3.2%															

Source: DLD and reserves data are from Calvo, Izquierdo, and Loo-Kung (2013). International Debt Securities data is from BIS.  
 LAC 7: Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. LAC 5 excludes Argentina and Venezuela.  
 DLD: Domestic Liability Dollarization. DLD Net 1 is DLD minus Reserves. DLD Net 2 is DLD Net 1 plus International Debt Securities.

**TABLE F2 INCREASE IN DLD SINCE 2007 WAS DRIVEN BY BANKS' FOREIGN LIABILITIES**

Country	1997				2007				2012			
	Deposits in Dollars (% GDP)	Foreign Liabilities (% GDP)	DLD (% of GDP)	Deposits in Dollars (% GDP)	Foreign Liabilities (% GDP)	DLD (% of GDP)	Deposits in Dollars (% GDP)	Foreign Liabilities (% GDP)	Deposits in Dollars (% GDP)	Foreign Liabilities (% GDP)	DLD (% of GDP)	DLD (% of GDP)
Argentina	10.9%	7.2%	18.1%	2.4%	2.4%	4.8%	2.4%	0.7%	2.4%	0.7%	3.0%	
Brazil	0.0%	7.0%	7.0%	0.0%	6.2%	6.2%	0.0%	8.8%	0.0%	8.8%	8.8%	
Chile	2.0%	5.1%	7.1%	4.8%	5.3%	10.1%	5.7%	7.3%	5.7%	7.3%	13.0%	
Colombia	3.5%	3.5%	7.1%	0.0%	1.9%	1.9%	0.0%	5.4%	0.0%	5.4%	5.4%	
Mexico	2.4%	10.6%	13.0%	2.2%	2.3%	3.5%	2.5%	3.9%	2.5%	3.9%	4.9%	
Peru	17.5%	6.0%	23.5%	14.9%	4.1%	19.0%	12.7%	7.3%	12.7%	7.3%	20.0%	
Venezuela	0.0%	0.3%	0.3%	0.1%	0.3%	0.4%	0.0%	0.1%	0.0%	0.1%	0.1%	
Average-LAC7	5.2%	5.7%	10.9%	3.5%	3.2%	6.6%	3.8%	4.8%	3.8%	4.8%	7.9%	
Average-LAC5	4.2%	5.4%	9.6%	3.7%	3.3%	6.8%	3.5%	5.4%	3.5%	5.4%	8.7%	

Source: Calvo, Izquierdo, and Loo-Kung (2013).

LAC 7: Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. LAC 5 excludes Argentina and Venezuela.

DLD: Domestic Liability Dollarization.

## APPENDIX G

# Computing the Costs of Net and Gross Sudden Stops

Two different types of estimates of the costs of Sudden Stops have been computed in the literature. The definition of “disruption” in output in Cavallo, Powell, Pedemonte and Tavella (2013) is different from the estimates of output costs discussed elsewhere in the chapter (as in Calvo, Izquierdo and Loo-Kung 2013).<sup>1</sup> For comparability, estimated costs are recalculated as in Calvo, Izquierdo, and Loo-Kung (2013) for episodes in the countries in the Cavallo et al. (2013) sample.<sup>2</sup> The results are reported in Table G.1. On average, a net flow Sudden Stop is the most costly (i.e., the estimated cost is 13.5% of potential GDP in the sample of Emerging Markets, and 12.3% in the sample of Latin American and Caribbean countries only). The average estimated output cost of a Sudden Stop in Gross Inflows that is not a Sudden Stop in net flows (SSI) is 4% of potential GDP in the sample of all emerging markets, and approximately 1% of potential GDP in Latin America and the Caribbean. The estimated costs of Sudden Stops in Gross Outflows that are not net flows Sudden Stops (SSO) are 2.8% and 2.6% of potential GDP, respectively.

**TABLE G1** ESTIMATED COSTS OF SUDDEN STOPS

	2 Standard Deviation Sudden Stop		
	Net Flows	Gross Capital Inflows	Gross Capital Outflows
Emerging Markets	-12.94%	-3.73%	-2.78%
LAC 6	-12.27%	-0.83%	-2.61%

Source: Own calculations based on data from IMF: International Financial Statistics.

LAC 6: Argentina, Brazil, Chile, Colombia, Mexico, Peru. We don't compute the results for Venezuela because of the lack of quarterly GDP data. Net Flows is the sum of the gross capital Inflows and Outflows.

<sup>1</sup> Cavallo, Powell, Pedemonte and Tavella (2013) use an event study approach whereby the disruptiveness of the sudden stop is defined as the difference between the pre- and post-crisis real GDP trends. In other words, they compute trend GDP before and after the crisis. The gap between the two trend lines is their measure of the (average) disruption in GDP.

<sup>2</sup> Output costs are defined as the present discounted sum of any contiguous negative output gaps in the neighborhood of a sudden stop measured as the percentage difference between observed GDP and its corresponding HP trend.

