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THE WORLD *of* FORKING PATHS

Latin America and the Caribbean Facing Global Economic Risks

Coordinated by
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2012 Latin American and Caribbean Macroeconomic Report

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OF FORKING PATHS

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Acknowledgments

Foreword

"Reality is not always probable, or likely."
—Jorge Luis Borges

The Garden of Forking Paths was written by Borges in 1941. In a story within the main narrative, a Chinese historical figure is thought to have constructed an infinite labyrinth. Close to the end, it is revealed that the labyrinth was in fact a book he had written, that had many paths that forked once and then forked again and again, providing the reader with many alternative realities.

Borges' story is relevant today because the global economy is indeed characterized by many forking paths. As we have all learned since the 2008/09 financial crisis, events can change quickly and turn in unpredictable directions; scenarios hardly on anybody's mind a few years ago are now discussed on a routine basis. Perhaps other scenarios not discussed today will end up being realized.

To capture how alternative paths for the main participants in the world economy impact Latin America and the Caribbean, this report describes the maze of connections between the Region and the rest of the world, and provides an analysis of the most relevant topics within this labyrinth of connections. Our aim is to consider how Latin America and the Caribbean may fare under different paths taken by the world economy. On the whole, we are optimistic about the Region's prospects. And while we hope for the best, the Region should plan for the worst. In the pages that follow, the Region's resilience and potential reaction to possible shocks is assessed; on this basis, recommendations are proposed.

The views expressed in this report are those of the authors and do not necessarily reflect those of the Inter-American Development Bank, its Board of Governors or its Board of Directors.

Santiago Levy
Vice-President for Sectors and Knowledge
Inter-American Development Bank

CHAPTER 1

Executive Summary

The recent economic performance of Latin America and the Caribbean is cause for optimism. Growth has averaged 5.4% over the last two years, contributing some 14% of total global growth each year and helping the world to escape the Great Recession. Moreover, the Region survived that experience relatively unscathed, with all the larger economies avoiding a financial crisis. However, as noted in the previous Latin American and Caribbean Macroeconomic Report, *One Region, Two Speeds*, challenges remain. The Region's recovery was characterized by strong growth among commodity exporters in the South, but slower growth in many countries of Central America and the Caribbean.

The pattern of global demand and associated risks has once again changed. Uncertainty is high and the risk of another crisis, this time emanating from Europe, has risen. China, seen as critical for the commodity prices so important for many countries in the Region, is also slowing, and there are risks as to how deep that deceleration will be. While risks appear to be weighted towards the downside for Europe and China, they appear more balanced for the United States. Given recent figures there is some upside risk but with considerable uncertainty, particularly regarding fiscal policy.

The outlook thus implies divergent scenarios; it is indeed a world of forking paths. If Europe avoids a crisis, China's growth slows only mildly, and there are no significant unanticipated developments in the United States; forecasts for the Region are optimistic, with 2012 growth expected to be 3.6%. Interestingly, Brazil and Mexico should both grow at close to the regional average, although there remains heterogeneity across other countries in the Region. But if Europe's troubles deepen and Chinese growth slows more rapidly than expected, the United States may then be dragged into a new recession, and the Region will be affected. Scenarios developed in Chapter 2 illustrate that a shock of comparable magnitude to Lehman but originating in Europe, plus an autonomous negative shock to growth in China, would provoke a relatively mild recession for Latin America and the Caribbean. Moreover, in contrast to the previous crisis, the effects would be relatively homogeneous; the Region would slow at one speed. South America would be affected the most, but starting from a stronger position, while Mexico and Central America would be affected less, but starting from weaker initial conditions. However, the recession in the US post-Lehman was less persistent

than the average. If Europe suffers a recession through 2012 and a crisis in 2013, the effects on Latin America and the Caribbean would be both deeper and more persistent, and they would have more serious impacts on fiscal positions and on banking sectors.

The analysis in the next chapter raises a set of important issues that are considered in subsequent chapters. A first relates to commodity prices. The detailed consideration of scenarios for China's growth in Chapter 3 reveals differences among commodities. If China's growth falters, prices for metals such as copper, particularly important for Chile and Peru, may fall by more than a commodity aggregate, while grains prices, important for Argentina and Brazil, would fall by less. That said, the analysis also details great uncertainty regarding future commodity prices and hence the need for Latin American producers to manage their increased commodity dependency very carefully indeed.

A second issue is raised by strong capital inflows into Latin America and the Caribbean both before the Great Recession and in the years afterward. While those flows have now abated, experience indicates that about 50% of inflow surges in emerging economies end in either a banking crisis or a recession. Moreover, the recent inflow episode displayed potentially dangerous characteristics such as a relatively high proportion of portfolio and banking flows. The statistical analysis in Chapter 4 suggests a significant probability of those flows provoking a banking crisis. That said, it should be noted that the Region has improved banking supervision and implemented a set of macro prudential measures to reduce the likelihood of a crisis. The analysis indicates both the need to consolidate such measures and the continued vigilance required to ensure macroeconomic and financial stability in the face of high levels of capital inflows.

A third issue relates to fiscal policy. One reason the Region survived the global economic crisis relatively well was that, in contrast to previous crisis episodes, countries were able to implement effective countercyclical fiscal policy. Chapter 5 provides a review of the size of the fiscal stimulus and detail regarding the measures adopted. A truly countercyclical policy requires that those measures be withdrawn once the downturn has passed. While the Region did indeed reduce or eliminate some stimulus measures, others appeared to become more permanent. As a result, the structural fiscal deficits of the typical country in the Region are now higher than they were before the global economic crisis and countries may have sacrificed a degree of fiscal credibility. In several countries, fiscal space to respond to any new downturn is such that countries should only consider stimulus measures that can be easily reversed and are truly temporary in nature.

Monetary policy has also been an active area of policy action and debate. Countries in the Region have very different regimes, including three fully dollarized economies, three with fixed exchange rates, nine inflation targeters or countries transitioning to that regime, and nine with intermediate regimes. Across these different arrangements, the countries analyzed in Chapter 6 have exhibited stable money growth and limited

inflation despite serious shocks. Still, intermediate regimes had some of the highest pass-through from international commodities to domestic prices, while some fixed rate countries experienced sharp falls in growth but rebounded quickly. Inflation targeters allowed their nominal exchange rates to depreciate during the crisis but then experienced significant real appreciations. Interestingly, there was a tendency to increase policy interest rates at the onset of the crisis, given continued high commodity prices, and use direct monetary policy tools such as lowering liquidity requirements on banks to inject liquidity into financial systems. In this instance, direct tools and the interest rate were used as **substitutes**. However, as the crisis progressed, both direct tools and interest rates were used as **complements** to loosen monetary policy further. Subsequently, as the crisis passed and capital inflows resumed, both types of policy tools were again used as complements to implement tighter monetary policy. Inflation targeters may wish to consider new methods of communicating objectives and of using instruments in different ways in order to ensure full comprehension and hence appropriate reactions by the private sector.

One feature of monetary policy in several countries has been the build-up of international reserves. Nonetheless, considering Latin America and the Caribbean's balance sheet as a whole, while reserves increased, gross external liabilities fell prior to the Lehman crisis, further enhancing resilience, particularly among a group of commodity exporters that significantly reduced net liabilities. After the Great Recession, the Region as a whole resumed a process of financial integration with rising assets and liabilities. While foreign direct investment continued to increase as a share of liabilities for commodity importers, this was not the case for commodity exporters, for whom the share of potentially more dangerous portfolio liabilities has risen as a counterpart of higher portfolio inflows. At the same time, there has been a reduction in public sector liabilities, a corresponding fall in the share of external public debt, and an increase in local currency debt in total debt. The structure of private sector balance sheets suggests a rise in vulnerability since the Lehman crisis but coupled with an increase in the resilience of the public sector.

One of Latin America and the Caribbean's potential vulnerabilities is the major role that has been granted to foreign and particularly European banks in the Region. A detailed analysis of the links between Latin America and the Caribbean and the global banking network in Chapter 8 reveals direct links to European periphery banks, particularly Spanish banks, but also indirect exposures through links to banks in countries that are themselves exposed to Europe's periphery. In some cases these indirect exposures may be more important than the direct ones. The fact that European banks in Latin America are generally funded locally provides some measure of comfort. Nonetheless, European banks are deleveraging, and capital is considered by home supervisors on a consolidated basis, suggesting that adjustments in capital levels may yet imply lending

restrictions. Deleveraging has also provoked European banks to go from net purchasers of Latin American assets (including equity stakes and entire financial institutions) to net sellers. If there are unlimited funds to purchase these assets, or assets are sold in ways that do not affect lender-borrower relationships, then this may have limited impact on the Region. However, if relationships are severed or funds are limited, then there may be significant effects, particularly if the European crisis worsens.

Latin America and the Caribbean has made substantial economic progress both in terms of growth and in the ability to respond to external shocks. Chapter 9 reviews the Region's strengths and vulnerabilities in the current global context. There is evidence that many of the Region's economies have a greater proportion of public sector debt issued locally in local currency, have been able to use effective countercyclical fiscal policy, have greater possibilities of employing the exchange rate as a shock absorber while maintaining stable prices, and have deployed several macro-prudential tools. Vulnerabilities nonetheless remain, particularly due to commodity dependence, the significant capital inflow and credit boom, countries' relatively weaker fiscal position and the major role of European banks. While the world is one of forking paths and it is impossible to know which alternative will become reality, the Region has good reason to be optimistic thanks to the new set of tools it has developed and the experience it has gained deploying them effectively.

In the Face of Global Economic Risks

The global economy has entered a new phase. The European sovereign debt and banking crisis is not fully resolved and the strong growth in China that has supported high commodity prices is abating. Risks appear weighted to the downside in both cases. Risks regarding the US recovery, while significant, appear more balanced. In this chapter, a baseline is considered that is consistent with recent consensus and IMF World Economic Outlook projections. However, given the large risks, forecasts are subject to potentially large errors. The chapter uses a modeling exercise to analyze how countries in Latin America and the Caribbean might be affected by a set of negative shocks. The result is compared to what happened during the 2008–9 crisis; interesting differences are found. Questions that emerge from the analysis are addressed in subsequent chapters of this report.

The Region grows at 3.6% in 2012 in an optimistic scenario

Preliminary figures for 2011 suggest a respectable global growth rate of some 3.8%. However, growth hit 5.2% in 2010 and projections for 2012 and 2013 indicate expectations are declining (see Figure 2.1). Still, recent forecasts for global growth from the major agencies remain relatively benign. Most suggest that while Europe enters a relatively brief recession, the US economy continues to recover, China slows smoothly and Japanese growth rebounds. The baseline for this report reflects these recent forecasts: for 2012, the US is projected to grow 1.8%, the Eurozone suffers a relatively mild recession with

FIGURE ● 2.1

Declining Growth Forecasts for 2012

Legend: Apr-11, Sep-11, Jan-12

Categories: Eurozone, US, China, Japan, Brazil, Mexico

x-axis: GDP constant prices, percent change (−2, 0, 2, 4, 6, 8, 10, 12)
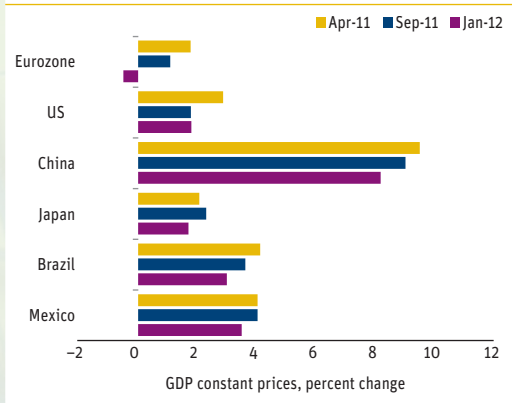
Source: World Economic Outlook, IMF (2012).

growth at −0.5% and China grows 8.5%. Latin America as a whole grows 3.6%, with Brazil and Mexico relatively close to this regional average.

But the risks are grave

Economic projections come with serious health warnings attached; they are subject to large forecast errors. This report focuses not only on an uncertain central scenario, but also on the risks, and how those risks may impact Latin America and the Caribbean. In particular, European growth is being dragged down by the European periphery, and the discussion revolves now on the possible depth and length of a Eurozone recession, not whether it will happen. Doubts regarding the solvency of some sovereigns have put banks with exposures to those nations under pressure, and weak bank solvency ratios complicate the position of some sovereigns. Greek banks have invested around 100% of their equity in Greek government debt, and Italian and Spanish banks have invested about 60% of their equity in their respective sovereign paper.[1] In the case of Spain, over 40% of total government debt is held by domestic banks.[2] The center of the Eurozone is not immune either. German banks have more than 30% of their capital exposed to Italian public and private sector assets and 33% exposed to Spain. French banks have 100% of their capital invested in Italian public and private debt and some 38% is exposed to Spain.[3]

The persistence of the European recession will hinge on the manner and speed with which the sovereign debt-banking problems are fully resolved. Latin America has considerable experience with these types of problems, and they are extremely challenging. The usual advice is to take decisive action to put both sovereigns and banks on a clearly sustainable course to minimize the overall costs. Once private actors see a path towards a sustainable solution they become a part of that solution, rather than a part of the problem. Such actions frequently imply politically difficult redistributions and substantial risks. But delays in action normally result in counterproductive responses by the private sector which may then substantially increase the eventual resolution costs. Frequently, the punishment in terms of growth forgone then appears to be far in excess of the (economic) problems, such as risks to sovereign debt or to current account sustainability.

A crisis in the Eurozone could be transmitted to Latin America and the Caribbean via various potential transmission channels: some 13% of the Region's exports go to

[1] Equity is an accounting concept that varies somewhat across countries (see Davies and Ng, 2011).
[2] See Bolton and Jeanne (2011).
[3] Cross-border holdings come from the BIS consolidated banking statistics and capital comes from the IMF's financial soundness indicators (see also Bolton and Jeanne, 2011 on European bank cross-border debt holdings).

the Eurozone and some countries in the Region receive a significant share of FDI and remittances from Europe (see the table in Appendix A for detailed statistics). Moreover, there are concerns that a European credit crunch will have global impacts, and that any unanticipated credit event (of a sovereign or financial institution) would provoke strong reactions among banks and in financial markets.

A second risk to global economic prospects is growth in the Chinese economy. For many years, rapid credit growth has fueled China's high investment rate, which will surely decline over the medium term; the question is whether this will be with growth falling mildly or a swifter deceleration. Given China's increased importance in global trade, a faster deceleration in China would affect world growth, thereby impacting Latin America and the Caribbean. Moreover, given the high commodity intensity of the economy, Chinese growth is important for maintaining relatively high commodity prices.

Risks to US growth appear more balanced. The US remains particularly important for Mexico, Central America and the Caribbean. On the negative side, housing remains depressed, consumer confidence is low and considerable uncertainty reigns. While current legislation calls for the harsh sequestration of fiscal spending, cuts are not due to start until January 2013, and the country is entering an election period. Depending on political outcomes, a new fiscal policy may emerge but there is significant uncertainty. On the other hand, there has been relatively good news of late on corporate performance.

In what follows, a modeling exercise is employed to consider two negative scenarios for world growth. The model is a Global Vector Auto Regression, which is detailed in Appendix B.[4]

A first negative scenario provokes a mild recession for the Region

A negative scenario involves a deepening of the Eurozone crisis and a slowdown in China's rate of growth. It further assumes a negative shock to global financial markets.[5] Specifically, this first negative scenario assumes that Eurozone GDP falls a little less than the US economy fell on impact during the Lehman crisis—some 2% below baseline.[6] The model tracks real variables accurately but does not capture extreme movements in financial markets. A 2% fall in European GDP generates roughly a 20% fall in equities. But US equities fell some 40% after the Lehman crisis.[7] This first negative scenario then assumes an additional 20% decline in European equity prices

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[4] The analysis is based on Cesa-Bianchi, Pesaran, Rebucci, and Xu (2012).
[5] This could be the result of a sovereign or financial institution credit event or a nation leaving the common currency.
[6] US GDP fell by 2.4% in the fourth quarter of 2008.
[7] The equity market fell on average by 40% per quarter in the two quarters after Lehman.

such that the fall in European equities mirrors that of US stock prices post-Lehman. Moreover, given the high degree of integration between US and European markets, an autonomous shock of some 15% is applied to US equities. This means US equity prices decrease a total of about 30%.[8] Finally, this first scenario also factors in a 1% autonomous negative shock to Chinese GDP.[9] Given the balance of risks in the US, the modeling exercise assumes no autonomous negative shock; US growth is only affected as an outcome of the model.[10]

The outcome is that in this first scenario global growth falls sharply in 2012, although somewhat less than in 2008–09 (see Figure 2.2). The Eurozone suffers a recession more severe than that of 2009, as the baseline already has Europe in a mild recession and then the shock is greater. In fact, Europe's GDP declines 5.8% relative to the baseline, somewhat more than the contraction in the US economy in the two quarters following the Lehman crisis.[11] The US slips back into recession despite the absence of an autonomous shock to US GDP. However, the US suffers less than after the Lehman shock, when the US was the epicenter of the crisis. China's growth in 2012 falls by roughly three percentage points: a 1% autonomous shock plus a 2% percent endogenous response. These estimates underscore the growing interaction between China and the rest of the world, as the Chinese economy has become more globally integrated. However, a caveat is that if the Chinese Government implements extraordinary fiscal or other measures, then it may be able to keep an endogenous negative reaction below 2%.[12] The impact on global, and in particular Chinese, growth has a significant impact on commodity prices, which fall some 30% below the baseline.

The sharp deterioration in the global outlook including recession in Europe and the US as well as a marked slowdown in China, has a strong impact on the typical Latin American and Caribbean economy. However, despite the fierce shocks to European GDP and equity markets, the overall impact is somewhat less than the after-effects of the Lehman crisis and the Region's economy dips –0.6% in 2012; although, in contrast to the 2008–9, the shock is more persistent, reflecting that the US recovery after Lehman has been faster than that following the average downturn.

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[8] The idea is to model shock to integrated global markets. An alternative is to consider the effect on the US as simply contagion from Europe.

[9] This is about one standard deviation in Chinese growth.

[10] Although the results are presented according to this calibration, if the reader believes an event of one half or of double the size of the assumed cocktail of shocks is warranted, then as the model is linear the reader may simply re-dimension the shocks accordingly.

[11] The fall in the US economy in the two quarters post-Lehman was some 5.2%.

[12] However, as the model includes the significant fiscal stimulus in 2009, these would have to be measures that went beyond that response (see Cova, Pisani, and Rebucci, 2011, for an account of the response in China to the 2008/2009 shock).

FIGURE ● 2.2

Simulations for the World and Latin America and the Caribbean

Growth, GDP, percent change
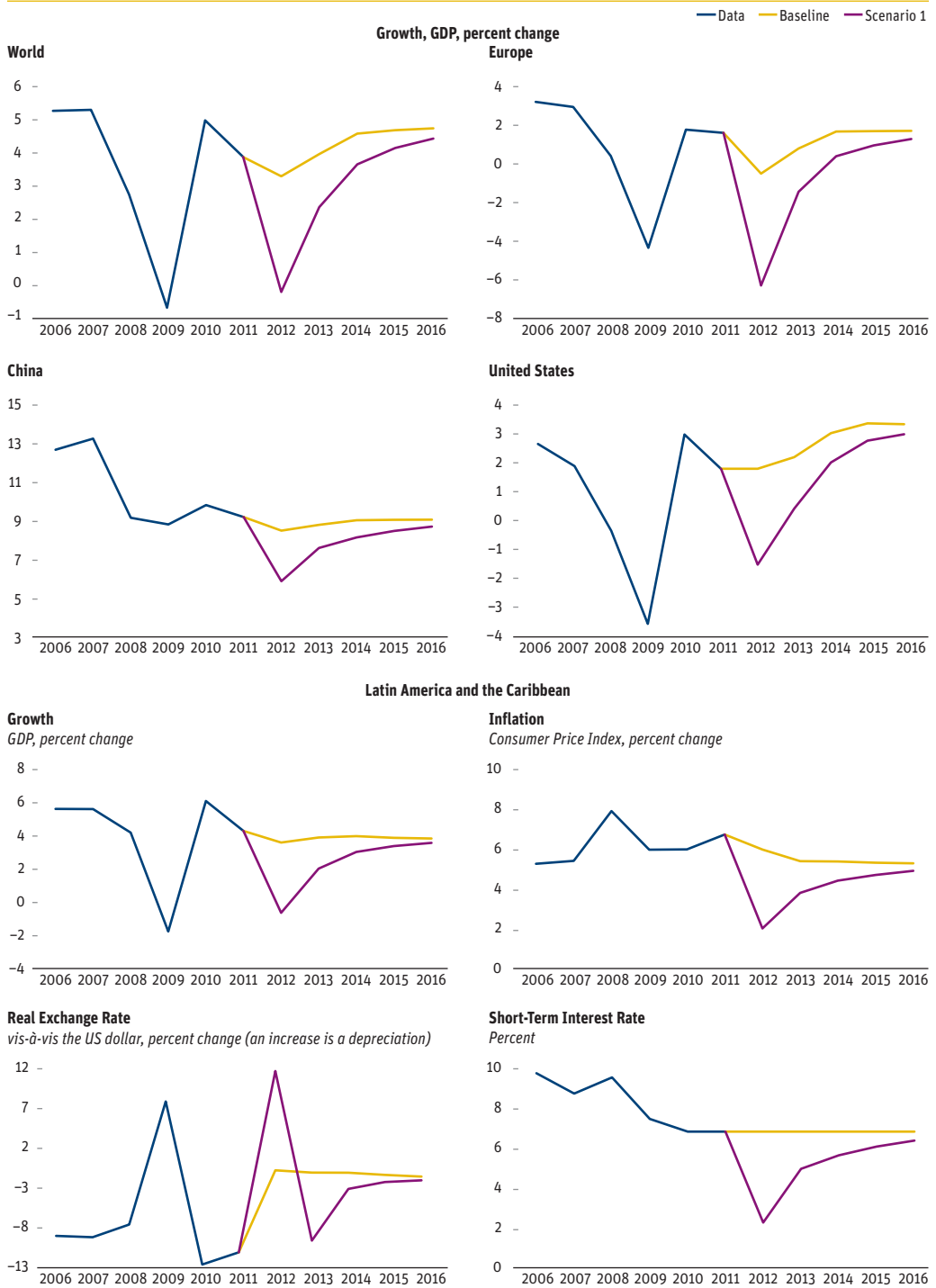
Source: IMF (2012), Consensus Forecast and authors' calculations.

Impact of the First Scenario on Country Groups

	2012			2009
	Baseline	Shock	Scenario 1	
Growth in:	Simple average across countries (percent)			
Countries more exposed to the United States*	3.17	–3.62	–0.45	–2.26
Countries more exposed to the Eurozone**	4.22	–3.36	0.86	0.23
Countries more exposed to China***	4.36	–3.70	0.66	0.19

Source: IMF (2012) and authors' calculations.
* Bahamas, Barbados, Costa Rica, Mexico, El Salvador, DR, Nicaragua and Guatemala.
** Haiti, Suriname, Chile, Belize, Jamaica, TT, Peru, Bolivia.
*** Venezuela, Argentina, Honduras, Paraguay, Uruguay, Colombia, Brazil, Ecuador, Guyana, Panama.

Also in contrast to the 2009 shock, the overall effect varies little across countries (see Table 2.1). The model captures the many and varied links between Latin America and the Caribbean and the rest of the world. These links are the potential transmission channels of external shocks to the Region. They include trade, remittances and finance. Given the sources of the shocks in the simulations presented, the exposures through these different channels are fairly well diversified across the region (see also the table in Appendix A for further details regarding these different channels).

Mexico, Central America and the Caribbean start from a weaker baseline position (as they were harder hit in the 2009 shock and the recovery in the US has been weak), but as the US recession is milder in this scenario compared to 2009, they suffer somewhat less. On the other hand, South America starts from a better position this time around thanks to the composition of global demand and high commodity prices in recent years. But given the sharp slowdown in China, and the fall in commodity prices, they suffer somewhat more. The diverse transmission mechanisms coupled with the variation between the initial conditions in Mexico/Central America/Caribbean and South America explain the relative homogeneity of the impact in the Region.

A delayed crisis provokes more persistent effects

The preceding scenario is based on a set of shocks that last only one period.[13] However, an alternative scenario for Europe might be a recession somewhat worse than the baseline through 2012, and then a crisis in 2013. Thus, a second scenario assumes that 50% of the first shock materializes in 2012 and then the same shock hits in 2013.

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[13] The effects of these shocks, however, are longer as they reflect the average persistence of shocks in the data.

FIGURE ● 2.3

Growth in the World and Latin America and the Caribbean

—— Data —— Baseline —— Scenario 1 —— Scenario 2

World Annual Growth

Latin America and the Caribbean Annual Growth
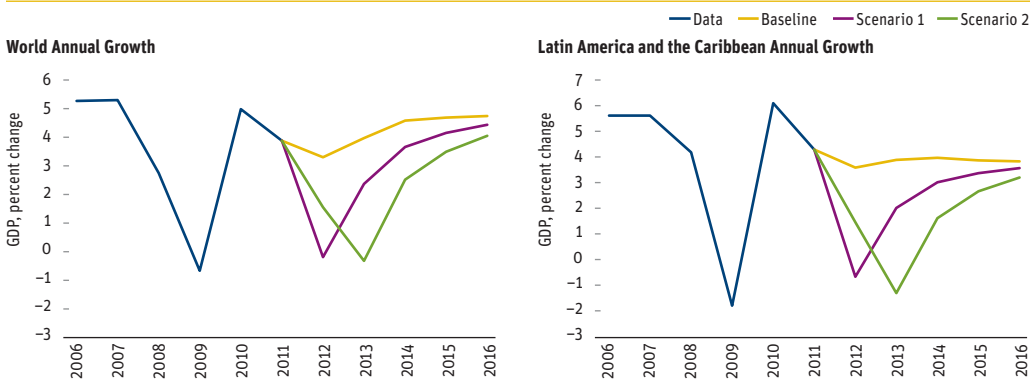
Source: IMF (2012), Consensus Forecasts and authors' calculations.

Consequently, the total size of the shock in this scenario is 150% of that in the first scenario, but it is distributed over two years.

In this case, the cumulative output loss for the major economic groups (US, Eurozone and China) is significantly worse and the deepest part of the recession hits in 2013 (see Figure 2.3). In Latin America and the Caribbean, growth slows through 2012, GDP drops over 1% in 2013, and the economy recovers slowly thereafter. The cumulative output loss in this scenario for the region as a whole would be some 12% of GDP as compared to 8% of GDP in the first negative scenario, relative to the baseline through 2016. Given the persistence of the recession, there would surely be greater pressure on employment, fiscal accounts and banking sectors.

The analysis raises a number of questions that deserve deeper study

This modeling analysis for global and Latin American and Caribbean growth raises several issues. First, commodity prices are represented by a single variable in the model and hence the full complexity of commodity price behavior may not be captured. Price processes for commodities and a more specific scenario analysis for China and the potential impact on copper and grain prices are reviewed in the following chapter. Second, in the period before and immediately after the Lehman crisis, Latin America received sizeable capital inflows that helped spur fast economic growth. But countries that have enjoyed large capital inflows and associated fast credit growth may face domestic economic problems of their own. Chapter 4 considers when such capital inflow booms tend to end in banking crises or recessions and the relevant risks in Latin America and the Caribbean today. Third, the above assumes that Latin America will respond to this shock, in terms of policy, as it did to previous shocks. However, a relevant question is

whether Latin American and Caribbean nations have the same fiscal and monetary space now as they had before the Lehman crisis. The issue of fiscal space is explored in Chapter 5 while the diverse monetary policy and exchange rate regimes across the Region and how they may react to such shocks is explored in Chapter 6. On the other hand, how vulnerable Latin America is to such external financial shocks also depends on the balance sheet of countries in the Region. In Chapter 7, the financial resilience of the Region is analyzed through countries' balance sheets. Finally, a deeper European crisis may have added impacts as European banks are particularly important for Latin American financial systems. Chapter 8 explores these links and presents a discussion of the relevant vulnerabilities.

On Commodities and China

Commodities have become particularly important (once again) for Latin America and the Caribbean; for eight countries, commodities represent more than 50% of exports, and for several countries growth cycles and commodity price cycles appear to be intimately intertwined.[1] Forecasting commodity prices is a difficult and risky prospect. Prices are volatile and shocks are persistent. Taking the long view, commodity prices have declined against manufactured goods prices, but this decline is punctuated by booms that may persist for several years followed by crashes. Appendix C provides a brief review of commodity price behavior. Chapter 2's first negative scenario indicates that commodity prices would fall by some 30%. However, each commodity has its own particular features. Oil, copper, and grains are the important exports for the Region. Oil is a special case and is particularly hard to forecast as geopolitics frequently affects prices.[2] This chapter focuses on copper and grains. Scenarios for the Chinese economy are presented and the implications for prices are detailed.

Copper prices are dependent not only on Chinese growth but also on investment

A small global macroeconomic model is estimated together with a model for the global copper market. The macroeconomic model incorporates industrialized economy growth and Chinese growth and investment, which are then used to feed a model for copper.[3]

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[1] See Gelb (1988) on the pros and cons of commodity dependency. See Collier and Venables (2011) for a recent account and case studies of how commodity revenues have been managed (the case of Chile is considered a good example). See Van der Ploeg and Venables (2011) for a more theoretical account of the problem of a developing country commodity producer in terms of investment, savings and consumption decisions. In standard growth regressions, terms of trade effects may be as important as educational attainment and political stability (see Barro and Sali-i-Martin (1995).

[2] See Kilian (2009) on disentangling shocks to oil prices. Note that geopolitical fears may be akin to a peso problem for commodities; for example, an increase in the perceived probability of the Strait of Hormuz being cut off (this narrow waterway in the Middle East carries some 35% of all seaborne oil, or roughly 20% of total oil traded worldwide; almost 17 million barrels per day) would drive up spot prices with significant real effects, even if it never actually occurs. See http://www.eia.gov/countries/regions-topics.cfm?fips=WOTC for data on oil transit choke points.

[3] The copper market model comprises five equations: Chinese refined consumption, non-Chinese refined consumption, global refined production, the stock to consumption ratio and the real dollar copper price.

Simulated Real Copper Price
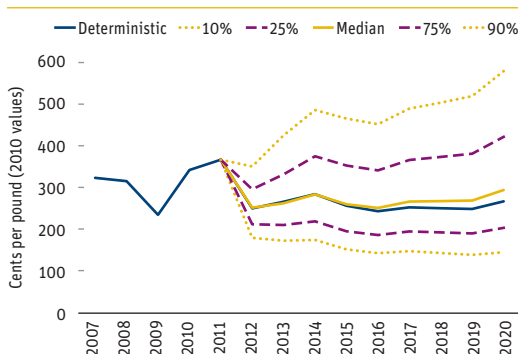
Source: Authors' calculations (2012).

A forecast is produced by simulating the model forward[4] (see Figure 3.1). However, given the high volatility of prices, confidence bands are wide. By way of example, there is a 50% possibility that prices are either less than 25% below the median forecast or 35% above the median forecast as of 2015.[5] In other words, projections for copper should be considered as indicative and subject to substantial forecast errors.

Still, different scenarios for the Chinese economy can be explored by varying Chinese growth rates and the proportion of Chinese GDP devoted to investment. The baseline scenario is consistent with the one employed in Chapter 2. It foresees Chinese growth of 8.5% in 2012 that then rises slowly to 9.1% in 2015 and remains constant thereafter. However, copper prices are also dependent on the share of investment in Chinese GDP. Two alternatives are considered: either the investment rate falls to some 31.3% of GDP in 2020, or the ratio declines marginally from 46% to 41% of GDP in the same period. Two further scenarios are also modeled and are consistent with the two negative scenarios presented in Chapter 2.

The resulting price paths are illustrated in Table 3.1. Under the baseline macroeconomic scenario but with a more strongly declining rate of Chinese investment, prices fall from their 2011 peak of $3.99/lb to $2.65/lb (in 2011 values) by 2016, down 34% from 2011. The first negative scenario envisions copper prices falling steeply throughout 2012 to just US$2.06/lb in 2013, or some 48% below 2011 values. Prices do not recover until 2015 and then only to US$2.25/lb. Under the second negative scenario, prices fall more slowly. If Chinese investment as a share of GDP slips only moderately to 41%, then price declines are diminished but remain significant; under the first negative scenario, they fall to US$2.84/lb and under the second scenario they drop to US$2.64/lb. The model, therefore, indicates the possibility of substantial downside risk for copper if Chinese growth falters and particularly if Chinese investment declines.

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[4] This forecast simply uses the past to predict the future with no additional assumptions regarding any of the explanatory factors.

[5] These reflect the 25% and 75% percentiles of the distribution of forecast errors. The median forecast is used rather than the deterministic one as the model is non-linear. However, since the error bands are wide, this difference is of little importance in this case.

TABLE ● 3.1

Copper Prices under Three Scenarios

Investment Rate	Baseline		Scenario 1		Scenario 2	
	Low	High	Low	High	Low	High
2012	299	326	271	295	247	268
2013	276	320	206	236	231	267
2014	281	319	214	238	231	257
2015	263	290	202	217	230	248
2016	265	284	225	236	250	264

Source: Author's calculations.
Note: The table reports the deterministic forecasts of the LME copper price under the three scenarios, times two variants, under consideration. Prices are in c/lb. at 2011 values.

Grain prices are less sensitive to scenarios in China

Prices within the grain complex tend to be highly correlated.[6] If a shock hits one product, say a higher demand for corn due to biofuels or greater demand from China for soya, then production of that commodity will tend to increase while the supply of others declines. Consequently, to consider the impact on Latin American producers it makes sense to analyze aggregate grain prices. Again, a global macroeconomic model is coupled with a model for the grains market.[7] Grain consumption depends on prices and the level of GDP, which is disaggregated between China and the rest of the world in order to allow for the analysis of Chinese-oriented scenarios. The real grains' price depends on the stock-consumption ratio and on supply shocks.[8] The crude oil (WTI) price also enters the non-Chinese grains consumption equation, as the attractiveness of the use of grains for biofuels depends on the price of crude.

While the model considers aggregate grain prices, subsidiary analyses then relate this aggregate to the price of specific products: namely corn, wheat and soybeans. The results from similar scenarios to those reported above show that Chinese growth has a significant impact on grain prices. However, a slowdown in China affects grains less than it does copper. Under the baseline, prices fall some 12%, 19% and 15% for wheat, corn and soybeans respectively from their 2011–12 crop-year projections to the 2015–16

[6] The grain complex here refers to corn, wheat and soybeans. As an example of high correlations, over the crop years 1960–61 to 2010–11, the correlation between deflated wheat and corn prices is 0.952 in levels and 0.833 in first differences.

[7] The model for grains follows that of Deaton and Laroque (1995); see the review of commodity price behavior in Appendix C for details of this approach.

[8] The evolution of the stock-consumption ratio, which in principle should be an identity, is substituted by an empirical approximation.

Simulated Grains Prices under Three Scenarios

	Wheat			Corn			Soybeans		
	Baseline	Scenario 1	Scenario 2	Baseline	Scenario 1	Scenario 2	Baseline	Scenario 1	Scenario 2
2011–12	263	260	262	212	210	211	425	421	423
2012–13	253	250	248	198	195	194	402	397	396
2013–14	244	240	239	187	183	182	384	379	377
2014–15	238	232	231	179	173	172	371	363	361
2015–16	232	225	223	172	165	163	360	349	347

Source: Authors' calculations.
Note: The table reports the deterministic forecasts of wheat, corn and soybean prices under the three scenarios under consideration. All prices are in $/ton at 2011 values.

crop year (see Table 3.2). Under the first negative scenario, these declines deepen to 14%, 22% and 18% respectively, with only marginal changes under the second negative shock scenario.

A deceleration in China is likely to affect producers of metals more than producers of grains

In the first negative scenario of Chapter 2, commodity prices may fall around 30%, but more specific analyses of copper and grains reveal differences between commodity groups. In particular, if Chinese investment rates fall and growth rates slow, then the effect on copper prices may be more significant than the modelling exercise in Chapter 2 suggests; copper prices may plummet by some 48% from 2011 levels. On the other hand, grain prices respond more closely to Chinese growth. Simulations suggest grain prices would fall significantly less than 30% under the first negative scenario of Chapter 2. These results have strong implications for Latin American producers. Metals producers face a much more uncertain world than grains exporters given the risks in the Chinese economy. In general, countries in the Region should actively manage their commodity dependency. Given current relatively high prices, and global uncertainties, financial hedging strategies may be appropriate for both companies and governments reliant on commodities for revenues. Risks that are not hedged with third parties may be managed internally through stabilization funds and other instruments, and tax and royalty systems can be designed to ensure transparency and certainty despite potentially volatile prices.

The Capital Inflows Surge: All's Well that Ends Well?

A surge in capital inflows may fast-track growth and development but may also provoke risks. While inflows and growth have now abated in the Region, gross inflows exceeded 6.5% and net inflows exceeded 3.0% of GDP in 2010 (see Figure 4.1).[1] Has Latin America and the Caribbean, in part due to appropriate prudential actions, survived this experience unscathed? This chapter assesses the evidence as to whether the Region may declare victory over these risks.

FIGURE ● 4.1

Inflows and Outflows
% of GDP

— Gross Inflows — Net Flows
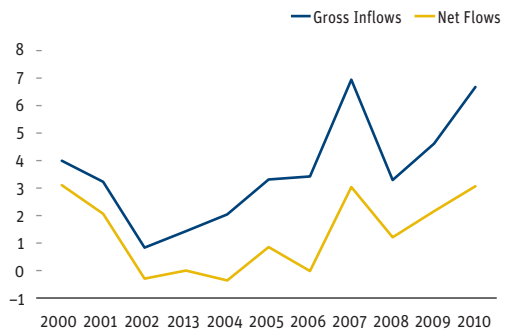
Source: IFS, IMF (2011).
Note: Data refer to the seven largest Latin American countries.

Warning: Capital inflow surges may damage economic health

A review of the theoretical and empirical work regarding the risks of capital inflow surges is presented in Appendix D. How such episodes end depends on the characteristics of both the recipient country and the nature of the capital inflows themselves. New evidence is presented here in order to understand why some episodes end with banking crises or recessions. The results are then applied to the recent capital inflow surge in Latin America in an attempt to assess the associated risks.[2]

In what follows, an inflow episode is defined as the total size of the inflow episode as a percentage of GDP over and above a trend. Using this measure, an inflow surge

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[1] Inflows refer to the flows of non-residents while outflows refer to the flows of residents; this distinction and relevant definitions are discussed further below.

[2] Please refer to Powell and Tavella (forthcoming) for further information on data and methodology.

Capital Inflow Episodes and Economic Outcomes

Source: Authors' calculations.

is defined as an episode that is greater than the median episode. Considering the period 1980 to 2005, there are some 94 capital inflow surges in emerging economies according to this measure, 28 of which ended in a banking crisis (30%), 38 of which ended in a recession (40%) and 18 of which ended in banking crisis and a recession. Therefore, the total number of inflow episodes that ended in a negative economic outcome (recession or banking crisis) was 48 (51%). The dataset also includes a set of recessions and banking crises that were not preceded by capital inflow episodes, as shown in Figure 4.2.

For these inflow episodes, the median surge lasts 1.5 years and averages some 6% of GDP per annum, and the median capital inflow episode results in "excess inflows" (across all the years of the episode and above the normal trend) of some 9.2% of GDP.[3]

The analysis considers when capital inflow surges may lead to either a systemic banking crisis or a recession. The explanatory variables considered are in line with the literature as discussed in Appendix D. They include the type of inflows (in particular portfolio inflows, debt inflows and bank inflows), the extent of the appreciation of the real exchange rate, growth in reserves as a percentage of the monetary base, growth in credit to the private sector (measured as a percentage of GDP) and the quality of banking supervision.[4]

The results of an econometric analysis are reported in Appendix E. There is consistent evidence that the type of inflow matters for the likelihood of a banking crisis; namely, the higher are portfolio inflows and the higher are banking inflows then the higher the probability of a subsequent banking crisis. There is also evidence that financial reform matters and, within financial reform, the quality of banking supervision appears to be particularly important. Interestingly, there is little evidence that the appreciation of the real exchange rate matters for the likelihood of banking crises, and only mild evidence

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[3] Calvo, Leiderman and Reinhart (1992), Sarno and Taylor (1999) and Forbes and Warnock (2011) all make the point that inflow surges tend to occur concurrently across countries. The assumption in the analysis here is that the fact that several countries may be experiencing a similar surge does not affect the way in which the surge affects each particular country. Moreover, it is assumed that each surge in the same country is an independent event.

[4] The quality of banking supervision is obtained from Abiad, Detragiache, and Tressel 2008. Other aspects of financial reform (credit controls and directed credit and reserve requirements) were also included in some specifications of the econometric analysis.

TABLE ● 4.1

Comparing the Data with the Model's Predictions (%)

Likelihood of a Banking Crisis		Actual	
		Banking Crisis	No Banking Crisis
Predicted	Banking Crisis	86.7	13.0
	No Banking Crisis	13.3	87.0
probability cut-off = 25%			

Source: Authors' calculations.

that reserve accumulation reduces the likelihood of a crisis or that the strength of credit growth increases that probability. In general, the results indicate that the likelihood of a banking crisis given a capital inflow surge depends largely on the type of inflows and the quality of the supervision of the banking system intermediating those flows.

Regarding the occurrence of recessions, the evidence points more to the importance of macroeconomic variables. In particular, there is evidence that reserve accumulation reduces the likelihood of a subsequent recession, while faster credit growth increases it.[5] There are no robust results regarding the importance of exchange rate appreciation in addition to the significant variables found. There is evidence that financial reforms also matter for the likelihood of recessions, and again the quality of banking supervision appears to be most important. Experiments were also conducted including the emergence of a banking crisis as an explanatory variable for recessions, and the results were always significant.

Latent risks in the Region may remain

The estimated models do a good job of predicting banking crises and recessions. For example, Table 4.1 compares the actual data with the predictions of the model for banking crises. If the model is interpreted as predicting a banking crisis whenever the probability of one exceeds 25%, some 87% of banking crises are predicted correctly and the so-called type 1 and type 2 errors are relatively small.[6]

Employing the definition of capital inflow surges considered above, eight countries in the region experienced a capital inflow surge after 2005.[7] These episodes were not

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[5] Credit growth may lead to a future recession without a banking crisis given the need for bank deleveraging.

[6] The 25% cut-off probability was selected in part as the type 1 (false alarms) and type 2 (failing to raise alarm when a crisis occurs) errors were roughly equal at that point. As shown in the table, each is equal to about 13%. The area under the "ROC Curve" is 0.91 indicating the model discriminates extremely well.

[7] Given the global economic crisis in 2008, it is somewhat problematic to date capital inflow episodes in the period 2006–2010. In some cases it is debatable whether the whole period should be considered an episode or whether there were two distinct episodes.

included in the analysis above. Given the relevant values of the explanatory variables and a preferred specification for the econometric model, the probability that the average country in the Region may suffer a banking crisis can be calculated. The results indicate that the range of probabilities is between 0% and 9% for a banking crisis depending on the episode and the country considered. A probability of 9% for a banking crisis is a relatively high figure. Indeed, given the accuracy of the model there is a 93% chance of correctly predicting a crisis actually occurring at that probability level. However, at that probability level if the researcher claimed that no crisis would occur, according to the model's accuracy she would only be correct some 55% of the time.

Although this is mitigated by improvements in the financial infrastructure

To generate these results, however, 2005 values of the financial reform variables were used.[8] Yet countries in the Region have continued to improve various aspects of the financial infrastructure, including banking supervision and measures designed precisely to mitigate the risks of capital inflows and lending booms—e.g., macro-prudential measures. Appendix F provides a detailed review of the many macro prudential measures employed in the Region. As an indication of the potential positive effects, suppose that these measures served to improve the financial reform variable by one standard deviation of that variable for all countries in the Region. The new results would then indicate that the range of probabilities of a banking crisis would then change to 0%–2.6%, again depending on the inflow episode and country under consideration.

Macro-prudential measures were justified, but some latent risks may remain

Capital inflow surges may spur growth and put development on a fast track, but in emerging economies they have also been associated with banking crises or recessions on about 50% of occasions. The recent capital inflow boom in Latin America and the Caribbean has some potentially dangerous characteristics, with relatively high portfolio inflows and banking flows. At the same time, however, prudential measures were implemented and financial sector supervision has surely been improved. While the full potential negative effects of the inflow surges and fast credit growth are not yet visible, these improvements in financial infrastructure certainly reduce the risks that this most recent episode will result in a banking crisis or a recession. Still, authorities may wish to monitor these risks very carefully.

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[8] The Abiad, Detragiache, and Tressel (2008) dataset employed ends in 2005.

Fiscal Policy in the Recent Downturn: Ready for Another Round?

What is the appropriate role for fiscal policy in response to downturns in Latin America and the Caribbean? This issue was hotly debated within the Region in the early stages of the recent global crisis, and words of caution were voiced for fiscal restraint in order to save liquidity and preserve market confidence (IDB, 2009b). In the event, breaking with the past, countries in Latin America and the Caribbean indeed undertook moderate fiscal stimulus. Fiscal balances were allowed to expand in almost every country in the Region. How should this same policy question be approached now, under current circumstances, if another global downturn occurs? Are countries ready for an encore performance?[1]

A successful expansive fiscal response to the Great Recession...

GDP growth sharply slowed from 2008 as a result of the global crisis, with the recovery commencing in 2010 (Fig. 5.1).[2] Not surprisingly, the downturn in GDP depressed tax collections, and the fall in commodity prices reduced commodity-linked fiscal revenues in the case of commodity-exporting countries. As a result, overall fiscal revenues as a percentage of GDP declined as well in 2008/2009, recovering thereafter as the domestic and global economy regained momentum. At the same time, primary fiscal balances plummeted (the primary balance, excluding interest payments, fell on the order of 4 percentage points of GDP in the typical country in the Region).

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[1] This chapter draws from Fernández-Arias and Pérez (forthcoming).

[2] Figure 5.1 also shows the evolution of fiscal variables as a percentage of GDP since the end of 2007, prior to the global crisis, for the typical country (the average of all 19 regional countries with available information). The previous patterns are roughly similar for other country aggregation schemes such as the Typical LAC-7 country (the average of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela), the Typical Commodity-exporting country (the average of countries with substantial fiscal revenue directly associated to commodity exports except Trinidad and Tobago not included in the sample (Argentina, Bolivia, Chile, Colombia, Ecuador, Mexico, Peru and Venezuela), and the Region as a whole. In this report we will conduct the full analysis for the typical country and comment on selected issues specifically relevant for other aggregation schemes, especially when they deviate from the typical country findings.

The countercyclical fiscal response analyzed in this section refers to how fiscal policy absorbed and offset the temporary shortfall of fiscal revenues in 2008/2009. The observed primary balance is affected by temporary revenues, which naturally even out over time and for that reason are not informative about the underlying policy stance and fiscal position. In other words, increasing fiscal deficits due to temporary low revenues should not be a cause for concern if they are appropriately managed. The underlying fiscal policy is best gauged by structural measures, leaving out temporary fluctuations. For example, trend or structural GDP leaves out cyclical deviations (the so-called output gap), and structural commodity prices are based on expected future prices (from which spot prices may differ substantially); structural revenues are those that would be obtained at structural GDP and commodity prices. The fiscal stance is best measured by the structural balance, which leaves out the effects of temporary revenue shocks (it is equal to structural revenues minus expenditures, or equivalently, the observed balance minus temporary revenues; see Appendix G). Structural fiscal statistics are measured as fractions of structural GDP so that they are not contaminated by cyclical fluctuations in GDP. The structural balance so measured results from factors that are permanent unless altered by policy, and it therefore has long-run implications for fiscal health and fiscal policy.

A cyclically-neutral or acyclical fiscal policy would leave the structural balance constant (or more generally, delinked from temporary revenues). A countercyclical fiscal policy would make the structural balance move with temporary revenues, thus leading to the amplification of the fluctuations of the observed balance. In particular, when fiscal policy is countercyclical, the structural balance would decline when temporary revenues decline (engineered through expenditure expansion and/or tax reduction). The collapse in the observed balance during 2008/2009 in Figure 5.1 was due not only to self-reversing, temporary revenue factors but also to a decline in the structural balance (Figure 5.2). In other words, countries did respond with countercyclical fiscal policy.[3]

In the typical country, the primary structural balance declined by about 1.6 percentage points of structural GDP in the period 2008/09. This decline of the structural balance is fully explained by the expansion in primary fiscal expenditures, averaging 2.1 percentage points of GDP (while there is variation across countries, almost all countries were in positive territory). On top of expenditure expansion, the rest of the countercyclical response is accounted for by the evolution of structural revenue, which actually increased by 0.5 percentage points in net terms. There are a number of factors underlying this net increase in structural revenue. On the one hand, there was a

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[3] This measure underestimates the power of countercyclical fiscal policy in countries with active credit policies through public banks. For example, in Brazil public banks were capitalized by some 3% of annual GDP and their credit grew by half in 2009, to become the main source of bank credit.

GDP Growth, Revenues and Primary Balance

Typical Latin America and Caribbean Country

Source: Latin Macro Watch, IDB (2012) and author's calculations.

Primary Spending and Structural Primary Balance

Typical Latin American and Caribbean Country

Source: Latin Macro Watch and author's calculations.

tax reduction of about 0.4 percentage points, also part of fiscal countercyclical policy, which added to expenditure expansion would amount to a 2.5 percentage point stimulus package. On the other hand, however, commodity-exporting countries experienced a substantial increase in structural commodity-linked revenues, more than offsetting the structural balance reduction of the typical country.

This last observation underlies the fact that commodity-linked revenues are very important in the Region, and this dependency leads to substantial volatility and

vulnerability to fiscal accounts as well as difficulties in estimating structural variables. As noted, despite the crisis, in commodity-exporting countries structural revenues from this source actually increased (by as much as 2.2 percentage points on average) because the structural prices of the relevant commodities increased.[4] For them, policies on tax and spending adapt to exogenous changes in structural, long-term prices of commodities in order to achieve fiscal objectives. For the typical commodity-exporting country faced with this positive shock to structural revenues, spending increased by 3.5 percentage points and yet the structural balance declined by only 0.5 percentage points. Highly uncertain price forecasts call for caution and a prudent increase in the estimated structural balance until high forecasts become more certain; even a marginal decline is of concern. Had estimated structural commodity prices remained at the pre-crisis level, all else constant, structural balances would have declined by as much as 3.3 percentage points.

Was a robust countercyclical fiscal policy the right macroeconomic policy as a crisis response in the region to stimulate demand (i.e., was there "macroeconomic space" for it)? Was it worth the financial cost and risk to fund it, either through borrowing or out of reserves, in times of illiquidity (i.e., was there "financing space" for it)? It is tempting to answer "yes" because the Region's performance in the face of the Great Recession was generally strong, but since there were other forces driving the recovery (such as fast-growing demand for the Region's primary products from booming economies in Asia), the contribution of fiscal stimulus to the Region's recovery remains to be established. Similarly, financing turned out not to be a problem, but it might have been if a more persistent credit crunch had drained international reserves and diminished official support.[5] Nevertheless, there is broad satisfaction among policymakers about the success of these policies; if anything, the experience illustrated that lack of macroeconomic or financing space is unlikely to be a major argument against countercyclical fiscal policy, if called for again in similar circumstances.[6]

...but slow fiscal retrenchment afterwards

While there was macroeconomic and financing space, was there also "fiscal space" (i.e., might the fiscal burden become too costly)? While a well-designed and prudently financed financial temporary stimulus package may have been precisely what was

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[4] As an indication, the average 5-year futures price increased by 38% between end-2007 and end-2009.

[5] There was official support and the credit crunch was resolved quickly after the G20 London Summit in April 2009 (Fernández-Arias 2011).

[6] In this regard, the experience validated the ex ante analysis in Fernández-Arias and Montiel (2010) concerning macroeconomic and financial space.

required, there is the risk that increased expenditures become permanent, simply adding to the fiscal burden in each downturn and eventually leading to costly fiscal adjustment or debt restructuring.

The exercise of countercyclical fiscal policy entails not only a fiscal expansion in downturns, but also—and critically—its removal afterwards and eventually a fiscal contraction in the booms. Otherwise, fiscal policy would simply be expansionary. It is therefore key to examine the fiscal stance after 2009, when recovery began. By 2011 temporary revenues were about neutral, calling for a normal fiscal stance. It causes concern that expenditure does not show any sign of retrenchment as recovery started to take hold, and was even inching up in 2011 according to preliminary information (Figure 5.2). Moreover, considering more detailed information it appears that expansions in social programs have typically been more inflexible (see Box 5.1).

Box 5.1 Fiscal Stimulus Measures in Latin America and the Caribbean

The bundle of "fiscal stimulus packages" recently implemented in Latin American countries can be divided into three broad categories (see the table in Appendix H). First, countercyclical measures were launched in order to sustain aggregate demand. Those include cutting taxes, infrastructure investments and other measures in support of the private sector. Second, a series of emergency measures were put in place in order to support labor demand, as in the case of workfare programs. Third, existing social protection programs were expanded in order to protect the incomes of those most vulnerable to falling into poverty as a consequence of the economic downturn.

For instance, Brazil's conditional cash transfer (CCT) program *Bolsa Família* has extended coverage to an additional 1.3 million families and also increased the value of its benefits. Colombia likewise increased the coverage of its CCT program (*Familias en Acción)* by 1.5 million families and increased expenditures on social programs by 42%. In Mexico, the Temporary Employment Program was expanded by 40% over what had been planned, a new in-kind transfer program was launched to target the poorest rural communities (*Programa de Apoyo Alimentario)* and the CCT program *Oportunidades* extended its coverage to an additional 1 million families.

While the vast majority of fiscal stimuli were progressively scaled back by the end of 2010, the increase in social spending remained largely in place in the aftermath of the global financial crisis. There may be various explanations behind this phenomenon. One hypothesis is that the targeting mechanism embedded in social programs, which is highly skewed toward the poor, might have played a key role. Poor voters are more likely to trade off political preferences in exchange for public resources. Accordingly, programmatic redistribution schemes may be more politically costly to scale back vis-à-vis fiscal measures that usually affect both poor and rich segments of the population.

The true test of countercyclicality, however, is the evolution of the structural balance. If there were structural fiscal features that supported increased spending on a permanent basis, the persistence of increased spending would still be consistent with a healthy fiscal position. One such structural feature could be a tax increase more than offsetting the countercyclical tax reduction in fiscal stimulus packages. In fact, in the typical country there was a tax increase of about 1 percentage point starting in 2010. This is somewhat larger than the previous tax reduction but still insufficient to sustain the new pattern of spending. At the same time, structural commodity-linked revenues remained flat or slightly decreased. All in all, the structural balance stagnated during the recovery phase and was therefore far from being normalized at pre-crisis levels (Figure 5.2).[7]

The Region is in worse shape to confront another downturn

Do countries in the Region now have room to execute a similar countercyclical response if necessary? Relative to the pre-crisis situation, the financing space appears to be less of a concern: despite some use of reserves during the previous crisis, countries subsequently accumulated substantial international reserves.[8] The advisability of countercyclical fiscal policy is therefore a question less of "financing space" than "fiscal space."

Nevertheless, higher prospective borrowing costs may be a concern in some countries. Captive domestic markets may be insufficient to support additional public debt. More generally, an expansionary fiscal package that does not square with a credible deleveraging rule going forward may trigger a costly increase in bond spreads. As a result of fiscal deficits in the period under consideration, in several countries debt has been accumulated faster than GDP growth, thus worsening debt ratios. The evolution of raw statistics may fail to reveal the underlying trends in some countries because of the appreciation of the real exchange rate reducing the value of foreign-currency debt in terms of GDP, but it becomes clear when this valuation change (a temporary effect) is removed. Structural debt ratios computed as structural debt (adjusted by non-structural valuation changes) as a fraction of structural GDP, which is the relevant measure of debt burden, ceased to improve and even inched up in the period (Figure 5.3).

Besides future borrowing costs, countries may find it costly to undertake expansionary fiscal policies because they amount to fiscal burdens going forward that weigh

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[7] The stagnation of the structural balance after the crisis holds not only for the typical country in the Region but also for all country groupings, including the typical LAC-7 country and the Region as a whole.
[8] In the aggregate, after declining by about 5%, the stock of reserves is now some 60% above pre-crisis levels. Furthermore, the mechanisms of the international financial safety net recently used are now better oiled, although the muscle and disposition of advanced countries to provide liquidity may not be the same.

down on fiscal sustainability, especially if the downturn is protracted or the expansion is not withdrawn immediately after the downturn. An unsustainable fiscal path eventually entails either fiscal adjustment to retain solvency or credit rationing/debt restructuring, all of which may be costly (and lead, in the case of countries receiving concessional lending, to aid fatigue). For this reason, countries that find themselves on an unsustainable fiscal path may lack the "fiscal space" needed to justify a countercyclical fiscal expansion.[9] This analysis estimates the primary struc-

FIGURE ● 5.3

Structural Public Debt
Typical Latin American and Caribbean Country

Source: Latin Macro Watch, IDB (2012) and author's calculations.
Note: Structural debt is calculated as debt at the average real exchange rate of the period over potential GDP.
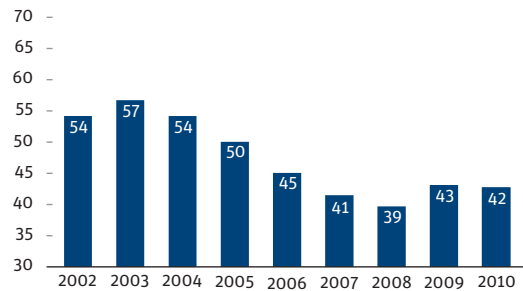
tural balance required to sustain the current structural debt/GDP ratio in the long run under assumptions of sustainable growth and interest rates. The higher projected interest rates and the lower projected growth, the higher the primary structural balance required to sustain initial debt. The gap between required structural fiscal balance and current balance (the required adjustment) is an indicator of fiscal space, and therefore of the risk of conducting countercyclical fiscal policy. The larger the gap, the more likely it is that a fiscal expansion may be fiscally costly (less fiscal space). The readiness of countries to effect countercyclical policy is assessed using this framework.[10]

The structural primary balance required to maintain the actual level of structural debt is calculated using a forecast of growth equal to the average over the previous two decades and a prospective real interest rate equal to the average real interest rate paid on public debt over the previous six years.[11] (This standard methodology is subject to the usual caveat, particularly for specific cases).[12] Comparing fiscal space by end-2010

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[9] This "fiscal space" constraint also applies to quasi-fiscal policies such as countercyclical credit policies to provide financial intermediation to segments of the private sector cut off from the normal flow of credit, such as exporters left without trade credit by international banks or small enterprises crowded out by large corporations turning to local bank financing after finding it difficult to secure external financing. To the extent that these policies only involve intermediation, there is no fiscal deficit. However, any recovery risk would amount to a contingent debt that would in turn encumber fiscal solvency.

[10] This analysis builds on the one conducted by Fernández-Arias and Montiel (2011) who argued that there was "fiscal space" for countercyclical fiscal policy in the recent crisis.

[11] We also considered a second method in which the real interest rate was obtained from an empirical model that predicts the interest rate on the basis of the level of debt and GDP growth (as well as country-specific characteristics) on the basis of the experience over the same period, obtaining similar results.

[12] For this analysis we were able to expand the sample to 23 countries.

TABLE ● 5.1	
Readiness Relative to 2007	
Higher	Barbados
	Bolivia
	Jamaica
	Uruguay
Similar	Argentina
	Belize
	Brazil
	Haiti
	Honduras
	Venezuela
Lower	Bahamas
	Chile
	Colombia
	Costa Rica
	Dominican Republic
	Ecuador
	El Salvador
	Guatemala
	Mexico
	Nicaragua
	Panama
	Paraguay
	Peru

Source: Latin Macro Watch, IDB (2012) and author's calculations.

with the pre-crisis fiscal space by end-2007, it appears that most countries are now in worse shape (Table 5.1).[13] The main reason for the deterioration is the widespread reduction in structural primary balances over the three-year period. In fact, of the 23 countries in the sample, only Barbados, Bolivia and Jamaica increased their fiscal balance.

Nevertheless, readiness could be worse now than before the previous crisis but still good—and vice versa.[14] In order to gauge current fiscal space, the required adjustment indicator as of end-2010 is employed to form three country categories based on the space available for countercyclical fiscal policy: those countries with "ample" space, "intermediate" space and "restricted" space, as shown in the table of Appendix I. This ranking is again illustrative only because, apart from data and model imprecision, the fiscal risk of countercyclical policy also depends on whether that expansion will be temporary—which is to some extent intangible. Countries that could credibly commit to brief fiscal expansions would be able to contain fiscal risks. On the other hand, countries relying on commodity incomes may have greater fiscal risks due to the uncertainty in future commodity prices.

However, is the current structural balance a fair indicator of countries' fiscal stance going forward? On the one hand, this standard may be too harsh if the failure

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[13] Lower readiness means that the required adjustment is at least one percentage point higher, and higher readiness means that it is at least one percentage point lower.
[14] For example, Barbados and Jamaica significantly improved their readiness, as shown in Table 5.1 (by conducting procyclical spending contraction), but they have "restricted" fiscal space, see Appendix I.

to withdraw the fiscal stimulus was justified due to lagging recovery in some areas or simply slowness to act in a brief window of opportunity. An optimistic scenario would then assume that, given a little more time, countries would have returned to their pre-crisis, 2007 structural balance. The opposite extreme (a pessimistic case) would be to assume that the fiscal stimulus measures that have not been withdrawn were actually permanent. If nothing more had been withdrawn, a similar stimulus would lead to a similar additional deterioration of the structural balance down the road, and the relevant fiscal stance from which to assess the fiscal space for that stimulus would be an even lower balance.[15] These two extreme scenarios illustrate that the impact of past policies on future credibility is important for the effectiveness of current policies: under the former optimistic scenario more countries have ample fiscal space whereas in the latter, pessimistic scenario, more countries are in the restricted category (see Appendix I Table). The true scenario may be somewhere in the middle, perhaps close to the central scenario, depending on the extent to which the fiscal stance could be expected to normalize to pre-crisis without much delay.

But there are still policy opportunities: Making lemonade with the lemons at hand

The important question tackled in this chapter is whether some economies in the Region have indeed evolved to the point where a countercyclical fiscal stance is appropriate ex ante in the face of a severe crisis. After two decades of reform, do the Region's macroeconomic institutions and circumstances now allow it to actively pursue macroeconomic stability in response to shocks, rather than be constrained by lack of financing or exercise restraint for the sake of preserving market confidence? Drawing on the analysis presented, the following are some elements of an answer:

1. With growth already slowing and the threat of downside risks, it would be inappropriate to withdraw much of the remaining fiscal stimulus. Rather than focusing on accelerated fiscal retrenchment, the more relevant policy question now is how to address the baseline scenario and the risk of the negative scenarios detailed in Chapter 2.

2. Based on recent experience, countries with fiscal space would be well-advised to consider fiscal stimulus packages, taking advantage of the macroeconomic and financing space available. Effective packages are designed to take advantage of

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[15] This notional balance would be the current one minus the deterioration observed in the recent period. For the three countries in which the structural balance did not deteriorate (Barbados, Bolivia and Jamaica), the extreme scenarios replicate the central scenario.

the macroeconomic space and maximize their multiplier effects on economic activity; only highly effective packages may justify the use of fiscal space.

3. Importantly, packages should be designed ex ante to be easily reversible and should be withdrawn in due course. Unemployment benefits, social spending with sunset clauses, and front-ending infrastructure maintenance are more easily reversed than an increase in baseline transfers or starting large infrastructure projects not in the pipeline. The credibility of countercyclical fiscal policy has to some extent been damaged by not dismantling the stimulus in short order after the recent crisis and, as a consequence, the fiscal space for it has been reduced. Since history cannot be rewritten, it is only fitting to repair credibility in the future by being strict in withdrawing the stimulus and saving temporary revenues in boom times.

4. Moreover, fiscal institutional reform to conduct prudent and credible cyclical fiscal management on a structural basis, such as introducing independent fiscal councils to underpin structural fiscal accounting and budgeting, would be a key complementary policy in enlarging the fiscal space currently available.

Monetary Policy: Regimes and Challenges

Latin American and Caribbean countries maintain a diverse set of monetary and exchange rate regimes that were tested by both the 2008 global financial shock and the subsequent period of resumed capital inflows. How did countries with different monetary policy approaches fare during these experiences, and what are the lessons learned? Which complementary policies did they pursue? What challenges did they face, and how are they now positioned to address the risks identified in this report? This chapter will address some of these questions through the prisms of the Region's various monetary and exchange rate policy arrangements.

For the purposes of this chapter, the Region's countries are divided into three groups according to a typical classification of regimes: i) inflation targeters, ii) exchange rate fixers and iii) intermediate regimes. The spirit of the analysis is to examine country groups, describe common experiences and draw common lessons. Argentina and Venezuela are not included as they do not fit well into these three categories. Inflation targeters allowed the nominal and the real exchange rate to depreciate the most during the recent crisis, which was followed by a subsequent and substantial real appreciation, as shown in Figure 6.1. At the same time, however, this group accumulated the most reserves, indicating substantial sterilization of inflows. Countries with intermediate regimes allowed a mild depreciation of the nominal exchange rate during the crisis, but it was not sufficient to prevent a real exchange rate appreciation. Likewise, the subsequent depreciation was not enough to restore competitiveness according to this measure. Fixers also experienced a real appreciation through the crisis (although less than those with a managed float) and undertook a subsequent depreciation to gradually return the real exchange rate to roughly its pre-crisis level. Policy interest rates actually tended to increase at the onset of the crisis, but both inflation targeters and managed floaters thereafter started to reduce rates. Inflation targeters subsequently began to tighten monetary policy as capital inflows grew, while intermediate regime countries maintained lower interest rates. The sections that follow provide further detail on each group and draw policy lessons.

Latin America and the Caribbean Economic Performance During and Post-Lehman
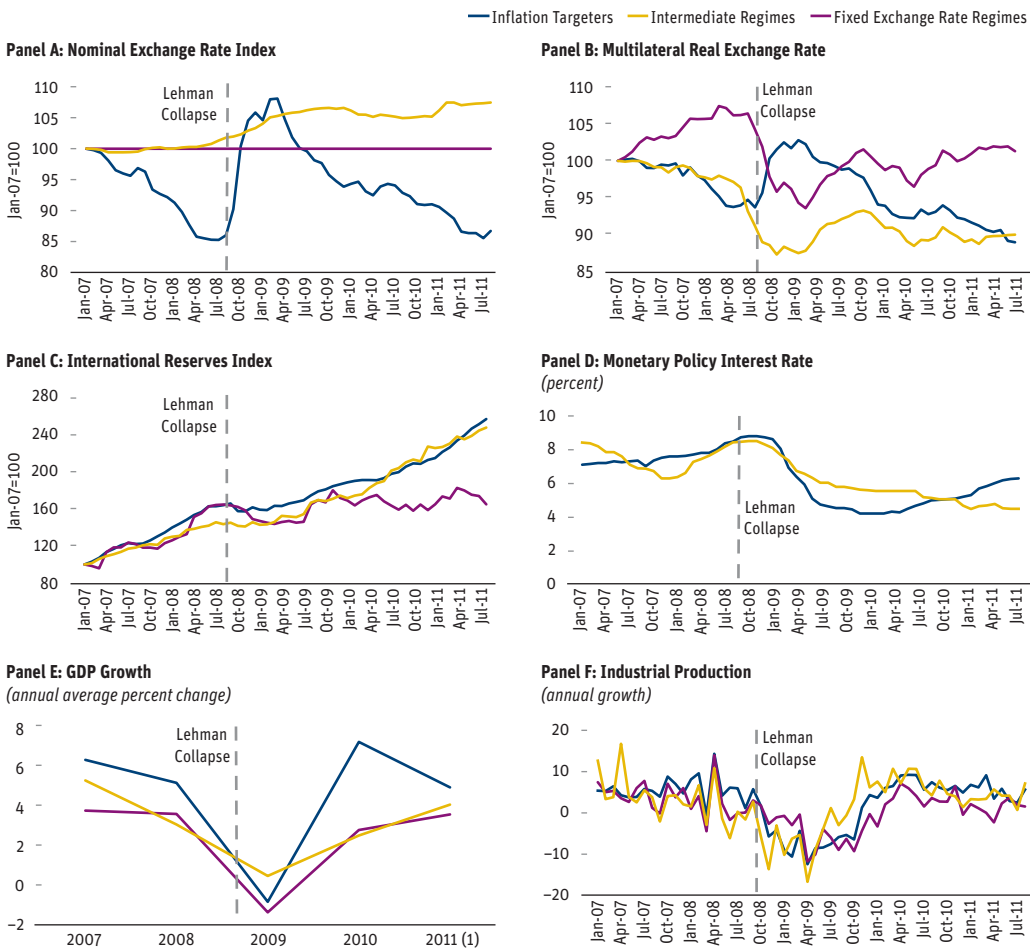
Source: Latin Macro Watch, IDB (2011) and Consensus Estimate (2011).
Note: Inflation Targeters: Brazil, Colombia, Chile, Guatemala, Mexico, Paraguay, Peru, Uruguay. Fixed Exchange Rate Regimes: Bahamas, Barbados, Belize, Ecuador, El Salvador, Panama. Intermediate Regimes: Bolivia, Costa Rica, Dominican Republic, Guyana, Haiti. Honduras, Jamaica, Nicaragua, Suriname, Trinidad and Tobago.

Inflation Targeting Regimes

Eight countries in the Region are classified as inflation targeters during the period of analysis.[1] While the idea of targeting prices or inflation rather than exchange rates or money has a long history (at least going back to Fisher and Keynes), modern inflation

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[1] These countries are Brazil, Chile, Colombia, Guatemala, Mexico, Paraguay, Peru and Uruguay. It should be noted that Guatemala also maintains a currency band (as in the early days of Chilean infla-tion targeting), and the Dominican Republic has recently adopted inflation targeting but did not have such a system during the period analyzed here.

targeting was pioneered by New Zealand in 1990 and by Chile, which began to transition to this regime in 1991. The system is now used by many countries including Australia, Canada, Sweden and the UK, as well as the other inflation targeters in Latin America.

The immediate response of this group to the Lehman shock did not include a lowering of the policy interest rate, and in some cases this rate was even increased. At the same time, however, direct policy tools were used to influence liquidity and credit conditions, such as reducing reserve requirements or offering liquidity on the basis of wider definitions of collateral. Only at the beginning of 2009, when the real effects of the crisis were clearer, did inflation targeters reduce policy interest rates.

For example, in the case of Brazil, the Lehman collapse resulted in a sudden halt to capital inflows which triggered a prompt response by the Brazilian Central Bank (BCB) to provide liquidity in several ways.[2] Dollar sales were implemented both in the spot market and in repo auctions, and the BCB announced the sale of up to US$50 billion in foreign exchange swaps. However, the policy rate was not immediately reduced. Liquidity was instead released by other methods such as a reduction in reserve requirements. In addition, the BCB changed discount window regulations to extend the maturity of discount loans and to widen the range of acceptable collateral for access to BCB lending. The SELIC policy interest rate was only lowered towards the end of January 2009. The strong recovery of the Brazilian economy in 2010 renewed capital inflows, and rises in commodity prices presented a different challenge for monetary policy. Inflation crept up to 7.5% in the third quarter of 2011, well above the inflation target of 4.5% plus/minus 2%. The policy response involved both a series of increases in the SELIC rate and, again, unconventional policies such as foreign exchange purchases, taxes on capital inflows and increases in reserve requirements.

The global crisis first hit Chile through a tightened access to external credit and a fall in commodity prices, including copper. As in Brazil, the policy interest rate was not lowered until early 2009. Rather, in order to provide liquidity the authorities auctioned dollar swaps and allowed financial institutions to use local currency, euros, and yen to complete foreign currency reserves holdings. The recovery of the Chilean economy began in the second half of 2009 after an aggressive cut in the policy rate, and 2010 growth actually exceeded Central Bank forecasts. A significant appreciation of the real exchange rate ensued in the second half of 2010—some 7% between June and December. The Central Bank announced a program of international reserves accumulation, justified by the perceived need to strengthen its international reserves position.

In Peru, the policy interest rate was initially raised after the Lehman collapse, but reserve requirements were reduced to enhance liquidity in the domestic financial

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[2] The accounts of central bank monetary policy actions given here draw on Céspedes, Chang, and Velasco (2012).

system. These measures were complemented by interventions in the foreign exchange market, and on several occasions reserve requirements were raised during the phase of capital inflows from 2009 to 2011.[3]

The use of non-conventional or direct tools of monetary policy in addition to the policy rate appears to have occurred for two general reasons.[4] First, they have been employed as **complementary** to the policy interest rate. In the period of strong capital inflows, the tendency was to increase rates but also to sterilize capital inflows, tighten reserve or liquidity requirements and impose other measures on capital inflows. One justification is that under these circumstances the policy interest rate may have little effect in reducing overall demand, particularly as raising interest rates may simply attract additional capital inflows. A second related justification is that in the Region's economies the policy interest rate may affect demand relatively slowly; the use of more direct measures may speed up the transmission of monetary policy.[5]

Secondly, however, direct tools may also be used as **substitutes** for the policy interest rate depending on the type of shock experienced.[6] As the Lehman crisis hit, central banks maintained and in some cases even raised the policy interest rate, given the sharp fall in capital inflows and hence the supply of dollars to the foreign exchange market. Nonetheless, at the same time reserve or liquidity requirements were reduced or other methods were employed given the negative shock to liquidity in domestic financial systems.[7] Policy rates were only reduced later.

Policy rates have since risen, but they are not at the same levels as before the Lehman crisis. There is thus less monetary policy space for using interest rates than in 2007. International reserves, on the other hand, are now higher. While inflation targeters may have less interest rate policy space, they may be in better shape to pursue direct policy actions to influence liquidity and credit in their economies, assuming this can be done while maintaining well-anchored inflationary expectations.

A challenge for inflation targeters is to find a good communication strategy for the use of direct and indirect policy instruments. An aim of inflation targeting is effective communication so that private sector agents assist the Central Bank in achieving its objectives rather than act against it. To maximize credibility, Central Banks that provide a good explanation of how they will use the various instruments at their disposal in

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[3] See Rossini et al. (2011) for a discussion of Peru's use of interest rate policy and other direct monetary policy tools in the face of different shocks.

[4] This abstracts from purely prudential motives. See Benigno et al. (forthcoming) for a possible theorical framework.

[5] See, for example, Vargas Herrera et al. (2011).

[6] This might be considered an extension of the "instrument assignment problem" as developed by Poole (1970).

[7] See Rossini et al. (2011) for discussion of Peru's use of interest rates and other tools, which makes reference to the use of different tools for different shocks.

order to attain their objectives will be most effective. A clear framework that highlights the circumstances under which direct tools may be used in complementary fashion (to make monetary policy more effective or increase the speed of its transmission) and when such tools may be used as substitutes (given the impact of different shocks) may be helpful in this regard.

Fixed Exchange Rate Regimes

A set of countries in the Region have fixed exchange rate regimes, all with the US dollar as the anchor, including The Bahamas, Barbados and Belize. Ecuador, El Salvador and Panama are fully dollarized economies. The basic trade-offs of fixed versus floating exchange rates are well-known.[8] The leading cost is that the nominal exchange rate cannot be used as a shock absorber for real shocks, while a leading benefit is that monetary shocks do not affect the economy through costly "excess" nominal exchange rate volatility. In addition, if domestic and foreign assets are perfect substitutes, there is not only a lack of nominal exchange rate flexibility to respond to real shocks, but essentially no room to conduct domestic monetary policy.[9] However, in emerging economies where full monetary policy credibility cannot be assumed for other regimes, the existence of a hard peg or dollarization may bring rewards in terms of lower and less volatile interest rates and lower inflation (see Figure 6.2).

Ecuador and Panama suffered some of the largest declines in growth during the 2008/9 crisis, from growth rates as high as 7.1% for Ecuador and 10.1% for Panama in 2008 to 0.4% for Ecuador and 3.2% for Panama in 2009. Yet both economies recovered quickly in 2010, assisted by the rebound in oil prices and trade, and with growth of close to their recent averages of about 8% and 4%, respectively.

Barbados and The Bahamas have a fixed exchange rate regime but also maintain longstanding capital controls that drive a wedge between domestic and foreign assets and potentially provide some, albeit limited, space for monetary policy. Barbados used this space actively, as the Central Bank lowered minimum deposit rates from 5.25% to 4.75% in November 2007, lowering them again in April 2008 and October 2008 to reach 4%. The Central Bank also used open market operations, purchasing treasuries held by banks to enhance liquidity in the financial system. These actions were complemented by fiscal policy. However, as the crisis hit, Barbados' debt to GDP ratio was already over 100%, constraining the fiscal space available for an effective countercyclical response.

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[8] Mundell (1960) outlines this trade-off. Also see Lahiri, Singh, and Végh (2007) for an interesting analysis assuming agents are financially constrained.

[9] The well-known "impossible trinity" implies that if the exchange rate is fixed and the capital account is completely open (domestic and foreign assets are perfect substitutes), then there is no room for monetary policy.

Inflation Performance: Dollarized Countries versus Latin America and the Caribbean

Panel A. Annual Inflation

Panel B. Real Exchange Volatility
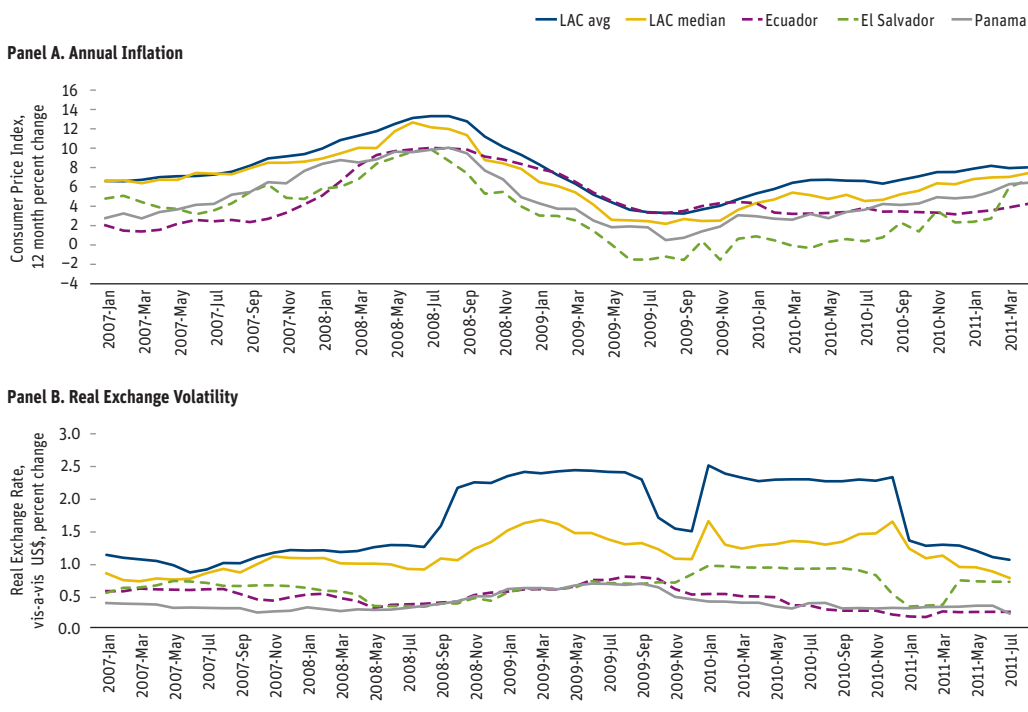
Source: Latin Macro Watch, IDB (2011).

On the other hand, The Bahamas, which enjoyed greater fiscal space, chose not to use interest rates to react to the 2008 shock, but rather employed various fiscal tools.

In summary, while the exchange rate fixers may have suffered somewhat more than other groups during the crisis, they benefitted from the strong nominal anchor and maintained very stable money demand and inflation. The challenge for this group is to find additional mechanisms to reduce the impact of external shocks. Movements in the nominal exchange rate may be thought of as a coordinating device to effect price and wage changes across the economy. Fixed exchange rate economies may then benefit from other mechanisms to allow for price and wage flexibility. In addition, countries with fixed exchange rates are typically highly dollarized, and some are fully dollarized; authorities may wish to carefully monitor financial systems to ensure adequate dollar liquidity and high prudential standards for banks and other financial institutions.[10] Moreover, given the limited scope for countercyclical monetary policy to respond to real shocks, a fixed exchange rate regime places an additional burden

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[10] This might be said of all countries, but the point here is that the central bank in a dollarized economy cannot act as an unlimited lender of last resort in dollars.

on fiscal policy. Most countries in this group are now in a worse position to respond with fiscal policy than in the 2008 crisis. As discussed in Chapter 5, one way forward in the face of a negative shock might be to commit to fiscal rules for the longer term while postponing fiscal adjustment. This would likely be best achieved with the aid of commitment devices such as an externally monitored adjustment program with a multilateral institution.[11]

Intermediate Regimes

The third group of countries in this analysis includes those that let their currencies float but with explicit and decisive intervention in foreign exchange markets so as to "manage" their floating scheme. Most of these countries are located in Central America and the Caribbean.[12] The economies included in this group have maintained their nominal exchange rates within a relatively tight band, inflation remains strongly anchored, and their growth has been the least volatile across all groups (see Figure 6.1).

A policy challenge for countries in this category is managing trade-offs between inflation and the nominal exchange rate. Lora, Powell and Tavella (2011), for example, analyze countries' response to shocks in commodity prices. They find that, while inflation targeting countries tended to allow nominal exchange rates to appreciate and hence domestic prices (particularly food prices) increased less, and countries with fixed rates had a higher rate of pass-through, some food-importing countries in the intermediate category suffered some of the highest rates of pass-through. One hypothesis is that the attempt to trade off the two nominal objectives led to higher inflation in the face of shocks, as the private sector may not be able to fully anticipate the reaction of the monetary authorities. This underlines the need to communicate effectively both the objectives of policies and how authorities would react to different shocks.

Jamaica also lies in this intermediate category. After the Lehman crisis, the Bank of Jamaica (BoJ) first allowed the exchange rate to depreciate to support growth (there was an almost 10% depreciation in the last quarter of 2008). Subsequently, however, the BoJ intervened and increased interest rates to ensure exchange rate stability. The BoJ additionally offered a temporary lending facility to domestic financial institutions. The country nonetheless entered a recession; given high debts and other domestic vulnerabilities, interest rates soared, which pushed the government to restructure domestic debt and seek an IMF agreement. The challenge for Jamaica is to pursue structural

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[11] The empirical evidence is that effectiveness of IMF programs is much higher in precautionary arrangements. (See Mody and Rebucci, 2006).

[12] The group includes Costa Rica, Honduras, and Nicaragua in Central America and the Dominican Republic, Guyana, Haiti, Jamaica, Suriname and Trinidad and Tobago, which might all be considered Caribbean nations. The geographical exception is then Bolivia, which is also included in this category.

reforms to stimulate growth and escape from its high debt ratios, thus reducing fiscal dominance and in turn allowing monetary policy to operate more effectively.

Some countries in this group are also commodity exporters, including Guyana, Suriname and Trinidad and Tobago. When commodity revenue accrues to the public sector, a savings rule for the government in foreign exchange may dictate exchange rate behavior or, in other words, countries may not be able to allow the exchange rate to truly float and at the same time implement a specific savings rule. Where commodity revenue accrues to the private sector, how much of the proceeds the private sector repatriates will have a large influence on the foreign exchange market.[13] A challenge is to strengthen the countercyclical properties of fiscal rules (adding or strengthening stabilization funds to the toolkit) and to consider whether allowing greater exchange rate flexibility will be beneficial—and, if so, how to achieve that aim.[14]

Some countries within this group see this regime as a transitional one. For example, Guatemala is transitioning out of this regime as it continues to maintain exchange rate bands, as Chile transitioned to inflation targeting in the 1990s. The Dominican Republic has also very recently adopted an inflation target, but is included in this group as it was not an inflation targeter during the Lehman crisis or immediately thereafter.

Conclusion

Latin America and the Caribbean includes countries with highly diverse exchange rate and monetary arrangements. Despite this heterogeneity the vast majority of countries has achieved stable rates of monetary growth and been successful in limiting inflation in the face of major external shocks. Among the twenty-four countries analyzed in this chapter, six have hard fixes or are dollarized, eight are considered inflation targeters and ten have intermediate regimes. Intermediate regimes are slowly transitioning towards inflation targeting, with Guatemala treated as an inflation targeter and the Dominican Republic now transitioning in the same direction. Given the heterogeneity of their circumstances, countries face a wide variety of challenges. Some intermediate regime countries face the challenge of fiscal dominance and hence have little monetary policy flexibility, while other commodity exporters should focus on finding consistent rules that allow for the management of both commodity price risk and exchange rate volatility. Fixed rate countries face the challenge of ensuring their economies have substitutes for exchange rate flexibility. Finally, inflation targeters may seek to enhance communication to allow for the efficient use of both direct and indirect policy instruments.

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[13] In the case of Guyana commodity exports are managed through a system of "boards." The Central Bank has been successful in maintaining exchange rate stability with a bias towards a more competitive exchange rate and reserve accumulation, despite strong external shocks.

[14] Suriname is an example of a commodity exporter moving towards greater exchange rate flexibility.

Resilience to Shocks:
A Balance Sheet Analysis

A region of relatively small and open economies, Latin America and the Caribbean has been buffeted by severe external economic shocks. The vulnerability of a country to such shocks is in part determined by its external balance sheet. There has been much discussion in the economic literature of balance sheet effects in emerging economies, particularly related to partial dollarization, and of the balance sheet of industrialized economies through the recent economic crisis; however, there has been little comprehensive analysis of this topic for Latin America and the Caribbean.[1] This chapter considers changes in the balance sheet of the Region as a whole and of the Region's countries when divided into commodity exporters and commodity importers.

Latin America's Balance Sheet: An Overview

Adding the total external assets and liabilities of 15 Latin American nations reveals the Region to be a net debtor to the rest of the world. This is not surprising, as the Region has higher growth rates than capital-exporting nations and is in a process of convergence to levels of higher income (see Figure 7.1). Gross external assets and liabilities both grew from 2001 to 2010 in nominal dollars and are now almost US$2 trillion and some US$3 trillion, respectively. Again, this might be considered normal as the Region becomes more integrated with the rest of the world. However, the situation is more complex than these overall figures suggest. For example, as a percentage of cyclically adjusted GDP, the Region's liabilities fell to a minimum in 2006 and only thereafter did gross assets and liabilities start to rise together once again (see Figure 7.2).

Separating the Region into commodity exporters and commodity importers, the picture becomes somewhat clearer. Before the Great Recession, Latin American exporters used foreign receipts to reduce gross and net liabilities substantially relative to the size of their economies (see Figure 7.3). While net liabilities of this group amounted to almost 40% of adjusted GDP in 2001, they were just over 20% of adjusted GDP as the

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[1] See Lane and Milesi-Ferretti (2000) on the analysis of external balance sheets.
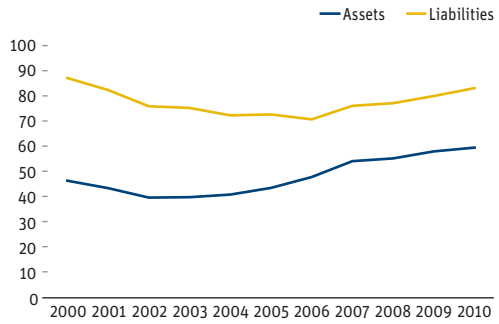
External Assets and Liabilities in Latin America and the Caribbean
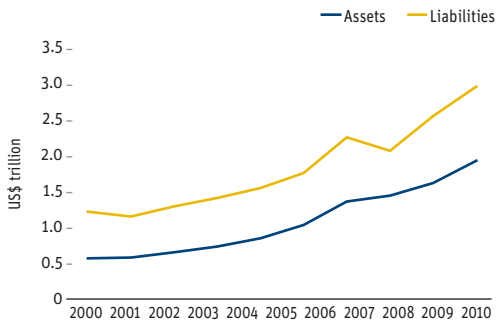
Source: IFS (2012).
Note: LAC includes: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela.

FIGURE ● 7.2

Latin America and the Caribbean External Assets and Liabilities *(percent of adjusted GDP)*
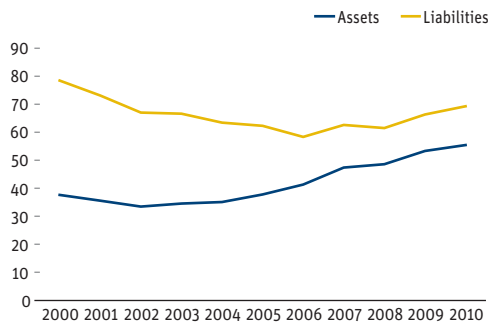

Source: IFS, IMF (2012) and Latin Macro Watch, IDB (2012).
Note: LAC includes: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela.

crisis hit. On the other hand, commodity importers' gross liabilities increased to some 120% of GDP and net liabilities to about 48% of GDP before the Great Recession (see Figure 7.4). Before the crisis, commodity exporters enhanced resilience by reducing gross liabilities and increasing gross assets; commodity importers were somewhat more vulnerable according to these overall measures. However, as Chapter 4 on capital inflows indicated, not all capital flows are the same in regards to increasing vulnerability, meaning the composition of the stock of assets and liabilities is also important.

FIGURE ● 7.3

External Assets and Liabilities
Commodity Exporters *(percent of adjusted GDP)*

Source: IFS, IMF (2012) and Latin Macro Watch, IDB (2012).
Note: Simple average across countries. Commodity exporters include: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela.
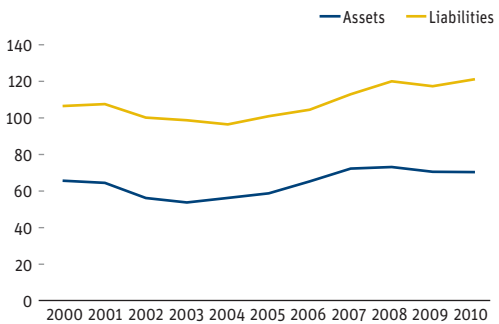
FIGURE ● 7.4

External Assets and Liabilties
Commodity Importers *(percent of adjusted GDP)*

Source: IFS, IMF (2012) and Latin Macro Watch, IDB (2012).
Note: Simple average across countries. Commodity importers include: Costa Rica, Dominican Republic, El Salvador and Panama.

FIGURE ● 7.5

External Liabilities
Commodity Exporters (*percent shares*)

Source: IFS, IMF (2012) and Latin Macro Watch, IDB (2011).
Note: Simple average across countries. Commodity exporters include: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela.

FIGURE ● 7.6

External Liabilities
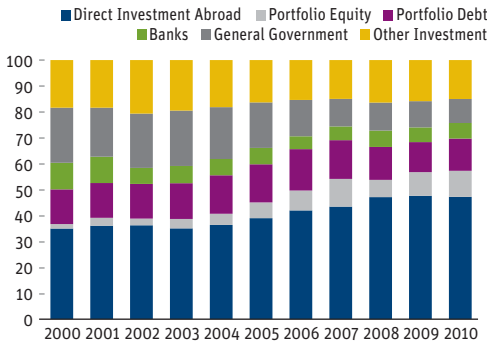Commodity Importers (*percent shares*)

Source: IFS, IMF (2012) and Latin Macro Watch, IDB (2012).
Note: Simple average across countries, Commodity importers include: Costa Rica, Dominican Republic, El Salvador and Panama.

Since the Great Recession, the composition of the balance sheet has changed. Commodity exporters have seen increasing portfolio inflows (equity and debt) such that the stock of these types of liabilities is now some 16% of GDP. Still, FDI liabilities represent a significant 32% of GDP. While these private sector liabilities have increased their share, government external liabilities have fallen sharply to just 6% of GDP. On the other hand, commodity importers have seen government liabilities remain roughly constant at some 11% of GDP while FDI liabilities have jumped to almost 50% of GDP. The stock of FDI liabilities has risen more than fourfold in US$ terms over the period in Costa Rica and more than threefold in Panama. Bank and portfolio equity liabilities nonetheless remain extremely important for commodity importers—at some 32% and 14% of GDP, respectively (see Figures 7.5 and 7.6).

On the asset side, reserve assets have grown to 20% of GDP for commodity exporters but only 14% of GDP for commodity importers. On the other hand, commodity importers have a very significant amount of assets in banks (29% of GDP), as shown in Figures 7.7 and 7.8.

Changes in Public Debt

At the same time, there have been substantial changes in public debt in the Region. As reviewed in Chapter 5, structural debt has come down since the early part of the decade but has stabilized around 42% of GDP for the typical country. The simple average of debt to GDP (measured at market exchange rates) is slightly lower at some 37%

FIGURE   7.7

External Assets
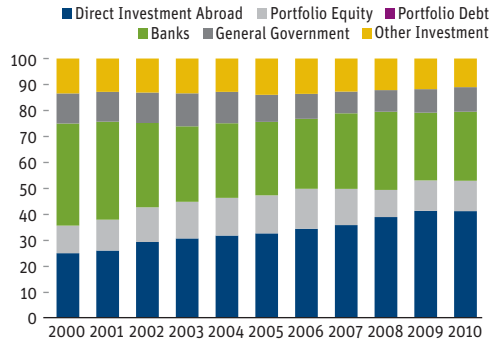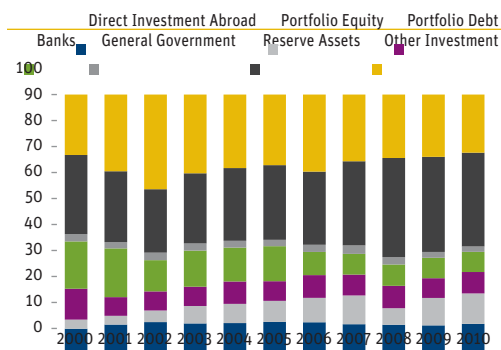
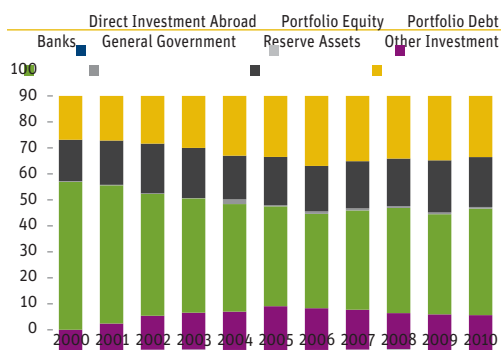Commodity Exporters (*percent shares*)

Source: IFS, IMF (2012) and Latin Macro Watch, IDB (2011).
Note: simple average across countries. Commodity exporters include:
Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay,
Peru, Uruguay and Venezuela.

FIGURE   7.8

Total External Assets

Commodity Importers (*percent shares*)

Source: IFS, IMF (2012) and Latin Macro Watch, IDB (2012).
Note: simple average across countries. Commodity importers include:
Costa Rica, Dominican Republic, El Salvador and Panama.

of GDP for 23 Latin American and Caribbean nations.[2] However, the structure and composition of debt have also changed significantly.

Consistent with the figures above, Latin America and the Caribbean's balance sheet indicates a reduction in external public debt and an increase in debt issued locally (Figure 7.9). This is more notable considering a weighted rather than a simple average, which shows external debt declining from about 50% in 2002 to some 16% by the end of 2010, strongly influenced by Brazil and Argentina. Following a similar trend, debt in local currency is also increasing, from some 51% in 2007 to 57% in 2010, according to a simple average. The Region had also improved the maturity structure of debt, although over the last few years the situation has become more complex. From 2007 to 2010, long-term debt has actually declined from 67% to 63% of the total for the average country, as has short-term debt (from 12% to 10%); medium-term debt, on the other hand, has risen from 20% to 26%. These changes in maturity are strongly linked to the changes in creditor composition. In 2002, almost 36% of debt of the typical country was owed to official creditors. However, by 2010, this had declined to 26%. Over the same period, market debt rose from 48% to 61% of total public sector debt (see Figure 7.10).

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[2] Debt refers to gross debt of central government. Simple average across the Region.

FIGURE ● 7.9

Debt Composition by Legislation
(percent shares)
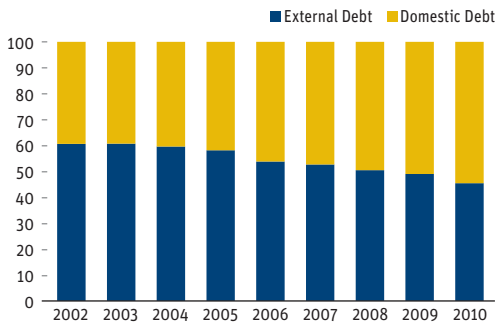
Source: IDB.
Note: Data refer to simple averages across countries.

FIGURE ● 7.10

Debt Composition by Creditor
(percent shares)
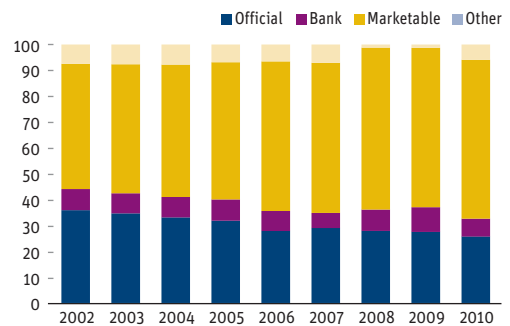
Source: IDB.
Note: Data refer to simple averages across countries.

Conclusions

Commodity exporters in the Region had reduced external vulnerability by cutting gross and net liabilities before the Great Recession. Moreover, their governments reduced vulnerability by boosting reserve assets and cutting government liabilities. After the crisis, the trend towards financial integration has resumed, with increases in the stock of FDI but also in the stock of portfolio debt and equity liabilities. This may be increasing vulnerability to a new shock. Commodity importers have quite different external balance sheets. They tend to be more substantial net debtors, although a large fraction of liabilities is in the form of FDI. At the same time, public sector debt composition has changed. External debt and debt in foreign currency has fallen, market debt has risen and debt owed to the official sector has declined. This implies that countries in the Region should have greater access to external borrowing and to official creditors if required.

Banking on Europe

A further source of potential vulnerability of Latin America and the Caribbean in the context of the current global economic problems is the role of foreign and in particular European banks in the Region. Foreign banks control majority market shares in several Latin American financial markets.[1] Foreign banks are important through a variety of mechanisms. They lend directly to the Region from abroad and intermediate funds within the Region, as well as assist in developing lending syndicates, underwriting, trading and brokering, and channeling foreign direct investment and other capital flows. European banks appear to have been particularly important in the market for trade credit in the Region.[2] Moreover, Latin American and Caribbean banks maintain close relations with foreign banks including European banks, and they have become more and more integrated into global banking and financial markets.[3] This chapter explores the links between European banks and Latin America and the Caribbean and assesses the Region's vulnerability to this particular transmission channel. Appendix K reviews the literature on the role of foreign banks in this regard.

The Composition of Foreign Bank Funding for Latin America and the Caribbean

Considering both cross-border and local lending from the subsidiaries of foreign banks in the Region in local currency, as of June 2011 world claims on Latin American and Caribbean countries (referred to as Foreign Claims by the BIS) amounted to almost $1.2 trillion or over 20% of the Region's GDP. As shown in Figure 8.1, Spanish

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[1] See, for example, the database on bank ownership developed by Claessens and van Horen (2012).
[2] See Chui et al. (2010).
[3] Galindo et al (2005)

FIGURE ● 8.1

Foreign Claims: Total Latin America and the Caribbean
(*22 countries*)

Legend: Spain, GIIP, Eurozone, Other Euro, UK, US, LAC, Offshore, Others

Values shown: 42%, 2%, 1%, 5%, 22%, 13%, 4%, 10%, 1%

Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012).

Foreign Claims of Reporting BIS Banks
(*as of 2011:Q2*)
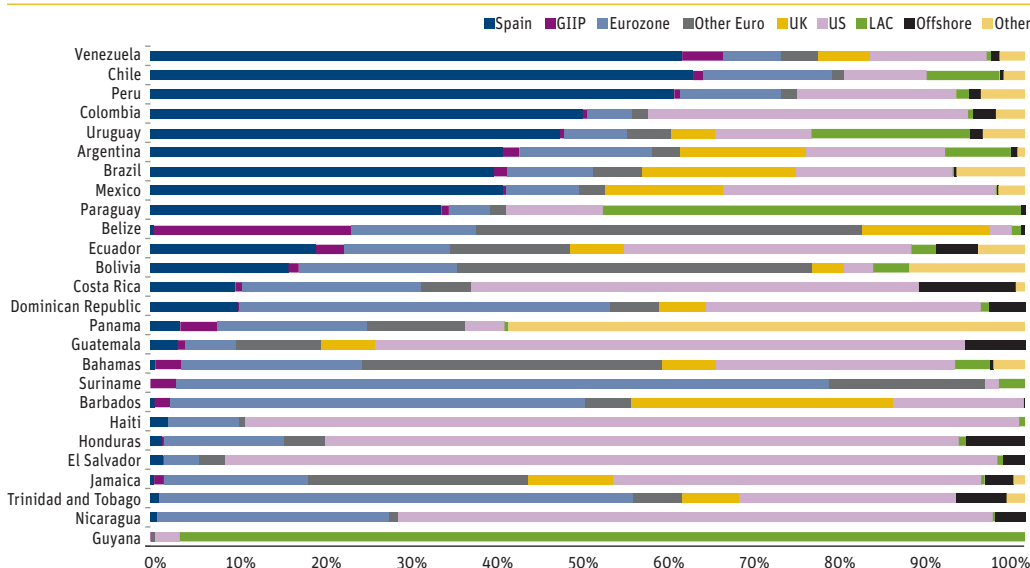
Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012).

banks are the most important source of international bank lending to the Region,[4] with some 42% of foreign claims. Banks from the US and the UK also hold a substantial share of total claims on the Region's economies. Claims from these countries increased substantially in the year to 2011:Q2, with growth rates over two digits. Banks from Greece, Italy, Ireland and Portugal (GIIP) are relatively unimportant for the Region as a whole and actually decreased over the year to 2011:Q2, possibly reflecting the strains on banks from this group.

The total for the Region masks significant heterogeneity. In Central America, US banks tend to have the highest proportion of foreign claims, in Bolivia, other Eurozone banks (i.e., those not from Spain or GIIP) have the largest share, and in the Caribbean, US and Canadian banks tend to be the most important (see Figure 8.2) However, Spain plus other GIIP claims account for more than 40% of total foreign claims in

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[4] Foreign claims reported to the BIS include direct cross-border lending by parent banks and lending by foreign affiliates in all currencies. This includes international banks' loans to banks in the host country that are not their subsidiaries or branches (such as loans, bank-to-bank credit lines, and trade-related credit) and loans to the non-financial and public sectors. These claims also cover portfolio flows (e.g., holdings of securities) and equity shares in unrelated institutions. See McGuire and Wooldridge (2005) for an explanation of the BIS banking statistics.

the largest economies in the Region, including Brazil, Mexico, Colombia, Argentina, Peru, and Chile.[5]

The available data suggest that most international lending is to the non-financial private sector (50%) and the public sector (40%). Cross-border interbank lending is relatively small, amounting to only 10% of total claims, suggesting that the Region's banks do not greatly rely on foreign claims.[6]

Is international lending important for the Region, and if so, what type?

Foreign Claims of Reporting BIS Banks as % of Total Bank Credit to Domestic Sector
(*2011:Q2*)

Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012) and IFS, IMF (2012).

Total foreign claims represent around 60% or more of total domestic credit for Chile, Guyana, Paraguay and Uruguay and more than 80% for Mexico and Peru. For Brazil the figure is lower but nonetheless significant at 20%. Considering only Spanish banks, international lending represents over 30% of total domestic credit for Chile, Mexico and Uruguay (see Figure 8.3).

However, the distinction between pure cross-border lending and lending by local affiliates is important because local claims funded domestically tend to be more stable than cross-border claims (see Appendix K for more details). In Brazil, Colombia, Chile, and Mexico the majority of total lending by foreign banks is by local affiliates in local currency. In contrast, in Central America and the Caribbean, international claims (cross-border claims in any currency plus local claims in foreign currency) account for most foreign claims (see Figure 8.4).[7] Cross-border claims (i.e., stripping out local claims in local currency) account for more than 20% of domestic credit

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[5] The case of Guyana, where Latin American banks have a large presence, is exceptional.

[6] For example, in Brazil and Mexico foreign claims on non-financial private firms represent over 50% of claims of Spanish and other European banks. According to data from 2011: Q2, claims on the public sector represent around 40% of total foreign claims. Kamil and Rai (2010) document a similar pattern in other countries in the Region.

[7] Note that the BIS consolidated statistics do not allow a separation of pure cross-border claims from foreign currency claims intermediated in host countries by foreign bank affiliates. Local claims in foreign currency are particularly important for dollarized economies such as Ecuador, El Salvador and Panama but they are also important in partially dollarized economies such as Peru and Uruguay.

FIGURE ● 8.4

Composition of Foreign Claims
(*as of 2011:Q2*)

Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012).

FIGURE ● 8.5

International Claims of Reporting BIS Banks as of 2011:Q2
(*as a percentage of bank credit to domestic sector*)

Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012) and IFS, IMF (2012).

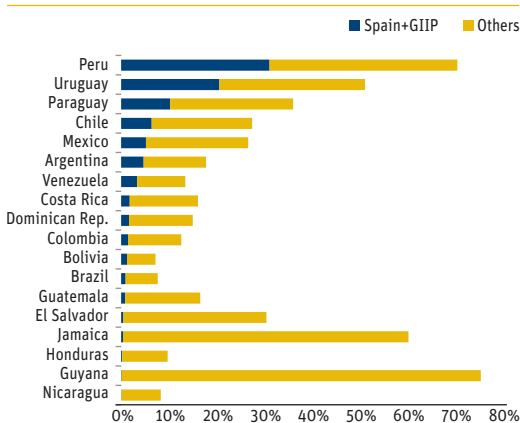for El Salvador, Jamaica, Guyana, Peru, Uruguay, Paraguay, Chile and Mexico (see Figure 8.5).[8] However, these statistics include locally funded dollar lending, which important for dollarized countries.

Even though local claims in local currency may be a large share of total foreign claims, this does not imply that the Region is invulnerable. First, the evidence suggests that both local and cross-border claims are affected by the health of parent institutions. This is only natural if the parent has to increase capital ratios on a consolidated basis—even if it is 100% locally funded. Second, if banks come under intense pressure at home, they may be tempted to share liquidity from other markets. Third, there is already significant evidence of asset sales by European financial institutions, reversing the trend of net purchases in recent years. In the review in Appendix K, it is suggested that these sales may disrupt relationships and, if only limited funds are available, push down asset prices (see Figure 8.6). Finally, there is already evidence of a tightening in credit conditions and in particular a sharp reduction in trade financing through syndicated lending, which is reviewed in the next section.[9]

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[8] Note that cross-border claims here include claims from other Latin American countries, which are particularly important for Guyana and Paraguay.

[9] The January 2011 Emerging Markets Bank Lending Conditions Survey of the Institute of International Finance (IIF), which includes nineteen banks from the Region, indicates the developing spillovers from Europe. A majority (74%) of banks reported a tightening in access to international funding. Banks in the Region reported a tightening in their supply of trade finance.

The Region's European Bank Vulnerabilities: Evidence from the Syndicated Loan Market

The syndicated loan market grew to represent over US$93 billion of lending to Latin America and the Caribbean by 2006. The global crisis had a major impact on this market, and syndicated lending fell to a low of about US$78 billion in 2008. The market has not recovered since (see Figure 8.7). Apart from being a significant source of funding, there is evidence that the syndicated loan data, which are available on a timely basis, predict movements in overall bank lending.[10]

Both Eurozone and non-Eurozone banks are significant actors in this market. In 2011, 53% of the Region's total syndicated lending came from banks based in Europe (41% when the UK is excluded). US-based banks are also important players, originating 20% of syndicated lending in the same year. Notably, Spanish and French banks have dominated syndicated trade financing in Latin America, with a combined market share of more than 40% of total bank-intermediated trade credit in 2011.[11]

Virtually all the key international banks in the syndicated loan market have seen their CDS spreads rise markedly,

Financial Mergers and Acquisitions Where Target Is in The Region
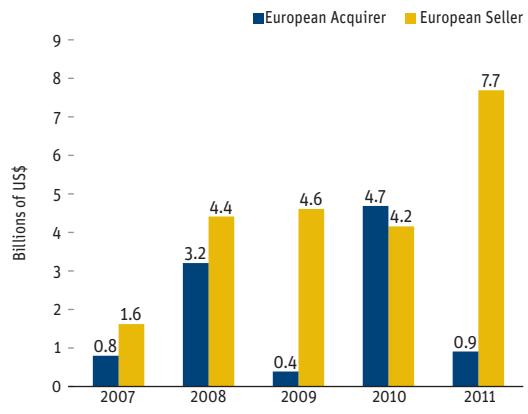
Source: Mergers and Acquisitions, Bloomberg (2012).

Value of Syndicated Lending to the Region from International Banks
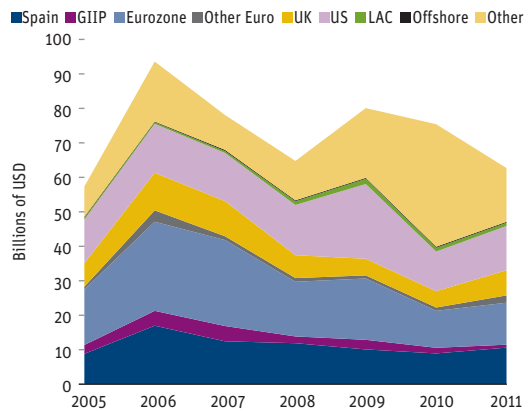
Source: Loans Analytics, Dealogic (2012).

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[10] Gadanecz and von Kleist (2002) argue that syndicated loans predict consolidated claims as published by the BIS.

[11] According to the sixth IMF/BAFT-IFSA Trade Finance Survey (gathered in August 2011), 47% percent of trade finance in 2010–2011 was intermediated by banks, with the rest divided evenly between open account and cash-in-advance transactions.

Credit Default Swap Rates for Key Banks
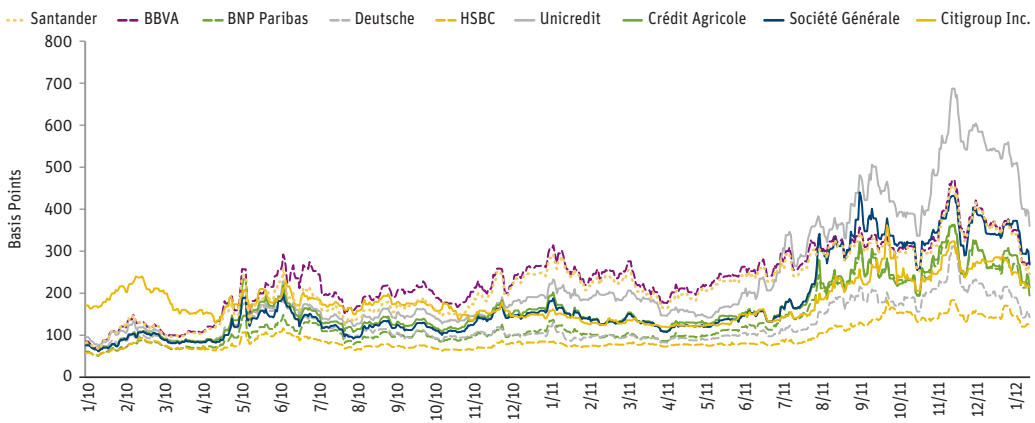
Source: Bloomberg (2012).

Origin of Syndicated Trade Finance in Latin America and the Caribbean, 2011
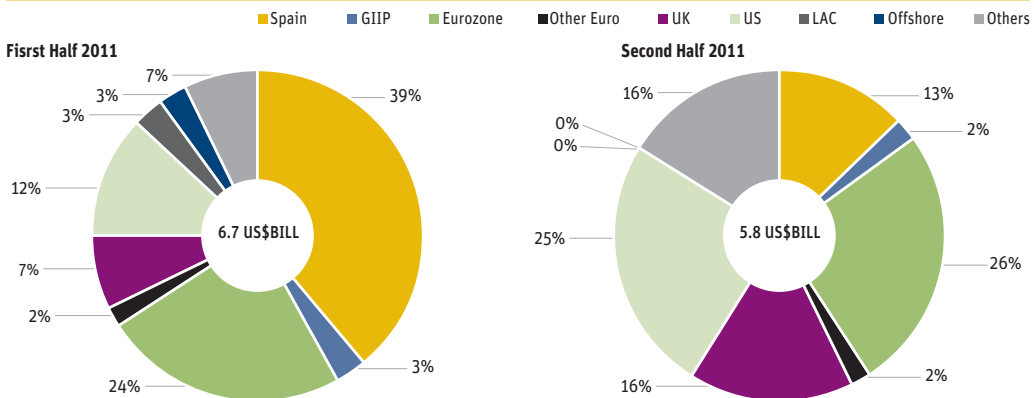
Source: Loans Analytics, Dealogic (2012).

particularly those from the Eurozone, as shown in Figure 8.8.[12] While the market for overall syndicated lending has remained stable thus far, there has been a sharp reduction in syndicated lending for trade finance.[13] The market fell from US$6.7 billion in the first half of 2011 to just US$5.8 billion in the second half of the year (see Figure 8.9).

[12] Figure shows CDS of senior debt for selected banks reported in Euromoney's Trade Finance Survey 2012 as the best trade finance providers globally and in LAC. The figure also includes banks important for trade finance by value, as reported by bank-intermediated trade finance in Dealogic Loan Analytics.
[13] This is actually quite surprising, as Chui et al. (2010) report econometric evidence that an increase in CDS spreads of 100 basis points leads to a loan supply reduction of 13% in the following quarter.

Moreover, the market share of European banks diminished substantially, particularly that of Italian and Spanish banks, while the market share of US banks and banks from other regions increased.[14]

While syndicated finance for trade has decreased, so has trade itself, particularly for emerging economies. Moreover, the Baltic Dry Index (a measure of the cost of reserving space on cargo vessels) is at levels only previously seen at the worst of the 2008 crisis.[15] The credit crunch in Europe is likely affecting both the demand for trade, as well as affecting the supply of trade finance; it is difficult to be certain whether supply or demand is the main driving force.

The Region's exposure to a global credit crunch: A network approach

Financial markets, including the market for global banking, have become highly integrated, and one way to consider this integration is in the form of a network. Recent research, particularly since the recent global crisis, has focused on the banking network and used this analogy to locate vulnerabilities. Haldane (2009), for example, argues that the banking network is both robust (to a problem of a bank in the periphery of the network) but also highly fragile if there is a problem at its core. Latin America is largely on the periphery of the global banking network, but it has significant links to Spain, the UK, the US and other European countries (see Figure 8.10).[16]

Given that the epicenter of the current crisis is in nations on the periphery of the Eurozone, a natural concern is the direct links to banks from those countries as reviewed above. However, as discussed in Appendix K, common lender effects have also been shown to be important; in other words, there may be vulnerabilities as the Region has links to banks from other countries that are exposed to countries in Europe's periphery. The foreign claims of banks from Germany, France, the Netherlands, Switzerland and Austria on the European periphery nations (Greece, Italy, Ireland, Portugal and Spain) represent over 100% of their capital. Claims of Japanese banks

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[14] Other Regions includes loans from banks in Asia, Africa, Australia and Canada, and also includes international organizations.

[15] The Baltic Dry Index (formerly, the Baltic Freight Index) is a composite of the Baltic Capesize, Panamax, Handysize and Supramax indices. This index may be affected by other factors such as a large increase in the supply of ships.

[16] The figure is constructed using BIS data on consolidated bank claims on an immediate borrower basis. The size of the nodes outside the Region is proportional to the share of world's claims on Latin American and Caribbean countries (excluding offshore financial centers of the Caribbean), highlighting the most important lenders to the region. The size of the nodes of countries in the Region is proportional to the share of foreign claims on total domestic credit, highlighting which countries are more dependent on foreign banks. The size of the linkage between node i and node j is proportional to the ratio of foreign claims of i's banks on country j to the capital of i's banks, thus highlighting the exposure of countries to their counterparties.

Latin America and the Caribbean in the Global Banking Network
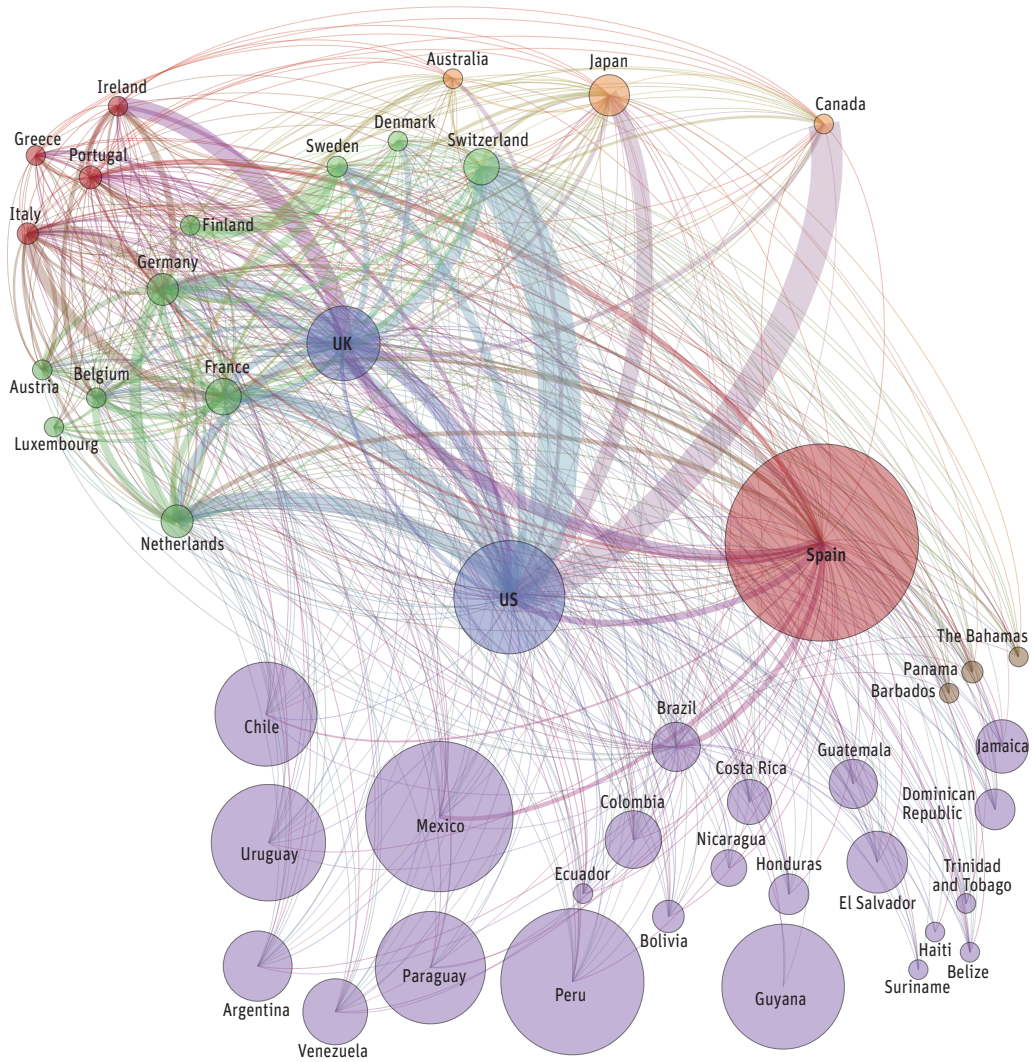
Source: Foreign claims data are taken from the BIS Consolidated Banking Statistics as of June 2011, and Capital is taken from the IMF's survey of Financial Soundness Indicators (IMF-FSI). Banks' capital is the latest available data and is defined in terms of Tier 1 capital, total regulatory capital, and capital and reserves. Latest available data for each country are as follows: Austria (2011:Q2), France (2010:Q4), Germany (2011:Q2), Netherlands (2010:Q3), Switzerland (2010:Q4), Japan (2011:Q1), United Kingdom (2011:Q2), and United States (2011:Q1).).

on the same group represented 16% of their capital, while for UK banks this figure is 51% and for US banks the ratio is 13%. But vulnerabilities do not stop there. Given the interconnectedness of the international finance network, there may be vulnerabilities from banks that have lent to banks that have lent to Europe's periphery and so on.

One way to gauge the Region's exposure to a credit crunch triggered by a European crisis is to construct an indicator of exposure considering features of the network of international bank lending. An index is presented below with three components: i) direct exposure to a credit squeeze of lending from banks from the European periphery (considered here as Spain plus Italy, Portugal, Ireland and Greece or SIPIG), normalized by the importance of these foreign claims on total domestic credit; ii) indirect exposure from non-SIPIG banks that are greatly exposed to SIPIG (normalized by capital of those banking systems); and iii) indirect exposure from non-SIPIG banks that are exposed to countries that are themselves exposed to SIPIG (again normalized by the capital of these banks). The methodology is detailed in Appendix J.

FIGURE ● 8.11

Direct and Indirect Exposure to SIGIP Banks

■ Direct exposure ■ Indirect exposure 1 ▪ Indirect exposure 2
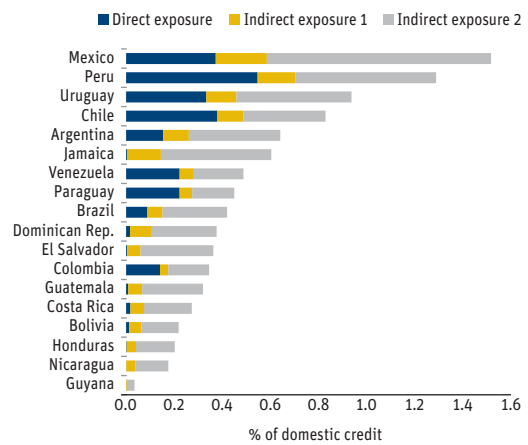
Source: Consolidated Banking Statistics (immediate borrower basis); BIS (2012); IFS, IMF (2012); FSI, IMF (2012) and author's calculations.
Note: See Appendix J for methodology.

Interestingly, while Peru and Chile have the most significant direct exposure, Mexico appears to be more vulnerable when indirect exposures are taken into account (see Figure 8.11). Moreover, while other countries such as Brazil appear to have very little direct exposure to the European periphery (about 5% of domestic credit), when indirect links are considered, total exposure rises considerably.

Conclusion

Latin America and the Caribbean is integrated into global finance, including international banking. Moreover, foreign bank affiliates are important in the Region for domestic financial intermediation, particularly subsidiaries of Spanish and some other European banks. Foreign banks have heightened competition and enhanced efficiency but these links also raise a question regarding vulnerabilities to the economic difficulties in Europe.

Under the benchmark scenario outlined in Chapter 2, it seems likely that the Region will escape relatively unharmed. In this scenario Europe faces only a mild recession and is seen to recover quite quickly. This implies that the process of European bank deleveraging must be fairly close to completion and that there will be less pressure to contain loan growth in the Region as well as less pressure for further asset sales. It would thus be hoped that strains in trade credit financing would also then ease through 2012.

If the situation in Europe worsens, however, it is difficult to see the Region escaping so lightly. Under a scenario of a crisis in Europe, further sovereign downgrades, and a fall in GDP of similar proportions to that after the Lehman crisis, European banks will be placed under renewed pressure. If capital ratio targets are maintained, then deleveraging will be more persistent. The implications for the Region go beyond the modeling exercise contemplated in Chapter 2.

What can be done in the face of these risks? If the situation in Europe worsens, the Region's authorities may wish to monitor liquidity to ensure there is no disruption to the workings of local financial markets. Moreover, corporate governance rules may highlight the appropriate management of banks independent of their ownership structures. As discussed, it is likely that asset sales will accelerate. Many such operations require regulatory approvals, and it may take time to find buyers. Authorities in the Region may wish to ensure affected institutions are in a position to sell assets smoothly if needed.

Conclusions and Recommendations

This report details the divergent paths that the world economy may take and the potential effects on Latin America and the Caribbean. Scenarios are constructed employing a modeling exercise that captures trade, financial and other linkages between the Region and the rest of the world. While vulnerabilities remain and external shocks have been and remain critical, the Region has a distinct set of strengths and has developed a growing array of policy tools. A balance of the vulnerabilities and strengths is detailed below, followed by a series of recommendations addressing either the vulnerabilities identified or ways to improve existing policy tools.

Vulnerabilities

Due to high prices and positive supply responses, the Region has become increasingly commodity-dependent of late. While this development has increased producers' export earnings, it also raises risks. As noted in Chapter 5, assumptions regarding the structural prices for commodities imply significant changes in structural deficit calculations. Metals prices in particular are vulnerable to a slowdown in China and to a fall in China's rate of investment. Grain prices may also decline, although risks here appear more contained given more permanent changes in the Chinese economy.

The Region is additionally vulnerable for having been the recipient of a large influx of capital. Emerging economies have suffered either a banking crisis or a recession in about 50% of cases of such capital inflow surges. Given the nature of the latest inflow surge, particularly the proportion of portfolio and banking flows, there may yet be latent risks. If a negative shock hits the Region, then growth and credit growth will surely abate, and it is only when banks' balance sheets cease to expand rapidly that the full extent of the capital inflow and credit boom's after-effects will be known.

Although fiscal policy was used effectively during the recent global economic crisis, for perhaps the first time in the Region's recent history with such downturns, some fiscal stimulus measures remain in place. Structural fiscal deficits have therefore grown, and fiscal credibility may have been somewhat eroded. Although structural

debt fell in recent decades, it has since stabilized at around 42% of GDP for the last few years. The Region is consequently less prepared to respond to a negative shock with countercyclical fiscal policy than it was before the Great Recession.

The vast majority of countries in the Region (across quite different monetary and exchange rate regimes), have maintained stable money growth and have been able to contain inflation despite strong exogenous shocks. The Region as a whole continues to transition towards inflation targeting, and countries with inflation targeting regimes used interest rates and direct (or non-conventional) policies in a variety of ways during the crisis. In the event of a large negative shock, however, inflation targeters may have only limited space to employ interest rate policies.

The Region maintains strong links to international banks and especially to European institutions. If the European crisis deepens this may be a source of vulnerability as a result of direct or indirect channels. Direct channels include pure cross-border lending and the presence of European banks in the Region. While most such banks are fully funded domestically, the process of deleveraging in Europe may still have significant impacts, potentially restricting capital and hence lending. Deleveraging has additionally promoted asset sales, and—if funds to buy assets are limited or sales imply the break-up of relationships—may lead to deleterious effects. Moreover, if the European crisis deepens, tensions may rise within the corporate governance of international banks and between home and host supervisors. In some cases however, indirect exposures may be even more important than those through direct links. The network of international banking is complex, and exposures may result not only from direct lending relationships but also through relations to banks that have lent to affected countries or institutions.

Strengths

While large capital inflows have increased potential risks, financial supervision in the Region has improved, and countries have employed a set of macro-prudential tools that have surely reduced the risk of a crisis. The use of those tools, moreover, has been a learning experience, and the lessons learned will be useful to the Region going forward.

The same can be said for fiscal policy. While structural deficits have increased, implementing countercyclical fiscal stimulus has been a process of trial and error for the Region, and the remaining fiscal space for countercyclical actions varies across countries. The experience of the previous downturn, however, will assist the Region in selecting the most effective policies given the more limited space.

Balance sheets in Latin America and the Caribbean overall have improved. Net liabilities fell, in particular those of commodity exporters, including the larger economies of the Region, although more recently the stock of portfolio debt and equity liabilities

have risen. International reserves have grown. Moreover, the composition of public sector debt has changed. In general there is a greater share of domestic debt issued in local currency; the public sector balance sheet has improved.

Finally, many countries in the Region have displayed greater exchange rate flexibility, perhaps in part as monetary credibility has increased and dollarization declined. Moreover, countries in the Region have greater reserves and an array of direct or non-conventional monetary policies as part of their tool kit to respond to negative shocks.

Policy Recommendations

- Commodity dependency has risen in the Region, and commodity-dependent countries should actively manage this dependency. Commodity prices are likely to fall as China and the world slow, although metals may fall by a much greater amount than grains. However, there remains significant uncertainty regarding future outcomes. Countries should be considering how best to insure against these risks in the short term, perhaps employing financial hedging instruments, and how to adjust to lower prices in the medium term.

- A number of commodity importers, most located in Central America and the Caribbean, will benefit from any falls in commodity prices. While many will be affected less by the negative scenarios outlined in this report, if the epicenter of a future crisis is Europe and not the United States, they start from weaker positions. Moreover, several countries in this category have limited or no exchange rate flexibility and have limited fiscal space to respond with countercyclical policy. In the face of a negative shock, countries in this position may wish to consider fiscal stimulus as space allows while at the same time committing to future fiscal reform and adjustment, enhancing the credibility of such a plan through an agreement with the IMF. Some may also wish to consider an ex ante agreement along these lines as insurance in case such a downturn occurs.

- More generally, several countries in the Region implemented effective fiscal policy during the Great Recession, although in some cases policies have not been fully reversed during the recovery. In the event of a new downturn, countries should consider carefully designing fiscal stimulus packages to ensure that the measures implemented can readily be reversed in the event of a temporary negative shock.

- The Region now includes nine countries with inflation targeting, including two countries transitioning to that regime. Inflation targeters have used both interest rates and more direct monetary policy tools. At times these policies have been used as substitutes, responding in different ways to different types of shocks, and at times they have been used as complements; direct tools may speed up

transmission mechanisms of monetary policy or may make monetary policy more effective. Inflation targeting is in part based on effective communication with the private sector so that actors incorporate likely policy actions into their expectations, thus increasing the credibility of the nominal anchor adopted. However, this only works if objectives and instruments and the links between them are well understood. More work may be required to communicate the respective circumstances under which direct tools and interest rates will be employed and how their use relates to the objectives of the monetary authority.

- Although a number of countries in the Region have experienced large capital inflows and strong credit growth, at the same time prudential measures have been strengthened, decreasing the likelihood that latent risks in financial systems will develop into more serious problems. This experience underlines the importance of taking strong measures to lean against the wind in boom times. Now, as credit growth abates, authorities may wish to monitor the quality of banks' and other financial institutions' lending portfolios to be able to take prompt action if any problems do emerge.

- The Region is host to a set of international banks including European institutions that are currently undergoing a process of deleveraging. While such institutions are largely run as independent subsidiaries in the Region, it is advisable to develop rules that highlight appropriate corporate governance of domestic banks irrespective of their ownership structures. Authorities may wish to monitor liquidity to ensure there is no disruption to local markets if the situation deteriorates. While current capital levels appear healthy, as deleveraging continues there may be lending restrictions and further asset sales. Such sales require identifying potential eligible purchasers, and many regulatory approvals, and it will be important to ensure that that these transactions produce only minimal disruption to lender-borrower relations. Authorities in the Region may wish to take preemptive action to identify potential purchasers. They may additionally wish to smooth processes for regulatory approvals and influence the nature of those transactions to minimize information destruction.

- Apart from Spain, countries in Europe's periphery provide little direct lending to the Region. However, indirect exposures through the global banking network may be important. This calls for a high level of international cooperation to understand the nature of these risks and be in a position to take cooperative action to address them. European banks are also important in particular markets including trade finance. Latin American and Caribbean authorities may wish to consider specific actions in those areas where European banks' activities are focused in order to ensure that those markets continue to operate smoothly in the event of a negative shock.

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Appendices

Diversified Channels of Transmission

The following table illustrates the various transmission channels whereby the global shocks modeled may impact Latin America and the Caribbean. The figures highlight the diversification of countries across these different channels.

TABLE • A.1

Diversified Channels of Transmission

	Share of exports to Europe (Average 2007–10)	Share of commodity exports (Average 2007–10)	Share of population emigrated to Europe (Average 1995–2007)	Remittances to GDP (Average 2007–10)	Share of European bank claims in domestic banks claims
Argentina	17.8	45.7	6.3	0.2	na
Bolivia	8.2	81.6	22.4	6.6	1.9
Brazil	23.2	41.4	1.5	0.3	10.8
Chile	21.0	37.9	4.4	0.0	50.4
Colombia	13.7	56.5	6.8	1.9	15.0
Costa Rica	17.4	24.5	1.7	2.0	4.8
Ecuador	13.1	77.6	30.8	5.9	3.8
El Salvador	5.8	7.7	1.2	16.8	1.2
Guatemala	5.6	35.8	0.5	11.1	1.3
Haiti	na		1.5	19.5	0.3
Honduras	19.7	55.5	2.1	18.9	1.2
Mexico	5.3	17.7	0.8	2.5	43.1
Nicaragua	11.5	59.9	1.5	12.9	0.5
Panama	3.4	7.0	1.0	0.8	na
Paraguay	8.4	75.6	8.7	3.2	28.1
Peru	17.3	54.4	6.4	1.8	na
Dominican Republic	12.8	9.2	11.4	7.4	7.0
Uruguay	17.7	56.1	17.3	na	27.5
Venezuela	na	74.0	4.8	0.0	na
Average	**13.1**	**45.5**	**7.2**	**5.4**	**5.4**

Source: Cepal (2011), BIS (2011) and IFS (2011).

Modeling Methodology and Data

To simulate the scenario summarized in Chapter 2, a Global Vector Auto Regression model (GVAR) is employed. A GVAR is a dynamic econometric model that facilitates the analysis of the international transmission of shocks, taking into account the interdependence among many countries. The GVAR 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). 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 prede-termined (i.e., not estimated) cross-country linkages based on trade shares.[1]

The model is estimated over the period 1979 Q4 to 2011 Q2 and hence may be considered a summary of relevant links and feedbacks between the economic and financial variables included in the model over that period. Apart from the shocks to European and Chinese GDP and to European and US equity markets, all other variables including growth rates elsewhere in the world and the subsequent growth in the US and in Europe, exchange rates and short-term and long-term interest rates are determined by their endogenous responses.

To simulate the scenario in the report, the Generalized Impulse Responses (GIRFs) to a cocktail of one-period shocks were computed and appended to the baseline projection. Unlike traditional impulse responses, GIRFs take into account the possibility that the error terms in the equations of the model are contemporaneously correlated. The simulated scenario therefore takes into account the general equilibrium interaction between the variables in the model. By assumption, the scenario unfolds in the first quarter of 2012 and then winds down according to the average degree of persistence in the data. Because the GVAR model is quarterly while the baseline projections are annual, the GIRFs are aggregated at annual frequency.[2] Regional and global variables are constructed by using PPP-GDP weights, considering all countries in GVAR model.

The GVAR model includes 26 country-specific models, including all major advanced and emerging economies in the world, accounting for about 90% of world GDP. The Latin America and the Caribbean region is represented by five of the largest economies in the Region (Argentina, Brazil, Chile, Peru, and Mexico). The Eurozone is made up of its eight largest economies: Germany, France, Italy, Spain, Netherlands, Belgium, Austria and Finland.[3] The data sources are described in Cesa-Bianchi, Pesaran, Rebucci, and Xu (2012).

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[1] Please refer to Cesa-Bianchi, Pesaran, Rebucci, and Xu (2012) for further details on GVAR modeling and for the model developed and employed here.
[2] GIRFs are accumulated, so we take their first differences.
[3] The time series data for the euro area are constructed as weighted averages using Purchasing Power Parity GDP weights, averaged over the 2006–2008 period.

The impact of the first scenario across countries in each group is estimated in a second stage of the modeling exercise. The annual rate of growth of the twenty-six borrowing countries of the IDB is regressed on its own lag and the contemporaneous values of US, Eurozone, and Chinese growth.[4] The three groups in Table 2.1 are then created by classifying countries according to the statistical significance of the relevant coefficients. For example, if a particular country's growth rate is statistically related to Chinese growth only, it would be in the China-dependent group. Finally, individual countries' exposures are calculated projecting country growth rates from 2012 to 2016 on the scenarios for US, Eurozone and China growth from the GVAR model. Similar results are obtained if only world growth is used to project country growth rates.[5] One way to interpret the procedure used to investigate country exposures by group is a conditional forecast based on a three-factor model, with US, Eurozone, and Chinese growth as the three factors.

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[4] These regressions typically have at least one variable that is statistically significant and an R^2 above 0.2.
[5] Adding commodity prices or financial variables typically lead to interpretable but not statistically significant loadings in the growth regressions.

A Brief Review of Commodity Price Behavior

Commodity[1] price behavior is particularly difficult to characterize.[2] Prices are volatile and shocks are persistent. Long time series reveal cycles, with sharp peaks and longer valleys, as shown in Figure C.1, which graphs real sugar prices from 1840 to 2010. While tests indeed indicate cycles and persistence, even with this long time series a precise characterization is difficult to determine accurately.[3] [4]
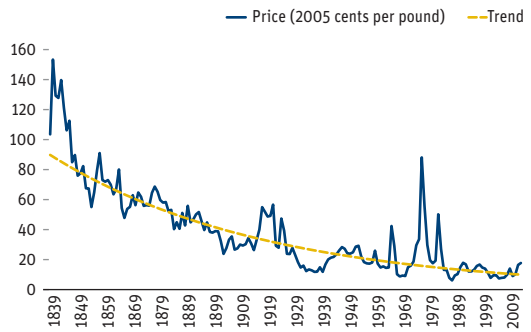
Milestones in the theory of commodity price behavior include Hotelling (1931), Samuelson (1957) and Gustafson (1958). Gustafson was the first to develop a model of intermittent commodity production (e.g.,

FIGURE ● C.1

The Real Sugar Price (1840–2010)

— Price (2005 cents per pound) – –Trend

Source: IMF, International Financial Statistics Pre (1948), N Deerr (1950).

annual harvests) in which storage decisions are based on economic return calculations. A complication is that whether it is profitable to store today for next year depends on the expectation that storage will be profitable from next year to the following year, and so on. Williams and Wright (1991) and Deaton and Laroque (1992) independently generalized Gustafson's model, providing elegant solutions to this dynamic programming problem.

Deaton and Laroque (1992, 1995) provided simulated price paths for commodities that exhibit sharp peaks and more persistent valleys. When the availability (the amount stored from the previous year plus this year's production) of the commodity is low, prices rise quite dramatically, and price peaks occur when essentially all availability is consumed. Hence volatility is higher at higher price levels. At the other extreme, when there is ample availability, prices are low and persistent, akin to a random walk.[5]

Commodities might be thought of in terms of their perishability, which affects storage costs. At one extreme, gold hardly deteriorates, and its prices behave like financial assets—essentially

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[1] Commodities include agricultural products with annual crop cycles, tree crops such as cocoa, coffee and sugar (with multi-annual crop cycles), metals and oil and associated products. More recently other products have been "commoditized" (implying that a standard has been created), including electricity and houses.

[2] A product is normally considered a commodity if: a) a homogenous standard grade or quality can be defined; there is a relatively high value-to-weight ratio; there is relatively free trade without tariff or quota provisions (so all producers and consumers face approximately the same prices) and there is trading on a commodity futures markets (where price discovery normally occurs).

[3] This figure and this review is based on Gilbert, Powell and Mu (forthcoming).

[4] Tests reveal two cycles (one at 6 and one at 26 years), with a persistent autoregressive (AR) process and a stochastic trend. However, some variation in the exact specification cannot be rejected statistically.

[5] The term "random walk" is used as shorthand. A Martingale process is a more accurate description.

a random walk. On the other hand, for perishable agricultural goods this year's harvest may vary in quality from and even be considered a different product than last year's. These goods are thus susceptible to more frequent stock-outs and price peaks. Oil tends to be somewhere in the middle, as storage is costly in terms of infrastructure requirements and environmental risks and both demand and supply shocks can be significant.

Deaton and Laroque (1992, 1995) assumed deterministic (known) demand and uncertain supply; the advance in the latter work advanced the model by being the introduction of correlated supply shocks. In fact the model can be switched to have known supply and uncertainty in demand, which again may be correlated over time. Dvir and Rogoff (2010) solve such a model and apply the results to the oil market, employing the approach to characterize different "epochs" of oil. However, while such approaches appear to capture some features of the nature of commodity prices, they do not capture longer cycles, nor do they capture all of the persistence, especially within commodity booms.

One of the features lacking in these models is investment. Consumption and production of most commodities grow together over time and do so as a result of investment.[6] The investment and production cost data needed to analyze this process, however, are generally lacking. Moreover, no model to date has integrated investment into a Deaton and Laroque approach.[7] One idea is to assume a specific "time to build," thus limiting the horizon of producers. This then captures growing production and consumption and also yields sharp price peaks when several demand shocks hit, followed by a crash when stocks have been rebuilt.

Recently there has been much discussion regarding the "financialization" of commodity markets, in particular the strong growth in commodity funds, and whether their actions have increased price levels or volatility.[8] There is conflicting evidence of an impact of commodity index funds on the level of prices, while stronger evidence suggests commodity index funds may affect volatility.[9]

This short review of commodity price theory helps to put in context the longer history of commodity prices. Grilli and Yang (1988) provide consistent data for a broad commodity index, updated by Pfaffenzeller, Newbold and Rayner (2007) and the subject of much econometric analysis. The series illustrates that commodity prices have declined over the long term in relation to manufactured goods unit values (MUVs), but this decline has been punctuated by significant booms and busts. The famous Prebisch-Singer hypothesis maintains that real commodity prices follow a declining trend. Powell (1991) argues that in fact real commodity prices are stationary but that, over the 100 years or so of the original GY series, there were three negative structural breaks. The breaks all followed significant booms, particularly the boom of 1920/21 and the

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[6] In fact, Dvir and Rogoff (2010) relax the usual stationarity assumption regarding production and consumption.

[7] Adding investment increases the dimensionality of the state space complicating the solultion to the dynamic programming problem

[8] Financialization is used here to refer to the growth of commodity funds and in particular index investment funds, which tend to take long positions on indices for medium time horizons. This is to be distinguished from financial speculation, which refers to shorter-term speculative positions that may be either long or short.

[9] Sanders and Irwin (2010, 2011a, 2011b) find no evidence that funds affect prices while Gilbert (2010a, 2010b) and Gilbert and Pfuderer (2012) take the opposite view. Gilbert and Pfuderer (2012) and Gilbert (2012) argue funds reduce volatility.

FIGURE ● C.2

One Hundred Ten Years of Real Commodity Prices
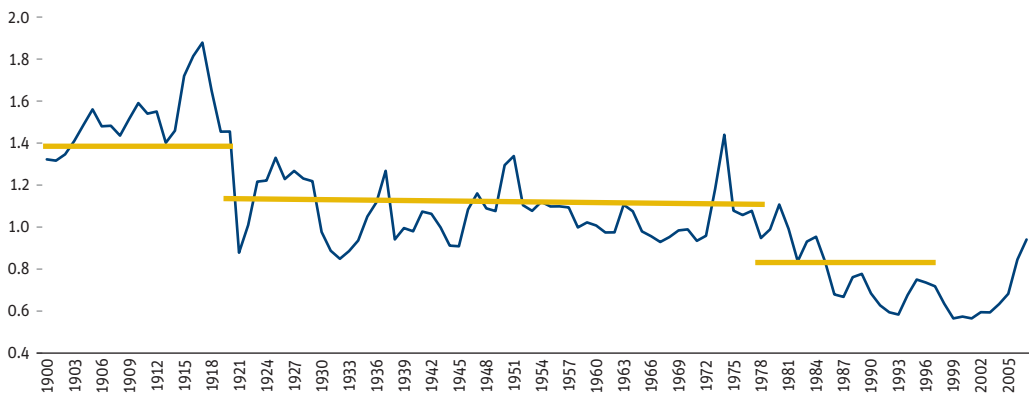
Source: Updated Grilli and Yang Index deflated by Manufacturing Export Unit Values.

boom of 1973/4. A hypothesis is that investment in supply (and perhaps in demand substitution) occurred in the boom that led to a reduction in production costs thereafter. Recent papers continue to discuss the merits of these and other alternative hypotheses.[10]

Consistent with the theoretical models above, empirical models of commodity markets in the short to medium term typically relate prices to stocks, at least in those markets in which stocks are measured reasonably accurately. Often, stocks enter the price relationship in a non-linear manner so that any given shock will have a larger price impact in a tight market relative to one which is well-supplied. Changes in stocks result from imbalances between consumption and production levels. Since commodity consumption depends on macroeconomic variables, including consumption, industrial production and investment, commodity models need to be developed in conjunction with a model of the world economy. The models employed in Chapter 3 to analyze copper and grains are developed in this spirit.

[10] See for example Cashin and McDermott (2002).

A Review of the Implications of Capital Inflow Surges

While strong capital inflows fuel growth and development, their links with macroeconomic and financial instability have long provoked discussion (see, for example, Díaz-Alejandro, 1985).[1] From the macroeconomic perspective, the literature has emphasized that surges in inflows are associated with real exchange rate appreciation and potential Dutch Disease.[2] In assessing the impact of capital inflows it is important to distinguish between gross and net inflows. Net inflows may be more important for macroeconomic analysis, but gross inflows are likely to be more relevant for financial intermediation.[3] A main concern for financial stability stems from upward pressure on asset prices, potential asset price bubbles and the possibility of lending booms. If credit growth is too fast, banks may reduce their effort in reviewing the quality of each borrower, leading to potential problems when the credit boom has passed. Four issues related to capital inflow booms are discussed further below: real exchange rate appreciation, asset price bubbles, lending booms and (subsequent) banking sector instability.

Appreciation of the Real Exchange Rate

Strong appreciations of the real exchange rate, even if temporary, may lead to persistent and costly effects. Most notably, the Dutch Disease literature has focused on the costs in terms of the loss in competitiveness of manufacturing and especially high value-added goods.[4] As such goods require specific skills and there may be significant learning required for successful production and exporting, if this sector suffers due to real exchange rate appreciations it may be very costly to recover. The effects are apparent in terms of both higher unemployment and a "commoditization" of the economy. Losing more sophisticated sectors may have many negative externalities, prompt the migration of skilled workers and even feed down to education.[5] Moreover, it has been suggested that "countries become what they export" or, in other words, countries that export more sophisticated products become richer.[6] In such a world the costs of Dutch Disease may be higher than even the original literature has suggested.

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[1] More recently, some authors argue that current account deficits, and the concomitant net capital inflows, were at the roots of the financial crisis of 2007–2008 in the US; see Portes (2009) and Reinhart and Rogoff (2009, Chapter 13).

[2] Dutch Disease refers to the effects of the economic boom in Holland that resulted from a large find of natural gas in the North Sea in the 1950s. This provoked strong export earnings, an appreciation of the real exchange rate and the loss in competitiveness of other exports. Once the boom was over, the country was then left with reduced commodity exports, reduced manufacturing and soaring unemployment. While Dutch Disease was thus originally related to commodity windfalls, similar effects have been argued in relation to capital inflows.

[3] We are indebted to Steve Ceccetti, Chief Economist at the BIS, for discussions on this point.

[4] See Corden (1984) for a classic reference on Dutch Disease.

[5] See Hidalgo et al. (2007)

[6] Hausman et al. (2005)

There is evidence that capital inflow surges are indeed associated with real appreciations.[7] Inflows tend to increase local absorption and increased expenditure on non-traded goods, pushing up their relative prices. Moreover, Latin America and the Caribbean appears to be more vulnerable than other regions, perhaps in part because inflows have tended to fuel larger increases in consumption relative to investment (see Athukorala and Rajapatirana, 2003, and Calvo et al., 1994). Moreover, Reinhart and Reinhart (2009) document that fiscal expansion is common during inflow surges across developing countries, exacerbating real appreciations, and there is evidence that Latin America's fiscal expenditures are more procyclical than those of other regions.[8] Chapter 5 of this report considers whether the procyclicality of fiscal expenditures in the Region has diminished. The type of capital inflow also matters: foreign direct investment is generally targeted to investment projects, while debt and short-term inflows are more likely to finance consumption (both public and private). Combes et al. (2011) estimate that portfolio investment flows have the largest appreciation effect on the exchange rate, some seven times greater than that of FDI or banking flows.[9]

Asset Price Rises

Calvo (2009) offers an explanation of how capital inflow episodes enhance the liquidity of assets and hence facilitate asset price bubbles. Asset price rises including asset "bubbles" are potentially dangerous for a number of reasons.[10] First, if prices diverge from fundamentals these "bubbles" may lead to changes in investments and other actions leading to a misallocation of resources. Second, financial intermediaries will make lending decisions based on those prices; for example, assets used for collateral may be significantly over-valued. Even if prices do not diverge from fundamentals, there are likely to be distributive effects from temporary asset price surges, leading to potential social tensions and, coupled with frictions, losses in efficiency. Moreover, as Kyotaki and Moore (1997) have demonstrated, asset price cycles and credit cycles may interact to generate excessive economic volatility, which would only be exacerbated in the presence of bubbles forming and then bursting.

Recent research indicates that large capital inflows are indeed associated with upward pressure on asset prices. For example, Aizenman and Jinjarak (2009) find robust evidence that current account deficits (i.e., net capital inflows) are associated with higher real estate prices,[11] and the effect appears to be stronger in non-OECD countries.[12] Moreover, IMF (2010) suggests

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[7] Calvo et al. (1993) also document the sharp appreciation of currencies across the region in capital inflow boom of the early 1990s. Cardarelli et al. (2009) use an index of exchange market pressure and show how Latin American countries faced appreciation pressures during the inflow period of 2004–2007.

[8] See Schadler et al. (1993), Calvo et al. (1996) and Cardarelli et al. (2009).

[9] Athukorala and Rajapatirana (2003) document that FDI flows to Latin American countries during the 1990s were concentrated in non-traded sectors (construction and commercial services), while in Asia they appeared to provide relatively more finance for exports.

[10] Here a bubble is defined as when prices divert from some accepted fundamental valuation.

[11] A one standard deviation increase in the current account deficit leads to an increase in real estate prices of 10%; see also Reinhart and Reinhart (2008).

[12] Using a VAR methodology, Sá et al. (2011) also find that a capital inflows shock leads to an increase in real estate prices in OECD countries.

that expansions in global liquidity are associated with increases in asset prices and larger portfolio inflows into emerging economies.

Lending Booms

As mentioned above, if credit grows too fast, banks may reduce the quality of credit assessments of borrowers. Moreover, there may be competitive pressures to maintain market share during booms, tempting financial institutions to lower credit quality guidelines. Moreover, if asset prices are rising, as previously reviewed, collateral values will appear high; even if the boom is temporary banks may lack the necessary information to know whether individual borrowers' incomes have grown due to temporary or permanent reasons. For all these reasons lending booms may be dangerous. However, this danger is rarely visible during the boom. As all new loans tend to be good loans, non-performing loans will be falling, and as borrowers will generally appear to be good credit risks, the risk weights that feed into banks' solvency ratios will be declining, causing solvency ratios to rise. Banking system problems thus tend not to reveal themselves until the lending boom subsides.

In an early paper, Gavin and Hausmann (1996) find that credit growth is a frequent precursor to banking crises. Recent results by Schularick and Taylor (forthcoming) and Gourinchas and Obstfeld (forthcoming) give further support to this view, and in their review Demirgüç-Kunt and Detragiache (2005) claim that credit growth is one of the most robust determinants of systemic banking crises. However, the IMF's September 2011 Global Financial Stability Report (IMF 2011, Chapter 3) argues that although credit growth is surely one determinant, high credit growth is still far from an accurate predictor of future problems. False alarms of crises (so called type 1 errors) and crises missed (type 2) errors remain relatively high.

Moreover, the evidence that surges in capital inflows are systematically associated with lending booms is mixed. Sachs et al. (1996) find no association between lending booms and surges in capital inflows during crises in the 1990s. Gourinchas et al. (2001), using data up to 1999, report only a small increase in capital inflows during lending booms. More recently, Calderón and Servén (2011), using quarterly data spanning 1970–2010, find "few asset price booms and capital flow bonanzas end up in a lending boom, even though lending booms are often preceded by these other kinds of booms." Although Mendoza and Terrones (2008) find that half of the lending booms in their sample were accompanied by large gross capital inflows, the existing evidence does not necessarily support the conventional belief that capital inflows necessarily fuel lending booms.[13]

These mixed results may be due to the subtle relationship between inflows and outflows. Powell, Ratha and Mohaptra (2002) argued that inflows and outflows are strongly correlated. Indeed, inflows may even "cause" outflows and vice versa.[14] But the data display other features

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[13] A recent paper by Furceri, Guichard, and Rusticelli (2011a and 2011b) computes impulse response functions of credit to the private sector after the start of a capital inflow bonanza and find a positive response. The limitation of this methodology, however, is that it does not permit determination of the direction of causality (Jorda, 2005).

[14] For example, the sale of a firm to non-residents may prompt inflows but also outflows as residents place some of the proceeds abroad. Residents placing money abroad (outflows), motivated by legal tax planning

as well. For example, Alberola et al. (2011) find that emerging countries tend to experience capital inflow booms together, while outflows are much more heterogeneous. In particular, they suggest that when inflows surge, countries with higher reserves tend to have lower levels of outflows than other countries.

Banking Sector Instability

The conventional view is that capital inflow surges provoke lending booms, which are a driver of banking crises. However, as reviewed above, there may be other mechanisms at work. These mechanisms include asset price booms, even if the resulting inflows are not intermediated through the banking system.

While previous studies have generally failed to find robust results,[15] a new strand of research is increasingly successful in linking rapid inflow growth (a surge, bonanza or boom) with an increased probability of financial crises, including systemic banking crises. Reinhart and Reinhart (2009) examine how economies perform during and after "capital flow bonanzas"[16] and find that bonanzas are associated with a higher probability of banking, currency, sovereign and inflation crises in developing countries. Caballero (2010) finds surges in *net* inflows are associated with an increased probability of systemic banking crises. Furceri, Guichard, and Rusticelli (2011a and 2011b) find similar results for *gross* debt inflows. Again, the type of inflow appears to matter, banking and portfolio inflows being particularly problematic.[17]

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or tax avoidance may bring money back in, perhaps as a loan from the same financial institution, obtaining any tax benefit offered to debt financing.

[15] See Sachs et al. (1996), Eichengreen and Rose (1998), Radelet and Sachs (1998), Fernández-Arias and Hausmann (2001), Eichengreen and Arteta (2002) and Mendis (2002).

[16] The term "bonanza" was used by Calvo, Leiderman and Reinhart (1992).

[17] Aizenman and Jinjarak (2009) and Sá et al. (2011).

Estimating the Likelihood of Banking Crises and Recessions

The following tables detail the results of selected econometric (probit) estimations for the likelihood of a banking crisis or a recession, conditional on the existence of a capital inflow surge. Three definitions of capital inflow surges are employed. The first, described in Chapter 4, involves the total area of "excess" gross inflows related to a normal level as estimated using a backward-looking Hodrick-Prescott filter. An inflow surge is defined as those areas that are greater than the median of the whole sample. The second considers annual gross inflows and defines an inflow surge as any year where the actual inflow exceeds the country-specific trend plus one standard deviation and the inflow is greater than one percentage point of GDP. The third definition is the same as the second but adds additional cases where the annual gross inflow is greater than the 75th percentile of the distribution of inflows for the country's region in the entire sample. For each definition a general specification and a parsimonious version of a probit regression are included in the table after applying standard model reduction principles. In the case of recessions and only for illustrative purposes, one specification including the existence of a banking crisis is also detailed. Please refer to Powell and Tavella (forthcoming) for further details.

TABLE • E.1

Probit Regressions for the Likelihood of a Banking Crisis

| | Inflow Surge Definitions | | | | | |
| | Total Area Over Trend (1) | | Annual Over Trend (2) | | (2) + Relative to Region (3) | |
	Full	Parsimonious	Full	Parsimonious	Full	Parsimonious
Inflow Surge	–0.012		–0.146		–0.124*	–0.055
	(0.750)		(0.342)		(0.075)	(0.216)
Banks/Inflows	0.579**	0.494**	1.064		0.701	
	(0.036)	(0.025)	(0.315)		(0.198)	
Portfolio/Inflows	0.711*	0.476*	3.558*	0.909	1.380**	1.025**
	(0.056)	(0.087)	(0.078)	(0.169)	(0.011)	(0.015)
Financial Reform	–4.906***		–3.295		–2.279**	–1.517
	(0.002)		(0.239)		(0.042)	(0.101)
Banking Supervision		–1.042***		–1.052*		
		(0.005)		(0.058)		
Outflows/Inflows	0.082		–1.204		–0.186	
	(0.627)		(0.247)		(0.628)	
Credit Growth	0.027		2.820	2.273	1.435*	1.071**
	(0.949)		(0.293)	(0.189)	(0.065)	(0.045)
Reserves Growth	–0.510		–2.697	–1.717	–0.816	–0.869
	(0.261)		(0.162)	(0.231)	(0.295)	(0.198)
Real Exchange Rate Growth	–0.489		7.43		–1.491	
	(0.674)		(0.225)		(0.415)	
N	61	61	46	47	67	71
Pseudo R2	0.411	0.353	0.60	0.537	0.446	0.350

Source: Auhors' calculations.
Note: P-values are reported in parenthesis. Significance at the one, five and ten percent levels is indicated by ***, ** and *, respectively.

TABLE ● E.2

Probit Regressions for the Likelihood of a Recession

| | Inflow Surge Definitions | | | | | |
| | Total Area Over Trend (1) | | Annual Over Trend (2) | | (2) + Relative to Region (3) | |
	Full	Parsimonious	Full	Parsimonious	Full	Parsimonious
Inflow Surge	–0.005	–0.005	–0.200		0.022	
	(0.837)	(0.821)	(0.162)		(0.440)	
Banks/Inflows	0.050	–0.042	0.988		–0.249	
	(0.778)	(0.830)	(0.300)		(0.556)	
Portfolio/Inflows	0.429	0.243	0.240		0.594*	
	(0.161)	(0.447)	(0.676)		(0.070)	
Portfolio				0.080		0.085***
				(0.110)		(0.004)
Financial Reform	–3.407***		–6.418*	–5.579*	–1.042	
	(0.003)		(0.081)	(0.067)	(0.232)	
Banking Supervision		–1.165***				–0.541**
		(0.000)				(0.012)
Outflows	–0.007		0.139	0.062	0.014	
	(0.717)		(0.109)	(0.186)	(0.373)	
Credit Growth	–0.006		15.043**	10.688**	0.430	0.370
	(0.986)		(0.015)	(0.027)	(0.228)	(0.266)
Reserves Growth	–0.973**	–0.800*	–6.618**	–6.593**	–1.297**	–1.194**
	(0.026)	(0.068)	(0.036)	(0.021)	(0.026)	(0.019)
Real Exchange Rate Growth	0.256*	0.237	–6.953		2.088	
	(0.097)	(0.106)	(0.146)		(0.128)	
N	62	62	44	45	65	63
Pseudo R2	0.24	0.32	0.73	0.66	0.21	0.17

Source: Auhors' calculations.
Note: P-values are reported in parenthesis. Significance at the one, five and ten percent levels is indicated by ***, ** and *, respectively.

A Review of the Use of Macro-Prudential Tools in the Region

The Latin American and Caribbean region has a fairly long history of using what are now referred to as macro-prudential tools. This short review details a selection of such tools and how they have been employed in the region.

Dynamic Provisions

In 2001 Uruguay adopted a scheme of dynamic provisioning, based on the experience of Spain, which introduced such a scheme in 2000. Uruguay's dynamic provisioning regulation exists in addition to traditional loan-loss provisions. It defines a rule-based system that requires a bank to contribute to its specific dynamic provisioning funds the difference between the monthly statistical net losses on loans to the non-financial private sector and the realized net loan loss in that month. The regulator defines the weights for the calculation of statistical losses on different loan categories.[1]

In 2007 Colombia adopted a model of dynamic provisioning that includes individual, countercyclical and general provisions. Initially, provisions were calculated based on expected losses under two scenarios defined by the regulator. Each year the regulator decided which scenario applied to the accumulation of individual provisions. Countercyclical provisioning was required only in years of rapid credit growth. In 2010 the system was amended towards a more rule-based model in which accumulation and release of the provisions are linked to bank-specific portfolio performance. The amounts to be accumulated are still defined by pre-specified default probabilities set by the regulator. Banks can measure the credit risk of loans using either a regulatory reference model or approved proprietary models.

Peru adopted dynamic provisioning in 2008. The regulation is activated when the average year-on-year growth of GDP over the last thirty months exceeds a threshold defined by the central bank. The triggering of the regulation requires banks to make additional provisioning beyond the existing generic provisions (which are specific to different types of loans based on debtor categories). Additional or cyclical provisioning is eliminated during periods of growth deceleration.

In December 2008 Bolivia introduced a dynamic provisioning regulation based on type of loan. The regulation requires banks to maintain additional provisions of between 1.5% and 5.5% (depending on the type of loan). During a contraction, banks can access those funds to offset up to half of the additional specific provisions required in a given month, provided that the dynamic provision has been phased in fully and that an indicator of loan quality has deteriorated for six consecutive months; authorization from the bank supervisor is required as well. Banks are required to replenish these provisions once they have used the funds, provided that the lending indicator improves.

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[1] This and other country descriptions also draw on Céspedes and Rebucci (2011).

Given the recent adoption of these dynamic provisioning schemes, it is difficult to gauge their effectiveness in curtailing excessive credit growth or in providing a buffer for banks during downturns. Research surveyed in Terrier et al. (2011) suggests that the Spanish scheme helped banks withstand the crisis better than banks in other industrialized economies. Dynamic provisioning did not, however, prove sufficient to curtail the procyclicality of credit, having only a marginal impact on credit growth. Also, as noted by Calderón and Servén (2011), the provisions accumulated in the boom may prove insufficient to cover all non-performing assets after the crisis.

Reserve Requirements

The Region has a fairly long history in the use of reserve requirements or liquidity requirements on banks as a macro tool for liquidity management. For example, Argentina employed liquidity requirements under the currency board explicitly as a macro tool during and post the 1995 Tequila crisis.

In 2008 Brazil used changes in reserve requirements (RRs) as an instrument to increase liquidity in the financial system and as a mechanism to allocate credit to the rural sector. RRs of demand deposits were reduced by 3 percentage points (p.p.) to 42%, RRs of time deposits by 2 p.p. to 13%, and RRs of rural savings by 5 p.p. to 15%. Conversely, in 2009 RRs were used as a tool for managing the boom, increasing RRs of rural savings and demand deposits by 1 p.p. RRs of term deposits were increased to levels above those prevailing before the global financial crisis. Additionally, the central bank introduced RRs to limit the net foreign exchange positions of banks, imposing RRs on capital inflows, as discussed below.

Colombia's central bank attempted to slow credit growth in mid-2007 by introducing new marginal RR on domestic deposits of up to 27% (covering term deposits and checking and savings accounts). As in Brazil, these measures were complemented with RRs on capital inflows. Also as in Brazil, amidst the worse of the crisis at the end of 2008 and in 2009, the central bank lowered RRs in an attempt to maintain adequate liquidity in the system. Marginal RRs were also eliminated.

Peru's authorities have also used RRs proactively in an attempt to manage the credit cycle and to dampen growth in capital inflows. Conventional unremunerated RRs were raised in early 2008 for both domestic and foreign currency deposits. Marginal RRs were introduced for deposits in domestic currency (up to 25%), and marginal RRs were increased for deposits in foreign currency (from 30% to 50%). After the bankruptcy of Lehman Brothers in 2008, these changes were reversed. During the acceleration of growth and resumption of capital inflows in 2010 and 2011, authorities increased marginal RRs to even higher rates (of up to 55% for foreign currency and 25% for domestic currency).

Reserve Requirements and Taxes on Capital Inflows

Chile was an early adopter of reserve requirements on foreign borrowing to curtail appreciation pressures during inflow surges in the 1990s. RRs on external borrowing were adjusted often, fluctuating between 10% and 30%, and the holding period depended on the duration of term of

the credit. In the recent episode of inflows to the region, however, Chile has not actively used reserve requirements, keeping its policy of unremunerated RRs of 0% unchanged.

In October 2009, amidst strong capital inflows, Brazil reintroduced the IOF (*imposto sobre operações financeiras*) that was first used in the 1990s and has been set at zero since 2008. The IOF imposed a tax of 2% on inflows of fixed income and portfolio equity (FDI and external borrowing were exempted). In late 2010 authorities raised the tax to 6%, additionally increasing a tax on daily margin adjustments on foreign positions in FX and interest rate contracts from 0.38 to 6%. There is also a cap on the net open FX position that banks can hold (30% of capital). However, since transactions supporting carry trade by banks involved both a long and short FX position, this cap on net open position is not binding. Also, since the IFO exempted external borrowing, there was a sharp increase in foreign borrowing at the end of 2010. Consequently, in March 2011 authorities extended the IFO of 6% to short-term foreign borrowing (for loans up to one year).

Colombia's central bank has likewise imposed measures to limit banks' FX exposures and curtail capital inflows. Unremunerated RRs on short-term external borrowing were first introduced in 1993, requiring holding up to 47% of foreign loans for a period of up to 12 months. In 2000 RRs were set at 0% but not eliminated from the regulation. During the recent episode of inflows the central bank reactivated RRs. In May 2007 RRs were raised to 40%, with a holding period of 6 months for all types of external borrowing and portfolio inflows regardless of maturity. In addition, a cap on banks' gross currency derivative position was imposed at 500% of capital on both the short and long sides. In October 2008 unremunerated RRs were set to zero.

Authorities in Peru have also actively managed RRs. Amidst a surge in capital inflows in early 2008 the central bank raised the marginal RR to up to 30% for bank deposits of non-residents. The RR was subsequently reduced to its original level of 6% in 2009. However, with renewed rapid growth in inflows in mid-2010, the RR was again increased, with rates up to 55%. Marginal RRs for deposits in FX by domestic residents were additionally increased in 2010. As a complementary measure, the remuneration to these funds was reduced. In 2011 the central bank reduced RRs on external FX liabilities with maturities under two years (from 75% to 60%), but extended their application to credit channeled through off-shore branches of domestic financial institutions.

The extensive literature on the effectiveness of reserve requirements and taxes on capital inflows indicates that in most cases RRs are effective in altering the composition of capital inflows, tilting them towards longer maturities. However, the evidence on their usefulness in reducing the volume of net inflows is less clear. Thus, RRs seem not to be effective in reducing appreciation pressures during episodes of large inflows. These caveats notwithstanding, Montoro and Moreno (2011) evaluate the recent experience of Brazil, Colombia and Peru with RRs, and they find that tweaking RRs "may have helped to stabilize interbank rates and influence market rates in a way that moderated capital flows. They may also have helped to smooth credit growth during the expansionary and contractionary phases of the economic and financial cycle." Despite these findings, RRs may exacerbate distortions in the financial system that increase the cost of credit and reduce financial intermediation, in part because banks tend to reduce their deposit funding when facing RRs.

Instruments to Manage and Limit Systemic Foreign Exchange Risk

Authorities in highly dollarized economies such as Peru and Uruguay have introduced prudential measures to manage foreign exchange credit risk. In Peru, since 2006 banks have been required to accumulate additional provisions of up to 1% for credit and leasing operations in foreign currency (except those with automatic guarantees). Additionally, since July 2010 banks are required to hold an additional capital requirement of 2.5% of total FX exposure.

In Uruguay, additional provisioning also applies to loans in foreign currency. To implement the additional provisioning in commercial loans, banks are required to assess the client's ability to pay in case of depreciations of up to 60% and provision according to a scale set by the regulator (with provisions up to 7% if the borrower is deemed unable to pay if a depreciation of 20% takes place). For consumer loans, provisions depend on the borrower's income relative to monthly projected payments, with provisions as high as 20%.

Liquidity Requirements

In 2009 Colombia adopted a regulation requiring financial institutions to manage liquidity risk. The regulation seeks to identify, measure, control and monitor liquidity risk in the trading book and on and off of banks' balance sheets. The regulator has developed minimum guidelines, based on a set of financial and market indicators, to measure credit institutions' liquidity, and credit institutions are required to send to the regulator a weekly report measuring their liquidity risk. The standardized report allows the central bank to perform periodic stress tests to gauge the liquidity risk of individual financial institutions and the system as a whole. The results of these stress tests are reported in the central bank's financial stability report.

Loan-to-Value Ratios

In December 2010 Brazil introduced regulation to tighten the already existing rules on LTV in auto loans. The aim of the regulation was to discourage high LTV ratios on auto loans. Specifically, for any given maturity, the new rule stimulates a greater risk weight on loans that carry high LTVs. Terrier et al. (2011) highlight the fact that auto sales flattened immediately following the introduction of the new regulation.

Structural Balance Calculations

In order to measure fiscal outcomes and assess policy it is useful to decompose total revenues (R), distinguishing between structural revenues (SR) and temporary revenues (TR), and in turn consider the structural primary balance (SB), which disregards temporary revenues (in contrast to the observed primary balance discussed in Chapter 5.

Primary Balance (B) = Total Revenues (R) – Primary Expenditures (G) =
Temporary Revenues (TR) + Structural Revenues (SR) – Primary Expenditures (G)
Primary Structural Balance (SB) = Structural Revenues (SR) – Primary Expenditures (G) =
Primary Balance (B) – Temporary Revenues (TR)

In the analysis revenues were decomposed between structural and temporary as follows. GDP-linked temporary revenues were estimated as tax collection related to the output gap, i.e., difference between observed and structural or trend GDP.[1] As expected, temporary revenues follow a predictable pattern induced by the business cycle (Chapter 5, Figure 5.2). Commodity-linked temporary revenues, however, depend on the exogenous evolution of international commodity prices. Structural or long-term revenues were estimated with two alternative methods. The Revenue Method is based on de-trending the commodity revenue series in each commodity-exporting country in a way similar to the method utilized by Chile, which has a formal procedure for producing these estimations.[2] The Price Method is based on the revenue derived from the price gap between the effective price of sale and a reference, structural long-term price, taken as the market price forecast of the relevant commodities at a 5-year horizon.[3] Temporary commodity revenues declined and rebounded sharply but are directly relevant only for the eight commodity-exporting countries in the sample.

A structural fiscal sustainability analysis provides a way to summarize considerations concerning fiscal space and compare the current and pre-crisis situations. Given a forecast of structural or trend GDP growth (g), this framework determines the level of the structural primary balance (b) that is required to sustain an initial level of structural debt (d) rolled over at a

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[1] Trend GDP was estimated with an HP filter with lambda = 1,600 (quarterly data) to filter observed series in real time (only considering information six quarters into the future at each point in time). Tax revenue assumes a unitary elasticity.

[2] We apply an HP filter to Chilean commodity revenues at each point in time (in real time) and choose the parameter lambda which best approximates the actual Chilean estimations over time. Then we apply that same filtering method to commodity revenues in each country, in all cases allowing for structural breaks. This builds upon the method used in IDB (2007). However, here we mimic the Chilean method by using real-time filtering as opposed to relying on unavailable future observations and focus exclusively on commodity revenues rather total revenues. Hence, it is relevant only for commodity-exporting countries.

[3] Consensus forecasts in real time are obtained from Bloomberg and supplemented by additional market information when incomplete. This method is similar to the method used by Vladkova-Hollar and Zettelmeyer (2008)

certain prospective real interest rate (r). This framework puts together growth prospects, the initial debt burden and the corresponding financing conditions the country is expected to face to determine the kind of structural primary balance it should aim at (barring exceptional crisis circumstances) to make it sustainable. As an approximation, the required structural primary balance $b^* = d(r-g)$. The gap between this required structural balance and the actual one, taken as a measure of the fiscal stance in normal times, is an indicator of fiscal space.

Specific Fiscal Stimulus Packages

The following table details varied fiscal stimulus packages implemented in the Region as a response to the Great Recession. The packages are placed into three categories and the final column summarizes whether these stimulus measures were fully withdrawn, partially withdrawn or maintained.

TABLE ● H.1

Examples of Countercyclical Fiscal Measures Announced as of December 2009

Country	(1) Workfare	(2) Social Protection	(3) Fiscal Stimuli	Have these policies been maintained or scaled back in 2010–11?
Argentina	Subsidy of 10% of labor cost for 12 months extendable by a further 12 months (at 5%). Promotion of worker formalization (through incentives).			(1) Scaled back
Bahamas, The	Launch of the Unemployment Benefit and the National Training Program for recently terminated hotel workers.			(1) Terminated
Barbados	Launch of Tourism Investment Relief Fund. Allowance for employers to defer for one year their contribution to the National Insurance Scheme (NIS).	Free transportation for all school children. Training fund by the NIS to retrain workers who lost their jobs. Unemployment benefits paid out by the NIS.	The construction of two large office buildings by the NIS for later lease to the government. Infrastructure projects. A loan guarantee provided by the GoB to private financiers and developers to restart the prominent Four-Seasons Hotel and Villas project on the West Coast.	(1) Maintained (2) Unemployment benefits were further extended from 26 weeks to 40 weeks to cover the longer-term unemployed. (3) Maintained
Bolivia	Increase of minimum wage of 12% (14% in education and health sector).	Cash grants to pregnant and lactating mothers (*Bono Juana Azurduy*).		(1) Another increment of 10% in 2011, but due to inflationary pressures. (2) Maintained as a permanent program.
Brazil	Extension of unemployment insurance for fired workers from December 2008.	Expansion of CCT Program *Bolsa Familia* to an additional 1.3 million families and increase in transfer amount. New housing program "*Minha Casa Minha Vida.*"	Various tax reductions (individual income taxes. IPI tax cuts for home appliances, construction materials and motor vehicles, temporary zero tax for motorcycles, wheat and bread, reduction of taxes on credit operations).	(1) Scaled back (2) Maintained (3) Partially scaled back.

TABLE ● H.1

Examples of Countercyclical Fiscal Measures Announced as of December 2009 (*continued*)

Country	(1) Workfare	(2) Social Protection	(3) Fiscal Stimuli	Have these policies been maintained or scaled back in 2010–11?
Chile	Employment subsidy for low-wage young workers. Extension of Unemployment Solidarity Fund to provide access to all unemployed workers.	Additional cash transfers to low income households. Payment of US$ 70 per family dependent made available for most vulnerable households in March 2009.	Public investments in infrastructures and housing. Various tax reductions.	(1) Maintained (2) Scaled back (3) Scaled back
Colombia		Increase number of families covered by Famílias en Acción by 1.5 million. Social programs Estimated to grow by 42% vis-à-vis 2008.	Investment in public works.	(2) CCT maintained and further expanded to 2.6 million families. (3) Scaled back
Honduras	Minimum wage increased to 290 USD in urban and 215 USD in rural regions.	Increased coverage of CCT program *Red solidaria* from 150,000 to 220,000.		(1) Maintained (2) Maintained and further expanded (under new name *Bono 10mil*).
Mexico	The temporary employment program at the federal level was expanded by 40% over what had been planned. Launch of Employment Preservation Program for protecting employment in vulnerable businesses.	Launch of the *Programa de Apoyo Alimentario* (PAL) and expansion of *Oportunidades* Program.	Public investments in infrastructures, support to private sector and reduction in energy price for households.	(1) Temporary employment program further expanded. (26% vis-à-vis 2009). Employment Preservation Program scaled back. (2) PAL expanded and *Oportunidades* maintained. (3) Maintained
Nicaragua	Launch of *Programa Nacional de Inserción Laboral* (1,000 youths expected to enter the labor market).	Various nutritional supplement programs such as *Programa Alimentos*.		(1) Scaled back (2) Scaled back
Paraguay	Employment generation through public work program.	Expansion of CCT coverage to an additional 120,000 families.	Increase in public spending (of which 50% is on infrastructure).	(1) Maintained (2) Maintained (3) Scaled back
Peru	Incentives schemes for workers formalization, workfare programs.		Investment in infrastructure and support ot the private sector.	(1) Scaled back (3) Scaled back

Examples of Countercyclical Fiscal Measures Announced as of December 2009 (*continued*)

Country	(1) Workfare	(2) Social Protection	(3) Fiscal Stimuli	Have these policies been maintained or scaled back in 2010–11?
Uruguay	Workfare and training programs.		Investment Incentives (120% deduction of investment expenditure in the calculation of inclome tax); Increase of Public Investment; 3) Gasoil Value Added Tax Exemption for Industry for 90 days; 4) Corporate income tax exemption for industries that employ "quality workers" (e.g., merchant marine, automobile).	(1) Scaled back (3) Scaled back

Source: CEPAL (2009) and IDB (2012).

Countercyclical Fiscal Space

The table below places countries into three categories regarding fiscal space for countercyclical stimulus measures. Countries with restricted space are those where, considering a standard methodology and assumptions on growth and interest rates, structural deficit calculations imply that higher fiscal adjustment is required to maintain debt levels, those in the intermediate category require a lower level of fiscal adjustment to maintain current debt levels and those in the ample category currently require no fiscal adjustment to maintain debt levels given the assumptions made.

TABLE ● I.1

	Scenarios		
Space	**Optimistic**	**Central**	**Pessimistic**
Ample	Argentina	Argentina	Argentina
	Belize	Belize	Belize
	Bolivia	Bolivia	Bolivia
	Chile	Chile	Nicaragua
	Colombia	El Salvador	
	Costa Rica	Nicaragua	
	Dominican Republic	Paraguay	
	Ecuador	Venezuela	
	El Salvador		
	Nicaragua		
	Panama		
	Paraguay		
	Peru		
	Uruguay		
	Venezuela		
Intermediate	Brazil	Brazil	El Salvador
	Guatemala	Dominican Republic	Paraguay
	Haiti	Ecuador	Uruguay
	Mexico	Panama	Venezuela
		Peru	
		Uruguay	
Restricted	Bahamas	Bahamas	Bahamas
	Barbados	Barbados	Barbados
	Honduras	Colombia	Brazil
	Jamaica	Costa Rica	Chile
		Guatemala	Colombia
		Haiti	Costa Rica
		Honduras	Dominican Republic
		Jamaica	Ecuador
		Mexico	Guatemala
			Haiti
			Honduras
			Jamaica
			Mexico
			Panama
			Peru

Source: Latin Macro Watch, IDB (2012) and author's calculations.

The Measurement of Direct and Indirect Exposures

In order to consider the direct and indirect exposure of Latin America and the Caribbean to the European periphery the following measures are calculated.

a. Direct exposure: $= \dfrac{\sum\limits_{j=SIPIG} Claims_{ji}}{Credit_i}$

where the numerator is the sum of the Claims of all SIPIG countries (Spain, Italy, Portugal, Ireland and Greece) on LAC country i and the denominator is domestic credit in LAC country i.

b. Indirect exposure 1: $= \sum\limits_{j=US,Eur,Ja,UK} \dfrac{Claims_{j,SIPIG}}{Capital_j} * \dfrac{Claims_{ji}}{Credit_i}$

where the first term is the claims of j (which is each of the US, Eurozone (non SIPIG), Japan and UK) on SIPIG divided by the capital of banks in that country j and the second term is then the claims of j on LAC country, i.

c. Indirect exposure 2: $= \sum\limits_{j=US,Eur,Ja,UK} \sum\limits_{k=US,Eur,Ja,US,k\neq j} \dfrac{Claims_{kj}}{Capital_k} * \dfrac{Claims_{j,i}}{Capital_j} * \dfrac{Claims_{ji}}{Credit_i}$

where the first term is now the claims of k on j (where k is also each of the US, Eurozone (non-SIPIG), Japan and UK) but where k cannot be the same as j divided by the capital of banks in k. This measure then not only takes into account of who lends to LAC who is exposed to the European periphery, but also who lends to LAC who lends to someone else who is exposed to the European periphery.

A Review of the Role of Foreign Banks in Latin America and the Potential for Transmitting Shocks

Foreign banks have played a positive role in Latin America and the Caribbean in improving management and efficiency in local financial systems.[1] Their effect on stability, however, has been hotly debated. IDB (2004) argued they may have both a positive effect (providing a diversified source of funding to guard against local liquidity shocks) and a negative effect (i.e., the more diversified is the bank across countries, the more those investments may be substitutes and the sharper is the retrenchment in response to a negative shock in one particular country).[2] Moreover, foreign banks may import negative shocks from their home countries. Peek and Rosengren (2000) find evidence that Japanese banks in the US imported problems of the Japanese economy into the US, and Martínez-Pería, Powell and Vladkova-Hollar (2005) show more generally that negative shocks in a home country may affect banks' behavior in nations that host the affiliates of those banks. This is clearly not only an academic issue. During the recent Lehman crisis, there was a sharp fall in international lending to the Region (see Figure K.1) that affected all of the larger economies.

Analyzing the recent crisis, Cetorelli and Goldberg (2011) present evidence that foreign-owned banks facing liquidity shocks cut both cross-border lending to and local lending in emerging

FIGURE ● K.1

Quarterly Change in Cross-Border Claims on Latin America and the Caribbean
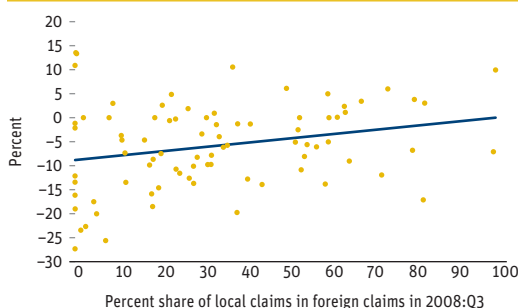(*billions of US$*)
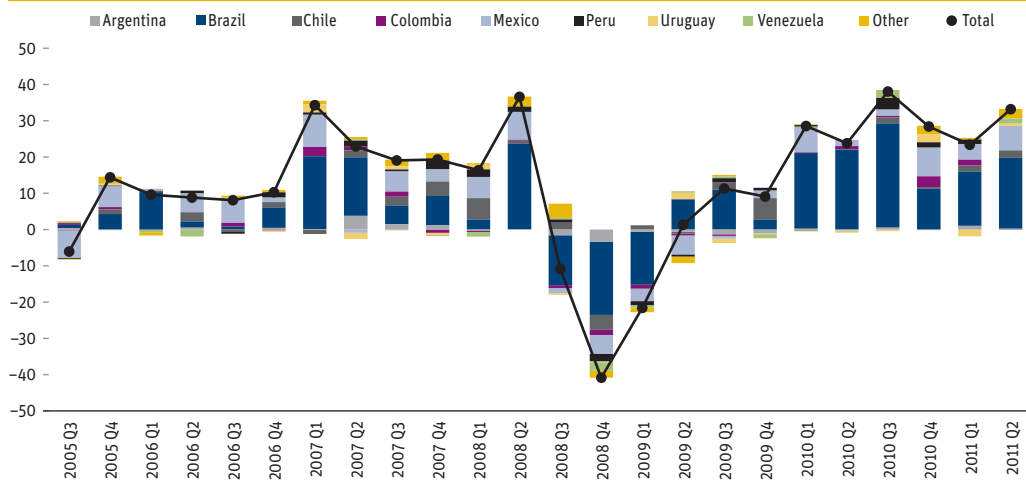
Source: Locational Banking Statistics by residence, BIS (2012).

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[1] See, for example, Claessens and Leaven (2003).
[2] See Galindo, Micco and Powell (2005) for further theoretical and empirical analysis.

Change in Foreign Claims during 2008 Crisis

Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012).

markets; this situation was compounded by the negative impact on domestically owned banks. Kamil and Rai (2010) argue that a deterioration of parent banks' financial indicators in advanced economies led to a reduction in their financing to Latin America. Galindo, Izquierdo, and Rojas-Suárez (2010) likewise find that increased risk aversion in high-income economies results in a decrease in real credit in the Region. Takáts (2010) finds that the impact of supply factors was stronger than that of demand factors in causing the sharp decline in bank lending to emerging market economies during the crisis.

However, the evidence suggests that the larger a foreign bank's total exposure (normally correlated with a substantial brick and mortar presence) the less procyclical the bank may be, that local lending with local funding tends to be more stable than cross-border lending, and that Spanish banks in the Region tend to be more stable in the face of international shocks than their other foreign peers.[3] Specifically, the evidence suggests that countries with a larger proportion of local claims in local currency in total foreign claims were less affected in 2008 (see Figure K.2).[4, 5]

There is nonetheless considerable variation across countries, and if the European crisis intensifies the Region may also be exposed to other potential impacts. Van Rijckeghem and Weder (2003), for instance, document "common lender effects" as important channels of transmission of the Mexican and Asian crises, as lending to emerging economies from creditor countries heavily exposed to those crisis countries was substantially reduced. Similar results are reported by Cetorelli and Goldberg (2010), who find that lending contractions by banks in emerging markets were stronger during the crisis if they had been dependent on cross-border borrowing from more vulnerable banking systems. Thus, Latin American and Caribbean countries with ties to banks in the US, UK, France, Germany or Japan who are themselves exposed to Eurozone periphery nations might see their access to international lending substantially reduced.

Weaknesses in European banks may also affect the Region's economies through other channels. First, European banks appear to have been particularly important in trade finance. Second, European banks are deleveraging. Even if subsidiaries are entirely funded by local deposits, as capital is assessed by home supervisors on a consolidated basis, deleveraging may

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[3] Martínez Pería, Powell and Vladkova-Hollar (2005), Kamil and Rai (2010) and Galindo, Izquierdo, and Rojas-Suárez (2010).

[4] Similarly, Ongena et al. (2011) report sharper reductions in foreign lending in Eastern Europe when banks' systems are funded relatively less with retail deposits.

[5] Figure includes eighty-two destination economies, as reported by banks to the BIS from twenty-five reporting banking systems. Uruguay is not plotted, being an outlier where foreign claims increased by 47% in the period.

well affect local lending as well as cross-border loans. Deleveraging implies raising capital or reducing assets. European banks may focus asset sales outside of their home country, in part due to home regulations. If such assets consist of entire banks with management *in situ* and investment funds are unlimited, then such sales may have a limited impact on the Region. However, if institutions are dismantled and relationships between borrowers and lenders are severed—the very essence of banking—or if only limited funds are available to purchase those assets, then such sales could have significant negative effects.

Finally, foreign banks under intense pressure at home may be tempted to share liquidity with other markets. This is simply the foreign bank taking advantage of its diversified sources of funding, but in this case—the opposite of that considered in IDB (2004)—the fear is that liquidity may leave the Region. Indeed, this is just one of several potential tensions that may arise, as the objectives of a global bank and those of a particular subsidiary may well diverge, as may the objectives of home and host regulators, particularly in times of stress.[6]

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[6] Powell and Majnoni (2007) discuss such tensions and suggest that, while consolidated supervision by the lead regulator is necessary, from the standpoint of host authorities, it is not sufficient.