World Economic and Financial Surveys

# Regional Economic Outlook

## Western Hemisphere

### Grappling with the Global Financial Crisis

OCT 08

INTERNATIONAL MONETARY FUND

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# Contents

This October 2008 issue of the *Regional Economic Outlook: Western Hemisphere* (REO) was prepared by a team led by Robert Rennhack and Vikram Haksar and under the direction of David Robinson, Caroline Atkinson, and Anoop Singh. This report reflects developments as of October 17, 2008. The team included Jingqing Chai, Ana Corbacho, Jorge Canales-Kriljenko, Roberto Garcia-Saltos, Priyadarshani Joshi, Herman Kamil, Carolina Saizar, Bennett Sutton, and Franciso Vasquez-Arias. Specific contributions were made by Trevor Alleyne, Ravi Balakrishnan, Andreas Bauer, Pelin Berkmen, Gabriel Di Bella, Rupa Duttagupta, Marcello Estevao, Kristian Hartelius, Eva Jenkner, Koshy Mathai, and Alvaro Piris. Bennett Sutton, Carolina Saizar, Joan McLeod-Tillman, Carolina Worthington, and Cristina Barbosa provided research and production assistance.

# Executive Summary

The world economy continues to be buffeted by the burgeoning downdraft of the financial crisis and volatile commodity prices. As such, the outlook points to a major downturn for the global economy, with growth falling to its slowest pace since the 2001–02 recession. However, authorities around the world have taken further, massive, and increasingly coordinated corrective actions. The central scenario in the *World Economic Outlook* anticipates that these will be successful in stabilizing financial conditions. However, it will take time, under any rescue plan, to restore the proper functioning of credit markets. For the United States, our baseline projection is that recovery will begin in the second half of 2009, and will be more gradual than previous recoveries, because of the exceptional nature of the asset price adjustments taking place. Overall, growth in the advanced economies as a whole will also be close to zero at least until the middle of 2009.

For Latin America and the Caribbean (LAC), the ongoing global turmoil represents a confluence of negative shocks: the freeze in global credit markets, weaker external demand, and lower commodity prices. These shocks can have strong negative feedback loops, particularly for financing conditions. A similar scenario, when stress-tested in the April 2008 *Regional Economic Outlook: Western Hemisphere,* risked near-recessionary conditions for the LAC region. But the region is not at that point and our central scenario points to growth of around 3 percent next year, close to the average for emerging market countries. The LAC region is expected to deal with the current global shocks better than in previous crises. This reflects the progress many countries in the region have made in improving their macroeconomic fundamentals over the past decade.

However, there are still a number of downside risks for the region. Foremost among these is the outlook for commodity prices. Prices remain elevated but could fall further, in line with the experience in previous global downturns. Of course, lower food and fuel prices would bring welcome relief for some countries, in particular low-income commodity importers in Central America and many Caribbean countries. But for the region as a whole, strong commodity prices have been a major factor in bolstering fiscal and external positions and driving growth in recent years. A further sharp fall would have considerable adverse implications for the region's fiscal and external positions. Policymakers remain on high alert to deal with the current shocks and these additional risks.

Against this background, several essential priorities arise for the region in the period ahead. First, it is key to preserve the proper and efficient functioning of financial systems by preemptively addressing risks from liquidity and asset quality, and some countries have already taken steps in this regard. Many countries have built up considerable foreign exchange buffers that could be used to deal with exceptional and temporary shocks. Second, it remains important to preserve the hard-won gains on inflation. Central banks will need to maintain an active communication with markets on policy challenges and measures, especially on the future course of inflation, to keep expectations well anchored. This is especially important for countries where domestic demand has been growing well above trend and inflation remains above target. Third, fiscal situations will likely come under stress at a time when there will be increased need to maintain a robust safety net for those low-income households that would be affected by the slowdown. This will require a much more targeted strategy for fiscal spending to ensure that essential needs can be met while containing any additional financing requirements.

# I. Global, U.S., and Canadian Outlook

## Global Outlook

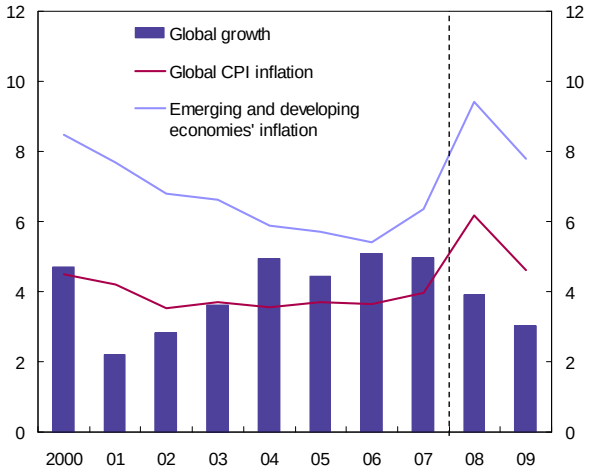
*The world economy continues to be buffeted by the burgeoning downdraft of the financial crisis and volatile commodity prices. As such, the outlook points to a major downturn for the global economy, with growth falling to its slowest pace since the 2001–02 recession. Levels of uncertainty and volatility are very high, presenting policymakers with a challenging environment to navigate.*

Cooling global growth has at its center the slowdown foreseen in the United States and tightening global financial conditions. Higher-than-expected commodity prices in the first half of the year sharpened existing global imbalances and added additional overall drag to world activity. Global output growth is currently projected to slow from 5.0 percent in 2007 to 3.9 percent in 2008 and 3.0 percent in 2009. As the world economy slows down, commodity prices are expected to continue to recede from still-high levels in the coming quarters.

Industrial economies have been hardest hit. Euro area growth is pegged at just 1.3 percent in 2008 and 0.2 percent in 2009, while Japan is set to grow at around ½ percent in both years. Emerging markets are also slowing, but they—in particular, China and India—are still expected to be the largest contributors to global growth.

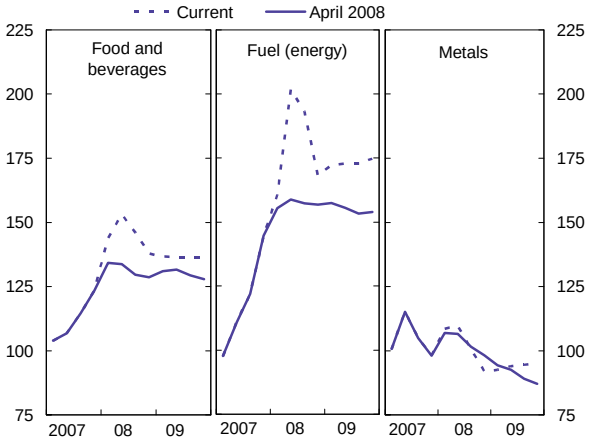
Through mid-2008 the growth slowdown had been accompanied by a rise in inflation, reflecting in part higher food and fuel prices. However, core and expected inflation remain relatively well anchored in advanced economies and widening output gaps in these economies will exert increasing downward pressure on prices. Inflation should also ease in a number of emerging market countries, although elevated price pressures will remain an issue in a number of these countries.

**Global Outlook**
*(Annual percent change)*




Source: IMF staff calculations.

**Commodity Price Projections**
*(Index, 2006 Q4 = 100)*

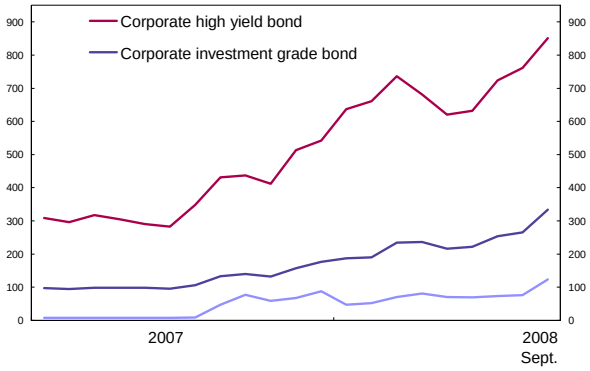



Sources: Bloomberg, L.P.; and IMF staff calculations.

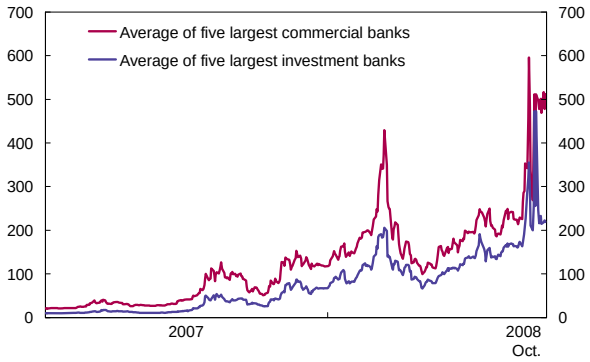
Note: This chapter was prepared by Rupa Duttagupta, Marcello Estevão, Koshy Mathai, and Andrew Swiston.

**Selected Financial Indicators for the United States**

**Selected Financial Indicators for the United States**
*(Interest rate spreads, basis points)*




**Cost of Insuring Debt of Financial Institutions Against Default**
*(Basis points)*




***Case-Shiller House* Price Indices**
*(June 2006=100)*


Sources: Bloomberg, L.P., Haver Analytics; Merrill Lynch; and IMF staff calculations.

## U.S. Outlook: Major Downturn with Protracted Recovery

The U.S. economy has weakened substantially over the past year. Net exports have provided remarkable support to headline GDP growth so far, but domestic demand has weakened, shrinking in the fourth quarter of 2007 and remaining essentially flat since then. The impact of the housing downturn, earlier limited to the construction sector, has now fed through to household spending and financial markets. Payrolls have shrunk steadily since January, driving the unemployment rate above 6 percent and curbing household purchasing power. And while inflation has started to ease, in line with fuel and food prices, it still stood at nearly 5½ percent year-on-year in August, putting further pressure on households.

Most dramatic, however, have been the recent developments in financial markets. Money markets have seized up; long-enduring Wall Street institutions have gone bankrupt, or been acquired; and the investment banking model has disappeared. Fannie Mae and Freddie Mac have been taken under federal conservatorship. The government has been forced to step in with massive interventions to keep credit flowing, including with innovative Federal Reserve (Fed) facilities and a broad program to buy bad assets and recapitalize the banking system. In mid-October the United States joined other advanced economies to adopt far-reaching measures—including guarantees for interbank lending, broader coverage of deposit insurance, and injections of capital—aimed at restoring confidence in the global financial system. The U.S. Treasury will channel up to US$250 billion of the US$700 billion approved under the Emergency Economic Stabilization Act (EESA) to inject capital into major U.S banks as well as other financial institutions. Most European countries, including France, Germany, Italy, and the United Kingdom, committed to a coordinated effort to bolster domestic banking systems with rescue packages for financial institutions totaling about US$2.5 trillion. The Japanese authorities have also maintained

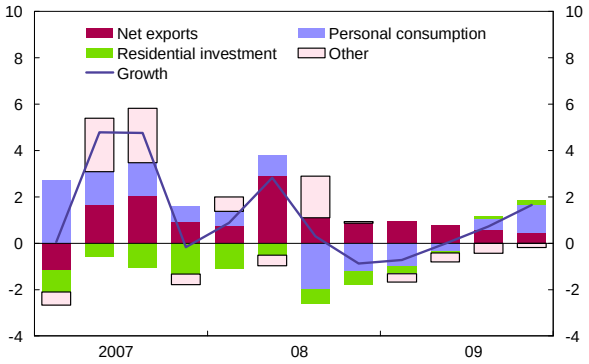
supportive monetary conditions and taken measures to inject liquidity into the interbank market. To boost international U.S. dollar liquidity, central banks also agreed to offer unlimited dollar funds to banks in short- and medium-term maturities, expanding existing international swap arrangements.

Against this backdrop, the prospects for the U.S. economy are weak. With inventories of unsold homes at near-record highs and unemployment still rising, house prices are expected to continue dropping, eroding both household wealth and the value of mortgage-backed securities on banks' balance sheets, which would feed back into economic activity. Compounding these difficulties, the fiscal stimulus payments that helped boost growth in the second quarter have ended. And while net exports will continue supporting growth, that contribution will decline given the slowdown abroad and the recent appreciation of the dollar. Recent measures, including actions taken under EESA, should help unclog and restore the flow of credit. Nonetheless, the widening of spreads and tightening of lending standards seen over the past year will continue to have lagged impacts, weighing on growth in coming quarters.

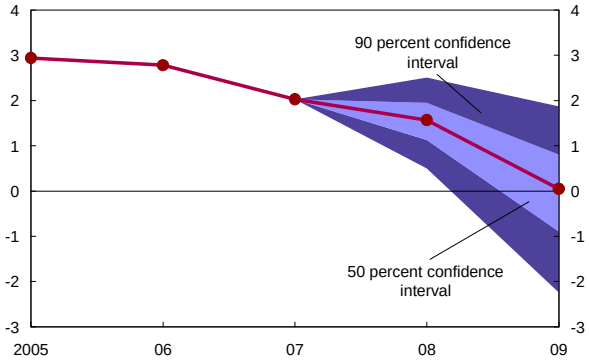
In light of these pressures—and notwithstanding accommodative monetary, financial, and fiscal policy—the IMF staff expects the U.S. economy to enter a downturn in the second half of 2008 and first half of 2009. As is typical of housing-driven recessions, only a gradual recovery is expected thereafter, with growth returning to potential only in 2010. Unlike the last recession, it is expected that much of the slowdown will be reflected in consumption as well as investment. Growth is forecast at just 0.8 percent in 2008 on a Q4/Q4 basis, falling to 0.4 percent in 2009, which puts

**United States: Forecasts for Growth and Inflation**

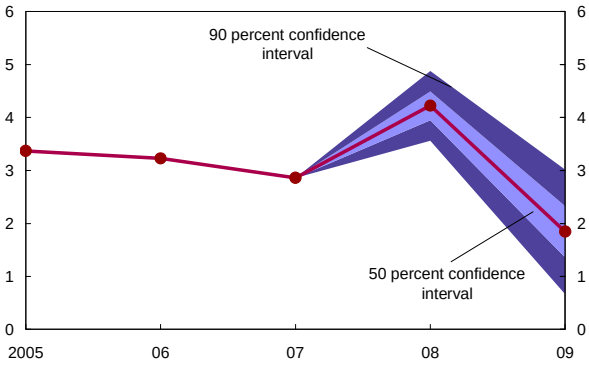
**Real GDP and Components**
*(Annualized quarterly growth rates)*




**Growth Forecast: Balance of Risks**
*(In percent)*




**Inflation Forecast: Balance of Risks**
*(In percent)*




Sources: Haver Analytics; and IMF staff calculations.

annual average growth at 1.6 and 0.1 percent, respectively, over the next two years. Increasing slack in the economy is expected to ease pressures on core inflation, while the assumed plateauing of oil prices would bring headline inflation down further, to below 2 percent by the second half of 2009.

Considerable uncertainty surrounds these forecasts, given the unprecedented nature of the shocks and the challenges in quantifying the associated macrofinancial linkages (see Box 1.1). Despite the efforts by the government and the Fed to resolve the financial crisis, markets have remained volatile, and downside risks to the baseline growth scenario are significant. Risks to the inflation baseline forecast, by contrast, are broadly balanced.

Policies are likely to continue to seek to manage these risks. Recent communications by the Fed indicate that it sees the balance of risks shifting, in light of the worsening financial turmoil and incoming data. On October 8, it cut the target for the federal funds rate by 50 basis points, as part of the coordinated step by many advanced economy central banks. Recent statements suggest that further cuts may be on the horizon. As for fiscal policy, there are calls in some quarters for a second round of tax rebates, but further fiscal actions would likely be more effective if targeted to housing and/or financial sectors directly. Indeed, this has been the orientation of the U.S. authorities with the EESA, recent bailouts, and other interventions, all of which imply substantial use of taxes to support financial markets. Finally, once the immediate crisis is past, fundamental issues of financial regulation will clearly need to be taken up.

## Canadian Outlook: Feeling Effects of U.S. Slowdown

Economic activity in Canada has suffered a setback, as slower growth in the United States and the effects of past real currency appreciation have sharply slowed net exports. Domestic demand growth—initially boosted by commodity-price gains—continued but softened to more modest levels, and the housing market has been cooling from the highs reached in 2006–07. The recent decline in commodity prices has weakened the Canadian dollar, bringing it back to the level of spring 2007. At the same time, the labor market is yet to fully show the economic strains, with payrolls continuing to rise in recent months; and the unemployment rate stable at 6.1 percent—close to a 33-year low of 5.8 percent that was achieved in late 2007.

Since mid-September, Canadian credit conditions have deteriorated significantly while equity prices have plunged by over 25 percent, reflecting both the global financial turmoil and the fall in commodity prices. The authorities implemented a temporary ban on short selling of financial stocks that expired on October 8. However, banks have so far weathered the ongoing financial strains well, partly reflecting conservative regulation, greater reliance on retail deposits rather than wholesale funding, and relatively low exposure to structured products. Despite these factors, vulnerabilities remain given Canada's financial and economic ties with the United States.

Within Canada, a regional divide in economic prospects has emerged. The resource-rich western provinces have benefited from commodity gains while the manufacturing-intensive Ontario and Quebec have borne the brunt of the slowdown. If maintained, these disparate shocks could force further large reallocations of resources within the country, which may be a challenge given apparent product market rigidities in the central provinces, although labor markets seem to be reasonably flexible.

Four-quarter growth is projected to decelerate to 0.3 percent in 2008—largely reflecting the negative outturn in the first half of the year—and recover to 1.7 percent in 2009, as the drag from net exports wears off. Average growth is estimated at 0.7 percent in 2008 and 1.2 percent in 2009. However, downside risks remain, in particular due to possibly tighter credit conditions for a protracted period, a slower-than-projected recovery in the

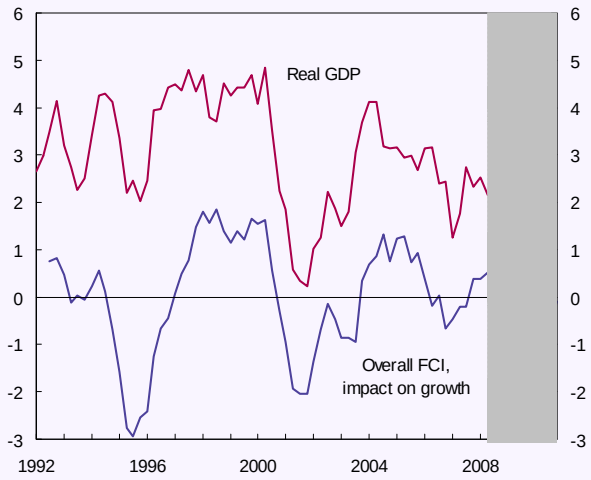
### Box 1.1. United States: Quantifying Macrofinancial Linkages

Financial conditions have changed dramatically since mid-2007, and while analysts generally agree that these changes will weigh on growth, there is less agreement on the likely size and timing of these effects. In order to produce a well-founded macroeconomic forecast, IMF staff have thus developed two alternative tools to assess the linkages between financial conditions and demand in the United States.

The IMF staff's financial conditions index (FCI) analyzes the interaction between an array of financial indicators and real GDP, based on impulse-response coefficients from vector autoregressions. The financial variables include short-term interest rates, bond spreads, equity prices, real effective exchange rates, and, importantly, bank lending standards. Tighter lending standards over recent quarters have compounded the effects of higher spreads in curtailing credit. The model suggests that, despite aggressive policy rate cuts by the Fed and dollar depreciation, financial conditions have tightened since mid-2007 and will, given lags, slow growth by around 1¼ percentage points over the remainder of this year. Further financial tightening envisaged in the staff's forecast implies an additional slowdown in 2009.

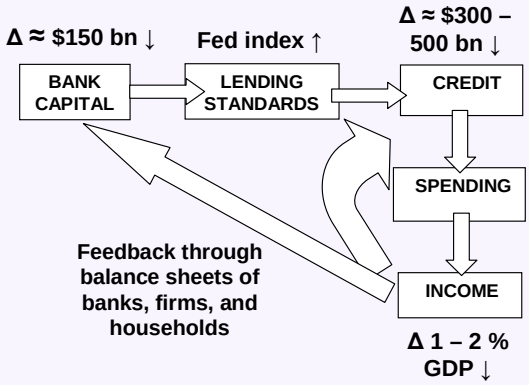
Taking a somewhat more structural view, the IMF staff also estimates a *banking model* that traces how strains on bank capital lead to tighter lending standards, a reduction in the volume of consumer, mortgage, and corporate credit, and thus diminished spending and income growth (which in turn puts further strains on capital adequacy). This very different approach yields estimates of macrofinancial linkages that are remarkably similar to those from the FCI. A 1-percentage-point shock to banks' capital-asset ratio—in line with U.S. banking sector losses reported in the April 2008 *Global Financial Stability Report*—subtracts some 1 to 2 percentage points from the baseline GDP path, with the maximum impact occurring after a year or so. The model can also be run in reverse, with credit and bank lending channels doubling the impact of an initial fall in spending/GDP and prolonging the response.

**United States: Financial Conditions and Growth**
*(Four quarter percent change)*




Sources: Haver Analytics; and IMF staff calculations.

**Impact of Shock to Bank Capital**




Note: This box was prepared by Ravi Balakrishnan.

United States, and a deeper-than-anticipated slowdown in the housing sector.

Canada's inflation experience has so far been a notable and welcome exception to international trends, allowing the government to announce tax reductions in late 2007, which gave a fortuitous stimulus to the economy of about ¾ percent of GDP in 2008. Headline inflation remained within he Bank of Canada's (BoC) target range of 1–3 percent for most of the year, providing space for the BoC to cut its policy rate by 150 basis points beginning in December 2007. With inflationary risks likely diminishing from a weakening economy and declining global commodity prices, the BoC also participated in a globally coordinated move (with

other major central banks) and cut its policy rate by a further ½ percentage point to 2½ percent on October 8. Similarly to other major central banks, the BoC provided ample liquidity in recent weeks and expanded its swap facility with the Fed to US$30 billion in late September. Looking ahead, the projected slow economic recovery should temper inflation expectations and provide space for further stimulus if needed, although continuing currency depreciation could pose upside risks.

# II. Latin American and Caribbean Outlook

*The regional outlook is being increasingly clouded by the deepening global financial turmoil. Growth is expected to slow markedly as the global slowdown and tightening financial conditions take hold, while external current accounts are set to weaken. Downside risks to growth have also increased, given the uncertain outlook for world commodity prices and the possibility of further spillovers from the strains to global financial stability. Flexible exchange rates should ease the adjustment for some. Policymakers face a delicate balance in mitigating the expected slowdown while maintaining orderly funding conditions, and seeking to anchor stability over the medium term.*

## Context

### The commodity boom has benefited many in the region . . .

The region is coming off a remarkable growth spell over the past five years, which has been achieved in tandem with strengthened balance sheets in all sectors and, until last year, generally falling inflation. Real growth has averaged about 5 percent since 2003, compared to the region's long-run average over 1970–2000 of about 3½ percent. Inflation meanwhile fell to a 37-year low of just over 5 percent by end-2006.

Important gains in the credibility of fiscal and monetary frameworks have supported these achievements. The increase in commodity prices over this period, with the especially sharp run-up since 2005, has also been a key part of the story.

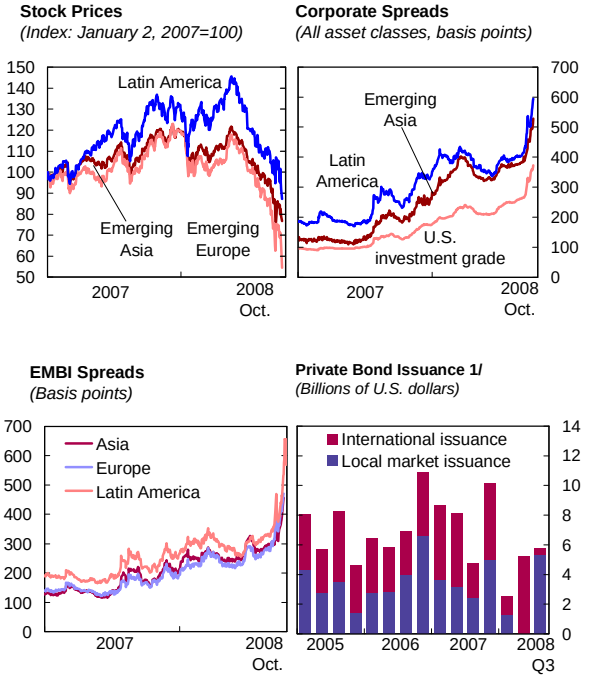
### . . . but global shocks are tightening financing conditions and weakening commodity prices

The worsening global financial conditions are increasingly clouding the regional outlook. The impact so far has been contained by the limited direct exposure of regional banks to troubled U.S. housing related assets. However, overall financing conditions for the LAC region have been tightening, especially since the sharp increase in global counterparty risk this past September.

- Equity markets have sold off dramatically in recent months raising the cost of capital. Spreads on external corporate bonds have also risen sharply, including since September. Meanwhile overall corporate bond issuance has slowed, which will have adverse effects on investment and growth in the coming period.

- Exchange rates have been more volatile over the past year, and have weakened sharply in many cases since September. This depreciation reflects in part, the loss of access

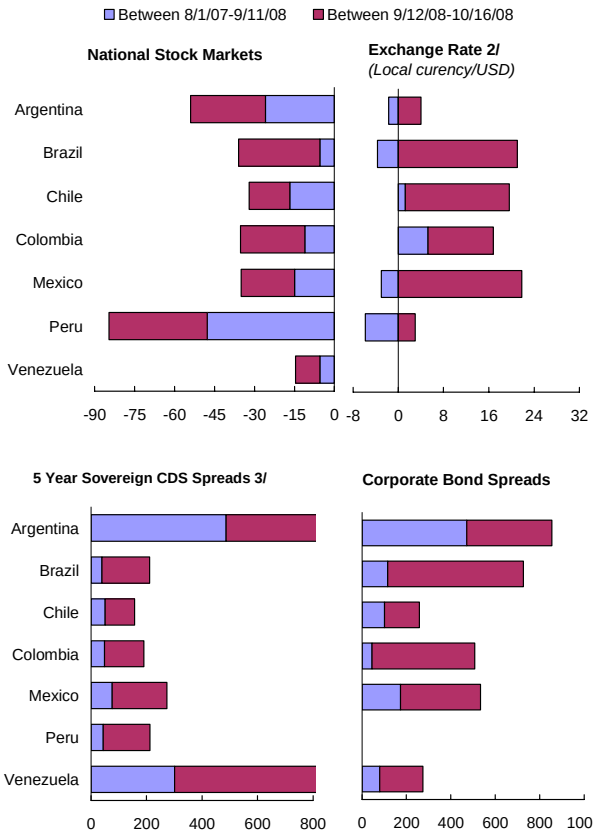
**Financial Market Developments**




Sources: Bloomberg; Datastream; Credit-Suisse; DealLogic, Inc.; and IMF staff calculations.
1/ Third quarter of 2008 comprises information available through August 2008.

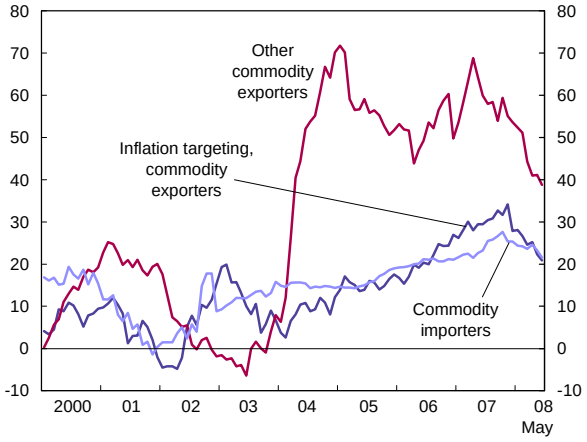
Note: This chapter was prepared by Vikram Haksar, Robert Rennhack, Jingqing Chai, Ana Corbacho, Roberto Garcia-Saltos, Herman Kamil, Carolina Saizar, and Bennett Sutton.

**Selected Financial Indicators – Recent Shocks 1/**




Sources: Bloomberg, LLP; Credit Suisse; Deutsche Bank; and IMF staff calculations
1/ September 12 refers to market close prior to Lehman Brothers bankruptcy.
2/ Increase indicates depreciation.
3/ Bars truncated for Argentina and Venezuela. Increase in spreads since September 11, 2008 are 1670 and 954 respectively.

**Credit to the Private Sector 1/**
*(12-month percent change)*




Source: IMF, International Financial Statistics.
1/ PPP-GDP weighted average.

to foreign credit lines, some capital repatriation, and the impact of lower commodity prices for the region's major commodity exporters.

- Domestic financial markets in many countries are beginning to come under pressure. There have been signs of stress for dollar and local currency funding in a number of important markets. Also, interbank funding costs for small and mid-sized banks have increased in some cases.

- Sovereign spreads have also risen, albeit less than in previous episodes of international financial stress, reflecting mainly the region's substantially strengthened fundamentals (Box 2.1). However, there has been substantial variation with some countries seeing sharp increases in risk premia.

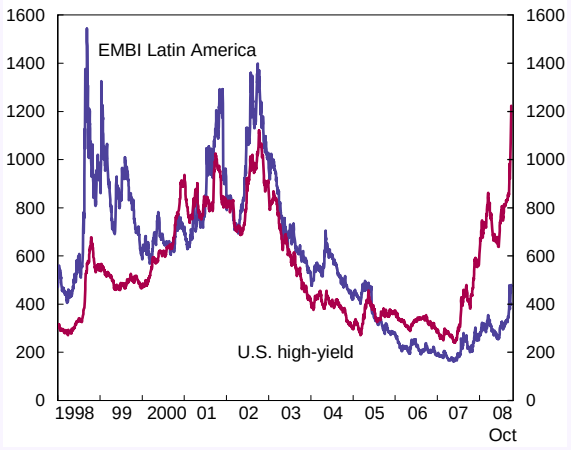
This has been accompanied by a slowdown in credit growth in many countries. While timely from a financial stability perspective, this will also tend to weigh on growth. The credit deceleration reflects a variety of factors including some natural pulling back by banks that have rapidly expanded balance sheets. Moreover, banks' own funding costs have risen with the increased global risk aversion (Box 2.2). There has also been some reduction in credit extension by global financial institutions that are important players in the region, but are experiencing strains on their balance sheets in home markets.

Weaker global growth prospects, along with resolution of some supply constraints, have led to a sharp fall in commodity prices since peaks in July, though prices are still well above end-2006 closes. Nonetheless, commodity price volatility has increased sharply, highlighting risks ahead. Oil products have experienced the sharpest declines and are down about 30 percent, at the time of writing, from their average levels in the first semester of this year. Likewise, prices have also dropped for many of the region's food exports, including soy products, corn, and coffee that are

## Box 2.1. Determinants of Sovereign Bond Spreads in Latin America

**Sovereign spreads in most Latin American countries have increased less than in previous bouts of international financial turbulence.** Following the collapse of Long-Term Capital Management in 1998, for example, the average sovereign spread in Latin America surged by more than 1000 basis points, to as high as 1600 basis points. This time around, while spreads on sovereign external debt for Latin America have risen since the onset of the credit crisis in mid-2007 (to 550 basis points, on average, by mid-October 2008), they remain well below their historical averages. Indeed, LAC sovereign and U.S. high-yield bond spreads have historically moved closely together during periods of financial stress. Since August 2007, however, U.S. high-yield spreads have increased almost 850 basis points, but LAC sovereign spreads have risen by about 350 basis points.

**Emerging Market Sovereign and U.S. High-Yield Spreads**
*(In basis points)*

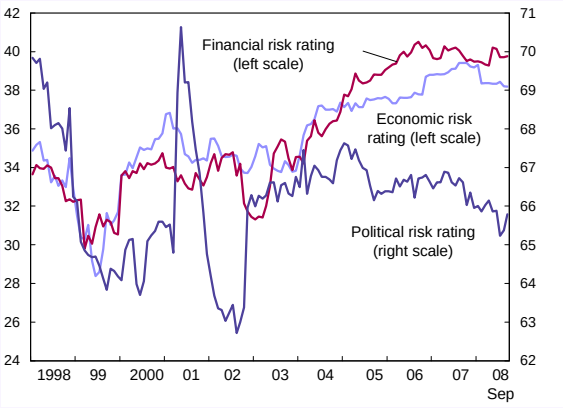



Sources: Bloomberg; and Datastream.

**What explains the more subdued response of the region's sovereign spreads in the face of the ongoing financial turmoil?** This is an important question given past research showing that external financial conditions and sovereign risk premia have historically been important determinants of fluctuations in Latin American growth (see Österholm and Zettelmeyer, 2007). To shed light on this issue, we review recent trends in Latin American sovereign debt spreads using a version of the panel data model developed by Hartelius, Kashiwase, and Kodres (2008). This model explains sovereign spreads in terms of two sets of factors: country fundamentals (proxied by economic, financial, and political risk ratings) and external financial factors (capturing global liquidity and investors' perception of global financial risk).[1]

**The region has entered the recent period of global financial turbulence from a position of reduced vulnerabilities.** The substantial buildup of international reserves, stronger fiscal positions, more credible monetary policy frameworks and improved structure of public debt have made Latin America more robust to external shocks. This is reflected in market perceptions of the region's economic and financial strength, as measured by a set of economic, financial, and political risk ratings (whereby higher ratings indicate better fundamentals and lower risk).[2] Many of these gains reflect the boost to the region from the recent commodity price boom.

**Fundamental Determinants of Sovereign Risks Have Improved**
*(Average using EMBI weights)*




Sources: PRS Group, *International Country Risk Guide*; and IMF staff calculations.

Note: This box was prepared by Kristian Hartelius and Herman Kamil.

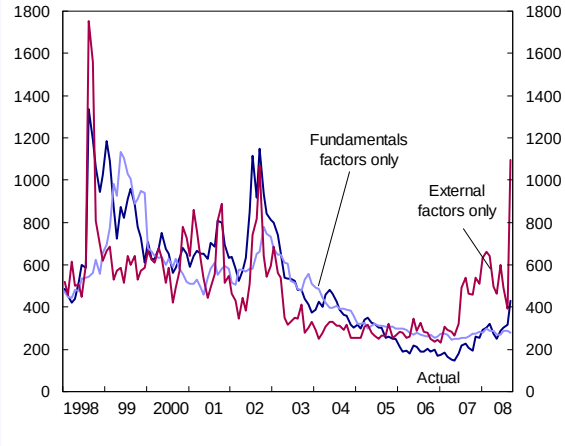
[1] As a proxy to capture investors' attitudes toward risk, we use the implied volatility of the U.S. stock market (VIX). The VIX has increased steadily in the last year as the global financial crisis has deepened. The model also includes both the yield on the three-month ahead federal funds futures and its volatility, to capture the extent to which the expected direction and uncertainty about U.S. monetary policy affects Latin American sovereign spreads. While the Fed has eased considerably since mid-2007, the volatility of the federal funds rate has increased systematically since the beginning of 2008.

[2] The *International Country Risk Guide*, published by the PRS Group, releases monthly ratings covering three types of risks: economic, financial, and political.

## Box 2.1 *(concluded)*

**The model explains fairly well the trends in sovereign spreads.** It captures most of the bouts of volatility in Latin American spreads during the 1990s and the Brazilian crisis in 2002, and mirrors closely the compression in EMBI spreads that started in 2003 during the period of expanded global liquidity (see Box 1.5 in the April 2006 GFSR). However, since mid-2007, the model's fitted values have overestimated actual spreads, which have been about 100 basis points lower than predicted by the model. This divergence could be explained by structural shifts in the parameters, or a faster decline in issuance of external debt than in previous periods, which are not controlled for in the model. It could also be reflecting an additional "search for yield" that is not captured by the VIX index.

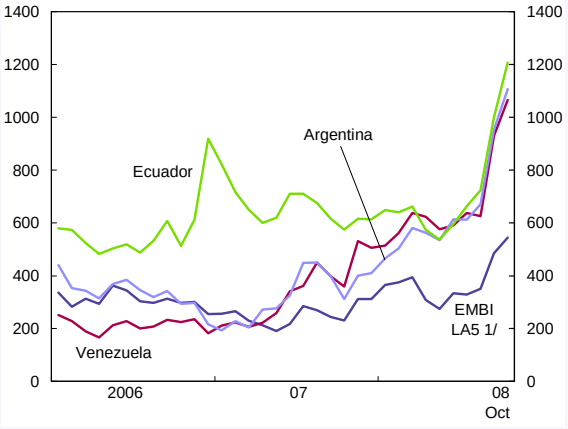
**EMBI Spread: Actual and Predicted Values by Separate Regressions**
*(Basis points)*




Sources: Bloomberg; and IMF staff calculations.

**Importantly, the results also suggest that recent movements in Latin American EMBI spreads appear well anchored in country fundamentals**. A separate regression using only the three risk ratings as independent variables (rather than the aggregate model), reveals that improved financial and economic risk ratings explain much more closely the recent dynamics of sovereign risk premia. This suggests that strengthened macroeconomic policy frameworks and robust fundamentals in the region can explain the observed resiliency of EMBI spreads in the face of global financial market volatility. At the same time, external financial factors alone appear to have over-predicted sovereign bond spreads over the past year. This may further suggest that the transmission of external financial shocks to sovereign financing conditions in Latin America have become more muted.

**Increased Differentiation in EMBI Spreads Across the Region**
*(In basis points)*




Sources: Bloomberg; and Datastream.
1/ LA5 is a weighted average that includes Brazil, Chile, Colombia, Mexico and Peru.

**However, with the sharp worsening in the global outlook since September, the influence of external conditions has increased**. The global slowdown and softening in commodity prices could have important effects on the fiscal stance of commodity producing countries. This may already be having an impact on aggregate EMBI spreads, which have risen substantially in recent weeks. Moreover, the aggregate regional EMBI masks increased differentiation across countries. Spreads have risen sharply in Argentina, Ecuador, and Venezuela. In other countries, by contrast, increases in spreads have been more modest. At the same time, spreads on external bonds issued by Latin American corporations have widened substantially since August 2007, rising on average by 530 points. This could point to an increasing role for private credit spreads as a mechanism for transmitting global financial shocks to the real sector in the region.

## Box 2.2. Financial System Stability Developments

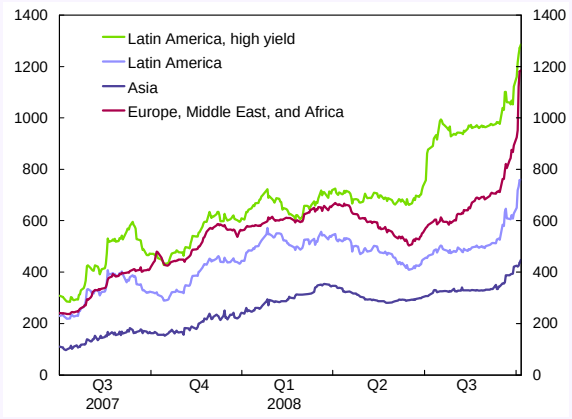
**Latest available financial soundness indicators (FSIs) continue to point to the overall robustness of banks across the region through earlier this year.** Capital remains adequate, in part reflecting relatively low levels of impaired assets. Meanwhile coverage against potential losses on identified nonperforming loans (NPLs) is high, while bank income remains buoyant. However, FSIs are backward looking and slow-moving indicators of financial system risk. Looking ahead, some risks are rising over financial stability prospects in the region:

**LAC: Selected Financial Soundness Indicators, 2008**

| | Capital Adequacy | | NPL Ratio | | Provision/NPLs | | Return on Assets | |
|---|---|---|---|---|---|---|---|---|
| | 2007 | 2008 | 2007 | 2008 | 2007 | 2008 | 2007 | 2008 |
| LAC | 14.4 | 14.4 | 2.5 | 2.5 | 134.4 | 132.8 | 2.1 | 2.1 |
| Argentina | 16.8 | 16.8 | 2.7 | 2.8 | 129.6 | 122.3 | 1.5 | 1.7 |
| Brazil | 18.7 | 18.1 | 3.0 | 2.9 | 181.8 | 181.7 | 2.9 | 2.8 |
| Chile | 12.2 | 12.4 | 0.8 | 0.9 | 210.4 | 187.5 | 1.1 | 1.1 |
| Colombia | 12.8 | 13.3 | 3.2 | 3.9 | 134.5 | 120.2 | 2.3 | 2.7 |
| Mexico | 16.0 | 16.0 | 2.5 | 2.1 | 169.2 | 184.0 | 2.8 | 2.9 |
| Peru | 11.7 | 12.2 | 1.3 | 1.3 | 131.6 | 139.4 | 2.5 | 2.6 |
| United States | 12.8 | 12.8 | 1.4 | 1.7 | 156.5 | 189.4 | 0.8 | 0.6 |

Sources: National authorities; and IMF staff calculations.

**External Spreads for Emerging Market Financial Firms**
***(In basis points, all asset classes)***



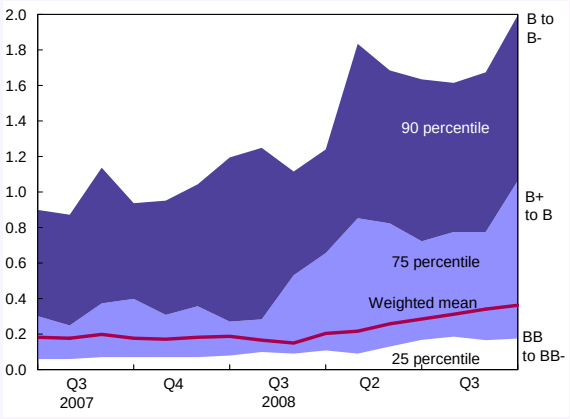

Source: Credit Suisse EMCI.

**Concerns are rising over asset quality, especially for weaker banks**. Slowing output growth and increasingly volatile commodity prices could adversely affect corporate and household cashflows in many countries. This would undermine credit quality and create risks for bank capital. These concerns are highlighted in bond and equity market measures of financial institution risk.

- Bond-market-based indicators suggest that risks facing emerging market financial institutions have increased sharply, including in Latin America, and especially among lower-rated banks in the region. Risk premia on bonds issued by high-grade financial institutions have also not been immune from the global shock, moving up in tandem with spreads for high-grade U.S. financials.

- Equity-market-based estimates of default risk (measured as the probability of default) show a widening dispersion in the risk among regional banks. The distribution of risk has shifted upwards with a fatter tail. This implies that default risks for smaller banks have increased substantially.

**Estimates of Default Risk of Latin American Banks 1/**

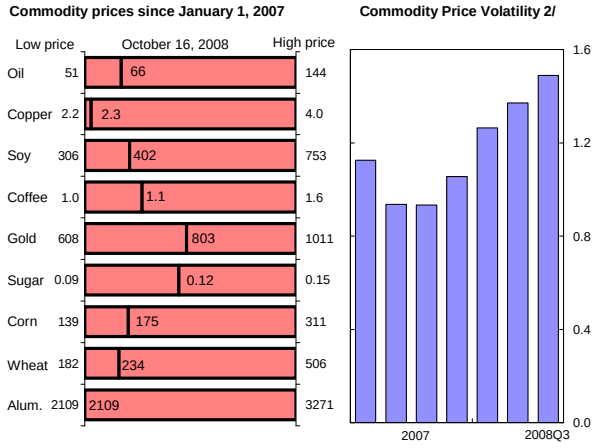



Sources: Moody's KMV and IMF staff calculations.
1/ One-year ahead EDF. Right axis shows correlations with S&P rating categories.

**Lending by global banks in the region has slowed more than credit from local banks.** The emerging signs of slowing aggregate credit growth offer a timely pause from the recent years' rapid credit expansion, which has lowered credit quality in some institutions. However, there is evidence that lending by global banks active in the region has slowed sharply, in part reflecting their efforts to reduce leverage and shrink balance sheets globally. A disruptive slowdown here could add further pressures on already tightening financing conditions for the corporate sector in some countries.

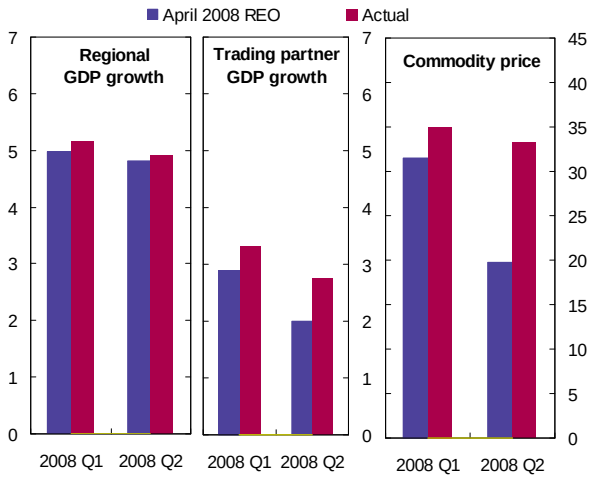
Note: This box was prepared by Jingqing Chai.

**Regionally Important Commodity Prices Have Retreated 1/**




Sources: Bloomberg; Wall Street Jounal; and IMF staff calculations.
1/ Black line and adjacent number indicate closing price as of October 8, 2008; prices in dollars per metric ton except crude oil (per barrel), coffee, copper, sugar (a pound), and gold (an ounce).
2/ Conditional standard deviation of daily percent changes in aggregate commodity export price index for Latin America.

**Developments in the First Half of 2008**
*(Percent change)*




Source: IMF staff calculations.

important in countries such as Argentina, Brazil, and Colombia.

## In the first half of 2008, growth and inflation exceeded expectations . . .

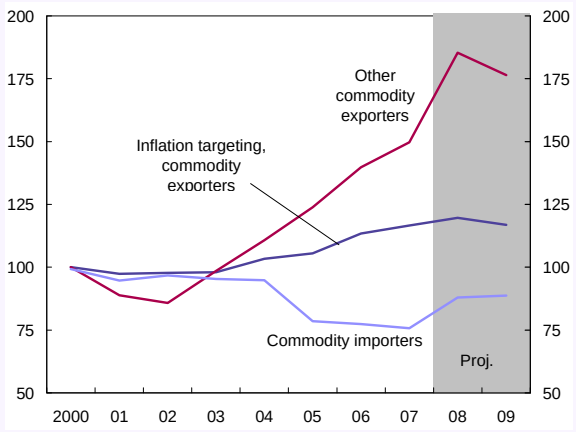
The outlook in the April 2008 REO was also dominated by uncertainty from the burgeoning global financial turmoil, and how and when this would affect the region. Given the April WEO projections for slower global growth and slowing

### Box 2.3. Differential Impact of Commodity Boom

To analyze the impact of the commodity price boom and its interaction with monetary policy regimes, we consider three groups of countries across the region in discussing the outlook.

- Inflation-targeting (IT) economies (Brazil, Chile, Colombia, Mexico, Peru, and Uruguay), many of which are net commodity exporters that have experienced sizable terms of trade gains. These countries have grown rapidly, though inflation pressures have in part been offset by appreciating currencies and monetary policy actions.
- Other net commodity exporters, which have less flexible exchange rate regimes (mainly Argentina, Bolivia, Ecuador, Trinidad and Tobago, and Venezuela). These countries have mostly experienced very large terms of trade gains, which combined with procyclical policies have boosted growth, but also pushed up inflation significantly.
- Net-commodity-importing countries, in Central America and the Caribbean, which have been especially hard hit by rising food and fuel prices, pushing up inflation and underlying current account deficits. With many of these countries having exchange regimes pegged to the dollar, the weaker dollar has allowed for some nominal depreciation to smooth the effects of the terms of trade shock.

**Terms of Trade 1/**
*(Index 2000=100)*




Source: IMF staff calculations.
1/ PPP-GDP weighted average.

Note: This box was prepared by Vikram Haksar.

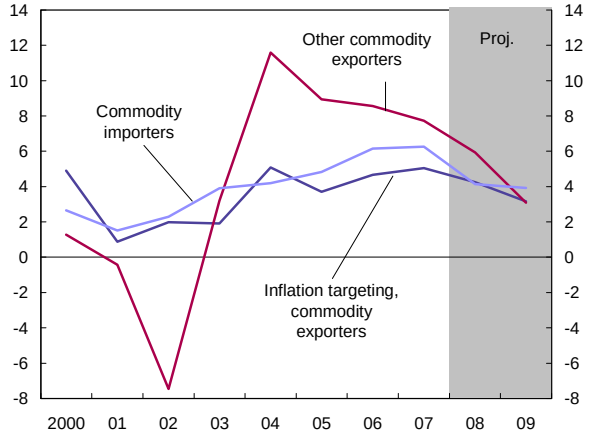
world commodity price increases, the April REO forecast a gradual slowdown in GDP growth in the LAC region to 4.4 percent in 2008 and 3.6 percent in 2009. Inflation was simultaneously projected to fall from 6.3 percent in 2008 to 6.1 percent in 2009.

In the event, both the growth momentum and inflation pressures in the first half of this year proved higher than expected. Growth in the first half of 2008 averaged 5¼ percent, reflecting a more gradual than projected slowdown in external demand and stronger than expected commodity prices.

This strong growth reflected a continuation of the trend whereby the region's net commodity exporters have been supported by the commodity price boom. Commodity strength boosted household incomes and consumption; and created internal funding for new investment, including attracting substantial foreign direct investment (FDI). Separately, growth in many of the commodity importers was supported by factors such as the effects of regional trade initiatives (such as CAFTA-DR), and increased tourist arrivals (especially important in the Caribbean). Additional impetus to growth came from the rapid public spending growth in commodity exporting countries. As a result, output gaps in the region's main economies have largely closed, with several economies, including, for example, Argentina and Colombia, above potential.[1]

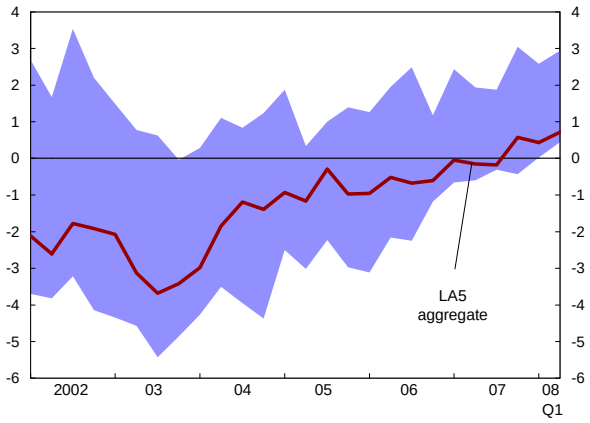
By the first half of this year, overheating was a significant concern as strong domestic demand, combined with supply shocks—including from commodity prices—pushed up inflation across the region (as examined more closely in Chapter 3). Since the end of 2007, headline inflation in the LAC region has risen by over 1½ percentage points, reaching 8¾ percent year-on-year in August. Inflation has risen well into the double digits in the non-IT commodity exporters, including Venezuela and Bolivia, and analysts

**Real GDP Growth 1/**
*(Annual percent change)*




Source: IMF staff calculations.
1/ PPP-GDP weighted average.

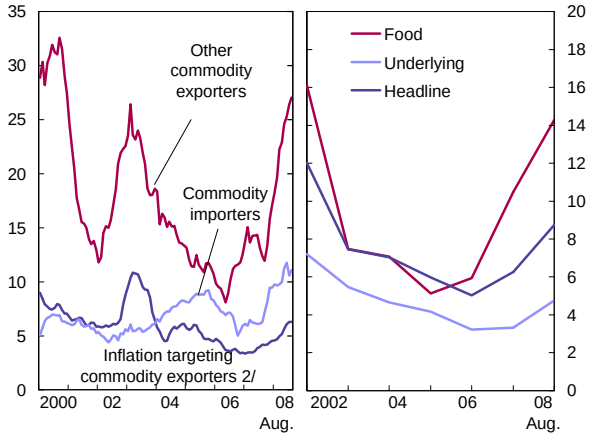
**Output Gap in Selected Latin American Countries 1/**
*(Percent of potential GDP)*



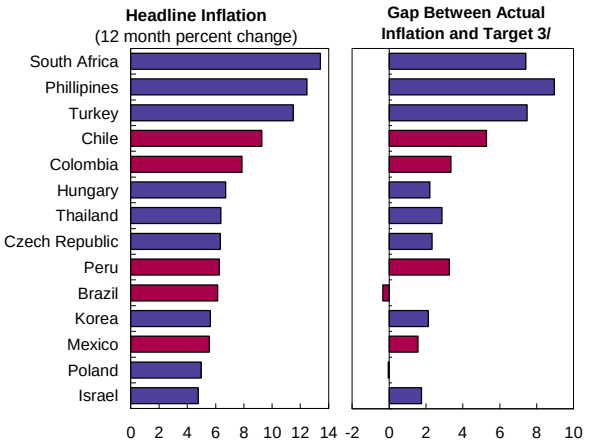

Source: IMF staff calculations.
1/ Shaded area corresponds to the maximum and minimum of the output gap estimates from individual countries' GPMs. LA5 includes Brazil, Chile, Colombia, Mexico, and Peru.

[1] The output gap estimates presented in the figure are derived from a regional model recently developed by IMF staff: the Global Projection Model–Latin America (GPM–LA).

**Inflation in Latin America 1/**
***(12-month percent change)***

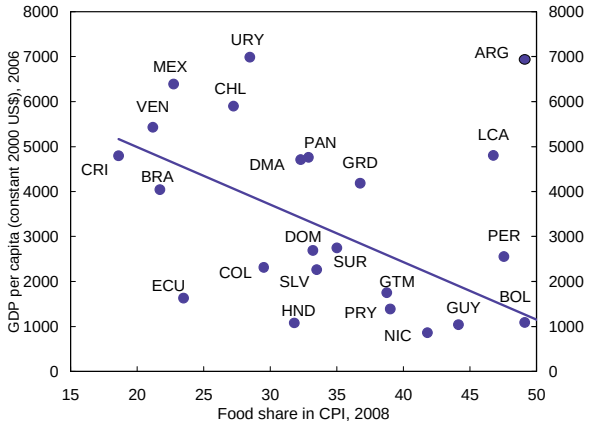



**Performance of Emerging Market Inflation Targeters**




Sources: Haver Analytics; national authorities; and IMF staff calculations.
1/ PPP-GDP weighted average.
2/ Commodity exporters that are inflation targeters.
3/ Gap defined as the difference between headline CPI inflation over the 12 month period to August 2008 and the upper bound of inflation target band.

**GDP per Capita and Food Share in CPI**




Sources: World Bank, *World Development Indicators*; national authorities; and Haver Analytics.

believe that actual inflation in Argentina is considerably higher than the official rate of 9 percent in August.[2] Inflation also moved up sharply in commodity importers, including several in Central America and the Caribbean, many of whom have been hard hit by the global food price shock. The region's inflation targeters have fared better, also in comparison with many emerging market inflation targeters from other regions. Nonetheless, outside Brazil, inflation is currently above target ranges, in some cases by a wide margin.

Underlying inflation also increased in most countries across the region reflecting second round effects of recent supply shocks. Inflation expectations for 2009 have also shifted up. Indeed, both core and end-2009 expected inflation have risen in most countries by ½–2 percentage points since end-2007.

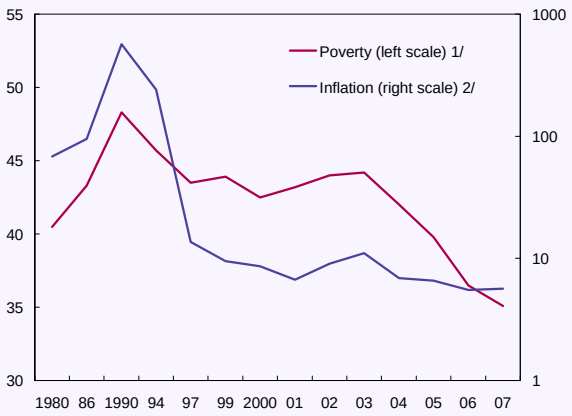
The pick-up especially in food inflation has prompted significant social concerns and puts at risk the gains on poverty reduction from the sustained reduction of inflation across the region through 2006 (see Box 2.4). Food price shocks tend to have a bigger impact on consumption levels in low-income countries, which have higher shares of food in their consumption baskets. Within countries, food price hikes also impact poor households the most. As discussed in Chapter 4, the increase in food prices since end-2006 has likely implied a sizable reduction in real consumption levels for the poor, particularly in urban areas, as well as net food consumers in rural areas. For instance, analysis by IMF staff suggests that the rise in food prices since end-2006 may have lowered real consumption of poor urban households, all else equal, by 16 percent in Nicaragua and 3 percent in Mexico in this period.

[2] Data for CPI inflation for several provincial capitals for August 2008 are generally well above this rate, although it should be noted that provincial data do not reflect price changes on the same basket of goods.

### Box 2.4. Inflation and Poverty

**The sustained growth with low inflation of recent years has helped substantially reduce poverty levels in the LAC region.** Poverty rates have declined from 44 percent in 2002 to 35 percent of the population in 2007, implying an absolute reduction in the poverty headcount of more than 30 million people. In many countries, the reduction in poverty has also been accompanied by some improvement in the distribution of income. Past REOs have discussed the links between growth and poverty reduction. It has been argued that sustained aggregate growth has contributed to rising employment and wages. The resulting boost to household income has helped lower poverty. But lower inflation itself has likely boosted growth in the region. Numerous studies (including Sarel, 1995, and Ghosh and Phillips, 1998) have documented the presence of a nonlinear relationship between growth and inflation. Reducing inflation to even moderate levels can have important growth effects. Moreover, strengthened fiscal frameworks have created fiscal room to expand targeted anti-poverty schemes in countries ranging from Brazil, to Chile and Mexico that have also contributed to these gains.

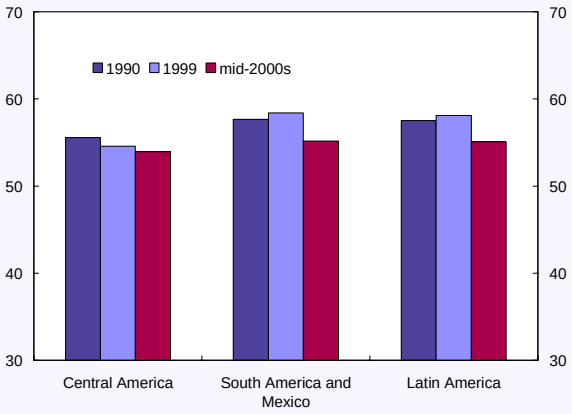
**Latin America: Poverty and Inflation, 1980–2007**
*(In percent)*




Sources: ECLAC (2008); and IMF staff calculations.
1/ Population-weighted average for 19 countries.
2/ Period average. PPP-GDP weighted average for 19 countries. Logarithmic scale.

**However, there is a risk that the recent acceleration in inflation may reverse some of the achieved social gains.** First, higher inflation could indirectly affect poverty by putting growth and employment prospects at risk because of its negative impact on the efficiency of investment. But inflation could also increase poverty by reducing the purchasing power of wages, incomes from self-employment, and government transfers. Disposable incomes could suffer further through the erosion of nominal assets, including cash, by the so-called inflation tax. Finally, inequality could rise, for example if low-income households or the middle class have less access to instruments that protect against the negative consequences of inflation than high-income households.

**Latin American Income Inequality**
*(Gini coefficient; larger figures indicate greater income inequality) 1/*




Source: ECLAC (2007).
1/ Population-weighted averages. 1990 indicates available observation closest to 1990; 1999 indicates available observation closest to 1999; mid-2000s indicates most recent available observation.

**Most available empirical studies show that inflation is harmful for the poor and for the distribution of income.** Cross-country studies by Romer and Romer (1999), Agénor (2004), Bûlir and Gulde (1995), Bûlir (2001), and Easterly and Fischer (2001) found significant positive relationships between the level of inflation and poverty and income inequality. For specific LAC countries, studies by Cardoso, Paes de Barros, and Urani (1995); Amadeo and Neri (1997); Corseuil and others (2000); and Fereira, Leite, and Litchfield (2006) for Brazil and Székely (2005) for Mexico have found similar relationships.

**The fact that higher inflation has been driven by rising food prices is of added concern.** Poor households are likely to experience sharper declines in real income than more affluent households, because food products make up a higher share of their consumption. This is confirmed by the World Bank's poor persons price index, which shows that during 2007 in 10 out of 12 LAC countries the poor faced effective inflation rates that exceeded significantly the general rate (World Bank, 2008a). Additional discussion of this issue is presented in Chapter 4.

Note: This box was prepared by Andreas Bauer.

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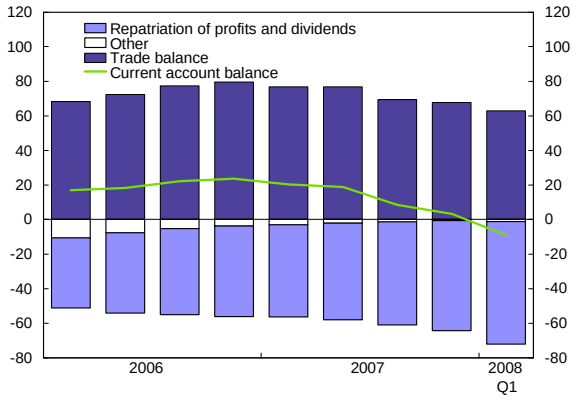
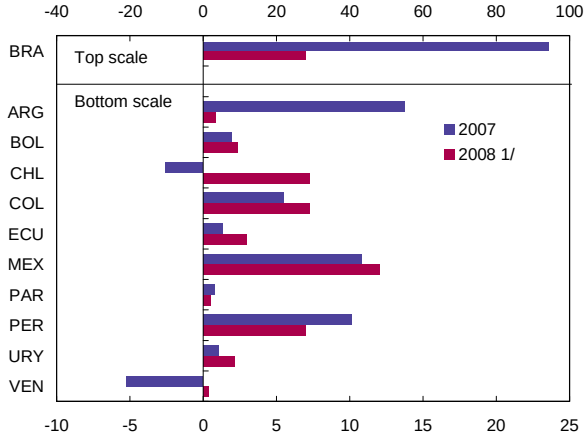
**Decomposition of Aggregate Current Account Developments 1/**
*(4-quarter rolling sums, billions of U.S. dollars)*




Source: IMF staff calculations.
1/ Countries included are Argentina, Brazil, Chile, Colombia, Mexico, and Peru.

**Reserve Accumulation in Selected Latin American Economies**
*(Billions of U.S. dollars)*




Sources: IMF, *International Financial Statistics* ; and IMF staff calculations.
1/ Change in the stock of reserves from end 2007 to September 2008 (or latest month available).

## . . . and current accounts have weakened

External current account positions across the region are weakening. Deficits are already large in the smaller commodity importers in Central America and the Caribbean. But current accounts also moved into deficit in several of the largest regional economies in the first quarter of 2008, for the first time in the last five years. Indeed, the aggregate trade balance for the IT commodity exporters through March 2008 had shrunk 50 percent from its peak 18 months earlier. Surpluses are also falling in the non-IT commodity exporters.

Another new development in the region is that a large part of the deterioration in the current account for many commodity exporters has come from rising profit and dividend repatriation of foreign firms, likely linked to FDI in resource-intensive industries and the financial sectors. Indeed, over half of the deterioration in the aggregate current account of Argentina, Brazil, Chile, Colombia, Mexico, and Peru between September 2006 and the first quarter of 2008 is explained by higher profit and dividend remittances, though part of this may re-enter as FDI in the capital account. This is in contrast to developments in other emerging market regions discussed in the WEO, where the deterioration of current accounts mostly reflects a marked weakening of already negative trade balances.

Nonetheless, while current account surpluses have shrunk, international reserves in all the major regional economies have increased this year. This reflects continued positive overall capital inflows. However, the pace of portfolio flows and external issuance has slowed. Meanwhile, FDI flows have decelerated in some cases. Recent reports also suggest that carry-trades have been unwinding on the back of global difficulties in obtaining funding.

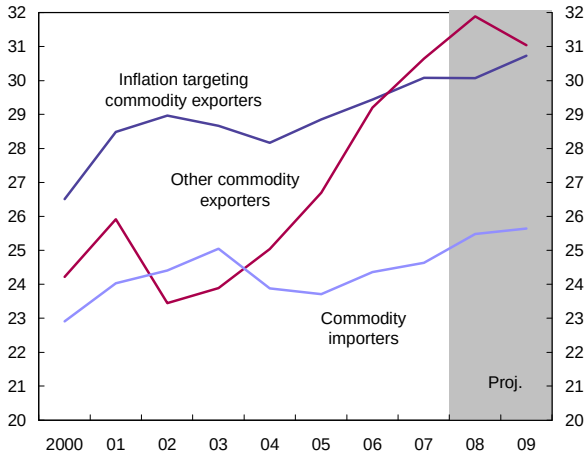
# A Varying Policy Mix

## Public expenditures have grown rapidly. . .

Real public spending has grown at a fast clip through this year, which has tended to add a pro-cyclical fiscal impulse across much of the region, including in many of the inflation-targeting (IT) countries. Primary public spending has risen especially sharply in the energy exporting countries, which were already growing extremely rapidly. While capital spending has increased in some countries, growth in current spending has been even faster in most cases.

The fiscal impulse discussed above reflects the fact that a large part of the spending increases have been financed by taxes on buoyant commodity exports. Increased tax revenues, on the back of higher commodity prices and strong economic activity, have supported a strengthening in aggregate primary and overall balances across much of the region. However, surpluses have stabilized for the region as a whole in recent years and indeed have contracted in the non-IT commodity exporters, where revenue gains have begun to moderate while spending has continued to rise quickly.

**Primary Expenditure 1/**
*(Percent of GDP)*

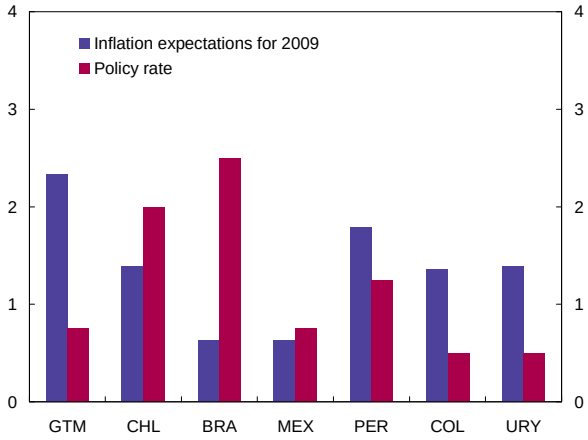



Source: IMF staff calculations.
1/ PPP-GDP weighted average.

## . . . while monetary policy was tightened in several cases

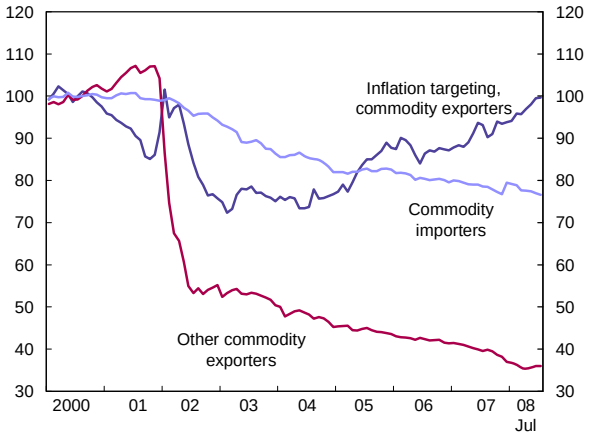
Responding to the rise in headline inflation and pick-up in expectations, monetary authorities in many inflation targeting countries raised policy rates this year. On average rates rose by about 125 basis points through mid-October, with larger increases including in Brazil, Chile, Colombia, Mexico, and Peru. Interest rates have also been increased in a number of other countries, including Argentina, the Dominican Republic, Guatemala, and Jamaica, and reserve requirements were increased earlier this year to tighten credit conditions in some cases.

**Inflation Expectations and Policy Responses**
*(In percent; change in values between Jan. and Sept. 2008)*




Sources: Consensus Economics, *Consensus Forecasts*; Inter-American Development Bank, Revela Database; and IMF staff calculations.

**Nominal Effective Exchange Rates 1/**
*(Index 2000=100)*




Source: IMF staff calculations.
1/ PPP-GDP weighted average.

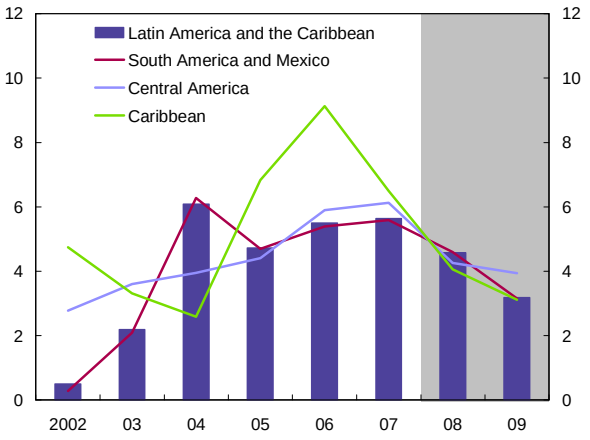
**Macro Outlook for LAC Region 1/**

| | 2005 | 2006 | 2007 | 2008 Proj. | 2009 Proj. |
|---|---|---|---|---|---|
| Real GDP growth, percent | 4.7 | 5.5 | 5.6 | 4.6 | 3.2 |
| End of period inflation, percent | 5.9 | 5.0 | 6.3 | 8.5 | 6.6 |
| Overall public sector balance, percent of GDP | -1.2 | -1.0 | -1.1 | -0.7 | -1.1 |
| Overall primary balance, percent of GDP | 3.4 | 3.3 | 2.9 | 3.0 | 2.4 |
| Current account balance, percent of GDP 2/ | 1.3 | 1.5 | 0.4 | -0.8 | -1.6 |

Source: IMF staff estimates.

1/ PPP GDP weighted averages.
2/ Weighted by GDP at market exchange rates.

**Real GDP Growth**
*(Annual percent change)*




Source: IMF staff calculations.

Several currencies in Latin America appreciated significantly through mid-2008, against the dollar and in effective terms, in tandem with strong reserve accumulation in many cases. This reflected high commodity prices, strong macroeconomic fundamentals, and significant foreign investor appetite for domestic assets. The nominal effective appreciation was an important counter to inflation pressures in IT countries. By contrast, monetary conditions tended to ease in countries with exchange rates pegged to the dollar, as these effectively imported the looser policy stance from the United States. This is apparent, for example, in the Caribbean countries with long-standing dollar pegs. The resulting depreciation in effective exchange rates in these countries helped them adjust to some extent to the large negative terms of trade shock they have experienced, but also contributed to inflationary pressures.

More recently, in response to growing pressures in domestic financial markets as the global turmoil spread, some central banks have taken steps to inject liquidity. Measures have included lowering reserve requirements, and arranging dollar funding lines for banks and trade credits for exporters. Moreover, a number of authorities have intervened in foreign exchange markets at times in recent weeks to smooth volatility in their currencies.

## Economic Outlook and Risks

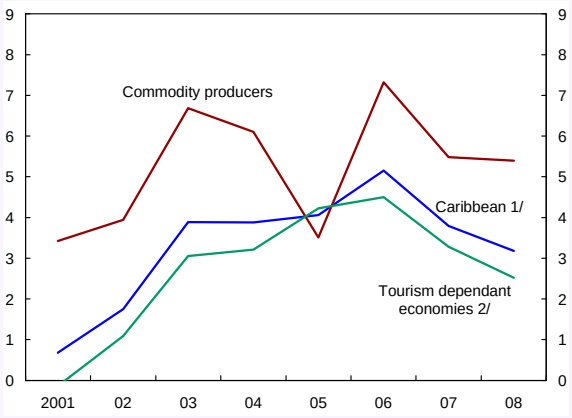
### Growth is now set to slow . . .

During the second half of the year, the region's strong growth momentum will increasingly be offset by the sharply weaker outlook for global financial conditions, external demand, and commodity prices. Given the strong first half, growth for 2008 as a whole is projected at 4.6 percent—still at, or above, trend in most countries—before falling back sharply to 3.2 percent in 2009 (Box 2.5 discusses prospects for the Caribbean region).

## Box 2.5. The Caribbean: Weathering the Global Storm

**The Caribbean has been buffeted by slower global growth and the sharp rise in international commodity prices since 2005.** Real GDP is projected to grow by 3¼ percent this year—well below the 4 percent average annual growth in 2003–07. Inflation is projected to reach 8 percent by end-2008—the highest rate since the mid-1990s.

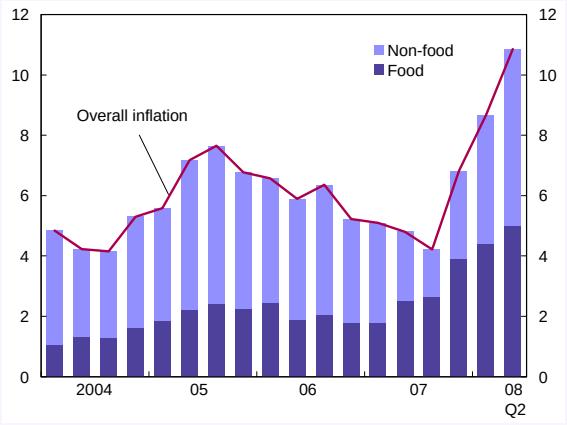
**Real GDP Growth in the Caribbean**
*(Percent change)*




Sources: National authorities; and IMF staff calculations.
1/ Simple average.
2/ Includes ECCU, Bahamas, Jamaica, Barbados, and Belize.

**The slowdown in advanced economies is dampening demand for tourism—one of the region's key exports.**[1] Tourism has been hit by more stringent travel requirements for U.S. citizens, the reopening of the Cancun market, as well as weaker economic conditions in the United States. The weak U.S. dollar propped up demand by Canadian and European tourists, but looking ahead, slower growth in these countries will dampen tourism demand. Moreover, high fuel costs are forcing major airlines cut back their routes.

**Contribution to Overall Inflation in the Caribbean 1/**
*(Annual percent change)*




Sources: National authorities; and IMF staff calculations.
1/ Unweighted inflation across The Bahamas, Barbados, Belize, ECCU, Guyana, Jamaica, Suriname, and Trinidad and Tobago.

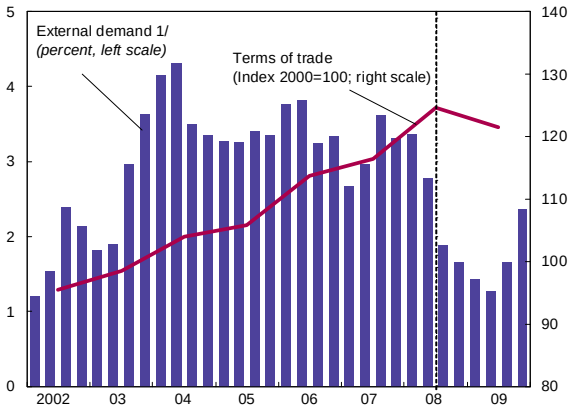
**Headline inflation has escalated on the back of higher world food and fuel prices.** Food accounts for a large share of consumer baskets in most countries, reaching 54 percent in St. Vincent and the Grenadines. Hurricane-related damages drove food price inflation up to 35 percent in Jamaica. Many countries generally allowed full pass-through of higher international fuel prices to domestic prices. In several countries the depreciating U.S. dollar and strong domestic demand have pushed up inflation.

**With more costly imports, the external current account deficit has soared in most countries.** Food and fuel imports are expected to rise substantially, pushing current account deficits to as high as 35 percent of GDP in the ECCU. Financing for current account deficits is expected to continue to come mainly from foreign direct investment and external assistance (most notably via Petrocaribe).

**The key near-term policy challenge is to weather the difficult period ahead.** Thus far, the region has been relatively unaffected by the global financial crisis. Looking ahead, it will be important to ensure adequate liquidity for the financial system and foreign exchange reserves to support external payments. Policymakers should seek ways to establish precautionary credit lines. In most of the region, fiscal discipline and a restrained credit policy would help safeguard net international reserves and signal continued commitment to ease high public debt burdens both of which would be key to support confidence among market participants. In fact, a number of countries (including Barbados, Belize, Jamaica, and St. Lucia) are targeting lower fiscal deficits. At the same time, many countries have also sought to soften the negative consequences of the rising cost of food on the poor through measures ranging from cuts to domestic tax rates and import tariffs to targeted subsidies. The possible benefits and cost of such efforts are explored more fully in Chapter 4 of this REO.

Note: This box was prepared by Trevor Alleyne.
[1] The net-commodity-exporting countries in the region are exceptions to these trends. Trinidad and Tobago (oil and gas) and Suriname (metals) are projected to grow by 5½ percent this year. Both countries will continue to run current account surpluses.

**External Demand Growth and Terms of Trade**




Sources: WEO; and IMF, *Direction of Trade Statistics*.
1/ Growth in real GDP, weighted by trade shares with respect to LA6.

**Box 2.6. Do Migrant Remittances to the LAC Region Fall During U.S. Slowdowns?**

It has previously been difficult to find a relationship between economic slowdowns in the United States and reductions in remittance flows to the LAC region at the aggregate level (Roache, 2007). However, ongoing research at the IMF (Magnusson, 2008) suggests that remittance flows to countries in the region are more connected to economic conditions in the specific region of the United States where their migrants live, as well as the sectors especially important for migrants' employment opportunities. Immigrants from the region cluster in a limited number of U.S. states while there is substantial heterogeneity in business cycles between states. As such, the ongoing housing related slump that has hit states such as California particularly hard, may have especially adverse effects for countries such as Mexico. This reflects the high concentration of Mexican migrants living in California and working in the construction sector. Remittances to El Salvador have also slowed markedly, but by less than in Mexico reflecting that they are less exposed to regions in the United States comparatively hard hit by the housing and construction downturn.

Note: This box was prepared by Kristin Magnusson.

Underlying this forecast are three key factors. First, the tightening in global financial conditions and increase in risk aversion now underway is likely to prove persistent as the seismic shifts taking place in the global financial system are expected to take some time to play out (Box 2.7 examines the impact on the region of the tightening in U.S. financial conditions). This will continue to dampen external financing and further tighten domestic financing conditions. Combined with the deceleration in credit growth, these factors should add substantial drag to growth.

Second, growth in partner country demand for the region is now expected to fall markedly. The United States, Europe, and Japan—which together account for about 70 percent of the region's exports—are set to slow sharply over the next couple of years. This will affect all economies in the region, but especially those that have close economic linkages with advanced economy partners, such as Mexico, Central America, and the Caribbean. Further, many countries, including especially in the Caribbean, are being affected by a reduced demand for tourism services from both the United States and Europe. Additional downdrafts are set to arise from already weakening remittances from the United States, and especially so for Mexico and some in Central America and the Caribbean. This reflects the slowdown in the United States, especially in the construction sector, which employs many migrants from Mexico (Box 2.6).

Third, as commodity prices fall back, the terms of trade facing the LAC region are projected to worsen by about 3 percent through 2009 in the current WEO baseline. This will shift into reverse another key growth impulse of recent years for the region's commodity exporters—a 10 percent drop in commodity prices reduces regional growth by about 0.8 percentage point. However, the projected falloff in oil prices would reduce the drag facing the region's net commodity importers.

## Box 2.7. Spillovers from the United States to Latin America

**A key question is how much financial conditions in the United States affect growth in Latin America.** This box assesses the effect of different shocks in the United States on the region, drawing on the Global Projection Model (GPM) for Brazil, Chile, Colombia, Mexico, and Peru (LA5).

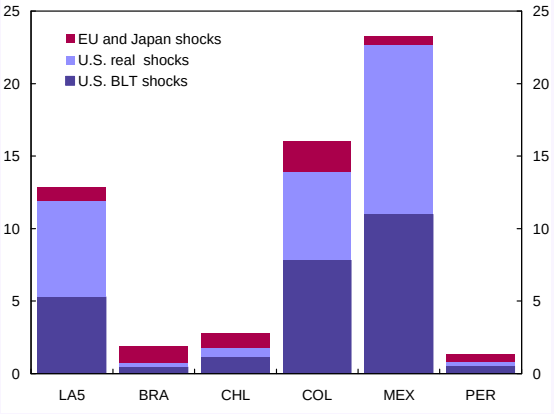
**The results suggest that shocks in the United States account for about 12 percent of the variation in LA5 growth.** About half of this variation is explained by changes in U.S. financial conditions, which are a forward looking indicator on the availability of financing and a leading indicator for output.[1] Within this, there is also substantial variation across countries. The effects of shocks in the United States, unsurprisingly, are strongest in those countries with the closest trade linkages to the United States, although in some countries, financial linkages are relatively more important.

**Output shocks in the United States tend to affect Latin America more than Europe or Japan, in terms of size, speed, and duration of impact.** A shock of 0.4 percent to the negative output gap in the United States generates a negative output gap in the LA5 of 0.1 percent on impact and a 0.4 percent cumulative effect after a year. Also, a shock to output in the United States transmits more quickly to Latin American output than shocks to financial conditions in the United States.

**Shocks to U.S. financial conditions affect Latin America with a lag—a peak effect occurs after 1½ years—but are more persistent than U.S. output gap shocks.** A 6 percentage point increase in bank lending tightening conditions in the United States—which grows to 35 percentage points after a year because of negative feedback effects—generates a negative output gap in the LA5 of 0.1 percent on impact and 0.6 percent after 2½ years. This is a particularly important finding to keep in mind in the current context, where the financial condition variable used in the GPM has increased 53 percentage points since September last year. This suggests that, with the large shock to U.S. financial conditions still playing out, the effects of the financial tightening in the United States on growth in the region could still be in the pipeline.

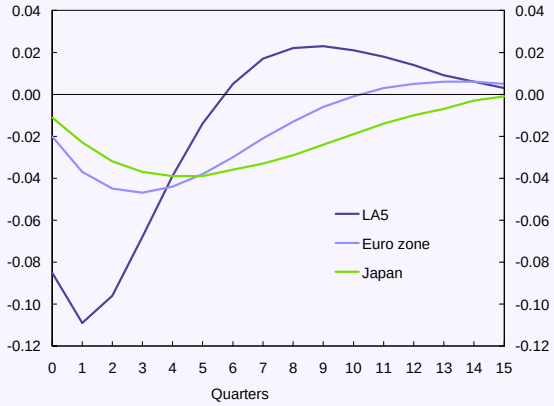
Note: This box was prepared by Jorge Canales-Kriljenko and Roberto Garcia-Saltos.
[1] Measured by the Bank Lending Tightening (BLT) variable as described in Appendix 3.1.

**Contribution of G3 Shocks to the Variance in the 4th-Quarter GDP Growth**
*(In percent)*



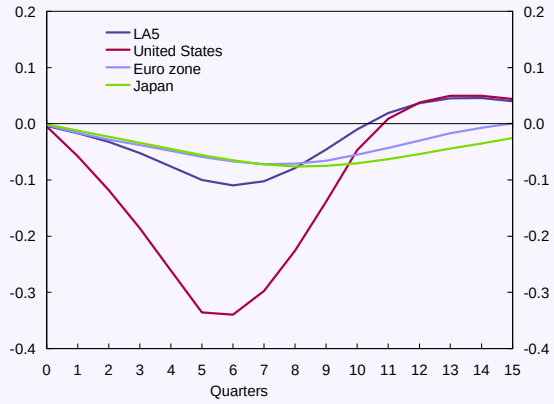

Source: IMF staff calculations.

**Output Gap Response to a 0.4 Percent Negative U.S. Output Gap Shock 1/**
*(In percent)*



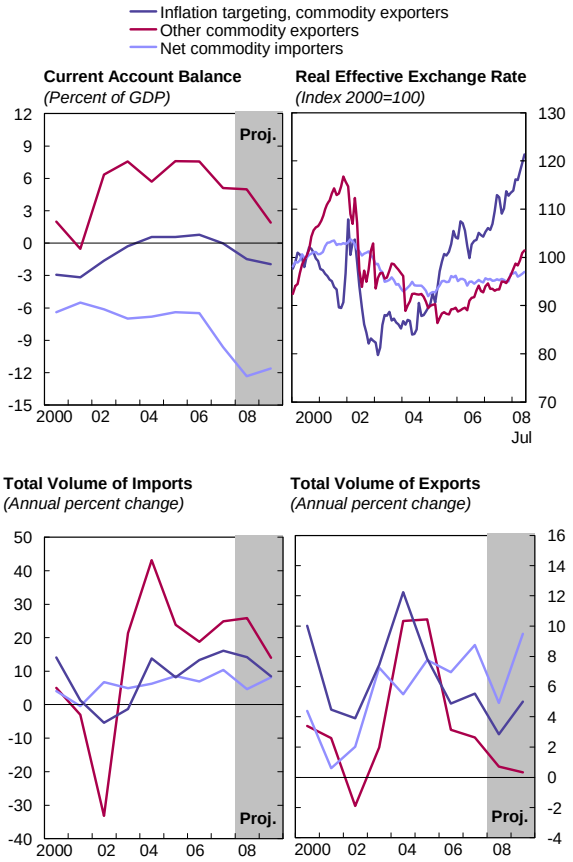

Sources: IMF staff calculations.
1/ Size of the shock is one standard deviation.

**Output Gap Response to a 6 Percentage Points Shock in U.S. Bank Lending Tightening 1/**
*(In percent)*




Sources: IMF staff calculations.
1/ Size of the shock is one standard deviation.

**External Sector Developments 1/**




Sources: World Economic Outlook database and IMF staff calculations.
1/ PPP-GDP weighted average.

## . . . current accounts to weaken . . .

The worsening in the current account in recent years reflects a combination of strong domestic demand, exacerbated by contracting oil export volumes in some of the energy exporters, especially Venezuela, and rising profit transfers. Meanwhile, the net commodity importers in Central America and the Caribbean have seen substantial increases in their oil import bills in recent years, which in some countries have been partially financed through Venezuela's Petrocaribe initiative (see Box 2.8). Looking ahead, external current account positions are expected to continue to weaken—especially in Bolivia, Chile, the Dominican Republic, Panama, Trinidad and Tobago, and Venezuela—as external demand, remittance flows, and the terms of trade weaken, offsetting the impact of weaker domestic demand. Indeed, the LAC region as a whole is expected to run a current account deficit this year for the first time since 2002.

## . . . and inflation to fall . . .

The sharp slowdown in the global and regional economies, falling commodity prices, and the lagged effects of past policy tightening should bring inflation down. Inflation in the baseline scenario is projected to fall from 8.5 percent in 2008, to 6.6 percent in 2009. Inflation in the region as a whole should gradually return toward levels consistent with countries' inflation objectives over 2009–10, though in some cases, pressures may persist. Some authorities in the region (including notably Brazil and Peru) have tightened fiscal policy in 2008 to better support the overall policy mix in containing inflation pressures.

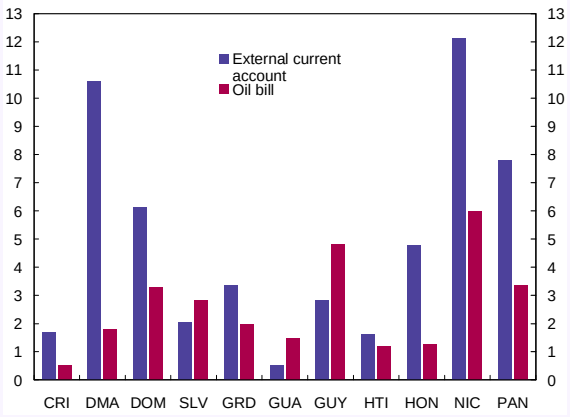
## . . . with growth risks to the downside

This is a time of unparalleled uncertainty for the global and regional economies. The shocks currently working their way through the global financial system are beyond any seen in the last 70 years in terms of their size and scope.

## Box 2.8. Absorbing the Oil Shock in Central America and the Caribbean: The Role of Petrocaribe

**Rising world fuel and food prices have had a significant impact on external balances in Central America and the Caribbean (CAC).**[1] External current account balances have deteriorated markedly since 2006. This reflects primarily the increase in the oil bill, as CAC countries are net oil importers, while some countries (the Dominican Republic, El Salvador, Grenada, Haiti, Jamaica, and Panama) are also net food importers. Recent work by IMF staff suggests that the impact on the current account of any further increase in oil prices would likely be larger than a similar additional increase in food prices. If a combined shock were to materialize, the most affected countries within the CAC would be Dominica, the Dominican Republic, El Salvador, Grenada, Haiti, Honduras, and Jamaica (IMF, 2008a).

**Increase in Current Account Deficit, 2007-08**
*(Percent of GDP)*




Source: IMF staff calculations.

**The Petrocaribe initiative has helped cushion the shock.** Petrocaribe provides concessional financing on petroleum imports from Venezuela, and in many countries, also a framework for coordinating energy policy. The terms of this financing are common across countries (25-year maturity, with a 2-year grace period, at an interest rate of 2 percent), while the amount of available financing varies, being governed by an import quota negotiated bilaterally with Venezuela in thousands of barrels per day. In addition, the share of imports that can be financed, as well as the grant element of the loan, fluctuate with the world price of oil. Venezuela has also provided financing under the *Alternativa Bolivariana para las Américas* (ALBA), including for energy infrastructure projects. Among the CAC countries, Nicaragua has been the largest beneficiary of ALBA financing during 2007, a trend that is expected to continue in 2008.

**Oil Bill and Expected Financing Under Petrocaribe, 2008**

| Country | Oil bill | Financing | |
|---|---|---|---|
| | (% of GDP) | US$ bn | (% of GDP) |
| Costa Rica | 6.1 | 0.0 | 0.0 |
| Dominica | 9.9 | 0.0 | 0.0 |
| Dominican Republic | 11.2 | 0.8 | 2.0 |
| El Salvador | 8.6 | 0.0 | 0.2 |
| Guatemala | 7.7 | 0.0 | 0.0 |
| Grenada | 10.5 | 0.0 | 1.2 |
| Guyana | 30.9 | 0.1 | 6.2 |
| Haiti | 9.4 | 0.1 | 1.4 |
| Honduras | 11.0 | 0.1 | 0.8 |
| Jamaica | 15.5 | 0.8 | 6.2 |
| Nicaragua | 18.7 | 0.3 | 5.1 |
| Panama | 6.4 | 0.0 | 0.0 |
| Memo item: | | | |
| Total financing in billion dollars: 2.2 | | | |

Source: IMF staff calculations.

**Financing from Petrocaribe is expected to be substantial for the CAC.** So far, members have not received their full quota,[2] including due to rigidities in changing oil supply sources,[3] and technical considerations linked to the use of the Venezuelan crude oil mix in local refineries. Financing is still expected to be substantial for some countries in 2008, reaching about 5–6 percent of GDP in Guyana, Jamaica, and Nicaragua, and about 1–2 percent of GDP in the Dominican Republic, Grenada, Haiti, and Honduras. Many other CAC countries are seeking similar arrangements with Venezuela (which need to be implemented in El Salvador and Guatemala, and are under negotiation in Costa Rica).

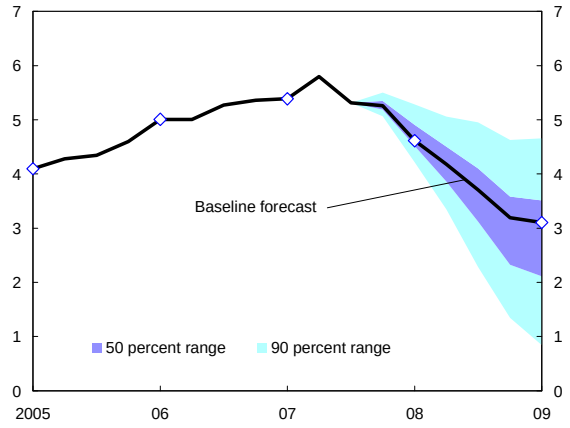
Note: This box was prepared by Gabriel Di Bella.

[1] CAC countries analyzed in this box include Costa Rica, Dominica, the Dominican Republic, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, and Panama.

[2] According to IMF staff projections for 2008, Honduras will import crude and derivatives from Venezuela equivalent to about 55 percent of its quota, Nicaragua about 60 percent of its quota, and the Dominican Republic about 70 percent.

[3] The counterparty must be a state-owned oil company, but a significant part of oil imports are still managed by private companies.

**LA6 Growth Forecast: Balance of Risks**
*(Annual average growth rates; in percent)*




Source: IMF Western Hemisphere Department Regional Economic model.

Moreover, their short- and long-term implications are very difficult to judge, with much depending on how quickly the ongoing steps being taken by the U.S. and European authorities can stabilize financial markets. Also, in contrast to the outlook in April, global financial and commodity risks are now moving together, adding to potential volatilities for many commodity producers (although falling oil prices are an upside factor for growth and external sustainability in a number of countries, especially in Central America and the Caribbean).

Reflecting on these uncertainties, IMF staff have undertaken new risk scenario analysis for the growth outlook using the regional economic model for Latin America that has been developed earlier.[3] The model is focused on analyzing the impact on regional growth of shocks to external demand, international financial conditions, and commodity prices.

With the global economy projected to reach the threshold of recession in 2009 (which in the WEO is considered to be global growth of 3 percent or lower), our analysis focuses on commodity price risks as well as the impact of further tightening in financial conditions. We model the impact on regional growth of a 35 percent drop in average commodity prices in 2009 from their mid-2008 level. Such a drop in commodity prices is broadly in line with the experience of past global recessions. Tight financial conditions are modeled in two ways. First, a proxy for U.S. financial conditions (high-yield corporate spreads) is assumed to stay unchanged at currently high levels through end-2009. Second, the region's EMBI spreads are assumed to remain at current elevated levels of over 600 basis points reflecting the dependence of fiscal positions in many countries on commodity related revenues. In this scenario, regional growth would slow sharply, dropping to –0.3 percent annual growth in the last quarter of 2009. Full year growth in 2009 would average 0.7 percent, compared with 3.2 percent in the current baseline scenario.

Downside growth risks for the region as a whole have risen since April, in line with the increased downside global risks discussed in the October 2008 *World Economic Outlook*. These reflect especially uncertainties over the evolution of global financial conditions and external demand that have increased since the April 2008 *World Economic Outlook*. While there are some upside possibilities, for example if commodity prices were to rise sharply again, all told, risks to the growth outlook continue to be tilted to the downside around the baseline scenario discussed previously. The balance of risks is encapsulated in the fan chart for the regional growth outlook derived from the BVAR model. This fan chart merges together the baseline scenario, as well as the weaker growth scenario conditional on lower commodity prices and tighter financial conditions.

## Vulnerabilities Have Been Reduced, But Risks Still Present

As documented in past REOs, the LAC region's resilience to shocks has increased in recent years. Public debt levels and financing requirements have been reduced, and external

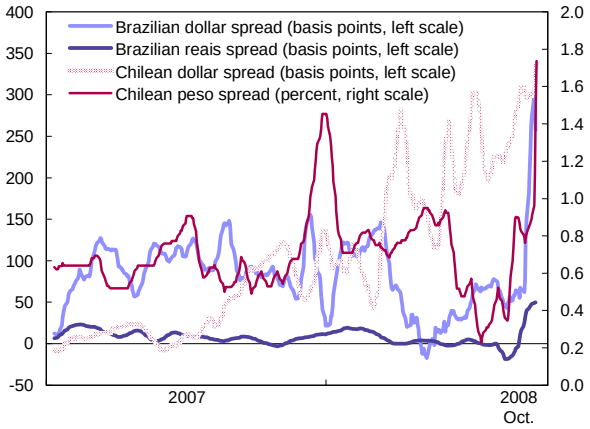
[3] The model used is the Bayesian VAR growth model (see November 2007 *Regional Economic Outlook: Western Hemisphere*, Chapter 3), for the LA6 countries (Argentina, Brazil, Chile, Colombia, Mexico, and Peru) which together account for about 80 percent of regional output.

current accounts have been strengthened. Moreover, the credibility of macro policy frameworks in many countries has been strengthened, while flexible exchange rates have provided an important shock absorber for several countries. Financial sectors too are more robust, with higher levels of capitalization and profitability.

Nonetheless, a number of concerns arise in the current global environment. First, developments since the failure of Lehman Brothers in mid-September have shown that money markets in some of the largest and most liquid regional financial systems are not immune to the ongoing global funding stresses. The cost of both dollar and domestic funding has shot up in a number of countries' interbank markets in recent weeks; and anecdotal evidence suggests that in some countries, access to external credit lines and trade credit has begun to tighten. Moreover, global banks account for a significant share of deposits in a number of countries in the region. Pressures on these banks in home markets could create risks of liquidity pressures in some countries in the LAC region.

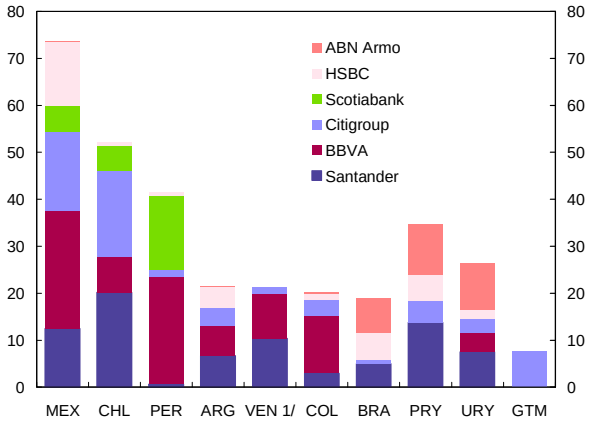
Second, funding concerns also arise in the context of the still significant public sector borrowing requirements in a number of countries. While public external financing requirements are much reduced relative to the start of the decade, a number of countries still face large domestic rollover requirements on public debt. Overall financing needs in some countries in the region are also well above those in other emerging market comparators. While many countries have a diversified domestic funding base, in some cases heightened risk aversion in domestic financial markets could pose risks, including upward pressures on yield curves. Additional risks arise in

**Money Market Pressures 1/**
*(Two week moving averages)*



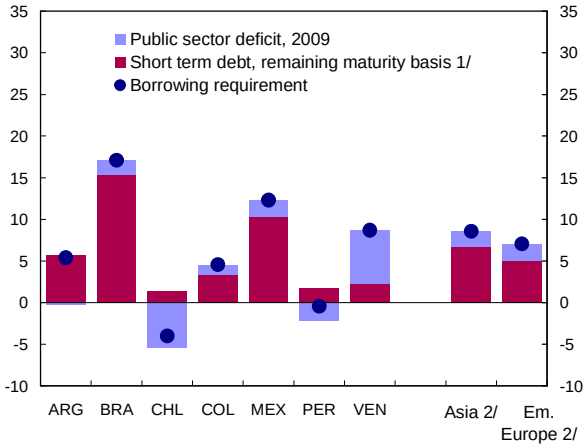

Sources: Barclays Capital; and IMF staff calculations.
1/ Local currency interest rate spreads: one-month deposit to Pre-DI swap spread (20-day m.a.) for Brazil; 30-day deposit rate to monetary policy rate spread in percent for Chile. Dollar interest rate spreads: 90-day USD/DI swap to 3-month Libor spread for Brazil; on- to off-shore 3 month Libor spread for Chile.

**Share of Deposits Held by Subsidiaries of International Banking Groups**
*(Percent of total banking system deposits, latest available)*



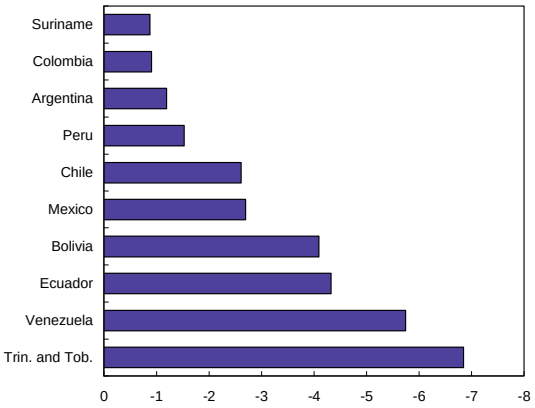

Sources: National authorities; and IMF staff calculations.
1/ Foreign banks' liabilities in percent of total banking system liabilities.

**Public Sector Financing Requirement**
*(Percent of GDP)*




Source: IMF staff calculations.
1/ Stock of short term debt including amortization projected for 2009.
2/ Public sector deficit measured by general government deficit.

**Sensitivity of Fiscal Revenue to Commodity Prices 1/**
*(In percent of 2008 GDP)*




Sources: National authorities; and IMF staff calculations.
1/ Impact on fiscal revenue of a 35 percent decline in commodity prices. Results for the 9 countries with public commodity revenue above 2 percent of GDP.

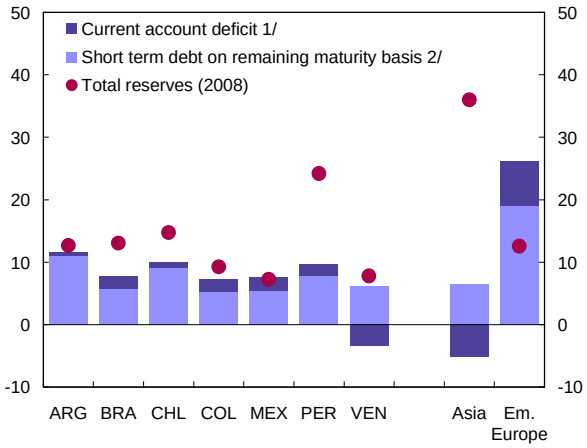
this context from the dependence of several countries on commodity revenues. Were commodity prices to fall by amounts consistent with past global recessions (the 35 percent drop discussed in the downside scenario above), fiscal revenues could drop sharply, putting pressure on borrowing requirements in some countries.

Third, rising current account deficits and tighter external financing conditions need to be carefully monitored. At the current juncture, aggregate external financing requirements appear manageable. Even with the projected increase in current account deficits in 2009, the level of external reserves in most of the major countries in the region is sufficient to cover external deficits as well as debt falling due. Nonetheless, coverage ratios are low in some countries, while the region as a whole is less well insulated on this metric than emerging market comparators in Asia, though in a stronger position than those in Eastern Europe. Moreover, while corporate foreign currency debt levels have fallen substantially (Chapter 5), risks have arisen in some cases from currency derivative exposures. Corporates in a number of countries have recently been exposed to large losses from weakening currencies on account of off-balance sheet derivative positions. Risks could arise here given uncertainty over the aggregate size and nature of these positions.

## Policies: Maintaining Confidence and Stability

The shocks buffeting the global economy present the first major test for the region's strengthened policy frameworks. The key policy challenge at this juncture is maintaining confidence and financial stability, while mitigating the expected slowdown. With significant downside risks to the outlook for the region, and the global situation evolving rapidly, policymakers will need to adapt quickly to changing circumstances.

**Coverage of Aggregate External Financing Requirements**
*(Percent of GDP )*




Source: IMF staff calculations.
1/ Projected 2009 current account deficit (positive values indicate deficit).
2/ Stock of short term debt including amortization projected to come due in 2009.

## Monetary and Exchange Rate Policy

With growth expected to slow, and commodity prices falling sharply, overheating and inflation concerns have become considerably less pressing. In light of the rapidly evolving global situation, authorities will have to carefully balance the impact of both internal and external developments, including on the exchange rate. Some countries—in which underlying inflation pressures are strongest—may need to tighten monetary policy. Others—particularly those where domestic demand is expected to weaken markedly and external pressures are not a concern—may have increasing room to ease.

Nonetheless, policymakers will need to keep a close eye on preserving the credibility of the monetary policy framework. Many countries will miss their inflation objectives this year, with the fast-growing non-IT commodity exporters facing the most significant challenge in reining in inflation. Moreover, inflation may not come back within target ranges in many countries till past 2009. In all cases, it will be important to clearly communicate authorities' expectations with regards to the inflation outlook. It will also be crucial to moderate wage demands to avoid destabilizing inflation expectations, especially in countries with fixed exchange rate regimes.

In the current global environment, flexible exchange rates in many countries will continue to act as a natural cushion in the event of such shocks. Countries faced with a temporary and sudden shortfall in capital flows will need to respond quickly and effectively, including by using reserves where such buffers exist. The purpose of intervention should not be to defend a particular exchange rate, but to mitigate adverse effects from the global crisis on banks and firms.

## Fiscal Policy

Fiscal positions are currently projected to weaken through 2009 in many countries in the baseline scenario, reflecting lower projected revenues, but also continued spending growth especially in those countries most dependent on commodity revenues. As such, fiscal policy in the region will need to be mindful of constraints that could arise from tightening financial conditions in some markets, and the desirability of taking steps to solidify further structural fiscal balances.

In the baseline scenario, fiscal policy across the region needs to be rebalanced towards containing spending growth to maintain fiscal stances broadly unchanged, allowing monetary policy to play the main countercyclical role. Also, in many countries, the ongoing global shock is beginning to create some pressure on government financing. This adds to the need for caution on spending, but also for vigilant treasury management, especially in countries with large financing requirements. Moderating spending would also facilitate needed adjustment in the face of large external imbalances in the commodity-importing countries.

In the event that downside risks to growth materialize, there is scope for countries that have built up credibility to allow revenue to fall without cutting spending. However, if a slowdown in growth is coupled with heightened global risk aversion, tighter financing conditions may impede a loosening of fiscal conditions, particularly in

countries with high debt levels and large financing requirements.

Additional spending stimulus would not be advisable in most countries in the region in the event of a sharper than expected downturn. The rapid spending growth in the region over recent years is probably perceived as permanent. As such, further discretionary spending increases risk undermining the credibility of the fiscal framework (as discussed in the April REO) and raising risk premia even further with adverse implications for medium term growth. These concerns are especially pointed in the case of the non-IT commodity exporters, whose particularly procyclical fiscal stances in recent years have left little room for maneuver on fiscal policy. Options are also constrained for the commodity importers with fixed exchange rate regimes. A looser fiscal stance could result in a loss of international reserves and weakening of the underpinnings of exchange rate frameworks.

Looking ahead, countries would benefit from moving towards adopting long-term budgetary planning, which in the current conditions of heightened uncertainty would ensure authorities' commitment to a sound and sustainable fiscal policy for the future.

## Financial Stability Policies

Deeper domestic financial markets, reduced public sector financing requirements, together with lower exposure to exchange rate risks, have helped improve the resilience of regional financial markets to external shocks. Nonetheless, the ongoing turmoil roiling international financial markets is beginning to have an impact on some domestic financial markets in the region. Responding to these emerging stresses, authorities in several countries have taken appropriate measures to maintain stable conditions, including providing liquidity as needed, and seeking to safeguard the flow of trade credit.

The financial sector pressures in advanced economies have highlighted the need for vigilant oversight over domestic liquidity conditions, and authorities in some countries have already taken steps to ensure orderly market conditions. In this context, it will be important to continue work on contingency planning and improving financial safety nets (such as the clarification of the lender-of-last-resort functions and the role of various authorities in managing financial stability) and bank resolution frameworks. Further, the significant foreign participation in several regional financial systems highlights the need for continuing to strengthen consolidated and cross-border supervision, as well as coordination with foreign supervisory authorities.

While now decelerating, credit has grown rapidly in recent years and risks from deterioration in credit quality may still be in the pipeline. As much international experience has shown, including the recent developments in the United States, episodes of rapid credit growth are often accompanied by a relaxation in lending standards, which subsequently tends to compromise the quality of bank portfolios and erode financial institutions' capital. While credit-to-GDP ratios in the region are low by international standards, the rapid catch up process in recent years raises prudential risks that regional authorities are already responding to with steps to strengthen oversight.

## Social Policies

Higher inflation, especially food inflation, has created substantial stress on the income of the poorest. International experience has shown that targeted social assistance is the most cost effective means to mitigate the impact on the poor of higher food and fuel prices. Indeed, the fiscal cost of protecting the most vulnerable households is moderate when using targeted instruments.

A key challenge is that many countries still lack effective social safety nets that adequately reach vulnerable households. Second best options, such as subsidies or tariff reductions, may be needed in the near term, but should be periodically

reassessed and removed as better instruments can be put in place. More fundamentally, a strong anti-inflation policy is also a strong pro-poor policy. This increases the imperatives for authorities in the region to deal firmly with inflation pressures.

## Policies to Boost Growth Potential

IMF staff analysis highlights the unfinished agenda on boosting investment and growth. From a medium term perspective, staff analyses have shown investment growth to be affected by the size and persistence of financing constraints (see Chapter 6). These constraints are found to be more severe for smaller firms in the region, which gives additional impetus to the need to strengthen capital markets and credit institutions, and promote access to finance. Key aspects here include developing financial infrastructure (e.g., ratings agencies, transparent and better accounting standards) and sound legal frameworks (property rights, foreclosure process and bankruptcy reform), to increase intermediation and lower obstacles to increased bank and capital market funding for mid-sized and smaller firms.

Constraints implied by the low rates of public capital formation in the region have also been well documented. Many analyses point to continued deficiencies in public services provision in the region, whether on infrastructure but also on education. As such, giving increased priority to increasing the level and quality of public investment as opposed to consumption remains a key challenge for the region.

# III. Keeping Inflation Under Control

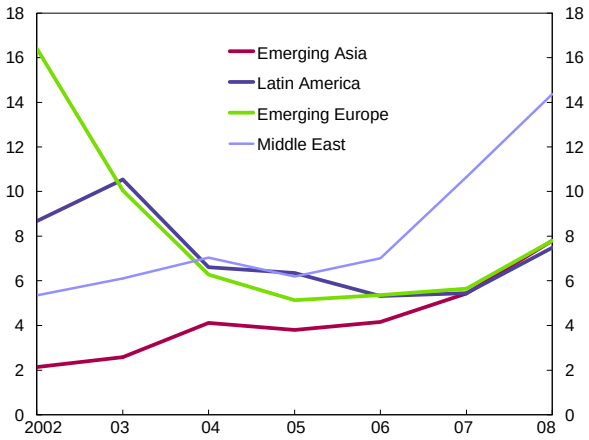
## Rising Inflation

The recent inflationary episode in Latin America and the Caribbean has been the first real test of the region's commitment to low inflation, especially for the countries with formal inflation-targeting (IT) frameworks. Inflation in the region—which rose to over 8 percent in August 2008—is expected to remain high through end-2008, before beginning to decline gradually in 2009. All other emerging markets have also experienced similar price pressures, with consumer prices rising by over 14 percent a year in the Middle East and by about 8 percent a year in emerging Asia and Europe. Within the region, inflation pressures have been most acute in countries with less flexible exchange rate regimes (including most countries in Central America, Bolivia, Ecuador, and, notably Venezuela, with inflation surpassing 30 percent). In contrast, the IT countries have the lowest inflation in the region, on average. Yet even in these countries headline inflation picked up on average by over 2 percentage points between August 2007 and August 2008, and exceeded the target range in most of the IT countries, often by a wide margin, as of August 2008.

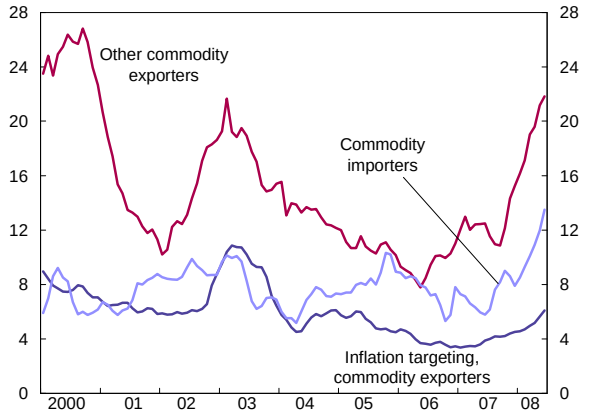
This chapter analyzes the challenges faced by the major IT central banks in the region (Brazil, Chile, Colombia, Mexico, and Peru)[4] as many of them work to bring inflation back within the target range. The results are based on a new dynamic model (Global Projection Model—GPM) estimated for the United States, Europe, Japan, and the five IT countries for the period 2001 through the first quarter in 2008.[5] The key behavioral equations for

**Inflation on the Rise**

**Headline Inflation in Emerging Markets**
*(Percent)*




**Headline Inflation in Latin America by Monetary Framework**
*(Percent)*



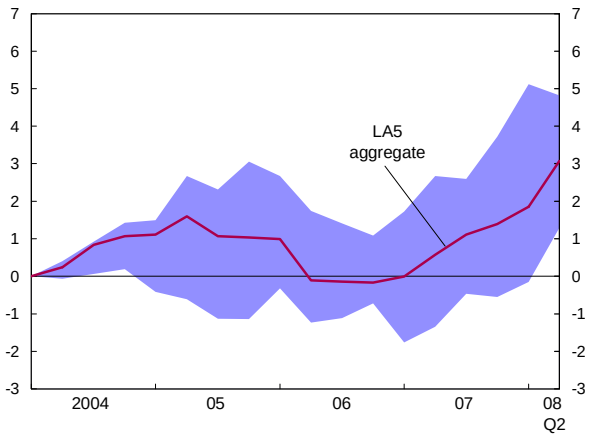

Sources: Haver Analytics; and IMF staff calculations.

Note: This chapter was prepared by Roberto Garcia-Saltos, Jorge Canales-Kriljenko, and Robert Rennhack. The authors acknowledge the support from Douglas Laxton, Ondra Kamenik, Irina Tytell, and Ioan Carabenciov.

[4] Together these countries account for three-fourths of the LAC region's GDP.

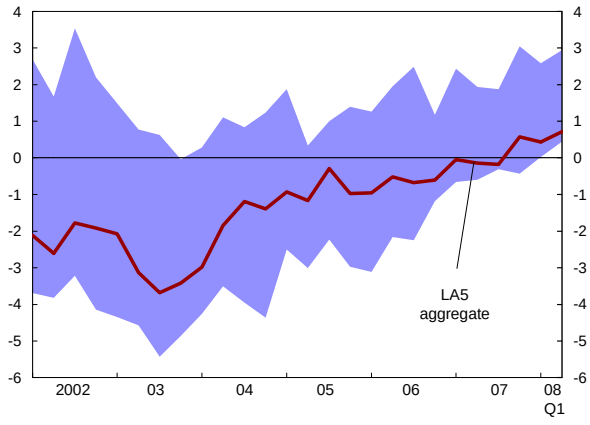
[5] The model was estimated for an aggregate of the five IT countries as well as for each country individually.

**Contribution of Cost-Push to Headline Inflation 1/**
*(Percentage points)*




Source: IMF staff calculations.
1/ Shaded area corresponds to the maximum and minimum contributions from individual countries' GPM's.

**Output Gap in Selected Latin American Countries 1/**
*(Percent of potential GDP)*




Source: IMF staff calculations.
1/ Shaded area corresponds to the maximum and minimum of the output gap estimates from individual countries' GPMs. LA5 includes Brazil, Chile, Colombia, Mexico, and Peru.

each country block include (1) a neo-Keynesian Phillips curve that explains inflation in terms of expected as well as past inflation, the real exchange rate, and the domestic output gap; (2) an equation that explains the domestic output gap in terms of the domestic interest rate, the real exchange rate, expected future and past domestic output gaps, and the output gaps of the trading partners; (3) a Taylor rule to explain how the central banks adjusted their policy interest rates over this period; and (4) an equation that explains the real exchange rate in terms of the real interest differential. Further details of the model are presented in Appendix 3.1.

Much of the literature in this area focuses on the gains from adopting IT frameworks. For example, Goretti and Laxton (2005) find that IT has helped anchor long-term inflation expectations and support growth by reducing long-term interest rates. Goncalves and Salles (2008) conclude that inflation targeting has helped not only lower inflation but also reduce output volatility. Another strand of the literature analyzes the relationship between policy interest rates and inflation in the context of small macroeconomic models. This includes Berg, Karam, and Laxton (2006); Castillo, Montoro, and Tuesta (2006); Gouvea and others (2008); McDermott and McMenamin (2008); and Medina, Munro, and Soto (2008). The GPM model extends this second strand of the literature in several ways, including by allowing for a clear decomposition of the sources of inflation and the estimation of Taylor rules in a consistent framework. With links across countries, it also allows for an analysis of the effect of foreign demand on growth and output in these five countries, and includes a measure of bank lending conditions in the United States.

## Supply shocks hit when economies near capacity . . .

The leading source of inflation over the period 2001–2008:QI came from rising costs, most likely stemming from the sharp rise in world food and fuel prices as well as the effects in some countries of adverse weather on domestic food prices. The analysis based on the GPM finds that cost-push

shocks accounted for a significant share of the rise in inflation since 2006 and by early 2008 explained about 2 percentage points of headline inflation, which averaged 6 percent for these five countries in this period. The results also show that these cost pressures were very persistent, starting in late 2006 and building steadily through early 2008. Chile in early 2008 appears to have been most affected by supply factors, most likely reflecting the recurrence of domestic supply shocks. Peru also appears to have been affected by sharp increases in the cost of food, which accounts for a large share of the CPI basket. The effects of these supply shocks were much less in Mexico, where food accounts for a lower share of the consumption basket.

The supply shocks hit when capacity constraints were tightening after years of steady growth. The estimates based on the GPM show that in 2003–04, these economies were operating well below potential, helping curb inflation. However this gap had closed by late 2006 and, for the past year, many of these five countries have been operating above potential. Through the first quarter of 2008, the excess demand pressures appear to have been the largest in Brazil, Peru, and Colombia, while Mexico and Chile seem to have been operating near capacity. Estimates suggest that—if the output gap had stayed at its level of end-2004—inflation would have been about 1½ percentage points lower in the first quarter of 2008. Of course, the extent of excess demand pressures can be difficult to measure. For example, over the past few years, real private investment has grown significantly in several countries in the region. For this reason, some countries have recently raised their estimates of potential output growth, suggesting that excess demand pressures could have been less than estimated.

Growth in major trading partners seems to have had little effect on demand conditions, on average, in these five countries. Following the outbreak of the financial crisis in the United States and other advanced economies in mid-2007, there was a question as to whether a slowdown in global growth would ease inflation pressures throughout the world by lowering demand for exports and world prices of commodities. The GPM-based estimates show that the slowdown in growth in the United States since mid-2007 curbed inflation by 0.3 percentage point in the first quarter of 2008 on average for these countries. Brazil, Chile, Peru, and, to a lesser extent, Colombia sell a large share of their exports to Europe and Asia, and their exports to the United States amount to a relatively low share of GDP. Of course, Mexico is much more influenced by developments in the United States, given the close trade and financial linkages between these two countries.

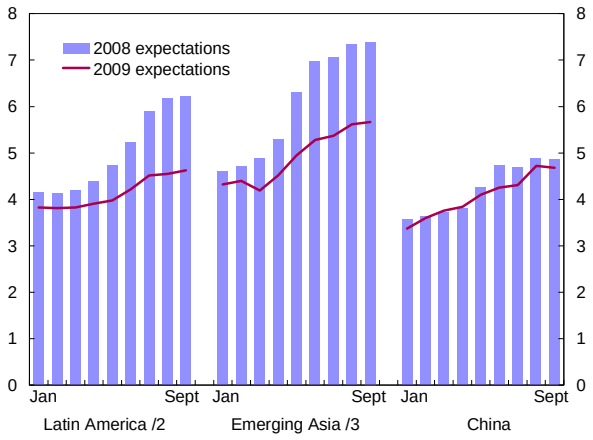
## . . . and spread to other prices

The initial surge in inflation has been spilling over to core inflation (inflation excluding fuel and volatile prices) as well as to non–traded goods inflation. Expected inflation has been increasing not only at a one-year horizon but at longer horizons as well. Also, nominal wage growth has picked up in a few of these countries.

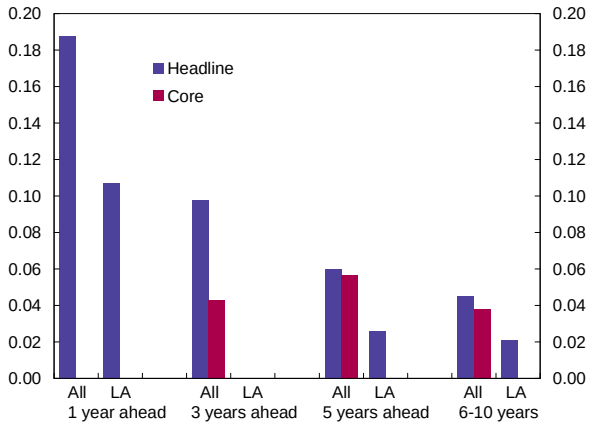
This spread of inflationary pressures is consistent with the finding that inflation in these countries is still persistent. That is, inflation takes a long time to return to trend, because of inertia in wage and price setting due to rigidities in contracts as well as more backward-looking inflation expectations. Several studies, such as Barkbu, Batini, and Garcia-Saltos (2006) and Capistrán and Ramos-Francia (2007), show that inflation in these countries has become less persistent after the adoption of IT. The analysis based on the GPM also confirms that current inflation has become increasingly linked to expected future inflation as opposed to past inflation in the 2001–08 period. However, these results also indicate that inflation in these five countries is considerably more persistent than in the United States, Europe, and Japan. In these five countries, inflation returns to trend 12 quarters after a shock, compared with 6 quarters for the United States and 4 quarters for Europe. This is consistent with García and Valdés (2005), who find that inflation persistence is considerably lower in the United Kingdom, Canada, and Norway than in Colombia and Mexico.

**Inflation Expectations**

**Expected Inflation for End-2008 vs. End-2009 1/**
*(January - July 2008, in percent)*




**Changes in Expected Inflation in Response to Changes in Actual Inflation 4/**
*(Expected inflation 1, 3, 5, and 6-10 years ahead; percentage point responses to a 1 percent point change in actual inflation)*




Sources: Consensus Economics, *Consensus Forecast*; IMF, *World Economic Outlook*, October 2008; and IMF staff calculations.
1/ Chart compares updated inflation expectations for years 2008 and 2009 as they are reported each month for the period January to July 2008.
2/ PPP-weighted average for Brazil, Chile, Colombia, Mexico, and Peru.
3/ PPP-weighted average for Indonesia, Singapore, and Taiwan.
4/ Based on statistically significant coefficients from panel regressions with fixed effects, using semi-annual data since 2003. "All" includes 26 emerging market countries; "LA" includes Brazil, Chile, Colombia, Mexico, and Peru.

Also, there is evidence that inflation expectations could be more firmly anchored. To look at this, we estimated a cross-country model of the effect of headline inflation on expected inflation for emerging market countries, including Latin America and other emerging market countries with IT.[6] In Latin America, expected inflation at a one-year horizon would rise by 10 basis points for every 100 basis point increase in headline inflation, and at a five-year horizon, the effect is significant but quite small. However, expectations appear more firmly anchored in the other emerging market IT countries, which include the Czech Republic, Hungary, Korea, Poland, and Thailand. This suggests that inflation expectations in the five IT countries in Latin America are reasonably well anchored, but there is room for further progress. In addition, large increases in headline inflation can still spill over onto expected inflation.

## Monetary Policy Has Been Tightened

The central banks in these five countries have been tightening monetary policy, especially during 2008 as inflation continued to rise. In the first eight months of 2008, these central banks raised their policy interest rate by at least 50 basis points and in some cases much more. Other emerging market IT countries are also tightening monetary policy.

The results of the estimated Taylor rules show that the policy reaction of the IT central banks in the region is very similar to that of the central banks in the United States, Europe, and Japan.[7] According to this estimated rule, these central banks tended to adjust their policy interest rates by about 220 basis points for every 100 basis point increase in expected headline inflation, similar to the response estimated for Europe and more than the response estimated

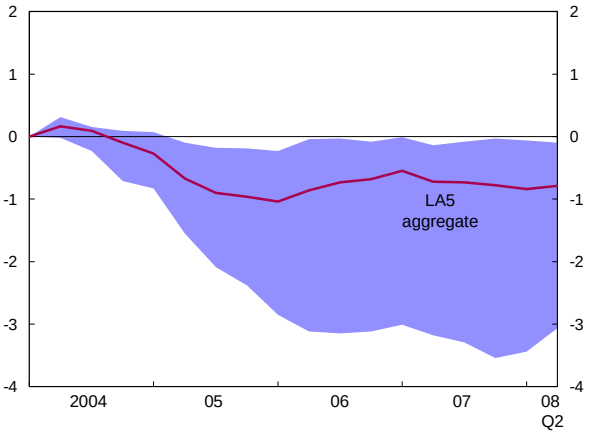
[6] See IMF (2008c, Appendix 3.1) for details.
[7] This policy rule estimated how much each central bank adjusted its policy interest rate each quarter to the deviations of forecast inflation from the target and the output gap. The rule also included the policy interest rate in the previous quarter to gauge how quickly these central banks adjusted their policy rate.

for the United States and Japan. On the other dimensions of the Taylor rule, the LA5 central banks behaved the same as in the United States, Europe, and Japan: they adjusted their policy interest rate by just 20 basis points for every 100 basis point increase in the gap between actual and potential output; preferred to gradually return their policy interest rates to a neutral stance; and sought to bring inflation back on target over a horizon of six to eight quarters. These results suggest that the IT central banks in the region have raised the policy interest rate in real terms in response to rising expected inflation. Yet they have proceeded cautiously to avoid an overreaction that might unduly slow growth.

Exchange rate flexibility and fiscal policy have supported monetary policy. For net commodity exporters, the rise in world food and fuel prices boosted their terms of trade, contributing to a significant appreciation in the nominal exchange rate and limiting the rise in traded goods inflation. The GPM-based analysis finds that currency appreciation reduced annual inflation pressures by 0.7 percent on average between 2005 and the first quarter of 2008. The effect of the currency appreciation was the most pronounced in Brazil, reflecting the large weight of traded goods in the CPI basket as well as the sizable appreciation of the real between 2004 and 2007. In recent years, these countries have sustained primary fiscal surpluses of about 3 percent of GDP on average, ranging from 9.5 percent of GDP in Chile to 1 percent of GDP in Mexico in 2007, and the overall fiscal deficit declined to 1 percent of GDP. In 2008, both Brazil and Peru have raised their targets for the primary fiscal surplus significantly. However, the growth in primary current spending in relation to GDP does pose some fiscal risks.

**Contribution of Currency Appreciation to Headline Inflation 1/**

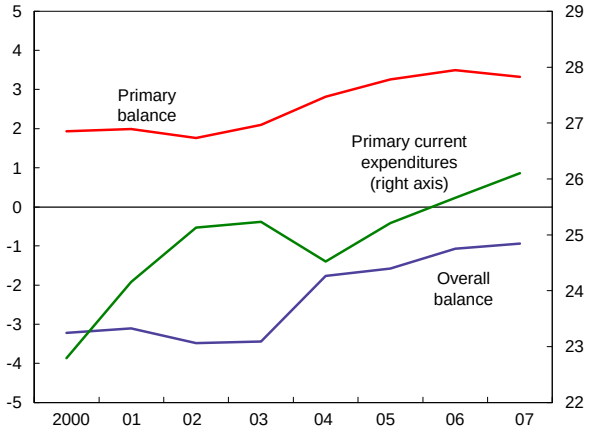
*(Percentage points)*




Source: IMF staff calculations.
1/ Shaded area corresponds to the maximum and minimum contributions from individual countries' GPM's.

**Fiscal Indicators in Inflation Targeting Countries 1/**

*(In percent of GDP)*




Source: IMF staff calculations.
1/ PPP-GDP weighted average.

## Conclusions

This chapter finds that the most important factor behind the rise in inflation since 2006 was supply shocks—most likely coming from higher food and fuel prices—that hit when excess demand pressures were building in most of these countries. The moderate slowdown in growth in advanced economies, through the first quarter of 2008 appears to have had only a modest effect on inflation in these five countries through early 2008.

Interestingly, the results of the Taylor rules suggest that the central banks in these five countries raise the policy interest rate firmly in response to higher inflation, as in Europe, which over time should help build credibility further. Also, monetary policy has been supported by exchange rate flexibility and a strong fiscal position.

Monetary policy continues to face a challenging environment. In many of the IT countries, headline inflation is still above target, with the economies operating above potential, yet the current global environment is full of uncertainty. It will be important to stand ready to adapt monetary policy as needed to bring headline inflation comfortably within the target range. An important lesson of this recent episode is that, while monetary policy has become more credible since the adoption of IT, there is still room to anchor inflation expectations even more firmly, which would help reduce the persistence of inflation.

## Appendix 3.1

This technical appendix provides a brief overview of the structure of the IMF's newly developed Global Projection Model (GPM). The full explanation of the results is presented in Canales-Kriljenko and others (2008). The appendix also presents the methodology used to estimate the determinants of inflation expectations.

### Global Projection Model[8]

The GPM is a multicountry open-economy dynamic macroeconomic model developed by the IMF's Research Department designed to illustrate the effects and importance of cross-border real and financial shocks (Carabenciov and others, 2008a and 2008b). Conceptually, it embraces the spirit of the New Keynesian synthesis, which blends the emphasis on nominal and real rigidities with the real business cycle tradition of dynamic stochastic general equilibrium modeling with rational expectations. The GPM also incorporates a financial variable in the United States, geared to identify directly the linkages between the real and financial sectors in the U.S. economy and the rest of the world. One of the virtues of this type of modeling framework is to produce model-consistent measures of key, yet unobservable, variables such as the output gap or the unemployment gap.

### Behavioral Equations

The GPM contains a few critical behavioral equations, namely an IS curve, a Phillips curve, a natural rate of unemployment equation, a monetary policy reaction function, and an uncovered interest rate parity equation. Below we present a summary of the specification of the model for a single country *i*.

The dynamic IS curve tracks the evolution of the domestic output gap:

$$y_{it} = \beta_{i,1} y_{it-1} + \beta_{i,2} y_{it+1} - \beta_{i,3} r_{it-1} + \beta_{i,4} \sum_j w_{i,j4} z_{i,j,t-1} + \beta_{i,5} \sum_j w_{i,j5} y_{j,t-1} + \varepsilon^{y}_{i,t}. \quad (1)$$

Domestic output gap ($y$) depends on the real interest rate gap ($r$), the effective real exchange rate gap (z), the foreign output ($y_j$), and a disturbance term ($\varepsilon^y$). A dynamic structure to account for real rigidities and to permit shocks to have persistent effects results from introducing a lagged term.

[8] For more details of the GPM see Carabenciov and others (2008).

Forward-looking elements in the aggregate demand are captured by a lead term. The foreign output gap is defined as a weighted average of the lagged foreign output gaps, where the weights ($\omega_{j5}$) are the ratios of exports from country *i* to *j*. The effective real exchange rate gap variable is computed as weighted average of the real exchange rate gaps of the foreign countries to which economy *i* exports. For the U.S. output gap equation, we take the original specification of the GPM, which includes a financial variable (Bank Lending Tightening, BLT) among its determinants.[9]

The unemployment gap ($u$) is

$$u_{it} = \alpha_{i,1} u_{it-1} + \alpha_{i,2} y_{it-1} + \varepsilon^{u}_{i,t} \qquad (2)$$

This is a dynamic version of Okun's law, in which the unemployment gap is a function of its lagged value, the contemporaneous output gap, and a disturbance term ($\varepsilon^{u}$).

The dynamic Phillips curve tracks the evolution of inflation:

$$\begin{aligned}\pi_{it} = {} & \lambda_{i,1}\pi 4_{i,t+4} + (1-\lambda_{i,1})\pi 4_{i,t-1} \\ & + \lambda_{i,2} y_{i,t-1} + \lambda_{i,3}\sum_{j} w_{i,j3}\Delta z_{i,j,t} \\ & + \varepsilon^{\pi}_{i,t}\end{aligned} \qquad (3)$$

Inflation depends on the expected and lagged inflation, the output gap, the change in the effective exchange rate of country *i*, and a disturbance term ($\varepsilon^{\pi}$). The size of $\lambda_1$ measures the relative weight of forward- versus backward-looking components in the inflation process. The backward-looking elements include direct and indirect indexation schemes to past inflation as well as the proportion of price setters who base their expectations of future inflation on past inflation. A high proportion of price setters who adjust their expectations based on past inflation is associated with low credibility. As in the case of the output gap equation, exchange rate movements also affect domestic inflation by changing the cost of the imported component of the consumer price index. The effects of exchange rate changes for country *i* are defined as the change of currency *i* relative to the U.S. dollar minus the change in currency *j* relative to the U.S. dollar. The weights on the changes in the bilateral real exchange rates are based on imports of country *i* from country *j*.

The monetary policy reaction function, a Taylor-type rule, determines the nominal interest rate:

$$\begin{aligned}I_{it} = (1-\gamma_{i,1}) & \begin{bmatrix}\overline{R}_{i,t+\pi 4_{i,t+3}} + \gamma_{i,2} \\ (\pi 4_{i,t+3} - \pi_i^{tar}) + \gamma_{i,4} y_{i,t}\end{bmatrix} \\ & + \gamma_{i,1} I_{it-1} + \varepsilon^{I}_{i,t}\end{aligned} \qquad (4)$$

The policy rate depends on its own lag, which characterizes well-known smoothing attributes of policy responses, the central bank's responses to output gap, and deviations of inflation from its target. The rate implied by this equation characterizes the inflation-targeting framework as an inflation-forecast-based target, as the central bank reacts to expected inflation three quarters ahead rather than to observed inflation. Over the long run, with no output gap and inflation at its target, the central bank aims at setting the interest rate at its "neutral" level (the equilibrium real interest rate plus the inflation target).

The uncovered interest rate parity *(UIP)*:

$$\begin{aligned}4(Z^{e}_{i,t+1} - Z_{it}) = {} & (R_{it} - R_{us,t}) \\ & - (\overline{R}_{i,t} - \overline{R}_{us,t}) + \varepsilon^{Z-Z^{e}}_{i,t}\end{aligned} \qquad (5)$$

This version of the *UIP* expressed in real terms indicates that the difference between the real exchange rate of currency *i* ($Z_i$) and its expected value the following quarter is equal to the difference between the real rate ($R$) in country *i* and its counterpart in the United States, less the difference

[9] The BLT is constructed as the average of the responses to four questions with respect to tightening terms and conditions in the Federal Reserve Board's quarterly Senior Loan Officer Survey of Bank Lending Practices.

in the equilibrium real interest rates ($\overline{R}$) in the two countries.

These behavioral equations plus the stochastic process for potential output, real GDP growth, unemployment, real interest rates, and real exchange rates complement the specification of the model.

## Estimation

The GPM has been estimated with Bayesian techniques for an aggregate of the IT countries in Latin America (LA5), plus the United States, Euro area, and Japan; the estimation covers the period 2001:Q4–2008:Q1.[10] The model is estimated with information from five observable variables. These are real GDP, the unemployment rate, CPI inflation, a short-term interest rate, and the exchange rate vis-à-vis the U.S. dollar.

As explained in Carabenciov and others (2008a and 2008b), Bayesian estimation techniques provide a middle ground between classical econometric methods and the calibration approach used in macroeconomic models. In this sense, the Bayesian approach has the benefit of putting some weight on the priors of the researchers (defined by a subjective model) and some weight on the data. These methods are a very efficient way of imposing cross-equation restrictions to produce both plausible dynamics and sensible forecasting properties, which are especially useful for small samples.

## Determinants of Inflation Expectations

The responses of expectations to actual inflation shown in the chart of the main text are based on a semiannual panel data set for 21 emerging economies that covers the period starting in 2003. The exercise builds from an identical exercise discussed in the IMF's (2008b) *World Economic Outlook*. The exercise links changes in expected inflation to changes in actual headline inflation and core inflation.[11]

$$\Delta\pi^{e}_{i,t} = \lambda_i + \theta\Delta\pi^{headline}_{i,t} + \varepsilon_{i,t}$$
$$\Delta\pi^{e}_{i,t} = \mu_i + \alpha\Delta\pi^{core}_{i,t} + \nu_{i,t}$$

In these equations, $\Delta\pi$ denotes first differences in expected inflation at various horizons (1, 3, 5, and 6–10 years ahead) and actual inflation (headline and core inflation) in percentage points. The data on inflation expectations are obtained from Consensus Economics and are based on surveys of professional forecasters published twice yearly in March/April and September/October. To correspond to these frequencies, the data on actual inflation refer to the first and third quarter of each year and are measured in year-on-year terms. The equations also include country- and year-fixed effects, and a dummy variable representing the IT countries in Latin America. The reported results include only the coefficients that are statistically significant at the 10 percent level.

[10] This LA5 aggregate represents 7.5 percent or world output and covers 73 percent of the region's output.

[11] See Goretti and Laxton (2005) for similar analyses.

# IV. Elevated Food Prices and Vulnerable Households: Fiscal Policy Options

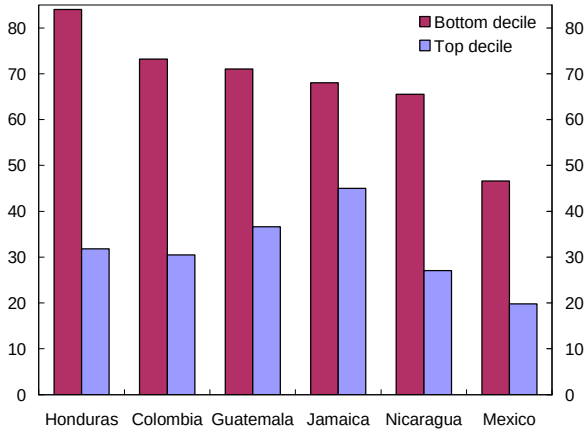
## Elevated Food Prices Trigger Policy Debate

The sharp run-up in food prices between 2006 and mid-2008 has set off a debate about how to deal with the adverse effects on low-income households, which typically devote a larger share of their budget to food. In fact, IDB and World Bank estimates suggest that the recent surge in food prices may have erased the gains in poverty reduction of the last decade in many countries (Box 4.1).

Policymakers across the region have adopted a variety of measures to try to mitigate the impact of rising food prices on the poor (Box 4.2). These steps have ranged from administrative measures (e.g., price controls, export quotas) to tax and expenditure measures (e.g., lowering indirect tax rates, expanding social safety nets). These actions entail varying degrees of fiscal and efficiency costs and effectiveness in reaching those households most exposed to food price hikes.

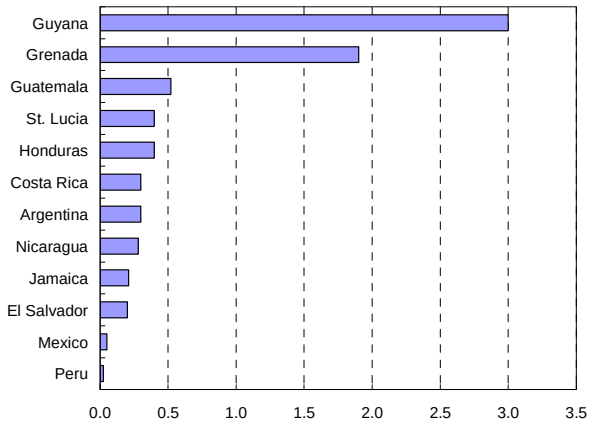
In most countries, the fiscal cost of the response to higher food prices has been limited so far. Guyana and Grenada are expected to devote fiscal costs of 2–3 percent of GDP in 2008, while for most other countries, the additional cost is projected at 0.2 percent of GDP. Compared with other regions, LAC countries have relied more on reducing taxes and tariffs, while food subsidies have been less prevalent.[12]

**Food Consumption by Decile**
*(In percent of total consumption)*




Source: Robles and others (2008).

**Fiscal Cost of Response to Food Price Shock**
*(In percent of GDP)1/*




Sources: National authorities; and IMF staff estimates.
1/ Projected cost for 2008, including subsidies, tax cuts, transfers, and other measures.

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Note: This chapter was prepared by Francisco Arias-Vazquez, Ana Corbacho, and Priyadarshani Joshi.

[12] In contrast, the fiscal cost of fuel subsidies is expected to average 1.8 percent of GDP for the LAC region. See IMF (2008a) for further details.

## Box 4.1. Impact of Rising Food Prices on Poverty

**According to the IDB, the LAC region will face a significant increase in poverty if measures to compensate for the impact of rising food prices are not implemented.** Estimates suggest that, without a policy response, more than 26 million people could fall into extreme poverty should food prices remain high (IDB, 2008). Central American and Caribbean countries, which import large quantities of food, would be at the greatest risk of deepening poverty. The estimates are calculated under an extreme scenario, to illustrate the serious consequences that rising food prices can have on poverty levels in the absence of effective policies.[1]

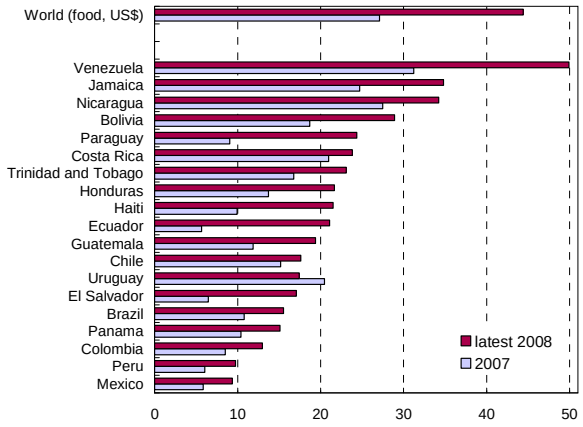
**Several studies from the World Bank confirm the adverse impact of food price hikes on poverty.** World Bank (2008a) constructed a poor person's price index for 12 countries in the LAC region, suggesting that in 2007 the effective inflation rate faced by poor households exceeded the national rate in most countries, by a margin of up to 3 percentage points. Dessus, Herrera, and de Hoyos (2008) simulate the first-round impact of a food inflation shock for a sample of 72 developing countries. In their central scenario, they find that for the most affected countries a 20 percent increase in prices would raise poverty rates by 4 percentage points on average. Their estimates focus exclusively on the urban sector and abstract from the positive impact that rising food prices may have on agricultural income of food producers. Using household survey data, Ivanic and Martin (2008) estimate the impact of price increases in several agricultural staples for nine developing countries (including Bolivia, Nicaragua, and Peru in LAC), taking into account income effects for food producers and unskilled labor. They find that a 10 percent price increase would raise the poverty rate by 0.4 percentage point on average.

**In this chapter, we extend previous analysis by assessing the costs and benefits of alternative fiscal policies that can be used to mitigate the welfare effect of rising food prices.** Using household survey data for Mexico and Nicaragua, we compute welfare losses due to rising domestic food prices by taking into consideration households' food consumption and production patterns, their urban versus rural location, their position in the welfare distribution, and their access to social safety nets and government's mitigating measures.

Note: This box was prepared by Ana Corbacho.

[1] Researchers assumed a 30 percent price increase in corn, rice, wheat, soybeans, sugar, and beef; full pass-through of international price increases to consumers; and no changes in consumption and production habits in response to the price signals.

**Food Inflation in Latin America**
*(In percent; end-of-period)*




Sources: National authorities; IMF WEO; and Haver Analytics.

Against this background, the chapter addresses two questions: (1) how large is the effect of rising food prices on household welfare and its distribution?[13] and (2) how cost-effective are different fiscal policies to buffer the adverse social effects of food inflation?

Drawing on household survey data for Mexico and Nicaragua, the results show that the recent rise in domestic food prices would reduce real consumption of the poorest households significantly. Of course, the effects vary widely across the region. While annual food inflation

[13] Our measure of welfare corresponds to household consumption per capita.

### Box 4.2. Policy Responses to Ease Effects of Higher Food Prices

**Countries have adopted a range of measures to ease the impact of higher food prices, including the following:**

- **Tax cuts**. Many countries (Belize, Bolivia, Brazil, Ecuador, Mexico, Peru, and most CARICOM and Central American countries) have lowered import tariffs on major food staples. Brazil, Dominica, Guyana, and St. Vincent and the Grenadines cut or eliminated VAT rates on selected food items, while Panama reduced income taxes for the low-income bracket.
- **Price subsidies**. The Dominican Republic, Ecuador, Guyana, and Jamaica introduced or extended food price subsidies. In Panama, the government has been importing and selling rice, wheat, vegetable oil, and canned fish in limited quantities at cost, and in Nicaragua, the government has been using state-owned commercialization centers to distribute subsidized food.
- **Social safety nets**. Interventions have ranged from direct food distribution (Grenada, Guatemala, and Peru) to the scaling-up of targeted income transfers (Barbados, Belize, Brazil, Chile, Costa Rica, El Salvador, Mexico, Jamaica, Trinidad and Tobago, and Panama), food security (Argentina and Guatemala), school feeding (Haiti and Nicaragua), and food-for-work programs (Brazil).
- **Price controls**. Mexico reached a voluntary agreement with private producers to cap the price of tortillas after protests in early 2007. Guatemala has also announced a few voluntary price agreements. Ecuador has been regulating the price of milk, and Bolivia replaced a ban on vegetable oil exports with a price ceiling.
- **Trade restrictions**. Argentina has imposed temporary restrictions on exports of beef, cereals, and dairy products. Several countries have imposed minor export restrictions on selected items, such as rice (Bolivia, Brazil, Ecuador, Honduras, and Suriname), while others eased import restrictions (Guyana, Nicaragua, and Panama).
- **Steps to encourage agricultural production**. Many governments have provided inputs (such as seeds and fertilizers), extended subsidized credit, and enhanced crop insurance (Bolivia, Brazil, Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, and Panama). In Mexico, a new public-private initiative (FONAMU) will improve corn and bean producers' access to financing.
- **Other.** The Bahamas, Belize, Dominica, El Salvador, Guyana, Panama, and St. Kitts and Nevis have raised wages or pensions. Honduras has increased its strategic grain reserve, and Venezuela has stepped up its ALBA-related assistance and pledged US$100 million to a food security fund.

Note: This box was prepared by Eva Jenkner.

reached around 10 percent in Mexico and Peru, it surpassed 30 percent in Nicaragua and Venezuela. The Caribbean countries also experienced significant increases in food prices.[14]

The analysis suggests that urban households at the bottom of the distribution would be the most affected. Absent any policy response, the rise in food prices between end-2006 and mid-2008 would imply a reduction of real consumption for these urban households of 16 percent in Nicaragua and 3 percent in Mexico. The rural poor have been relatively more protected as they typically produce food, helping to cushion the impact of food price hikes.

Expanding targeted transfers stands out as the most cost-effective policy to ease this burden.

[14] See Box 2.5 in Chapter 2 for a description of inflation trends in the Caribbean.

**Mexico and Nicaragua: Key Characteristics**
(In percent, unless otherwise indicated)

| | Mexico | Nicaragua |
|---|---|---|
| Headline inflation (Dec. '06 - Apr. '08) | 5.5 | 24.4 |
| Food inflation (Dec. '06 - Apr. '08) | 8.8 | 32.9 |
| Food share in CPI | 22.7 | 41.8 |
| Poverty 1/ | 20.7 | 48.3 |
| Extreme Poverty 1/ | 13.8 | 17.2 |
| GDP per capita in 2007 (US$) | 8,478.7 | 945.5 |
| Total households in sample | 20,326 | 6,732 |
| of which: percent rural | 26.5 | 49.1 |

Sources: WEO; national authorities; and IMF staff estimates.
1/ Percent of individuals below the poverty line. Latest estimates based on national definitions. For Mexico, poverty corresponds to abilities concept; extreme poverty to food concept.

Moreover, it is possible to compensate the extreme poor for much of their loss in real consumption at a relatively low fiscal cost. Other measures, such as price subsidies or controls, are more difficult to target effectively and may entail distortions that generate long-term costs. For example, subsidies distort price signals and may weaken a supply response, exerting upward pressure on prices over the medium term. However, an important trade-off arises in terms of coverage of vulnerable households. While subsidies or import tariff reductions ensure almost universal coverage of low-income families, the coverage of transfer programs is more limited.

The remainder of the chapter first analyzes which households would be most affected by rising food prices. It then assesses the cost-effectiveness of different fiscal policy instruments that could be used to protect the most vulnerable. The final section concludes.

## Food Price Inflation Can Have Strong Welfare Effects

This study relies on household survey data because the effects of food prices can vary widely across households, which spend different shares of their budget on food and consume different kinds of food. While other studies focus primarily on food consumption, we also consider food production. It is important to estimate net food consumption for each household because some, especially in the rural sector, produce food and are able to buffer the impact of higher food prices.

We selected two countries—Mexico and Nicaragua—that differ in many respects to provide a useful spectrum to assess the effectiveness of fiscal policies.[15] We simulate the effect of domestic food price increases between the end of 2006 and April 2008 (about 9 percent in Mexico and 30 percent in Nicaragua) on real household consumption.

We focus on the short-term impact of higher food prices. In the estimations, we assume that consumption and production patterns remain unchanged. However, over time, households are likely to engage in substitution to buffer real consumption losses. We also abstract from indirect effects that food price increases may have on wages and employment and do not factor in any policy response in the baseline scenarios. Therefore, the short-run impact should be interpreted as an upper bound on overall real consumption losses. The methodology is explained in Appendix 4.1 and in Arias-Vazquez, Corbacho, and Joshi (2008).

As expected, the share of consumption allocated to food without considering food production ("gross food share") declines with the level of welfare: households at the bottom of the distribution consume more food out of their budget than do the rich. Gross food shares are higher in Nicaragua—the poorer of the two countries—than in Mexico across the entire distribution. Similarly, gross food shares are higher in the rural than the urban sector in both countries, as rural populations tend to be poorer.

However, a different pattern emerges when looking at the share of consumption devoted to food taking into account food production ("net food share"). As before, low-income households in the urban sector are more exposed to food

[15] For Mexico, the database is Encuesta Nacional de Ingreso Gasto de los Hogares (ENIGH) 2006 and for Nicaragua, Ecuesta de Medición de Niveles de Vida (EMNV) 2005.

price hikes than wealthier households. However, rural households at the bottom and the top of the distribution are more protected because of their higher food production levels. In Nicaragua, households in the middle of the distribution turn out to be more vulnerable.

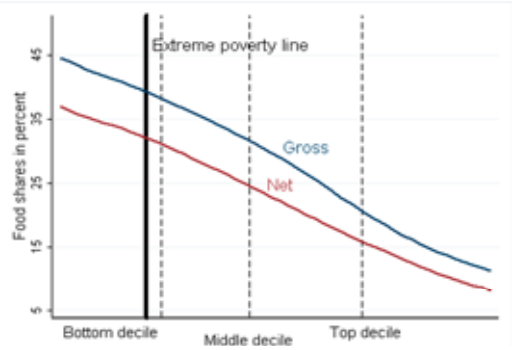
Even taking into account gains accruing to food producers, we find that food price hikes have a significant impact on welfare levels of low-income households. Based on net food shares, the run-up in food prices since 2006 would imply a decline of nearly 16 percent in real consumption of urban households in the bottom decile in Nicaragua. This compares with a decline of about 8 percent for households in the top decile. As expected, the estimates of consumption losses in the rural sector are sizable, but less than half those in the urban sector. In Mexico, overall consumption losses appear less severe because of the lower inflation in food prices as well as the smaller share of the budget spent on food. Real consumption losses are the largest for low-income households, at around 3 percent for the urban sector and 2 percent for the rural sector.

## Fiscal Policy Can Help Ease the Burden on the Poor

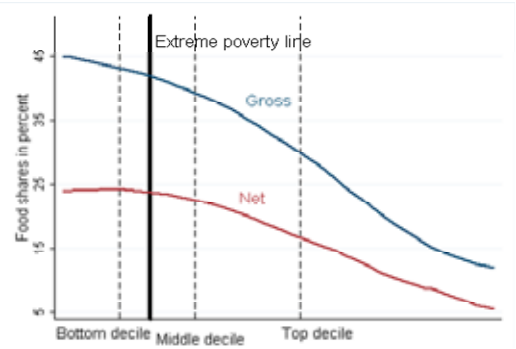
The key challenge has been to implement well-targeted policies that can reach the most vulnerable households at a reasonable fiscal cost. A common feature in both countries is the relatively high income inequality: household consumption in the two bottom deciles amounts to around 7 percent of national income. Then, given the degree of income inequality, large consumption losses of the most vulnerable households do not represent sizable shares in terms of aggregate income. Indeed, fully compensating for the effects of higher food prices on the extreme poor would require unsubstantial fiscal resources, amounting to 0.8 percent of national income in Nicaragua and 0.1 percent of national income in Mexico.

**Food Shares by Decile**
*(In percent of total consumption)*

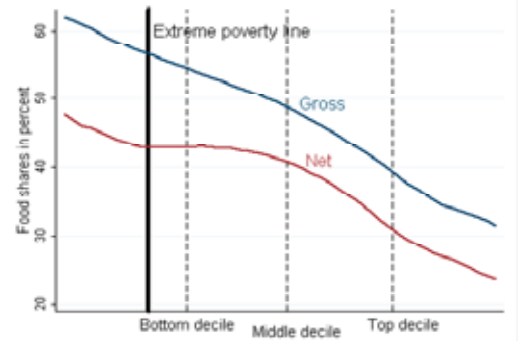
**Mexico: Urban Sector**



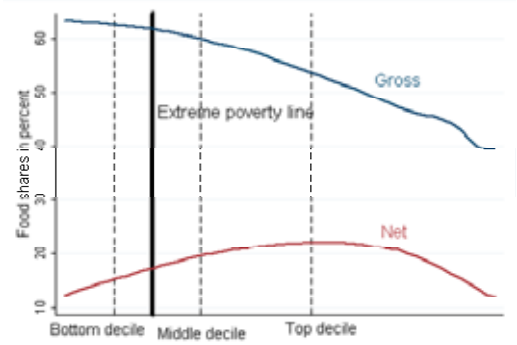

**Mexico: Rural Sector**




**Nicaragua: Urban Sector**



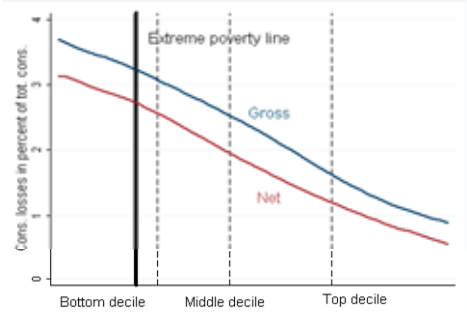

**Nicaragua: Rural Sector**



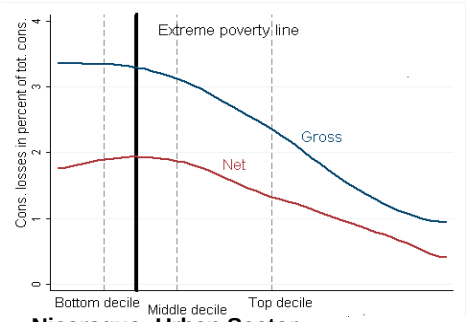

Source: IMF staff estimates based on ENIGH 2006 and ENMV 2005.

**Real Consumption Losses by Decile**
*(In percent of total consumption)*

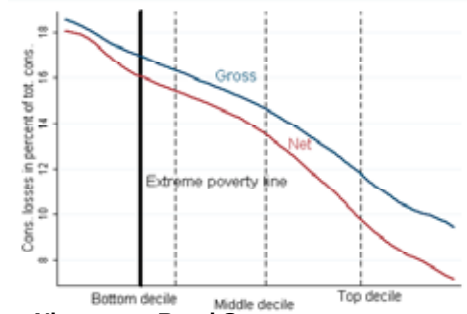
**Mexico: Urban Sector**



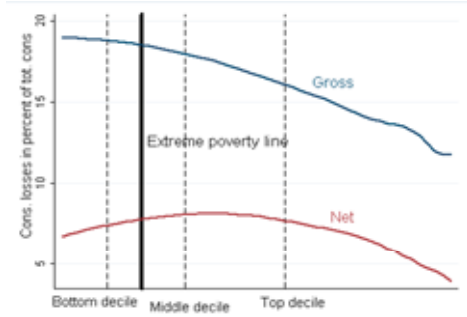

**Mexico: Rural Sector**




**Nicaragua: Urban Sector**




**Nicaragua: Rural Sector**




Source: IMF staff estimates based on ENIGH 2006 and ENMV 2005.

To look at the issue of targeting, we used the information in the household surveys on access to a variety of social government programs. This allows us to simulate the distributional impact of alternative fiscal policies. The scenarios are designed to make the cost of the different policies comparable in each country. In Mexico, the cost is small, around 0.1 percent of national income. In Nicaragua, the cost is higher, at around 1 percent of national income, in line with the more sizable consumption losses.[16]

We consider three main fiscal instruments:

(1) *Transfers to households*. We analyze an increase in transfers to participant households to compensate for their consumption losses.[17] In Mexico, we analyze an increase in the conditional cash transfer program *Progresa/Oportunidades*, which was the actual policy implemented by the authorities.[18] In Nicaragua, there is no conditional cash transfer program. We analyze instead an increase in the school feeding program, which was one of the responses to the food price shock.

(2) *Price subsidies.* We estimate the welfare impact of introducing price subsidies on five food items, with one scenario using the five food products that have the largest weight in the national consumption basket; and another using the top five in the consumption basket of the urban poor.[19] The latter scenario aims to better target subsidies to the consumption basket of the most vulnerable households.

[16] This corresponds to the cost of compensating consumption losses abstracting from other efficiency aspects. For transfers, the main efficiency costs relate to administrative setups; for subsidies, the standard deadweight loss; for tariff reductions, the elasticity of imports. For tariff reductions, there is also an efficiency gain, given that tariffs distort trade patterns.

[17] The compensation is set at 40 percent of consumption losses to keep the cost comparable across scenarios.

[18] *Oportunidades* transfers are automatically increased by inflation of the basic goods basket, and transfers were increased by an additional amount in May 2008.

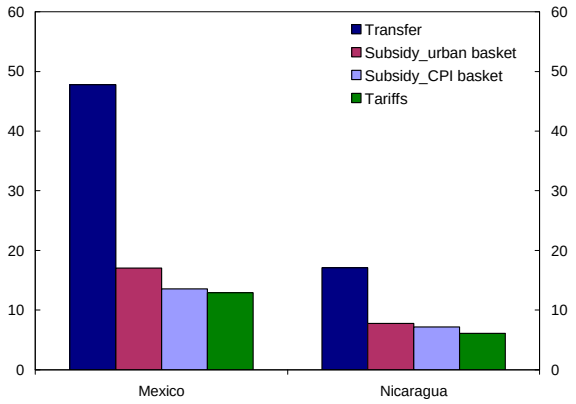
[19] The level of price subsidies was set to reduce inflation rates in these items by 30 percent.

(3) *Reductions in import tariffs.* We simulate the impact of eliminating import tariffs for key staple foods consumed by poor households. Relevant domestic prices are reduced to reflect these lower import costs, assuming a pass-through from import prices to domestic prices based on country-specific estimations (Box 4.3).

The simulations show that transfers to households are the most cost-effective instrument to reach vulnerable households. In Mexico, the conditional cash transfer program is significantly better targeted than tariffs or subsidies. Over 50 percent of program benefits would accrue to households in the bottom two deciles, compared with less than 20 percent under the other instruments. In Nicaragua, the school feeding program is also better targeted, but the difference is not as striking as in the case of Mexico. About 20 percent of program benefits would accrue to poor households, compared with under 10 percent for tariffs and subsidies. Within the price subsidy scenarios, selecting food items more relevant for the urban poor increases benefits for the most vulnerable households in a cost-effective manner.

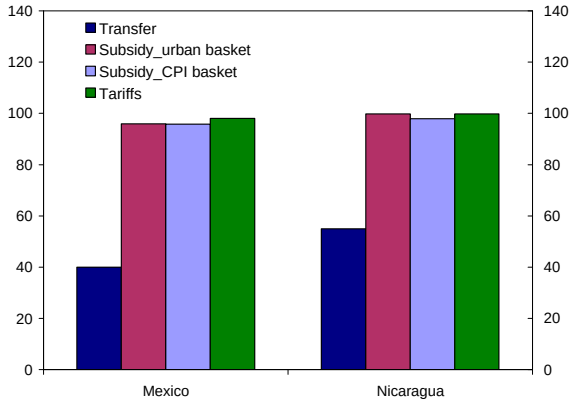
The drawback is the more limited coverage of transfer programs. In Mexico, the household survey indicates that *Oportunidades* reaches 40 percent of households in the bottom two deciles.[20] In Nicaragua, around 55 percent of households in the bottom two deciles receive benefits from the school feeding program in Nicaragua.[21] Instead, subsidies or tariff reductions potentially benefit all families that consume the key staple foods selected. This greater coverage of poor households of course extends the benefits to rich households as well.

**Share of Benefits for Bottom Two Deciles**
*(In percent of total program benefits)*




Source: IMF staff estimates based on ENIGH 2006 and EMNV 2005.

**Household Coverage in Bottom Two Deciles**
*(In percent of total households in bottom two deciles)*




Source: IMF staff estimates based on ENIGH 2006 and EMNV 2005.

[20] Administrative records show a broader coverage—around 70 percent.

[21] This corresponds to the coverage of all households in the bottom two deciles, including those without children or with children not enrolled in elementary school. If we include only households with children enrolled in school, the coverage is close to 80 percent.

### Box 4.3. Can Import Tariff Reductions Help Reduce Food Prices in the Region?

**Countries have considered selective reductions in import tariffs on agricultural commodities as a step to help lower domestic food prices.** In Nicaragua, the authorities have reduced or temporarily suspended tariffs on key staples since late 2007, when the country was hit by several natural disasters. In Mexico, the NAFTA agreement had already removed most barriers to free trade with the United States, and Mexico decided to eliminate its remaining transitional restrictions—on certain agricultural items—in 2007, a year in advance of its NAFTA commitment.

**However, reducing tariffs may have only a partial impact on domestic prices.** Effects of tariff cuts would be subject to the same partial "pass-through" that occurs when world commodity prices fluctuate. Also, while a reduction in import tariffs might help lower domestic prices, the effects could well be dwarfed when world commodity prices rise sharply. To quantify the extent of pass-through from world commodity prices to domestic prices, we estimated a vector error correction model. For some food staples, such as corn in Mexico, pass-through is almost complete, although this process takes well over two years. For powdered milk, pass-through to prices of domestic dairy products is significantly lower and takes much more time. In Nicaragua, pass-through for all products in the sample is also relatively low, yet the process is generally faster than in Mexico.

**Mexico: Pass-Through Effects from Commodity Prices**
(In percent, unless otherwise noted)

| | Tariff rate 1/ | | Pass-through 2/ | Half-life |
|---|---|---|---|---|
| | 2007 | Simulation | | (In quarters) |
| Corn | 18.2 | 0.0 | 0.9 | 8.1 |
| Powdered milk | 20.0 | 0.0 | 0.3 | 17.4 |

Sources: TRAINS database; and national authorities.

1/ Over-quota tariff rate under NAFTA prior to its elimination in 2007.
2/ Impact of 1 percent reduction in commodity prices on domestic prices of similar food items, estimated with a Vector Error Correction Model. Period corresponds to 1998Q1-2007Q4.

**Nicaragua: Pass-Through Effects from Commodity Prices**
(In percent, unless otherwise noted)

| | Tariff rate 1/ | | Pass-through 2/ | Half-life |
|---|---|---|---|---|
| | 2007 | Simulation | | (In quarters) |
| Corn | 11.6 | 0.0 | 0.5 | 2.5 |
| Rice | 61.2 | 0.0 | 0.6 | 5.6 |
| Wheat flour | 10.0 | 0.0 | 0.5 | 15.8 |
| Beans | 30.0 | 0.0 | 0.5 | 5.6 |
| Vegetable oil | 5.0 | 0.0 | 0.4 | 5.8 |

Sources: TRAINS database; and national authorities.

1/ These do not apply to CAFTA or other preferential agreements.
2/ Impact of 1 percent reduction in commodity prices on domestic prices of similar food items, estimated with a Vector Error Correction Model. Period corresponds to 1998Q1-2007Q4.

**Several factors can account for this incomplete and delayed pass-through.** Commodities are only one input in the production structure of firms selling food at the retail level. Changes in the input cost of commodities can then be absorbed by several margins that are country- and sector-specific. The low pass-through may also signal important domestic market imperfections, including weak transportation and distribution infrastructure that isolates communities from international trade; insufficient competition among domestic suppliers; and policies that restrict imports. All these factors may be operating together and reinforcing each other. While addressing some of these problems may take time, countries in the region that retain severe restrictions on agricultural imports could reconsider those policies. For such countries especially, it is possible that major liberalization of certain imports would significantly reduce domestic food prices, even if pass-through is only partial.

Note: This box was prepared by Ana Corbacho and Volodymyr Tulin.

## Conclusions

Based on this analysis of recent household surveys for Mexico and Nicaragua, the increase in food prices since 2006 would lead to a substantial reduction in real consumption levels absent a policy response. The most vulnerable would be low-income households in urban areas, as well as net food consumers in rural areas. However, protecting the extreme poor would not require sizable fiscal resources, and the key challenge is to implement well-targeted policies that also do not introduce distortions.

The best option is to develop an effective social safety net. The simulations for Mexico highlight the considerable payoff to having a well-targeted conditional cash transfer program to deliver vital relief to vulnerable households. At the same time, by conditioning income support on school attendance and health visits, conditional cash transfers provide incentives to invest in human capital, reducing not only current but also future poverty.

However, the design and implementation of conditional cash transfers take time. In countries where these programs are not in place, other short-term instruments are needed. As shown in the scenarios for Nicaragua, expanding coverage of other targeted measures, such as school feeding programs, can also be a cost-effective way to compensate vulnerable households.

Still, a difficult trade-off arises because transfer programs are able to reach far fewer families. In contrast, subsidies or tariff reductions ensure almost full coverage of households in the bottom deciles. In the future, a priority should be to increase coverage of social safety nets, particularly in the urban sector.

In this context, price subsidies may provide a way to reach many households in the short run, but they are poorly targeted, result in overconsumption, and may be difficult to reverse. They also present implementation and enforcement challenges. More fundamentally, domestic food producers stand to lose at a time when increased investment is critical to promote a supply response in agriculture. Finally, subsidies do not help in alleviating future poverty. They are better considered as a temporary relief measure and reassessed as social safety nets are expanded.

Import tariff reductions may be more benign, particularly if part of a broader trade reform to enhance economic efficiency. However, given that the pass-through of import costs to domestic prices can take a relatively long time, the effects of import tariff reductions on social welfare may materialize over the medium run. In countries where there are severe limitations on agricultural imports, such as quotas or tariff rate quotas, eliminating these has the potential to bring more significant reductions in domestic food prices.

## Appendix 4.1

This chapter focuses on the short-run impact of higher food prices. In the estimations, we assume that consumption and production patterns remain unchanged. Demand elasticities for staple foods consumed by poor households are believed to be small, because the poor typically consume the least expensive qualities and types of food, leaving little scope for substitution. In addition, when food prices for a broad range of goods move together, there are fewer opportunities for substitution. Also, poor households have generally less access to credit, land, and infrastructure, facing obstacles to expanding their own food production. Still, over time, households are likely to engage in substitution to buffer real consumption losses due to higher food prices. We also abstract from other indirect effects on wages or employment and do not factor in any policy response in the baseline simulations. Therefore, the short-run impact should be interpreted as an upper bound on overall real consumption losses.

Based on a simple model that recognizes the dual role of households as consumers and producers of food,[22] a first-order approximation of real consumption losses due to a percent change in food prices is given by

$$\Delta \ln C^h \approx \sum_i p_i \, (y_i^h - q_i^h) \; / \; c^h \; ) \; \Delta \ln p_i \, ,$$

where $y_i^h$ is the production and $q_i^h$ the consumption, of food item $i$ by household $h$, and $c^h$ is total household consumption.

Then, households will stand to lose from changes in food prices in proportion to the value of their net budget shares allocated to food (that

[22] For further details, see Deaton (1997).

is, the difference between the value of food production and consumption as a percent of their total consumption). Based on household survey data for Mexico and Nicaragua, we calculated household net budget shares for various food items. Then, we multiplied proportional price increases by the corresponding household net budget shares and aggregated these effects across consumption items.[23] Finally, to examine the distributional impact of food price hikes, we averaged real consumption losses across different welfare groups. In line with the literature, welfare groups are defined according to deciles of household consumption per capita.[24] We trimmed the sample for outliers by dropping households at the top and bottom 1 percent of the distribution. Results are based on the underlying surveys after adjusting for sample weighting, so that they are representative of the whole population.

Results on the mean value of food shares and real consumption losses by welfare groups are calculated with a nonparametric approach that allows for the possibility of nonlinear relationships. We used local polynomial regressions that trace a nonlinear relationship between a $y$ variable (food shares/real consumption losses) and an $x$ variable (the log of household consumption per capita), without specifying in advance the functional form of this relationship. A data-driven technique determines the shape of the relationship. Similar to parametric regression, a weighted sum of the $y$ observations is used to obtain the mean values. Instead of using equal weights as in ordinary least squares, or weights proportional to the inverse of variance as in weighted least squares, a different rationale determines the choice of weights in nonparametric regression. When estimating the expected value of $y$ at a particular level of $x_0$, the data points closer to $x_0$ receive more weight than those more remote from $x_0$. We used the kernel function to assign these weights, and determined the size of the bandwidth around each level of $x_0$ optimally to minimize bias in the regression.

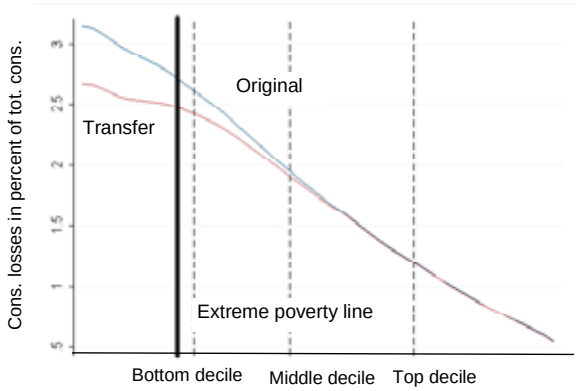
[23] We considered 15 categories of food items and match these with price changes based on national consumer price indices.

[24] See for instance Deaton and Zaidi (2003).

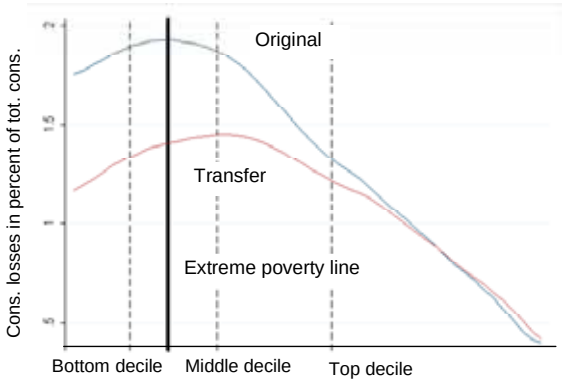
## Mexico: Real Consumption Losses Under Fiscal Policy Scenarios

*(In percent of total consumption)*

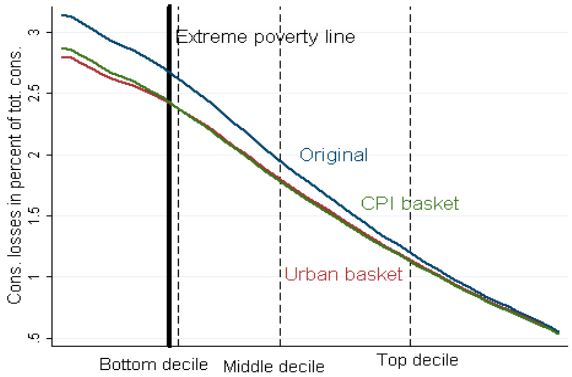
**Transfers: Urban Sector**



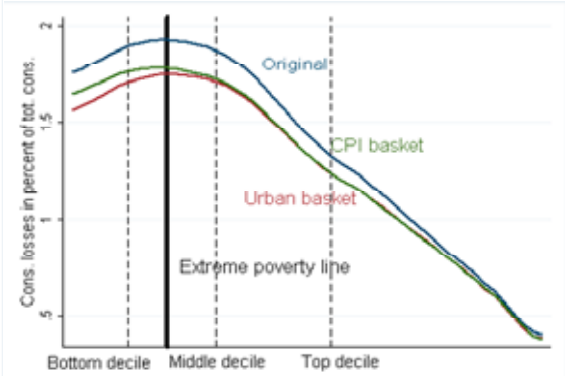

**Transfers: Rural Sector**



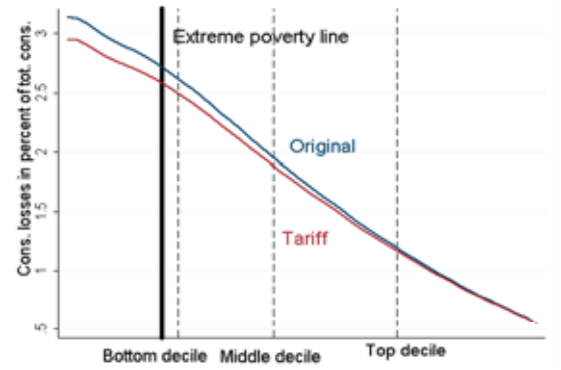

**Subsidies: Urban Sector**



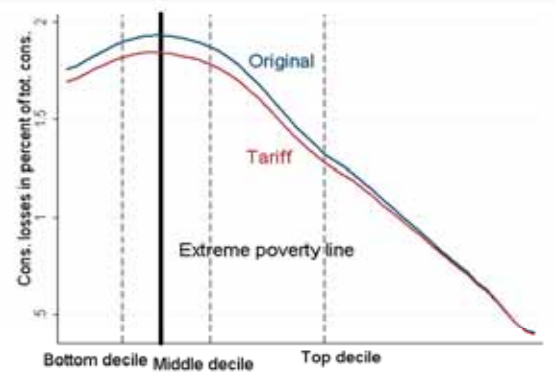

**Subsidies: Rural Sector**




**Tariffs: Urban Sector**




**Tariffs: Rural Sector**

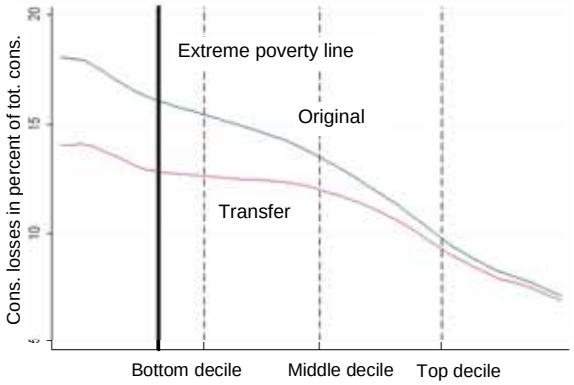



Source: IMF staff estimates based on ENIGH 2006.

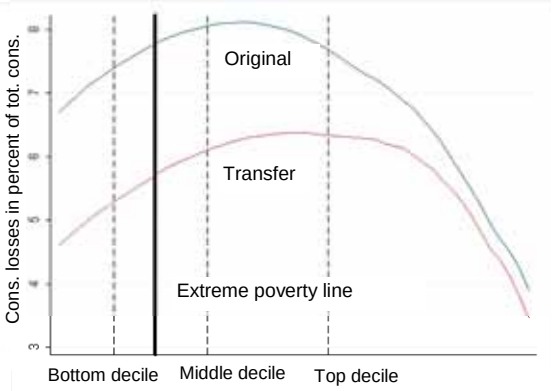
## Nicaragua: Real Consumption Losses Under Fiscal Policy Scenarios

*(In percent of total consumption)*

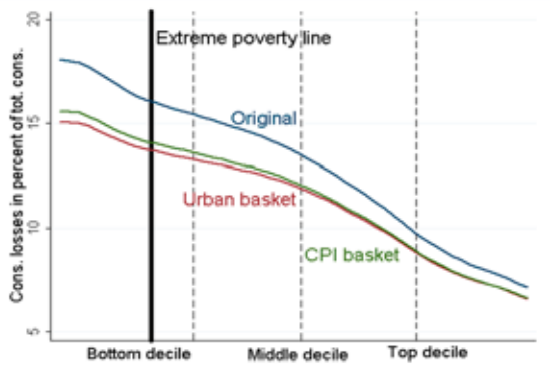
**Transfers: Urban Sector**



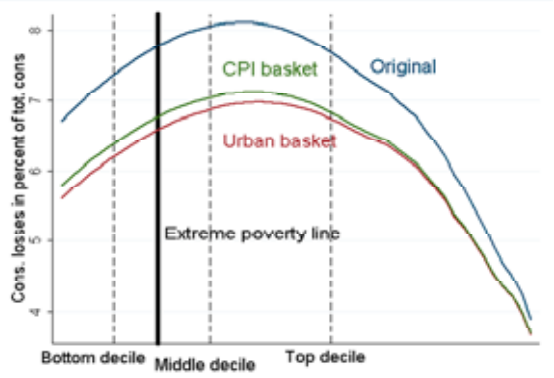

**Transfers: Rural Sector**



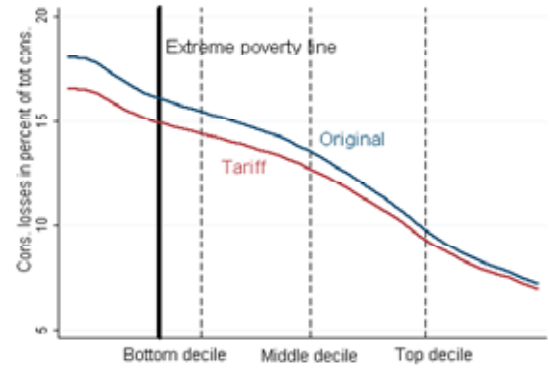

**Subsidies: Urban Sector**



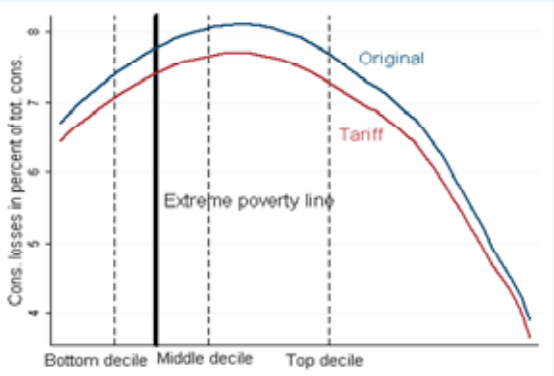

**Subsidies: Rural Sector**




**Tariffs: Urban Sector**




**Tariffs: Rural Sector**




Source: IMF staff estimates based on ENMV 2005.

# V. Corporate Vulnerability: Have Firms Reduced Their Exposure to Currency Risk?

## Firms Facing More Currency Volatility

Foreign currency financing can be a double-edged sword for companies in emerging markets. Foreign currency borrowing (usually in dollars) give firms options to secure funding at a lower cost and at longer maturities, yet can leave firms' balance sheets vulnerable to currency swings. In the 1990s and early this decade, sharp currency depreciations in several countries in Latin America drove up the value of firms' foreign currency debt relative to their assets and income, impairing many firms' ability to service debt. This, in turn, exacerbated the banking difficulties that many of these countries experienced.

Over the past decade, firms in many countries in Latin America have faced higher day-to-day fluctuations in exchange rates, as these countries now allow greater exchange rate flexibility to better adjust to external shocks and provide more independence to monetary policy. Moreover, by switching to more flexible regimes, countries have also removed the perception of implicit guarantees prevailing under pegged regimes. Under fixed or pegged regimes, the central bank would attempt to keep currency volatility within a preannounced range, effectively providing free currency risk insurance to the private sector.

This chapter looks at how firms have managed currency movements in this new environment, which has a bearing on the vulnerabilities of the corporate sector arising under a flexible exchange rate regime. This is especially important given the heightened exchange rate volatility and the sharp depreciation of currencies in the region in the past few months.

**Exchange Rate Volatility Across Periods 1/**

| | Nominal Exchange Rate 2/ | | Real Exchange Rate 2/ | |
|---|---|---|---|---|
| | 1995–98 | 2004–07 | 1995–98 | 2004–07 |
| Argentina | 0.01 | 1.15 | 0.33 | 1.20 |
| Brazil | 0.78 | 3.40 | 0.96 | 3.40 |
| Chile | 1.61 | 2.22 | 1.60 | 2.21 |
| Colombia | 2.53 | 3.25 | 2.72 | 3.34 |
| Mexico | 2.67 | 1.84 | 2.92 | 1.88 |
| Peru | 0.98 | 1.02 | 1.10 | 1.10 |

Sources: IMF, International Financial Statistics; and IMF staff calculations

1/ The first period is January 1995 to December 1998, except for Mexico, where it corresponds to the period January 1996 to December 1998. The second period is January 2004 to December 2007.
2/ Standard deviation of monthly percentage changes of the bilateral exchange rate with respect to the U.S. dollar.

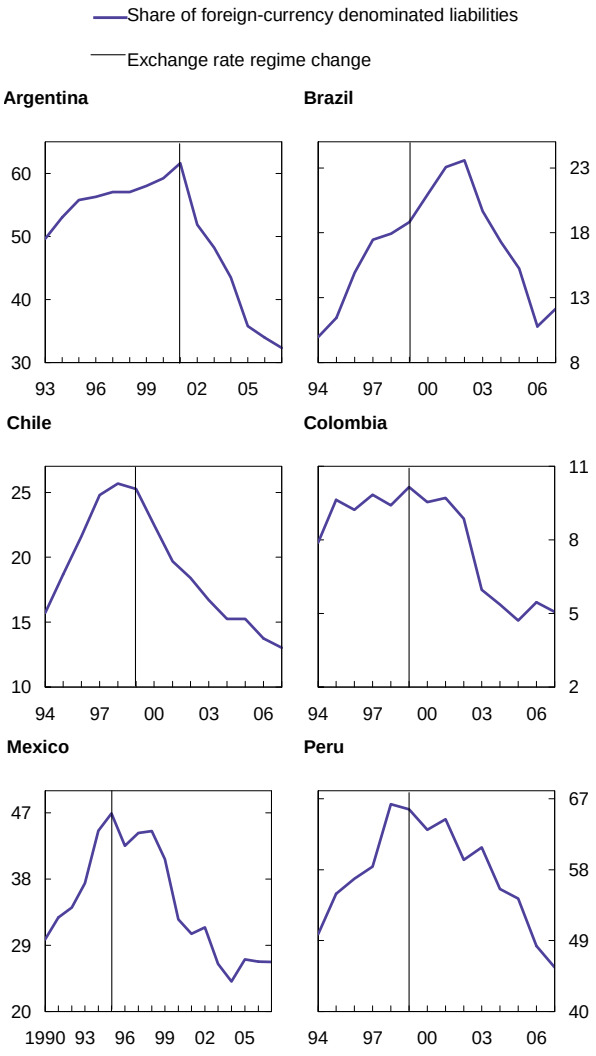
The chapter draws on a new micro-level database that links corporate balance sheet and stock market data for 1,200 publicly traded firms (both financial and nonfinancial) in Argentina, Brazil, Chile, Colombia, Mexico, and Peru.[25] For non-financial enterprises, the data set also provides detailed information on a firm's share of assets, liabilities, and sales in foreign currency.[26] With these data at hand, the chapter first describes the evolution of firms' net foreign currency positions over a relatively long time span (1992–2007). We complement this balance sheet analysis by exploring the sensitivity of firms' stock market valuations to exchange rate changes in two sub-periods, 1995–98 and 2004–07, and test whether

Note: This chapter was prepared by Herman Kamil and Bennett Sutton. The authors are grateful for the support of Benedict Clements and David Moreno.

[25] Focusing only on publicly listed firms may have the disadvantage that since many small firms are typically not quoted in the stock market, the sample may not be representative of the whole economy. On the other hand, focusing on publicly listed corporations has the benefit that financial statistics are more reliable and comprehensive than for private firms.

[26] The database is described in more detail in Appendix 5.1.

**Sharp Decline in Foreign Currency Debt Contracting by Non-Financial Firms**
*(Annual averages across firms)*




Source: IMF staff calculations.

the response of firms' market values to currency fluctuations has changed over time.

The results show that firms have become, on average, substantially more insulated from currency risk in the more recent period. They have relied less on foreign currency liabilities, and have reduced currency mismatches by using operational hedges (i.e., exports and dollar assets) more systematically. Using stock market return data, we find that for a significant fraction of firms, the impact of exchange rate changes on equity prices has declined considerably since mid-2000. Taken together, these results suggest that firms are better prepared to deal with exchange rate shocks than in previous crises. Companies seem to have become more aware of exchange rate risk, and have taken steps to adapt their balance sheet structure and risk-management practices to meet the potential challenges posed by greater exchange rate flexibility.

## Stronger Balance Sheets

Over the past 10 years, many firms in the nonfinancial sector have sharply cut their balance sheet exposure to a sudden devaluation by reducing the share of debt contracted in foreign currency. At the same time, they have reduced their cash-flow sensitivity to exchange rate changes by matching more systematically their foreign currency debt relative to their foreign currency revenues (as measured by their exports and dollar assets).

Looking at the trends of foreign currency exposure by country, we see that foreign currency debt as a share of total debt of nonfinancial firms rose sharply during the 1990s and then began to fall rapidly, typically when countries introduced flexible exchange rate regimes.[27] These shares have been relatively low in Brazil and Colombia, which actively discouraged financial dollarization, but reached fairly high levels in the two highly dollarized countries in the sample, Argentina and Peru. The sharp decline in foreign currency liabilities in Argentina since 2001 reflects, of course, the end of the convertibility scheme. The average share of foreign-currency-denominated

[27] Two additional facts are worth highlighting. First, the decline in the share of foreign currency debt is observed both in the tradable and nontradable sectors. Second, the decline in corporate liability dollarization in the most recent period is significant even after eliminating mechanical valuation effects, i.e., the appreciation of domestic currencies vis-à-vis the U.S. dollar. See Kamil (2008) for a more detailed discussion of these stylized facts.

liabilities in Latin America dropped from 35 percent in 1998 to 17 percent in 2007.[28]

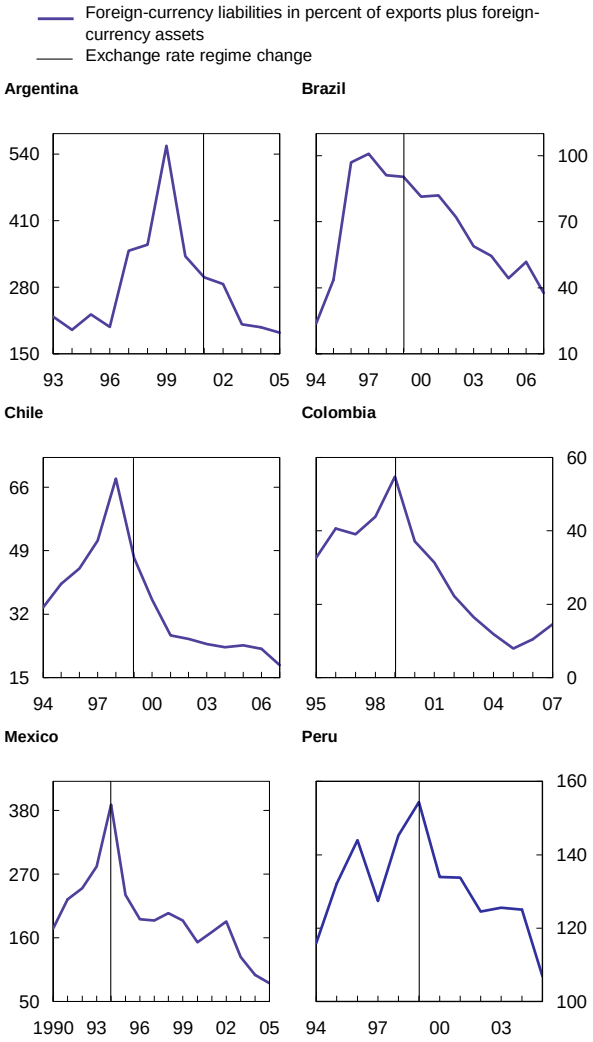
Also, in all six countries, firms have built up considerable foreign exchange buffers, by hedging a higher share of their dollar liabilities with export revenues and assets denominated in foreign currency. In the cases of Brazil, Chile, and Colombia, the sum of firm-level exports and dollarized assets is now, on average, much larger than foreign currency liabilities.[29]

## Beyond Balance Sheets: A Market-Based Approach

While balance sheets appear stronger, currency volatility can still affect a firm's financial position and operating performance through many other channels. Firms may rely on imported intermediate inputs, introducing currency risk into their cost structure. Firms can also be sensitive to exchange rate changes through multinational operations or competition in domestic markets with foreign companies. In highly competitive industries where markups are low, for example, exchange rate changes may affect profitability, since it may be more difficult to alter the price charged to customers. Finally, firms may purchase financial derivatives contracts to offset their balance-sheet exchange rate risk.

Yet information on the sensitivity of a firm's multinational activities and profit margins to currency movements is typically unavailable. Moreover, financial derivative positions are off–balance sheet, and often not reported. In this section we use an alternative way to gauge a firm's overall foreign currency exposure, by estimating the contemporaneous impact of exchange rate movements on a firm's stock-market valuation.

**Better Use of Natural Currency Hedging**
*(Annual medians across firms)*




Source: IMF staff calculations.

Stock prices' reaction to exchange rate changes should, in principle, summarize the multiple channels through which exchange rate fluctuations can affect firms' value.

In line with the literature, stock-market exchange rate exposure is defined as the percentage change in a firm's stock price following a 1 percent depreciation of the nominal effective exchange rate.[30] A firm has a positive (negative) exposure when nominal share values

[28] A similar reduction in financial dollarization is observed in household deposits in the banking sectors of Argentina, Chile, Mexico, and Peru (see Rennhack and Nozaki, 2006).
[29] These ratios, however, may underestimate the sensitivity of net income to an exchange rate depreciation, as they do not include firm-level imports, for which data are unavailable.
[30] See Dominguez and Tesar (2006) and references therein.

**Fraction of Firms Exposed to Currency Fluctuations in the Most Recent Period 1/**

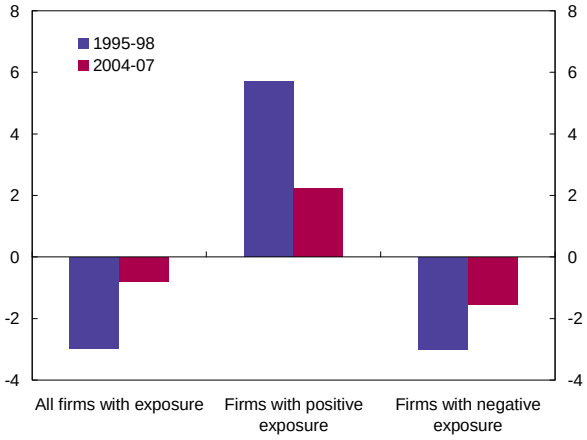
| | Exposed Firms (Percent of All Publicly-Traded Firms in each Country) | | Market Capitalization of Exposed Firms (Percent of Total Market Capitalization in each Country) | |
|---|---|---|---|---|
| | 1995-98 | 2004-07 | 1995-98 | 2004-07 |
| Argentina | 44.8 | 11.5 | 84.2 | 7.9 |
| Brazil | 34.7 | 16.7 | 76.1 | 10.8 |
| Chile | 19.6 | 6.6 | 45.2 | 2.4 |
| Colombia | 44.8 | 7.5 | 56.6 | 12.1 |
| Mexico | 18.4 | 10.7 | 43.3 | 5.3 |
| Peru | 26.1 | 15.5 | 48.9 | 15.5 |

Sources: Economatica; and IMF staff calculations.

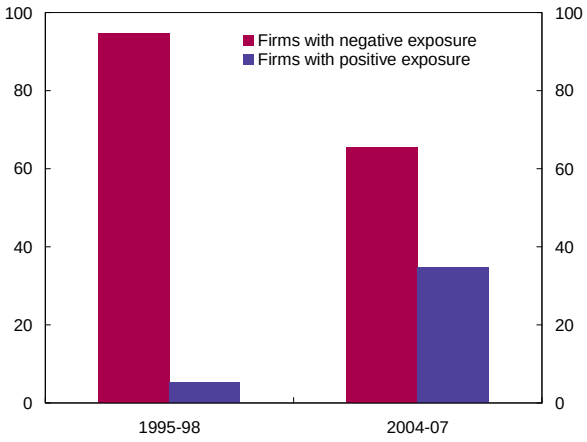
1/ Refers to firms with a statistically significant exchange-rate exposure coefficient (regardless of sign).

**Magnitude and Direction of Foreign Exchange Exposure 1/**

**Average elasticity of stock prices to a 1 percent exchange rate devaluation 2/**




**Proportion of firms negatively and positively exposed to exchange rate devaluations**




Sources: Economatica; and IMF staff calculations.
1/ Only firms with an exchange-rate exposure coefficient statistically different from zero are used in calculations.
2/ Average of exchange-rate exposure coefficients, weighted by firm's average market capitalization (in U.S. dollars) during the period.

are, on average, favorably (adversely) affected by a depreciation of the domestic currency.[31] If exchange rate changes have no statistically significant effects on a firm's stock returns, the firm is said to have no currency exposure.

To apply this approach, weekly stock-market data for all financial and nonfinancial publicly traded firms in six Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico, and Peru) were collected between January 1995 and December 2007.[32] The average sensitivity of each firm's stock price to currency fluctuations was estimated for two subperiods: 1995–98 and 2004–07. Using these two periods allows for a comparison of firms' behavior before and after many countries adopted more flexible exchange rates regimes. Also, choosing the 2004–07 period provides enough time to capture the effects of long-term trends, such as the development of markets to hedge currency risk.

The estimates support the view that firms' currency exposure has declined substantially in the more recent period. Specifically we find:

- *Fewer firms exposed*. During 1995–98, the fraction of firms exposed to currency risk ranged from a low of 18 percent for Mexico to a high of almost 45 percent for Argentina. By 2004–07, the fraction of firms exposed to exchange rate fluctuations had decreased in all countries, especially in Argentina, Brazil, Colombia, and Chile. The shift is even more striking when we consider the share of market capitalization accounted for by those firms that have exchange rate exposure. In Brazil, for example, this

[31] Likewise, for a firm with positive (negative) exposure, an exchange rate *appreciation* would decrease (increase) its stock market value, all else equal.

[32] In estimating the effect of exchange rates on firms' stock prices, controls are introduced to account for other factors that may simultaneously affect the value of the firm, like world stock market returns and world commodity prices. Appendix 5.1 presents the methodology in more detail and discusses the possible limitations of this approach.

share decreased from 76 percent in 1995–98 to 11 percent in the more recent period.[33] The fact that the market capitalization accounted for by firms with currency exposure has fallen more than proportionally to the fraction of exposed firms, suggests that it is mostly larger firms that have become increasingly insulated from currency risk. Given the economies of scale involved in operating in hedging markets, small and medium-sized firms may have less access to hedging strategies than large firms.[34]

- *Firms that remain exposed have, on average, a relatively lower degree of exposure.* In Mexico during 1995–98, for example, a 1 percent nominal depreciation (appreciation) would have reduced (increased) the value of the average firm's equity by 2 percent. However, by 2004–07, for the firms that remained exposed to currency risk, a 1 percent depreciation (appreciation) would have reduced (increase) the share price by 1.1 percent.[35]

- *The nature of the exposure has also changed between these two periods.* In the early sub-period of 1995–98, the vast majority of firms exposed to currency risk would have been harmed (helped) by unanticipated depreciation (appreciation) of the exchange rate. In contrast, during the most recent period, of the firms that are still exposed to currency risk, a significant share would be helped (harmed) by an unanticipated depreciation (appreciation) of the currency.

## More Active Use of Foreign Currency Derivatives

One important way firms may have cut the exposure to currency risk has been the growing reliance on financial derivatives to hedge currency risk. Over the past decade, transactions costs in forward-currency markets have come down sharply, falling by half or more in Brazil, Chile, and Mexico. Also, the number of firms participating in currency-derivative markets has skyrocketed, rising roughly fivefold in Colombia and Chile in the last six years. In Brazil, on the other hand, 60 percent of the publicly-traded firms in 2006 used some form of currency derivative. In Brazil, Chile, and Colombia, the trend towards increased use of foreign exchange derivatives became most noticeable after 1999, when these countries floated their currencies.

**Bid-Ask Spreads in Forward Markets**

| | 1998 | 2004–07 1/ |
|---|---|---|
| Brazil | 0.45 | 0.13 |
| Chile | 0.21 | 0.09 |
| Mexico | 0.21 | 0.11 |

Sources: Bloomberg; Jadresic and Selaive (2005).

1/ Average within period, in percentage.

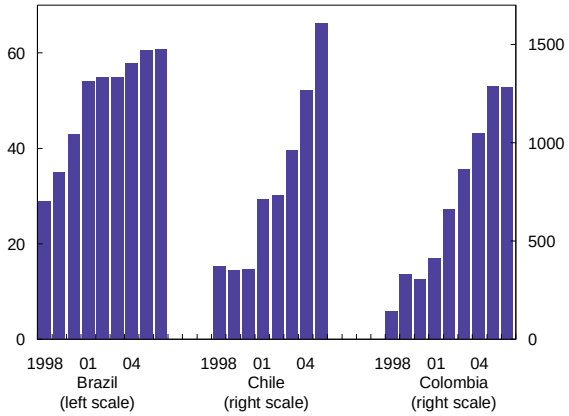
In Colombia, almost 90 percent of currency-derivative transactions are done through forward contracts. This is consistent with the fact that trade credits make up the bulk of foreign currency liabilities of Colombian firms (Echeverry and others, 2003). In contrast, the most commonly used instruments to manage foreign currency exposures in Brazil are currency swaps and options. This is consistent with the observation

[33] In unreported analysis, we confirmed that this result is not driven by changes across periods in the number or sectoral composition of firms quoting in the stock market .

[34] The changes in the nature of exposure across firms with different sizes could also be the result—at least in part—of stronger export growth in the transition to more flexible exchange rate regimes, leading to a greater export coverage and the buildup of foreign assets. The fact that smaller firms are left with large (negative) exposure could support this view, to the extent that smaller firms tend to operate only domestically while exporting firms tend to be large firms operating globally.

[35] This magnitude is consistent with Chue and Cook (2007) in a similar study covering 15 emerging-market countries. In general, average exchange rate exposure elasticities for Latin American firms are similar in magnitude to that of Turkey, but significantly higher (in absolute terms) than those of East Asian countries.

**Participation of Firms in Currency Derivatives Markets in Brazil, Chile, and Colombia**
*(Number of firms)1/*




Sources: National authorities; and IMF staff calculations.
1/ For Colombia and Chile, corresponds to the total number of firms either publicly traded or private. For Brazil, corresponds to the share of publicly traded firms.

primarily driven by firms that issue dollar-denominated or dollar-linked financial debt.

Evidence for Colombia indicates that derivatives transactions have been used to effectively offset the foreign-currency risk created by on-balance-sheet mismatches (Kamil, Maiguashca, and Perez, 2008) rather than for speculative purposes. Yet evidence on whether derivatives in Brazil and Mexico have been used for hedging purposes rather than for speculation is more sparse. There is the possibility that off-balance-sheet activities increase the risk exposure, when not used to hedge but to speculate. Very recently, some firms in Brazil and Mexico have incurred significant losses on foreign currency derivative positions when the exchange rate depreciated in October. More information disclosure is needed to understand the impact of off-balance-sheet transactions on the foreign exchange exposure of firms, especially foreign currency options.

## Conclusions

Our empirical analysis provides evidence that the corporate sector has been proactive in reducing its vulnerability to exchange rate risk since the financial crises in the 1990s and early this decade. Three "buffering" forces appear to be at work. First, firms rely less on foreign currency liabilities and now depend more on domestic sources of local currency funding. Second, firms have been more actively using "natural" currency hedges to offset the dollar risk arising from their debt portfolios. Third, many firms have been making extensive use of foreign-currency derivatives to protect themselves from unexpected movements of exchange rates. With effectively managed currency exposure, firms can reduce their cost of capital or sustain more financial leverage without incurring financial risk—a key pillar for sustained economic growth.

The reduced exposures of firms to foreign exchange risks are not only the direct result of firm actions, but also the improved macro-economic policies and institutional reforms that have increased financial depth and opportunities for risk diversification in these economies. For example, low and stable inflation has increased the availability of long-term domestic currency funding. The high demand by local institutional investors (partly due to regulatory incentives) has helped develop this market segment. Also, the transition to more flexible exchange rates has been accompanied by new legislation governing the role of pension funds in financial markets, which has helped spur the development of currency derivative markets. At the same time, changes in bank regulations have forced banks to care more about the credit risk arising from currency mismatches of borrowers.

Market-based estimates of exchange rate exposure provide additional insights on changes in both the magnitude and direction of exchange rate exposure. The fraction of firms exposed to changes in currency movements decreased significantly in 2004–07 compared with 1995–98. A similar story holds for the average sensitivity of firms' stock prices to exchange rate developments, which has also fallen in the most recent period. Moreover, the direction of exposure has also changed over time. During the first period, we find that the response of stock prices to exchange rate depreciations was overwhelmingly negative. By contrast, between 2004 and 2007, among those

Latin American firms that remained exposed, a higher fraction (35 percent) now benefit from a depreciation of the domestic currency.

Yet the results presented in this chapter give no room for complacency. We find that significant currency exposures have become concentrated among smaller firms, which could be vulnerable to a sharp currency depreciation. Also, more work is needed to understand the effect of off-balance-sheet transactions on foreign exchange exposure of firms, especially in countries like Brazil and Mexico, where markets have become more sophisticated and off-balance-sheet activities can substantially alter the overall risk exposure.

The empirical results presented in this chapter have important implications for exchange rate policy and financial stability. A plausible interpretation of our results is that the trend in the region to adopt flexible exchange rates has given firms sufficient incentives to manage currency risk and be better prepared for external shocks. In turn, the development of currency derivatives markets has been endogenous to the risks and the incentives corporations have faced; improved corporate governance and institutional infrastructure may have helped as well. As financial derivatives become more sophisticated and complex, it is important for regulatory frameworks to adapt to market developments, along with reinforcing prudential supervisory practices.

# Appendix 5.1

## Description of Data Set

The empirical analysis in this chapter draws on a new database with annual accounting and stock market information for over 1,200 financial and nonfinancial companies in Latin America. It covers all firms that are listed—or have been listed—in the six countries' stock exchanges between 1995 and 2007. A major difference between this data set and the ones used in prior cross-country work is that it contains detailed information on three key drivers of exchange rate exposure for nonfinancial firms: the currency composition of assets and liabilities, the share of foreign currency revenues in total sales, and firms' access to international debt and equity markets

The data for this paper were assembled from four different sources. Balance sheet and general company information were obtained from annual financial statements drawn from local stock markets or regulatory agencies in each country. This information was complemented and cross-checked with data obtained from commercial provider Economatica. Data on foreign currency liabilities and assets was hand-collected from the financial explanatory notes of firms' balance sheets. This data set was augmented with information on firms' involvement in international trade, using the countries' customs office records to match data on exports for each firm in the sample using their fiscal code identifier and/or name. Finally, Economatica was used to obtain stock market information for each firm.[36] Below we present the main summary statistics of the data set used.

## Methodology

The empirical model used to estimate stock market exchange rate exposure is given by

$$R_{it} = \beta_{0,i} + \beta_{1,i}\hat{S}_t + \beta_{2,i}R_t^W + \sum_{m=1}^{m=5}\delta_{m,i}P_{m,t}^C + e_{it},$$

where $R_{it}$ is the stock return of firm $i$ at time $t$, $\hat{S}_t$ measures the change in the country-specific trade-weighted exchange rate, $R_t^W$ is the return on a world stock market index measured in U.S. dollars, and $P_{m,t}^C$ denotes the percentage change in prices for five key commodities relevant for Latin

[36] Further details on the data construction and variable definitions are provided in Kamil (2008).

America (oil, corn, soybeans, coffee, and copper). We measure the exchange rate as the domestic currency price of foreign currency (so that an increase in $\hat{S}_t$ is equivalent to a depreciation). We find that the nominal exchange rates follows a random walk, implying that percentage changes in the nominal exchange rate are basically unanticipated.

To measure exposure at the firm level, it is necessary to distinguish between the direct effects of exchange rate movements on firm value, and the effects of other macroeconomic factors that simultaneously affect both firm value and exchange rates. Following Chue and Cook (2007) an instrumental-variable approach is used that identifies the total exposure of a company to exchange rate movements, yet abstracts from the influence of confounding macroeconomic shocks. For these purposes, world financial variables (the yen-dollar, and euro-dollar exchange rates and the federal funds interest rate) are used as instruments to identify that part of exchange rate movements that is exogenous to the market's local conditions.

Even though we can assume that world financial variables are exogenous, they can still be correlated with global shocks that affect Latin American stock markets. This possibility implies that the correlation between the world instruments and the error term can be nonzero, violating our identification assumptions. We include the term $R_t^W$ and world commodity prices to absorb any remaining correlation between world instruments and the error term.

Under this specification, the coefficient $\beta_1$ (the "exchange rate beta") reflects the change in stock returns that can be explained by movements in the exchange rate after conditioning on the world market return and changes in international commodity prices. For each country and period, we estimate equation (1) separately for each firm and compute $\beta_1$, the exchange rate beta, and its statistical significance.

One limitation of this stock-market approach to measuring exchange rate exposure is that some traded stocks may be illiquid, and thus prices changes may not accurately reflect the market's current assessment of firms' values. To reduce these concerns, we excluded from estimation firms with fewer than two months of data over the period 1995 to 2007. We also excluded outlier estimates of exchange rate betas in the lower and upper 2 percent of their distribution in each country.

**Summary Statistics of the Firm-Level Data Set**
**(average values across firms, except where noted)**

| | Balance Sheet Variables | | | Stock Market Variables | | |
|---|---|---|---|---|---|---|
| Firm-level Averages: | Dollarization of Liabilities (%) 1/ | Dollarization of Assets (%) 1/ | Exports to Sales (%) | Market Capitalization (mil. of dollars) 2/ | Stock Liquidity (%) 3/ | International Listing (%) 4/ |
| Argentina | 57.6 | 4.7 | 9.5 | 70 | 1.4 | 9 |
| Brazil | 17.4 | 1.6 | 11.7 | 146 | 2.4 | 14 |
| Chile | 22.4 | 8.4 | 8.8 | 137 | 1.6 | 8 |
| Colombia | 6.9 | 1.2 | 6.1 | 87 | 2.8 | 2 |
| Mexico | 37.8 | 7.5 | 14.3 | 179 | 2.0 | 19 |
| Peru | 62.1 | 15.6 | 17.9 | 35 | 1.6 | 3 |

Sources: Economatica; and IMF staff calculations.

1/ Liabilities (assets) denominated or indexed to foreign currency (typically the dollar), issued domestically or abroad.
2/ Median values.
3/ Monthly value traded of the stock, relative to its month-end market capitalization (period average for each firm).
4/ Fraction of firms that have cross-listed shares in the U.S. stock market .

# VI. Boosting Private Investment in the Long Term

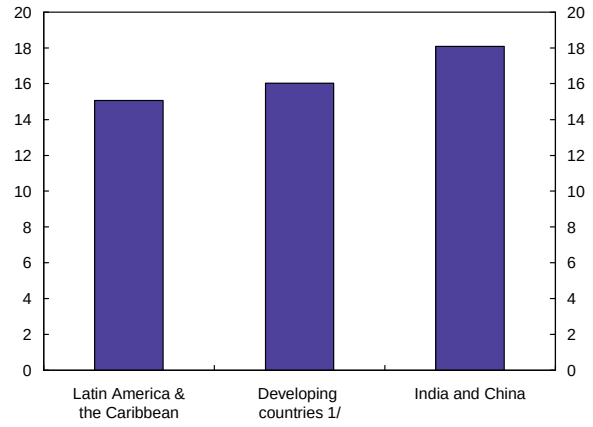
## Investment Still Lagging

The long-run growth record in the LAC region has been disappointing.[37] This reflects many factors, including a history of macroeconomic instability and institutional weaknesses. An important role has also been played by investment rates that have been low, including in the private sector, and especially when compared with fast-growing economies in other regions, including Asia.

Private investment has risen as a share of GDP in recent years, becoming a more important driver of the region's impressive growth since 2003. Nonetheless, investment-to-GDP ratios remain below those in other regions. Moreover, investment has not increased uniformly across all countries. The rise in the aggregate investment-to-GDP ratio has been driven especially by increases in Colombia and Venezuela and by the recovery in Argentina. Private investment in other countries, such as Brazil and in the Caribbean region, has risen less over this period.

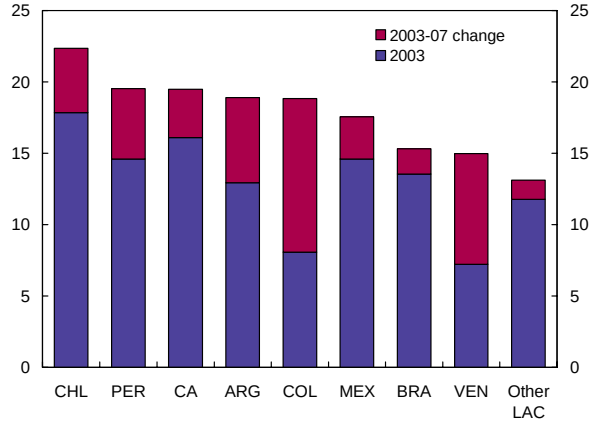
Further increasing private investment will likely be an important part of the effort to boost the region's still-moderate long-term growth rates. This chapter seeks to understand the factors behind the performance of private investment in the region in recent years. It concludes that, at an aggregate level, increased macroeconomic stability has played an important role in encouraging private investment in the past while the impact of other macro factors, including the recent terms of trade improvements, is less clear. The analysis is extended to the micro level by looking at firm-level data in the period since 2003, during which the region's resilience has increased substantially. The chapter presents the

**Private Investment**
*(In percent of GDP; 1993–2007 average)*




Source: IMF, *World Economic Outlook* (WEO) database.
1/ Excluding India, China and the countries of Latin American and the Caribbean.

**Increase in Real Private Investment**
(In percent of real GDP)

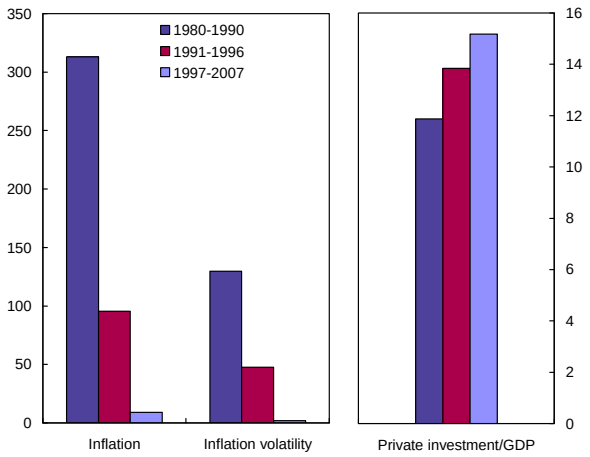



Source: WEO database, IMF.
Note: Country abbreviations follow ISO codes.

Note: This chapter was prepared by Jingqing Chai and Vikram Haksar.

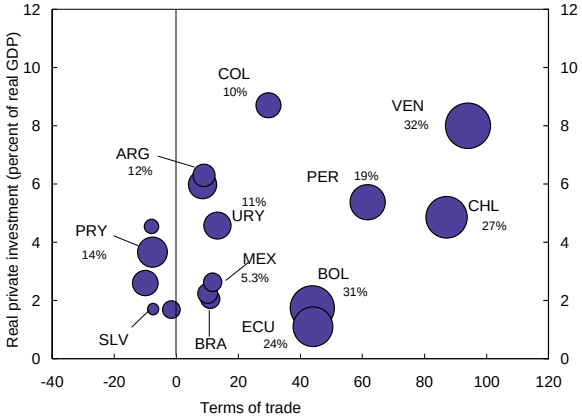
[37] Over 1980–2007, real GDP growth in the region averaged 2.9 percent, compared with 7.3 percent in emerging Asia.

**Inflation, Volatility, and Investment**
*(In percent)*




Sources: WEO database, IMF; and IMF staff calculations.

**Terms of Trade and Private Investment 1/**
*(2003-07 change; in percent)*




Sources: WEO database, IMF; and *Commodity Trade Statistics* , United Nations.
Note: Country abbreviations follow ISO codes.
1/ Size of bubble proportional to commodity exports in percent of GDP (2006).

results of a new cross-country analysis showing that firms in Latin America, especially smaller firms, continue to face important financing constraints that hold back investment, despite the recent gains on macro stability.[38] Indeed, the cost of financing for firms in the region is almost double that in Asia. All told, the analysis emphasizes the importance for growth and investment of preserving hard-won gains on low and stable inflation and the need to press on with the development of banking systems and capital markets to ease financing constraints.

## Importance of Macro Stability

To analyze the macroeconomic determinants of private investment, we conducted a cross-country empirical analysis for 1980–2007 relating private investment in the LAC region to various macro factors, including real GDP, the rate of inflation, the volatility of inflation, real interest rates, and the terms of trade, among other variables. The details of the estimation results and methodology are presented in Appendix 6.1.[39] The main findings are presented below along with some observations.[40]

- *The reduction in inflation has supported investment.* The decline in both the level and volatility in inflation, especially through the mid-1990s, has encouraged higher private investment. This may be because low and stable inflation gives investors assurances that the viability of long-term investment projects is less likely to be disrupted by macroeconomic instability.[41]

- *Borrowing costs are important*. As expected, the analysis shows that lower real interest rates

[38] Previous country studies for the region look at financing constraints in the period prior to 2002 (see Box 6.1).
[39] The analysis draws on Chai and Haksar (2008).
[40] External debt and national savings effects turn out to be hard to identify, although they have the expected signs. They may be captured in the variation of real output. There is some evidence that public investment has crowded out private investment in the LAC region, though further analysis is needed of the importance of infrastructure quality for private investment.
[41] See, for example, Greene and Villanueva (1991).

support private investment. Real lending rates in the region, while still high, have come down in the last years, facilitating the pick-up in investment. The reduction in real interest rates likely reflects a lower inflation premium given the improved inflation environment in the region. The substantial strengthening in public sector balance sheets has also contributed to impressive drops in risk premia.

- *Output growth and financial development also matter*. As in many other studies, real GDP growth on average was found to be highly significant in explaining real private investment in both in the long and short run. This reflects that output growth likely captures the effects of other important determinants of investment, including productivity growth and the rate of return on capital, and overall strengthening of economy-wide balance sheets. There is also some aggregate evidence that access to finance, measured by the level of real private credit, has had a positive effect on private investment.

- *Mixed effect of terms of trade.* Finally, while the terms of trade have improved significantly in a number of Latin American countries, their contribution to aggregate private investment for the region as a whole is mixed. There is substantial dispersion in investment rates and terms of trade gains across the region, with no clear overall pattern emerging. Nonetheless, four of the largest beneficiaries of the commodity boom, Chile, Colombia, Peru, and Venezuela, have seen important increases in private investment rates. In addition, at the firm level, on average, firms in commodity sectors have had much faster growth in investments and output (based on data from Brazil, Chile, Mexico, and Peru). On the other hand, some net commodity importers, including in the Caribbean region, have seen smaller gains on investment.

## Beyond Macro Stability

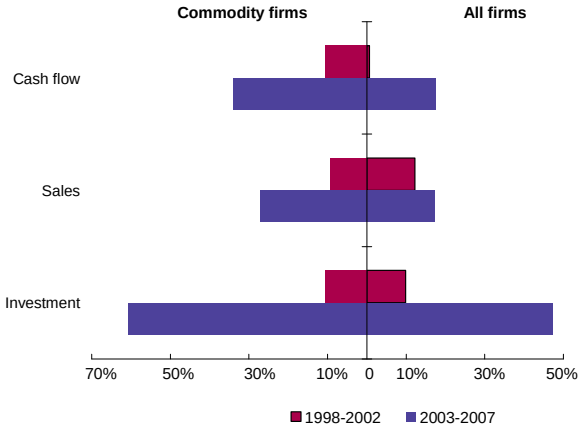
Macroeconomic factors alone, however, cannot quite explain why the LAC region has invested less than some of the other emerging market economies. Indeed, inflation and volatility in the larger regional economies are now comparable to other emerging market countries. Also, cross-border risk premia have fallen sharply to levels that are only marginally higher than spreads in emerging market comparators.

Despite the achievement of macroeconomic stability, the region lags behind in some key structural and financial dimensions that may be important to increase further investment. On average, the LAC region is less conducive to doing business than some of the other emerging market regions, particularly in the areas of public administration efficiency and ease of entry, as shown by the cost of doing business indicators compiled by the World Bank. There is also a considerable gap in financial development, measured by bank credit to GDP and stock market capitalization. Moreover, local nongovernment bond markets in the region are relatively small compared with other emerging markets. Recent reductions notwithstanding, the average real cost of borrowing facing Latin American firms remains substantially higher than that for firms in other emerging market regions. Reflecting these and other impediments, total factor productivity grew at less than 1 percent a year during 1990–2006 in the major countries in the region, compared with over 2 percent on average in other emerging market countries.

In sum, diverse structural and institutional features matter for private investment.[42] It is also clear that financial sector development and the cost

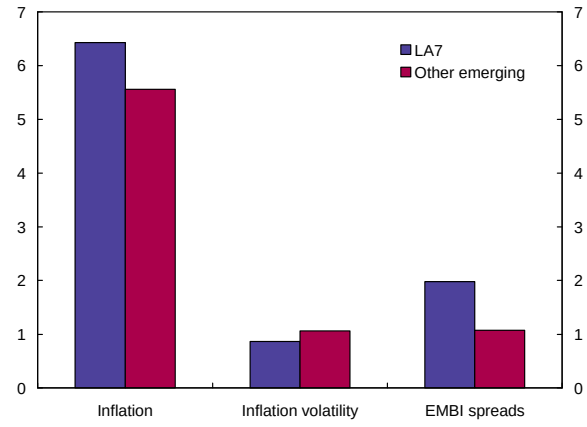
[42] Further discussion of the investment, growth, and productivity nexus in the region can be found in Singh and Cerisola (2006) and IMF (2007).

**Performance of Firms in Commodity Sectors**
*(Percent)*




Sources: Worldscope; and IMF staff calculations.

**Inflation, Volatility, and Risk Premia in EMs**
*(2005-07 average; in percent)*




Sources: WEO database, IMF; and Bloomberg.

of borrowing are key determinants of investment. In the remainder of this chapter, we focus on the impact of financing constraints on investment.

## Role of Financing Constraints

Much analysis in the corporate finance literature has highlighted the importance of financing constraints as a limiting factor for investment at the firm level (Box 6.1).[43] Financial market frictions, including imperfect information facing lenders, typically make it hard for firms to obtain "external" financing (that is, financing from outside the firm, rather than from retained earnings) for investment projects that would otherwise be profitable.

While the importance of financing constraints has been documented for firms across the world, including in developed countries, they may be particularly severe in the LAC region. This is manifested in both the relatively high cost of financing and the lack of access to credit for many LAC firms, despite the recent improvement in the region's corporate performance.

Cross-country firm-level data analyzed show that financing costs in the LAC region have fallen a bit over the last decade. However, they remain very high in comparison with other regions, in fact almost double those facing firms in the Asian region. Moreover, analysis of the distribution of financing costs across firms in the LAC region compared with, for example, Asian emerging markets reveals striking differences.[44] First, the distribution of financing costs for both large and

[43] Analyzing firm-level data allows for testing for how constraints vary across firm size and avoids well-known aggregation bias problems with aggregate investment data (see Bond and Lombardi, 2004).

[44] We draw the frequency distribution of financing costs over all firms in the sample using kernel density estimates. The *x*-axis of the graph shows the percent value of financing costs. The *y*-axis shows the percent of firms that face the corresponding level of financing costs. A rightward tilt of distribution *A* compared with distribution *B* means that more firms in distribution *A* face higher levels of financing costs than in *B*.

### Box 6.1. Literature on Financing Constraints and Investment

Investment by firms should depend on economic returns—the marginal productivity of new capital—and the costs of acquiring and installing that new capital. In a world of perfect capital markets, a firm's financial structure ought not to matter for its investment decisions. Firms could borrow all the funds required to maximize returns on capital at prevailing market rates (the Modigliani-Miller (1958) irrelevance of capital structure result). However, adverse selection and principal-agent problems make evaluation and monitoring costly for lenders, who tend to charge a higher lending interest rate or ration credit—relative to a perfect information benchmark—to compensate for the extra risk (Stiglitz and Weiss, 1981). This highlights the importance of thinking about the role of financing constraints in investment decisions by firms.[1]

With financial constraints, the firm's investment decision can be shown to be a function not just of fundamental opportunities (i.e., the expected marginal productivity of capital), but also of balance sheet characteristics. Evidence of financial constraints is usually inferred by finding strong relationships between investment and measures of internal funds—typically, cash flow. Arguably, the more financially constrained a firm is, the more it would rely on internal as opposed to external funding, all else equal.

One important problem with this approach is that cashflow is also likely to contain information about the future profitability of investments and thus be correlated with investment for reasons other than constrained access to external funds. In response to this problem, most empirical studies use additional information on the firms in the sample to sort them into groups that can be expected to face differing levels of access to market finance. An obvious criterion to use in this context is firm size. Another approach to circumventing this problem of interpretation of cash measures, is to use the stock of cash rather than cashflow (Forbes, 2007). This is intuitively appealing because, while financially constrained firms might be expected to accumulate cash stocks to fund investment, it is not obvious that cash stock on a firm's balance sheet is a good predictor of the expected returns on additional investment.

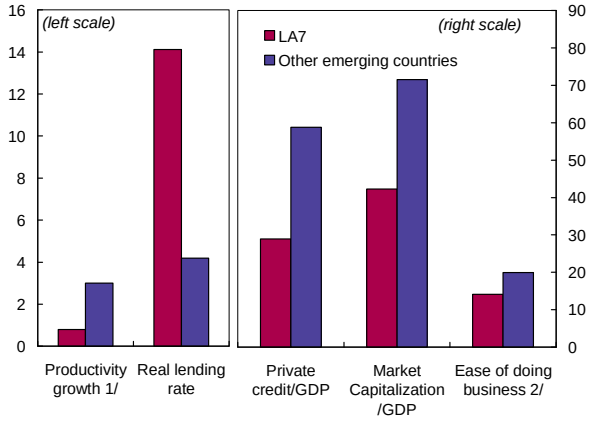
The additional empirical challenge for estimating models of investment is to find good proxies for the fundamental value of investment opportunities. Gilchrist and Himmelberg (1998) show that the marginal product of capital can be proxied for by the (level of) sales-to-capital stock ratio. Some other studies (e.g., Gelos and Werner, 2002) use the change in sales as a proxy for the expected profitability of capital. Another popular proxy is "Tobin's *q*"—the ratio of market value to replacement cost of capital (Hayashi, 1982), but it is unlikely to adequately reflect marginal *q* for developing country firms (Hubbard, 1998), and the lack of stock-market liquidity is a further problem.

Many empirical studies have been based on this framework. Fazzari and others (1988) cover U.S. manufacturing firms, while Love and Zicchino (2006) apply a similar approach for emerging market countries, and Bond and others (1997) do the same for European developed economies. Empirical studies of Latin American countries have found the existence of financing constraints in most economies studied (see an overview in Galindo and Schiantarelli, 2003). Gelos and Werner (2002) found that financial liberalization in Mexico resulted in an easing of financing constraints for some, in particular small firms. Forbes (2007) showed that financing constraints in Chile increased for smaller firms during the period of capital controls. De Brun, Gandelman, and Barbieri (2003) showed that small firms in Uruguay face higher financing constraints. Meanwhile, Castañeda (2003) shows that Mexican companies affiliated with banking groups are less financially constrained.

Note: This box was prepared by Alvaro Piris.

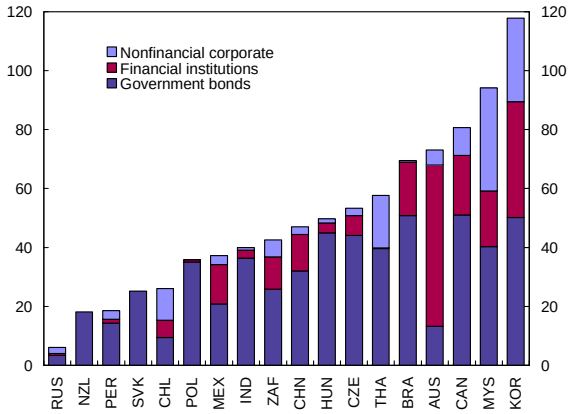
[1]While this is not the focus of this chapter, the "financial accelerator" literature notes that swings in aggregate investment appear larger than justified by changes in interest rates or measures of expected profitability (Bernanke and Gertler, 1989; Bernanke, 2007). Models in this literature take as a starting point that firms with high net worth will be more creditworthy and better able to access external finance at a lower cost. The observed volatility in aggregate investment is linked to procyclical movements in firms' net worth—high-asset prices or investor optimism in upswings lead to falls in the premia firms pay for external finance, thus boosting investment by more than might be explained by other fundamentals.

**Impediments to Higher Private Investment**
*(In percent, unless otherwise noted, 2002-06)*




Sources: World Bank, *Doing Business*; and IMF staff calculations.
1/ Productivity growth over period 1990-2006.
2/ Qualitative indicator between 0 and 100 where higher values convey greater ease of doing business. Average 2003-06.

**Size of Domestic Bond Markets 1/**
*(In percent of GDP)*




Sources: Bank for International Settlements; and IMF staff calculations.
1/ Outstanding stock as of September 2007.

small LAC firms is shifted to the right of those in the Asia region; that is, firms in the LAC region face higher financing costs across the board. Also, the distribution of financing costs for small firms in both regions is to the right of that for larger firms; that is, small firms in both regions face higher financing costs. However, it is particularly striking that the gap between the distributions for small and large firms is wider in the LAC region than in Asia. smaller firms in the LAC region face higher financing premia than in Asia.

Moreover, survey data from the World Bank in 2006 document that, on average, about 30 percent of LAC firms have access to bank loans or lines of credit, compared with 70 percent in the east Asian region. The survey results also illustrate that LAC firms rely much more heavily on internal funds to finance new investments or to provide working capital (60 percent of total firm investment is internally financed in the LAC region compared with 30 percent in Asia). This in part reflects the relatively small size of financial systems in many LAC countries.

As discussed in Box 6.1, in a world with no financial market imperfections, a firm's investment decision would not be constrained by its choice of financing. There would be no need for it to retain internal funds (cashflow) with the specific purpose of using this to finance investment—funding from outside the firm could always be found for profitable ventures. In reality, firms that face external financing constraints would tend to have lower investment and higher internal retention of funding (net cash flow) for investment. Another way of looking at the financing constraints from a cross-country perspective is that for two otherwise operationally identical firms, the firm that operates in a less developed financing environment will tend to invest less, on average, than the firm that has easier access to credit. Indeed, firms in the LAC region on average conserve a relatively large portion of their net cash flow from sales compared with those from the other emerging market regions, but at the same time they have

much lower investment rates. This means that firms in other emerging market regions have been able to invest more with less cash hoarding, again suggesting the presence of larger financing constraints for LAC firms.

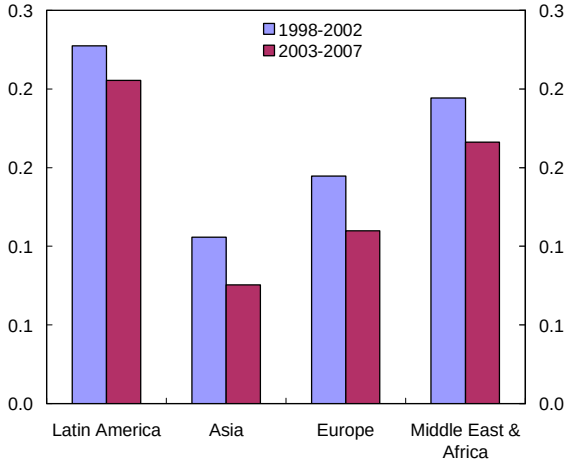
To analyze the effect of credit constraints on private investment more rigorously, we estimated a regression model linking investment by a firm to the marginal productivity of capital, and the extent of credit constraints. As is common in this literature, the productivity of capital is proxied by the ratio of sales to capital, with the intuition being that strong sales should signal expected returns on additional investment. Meanwhile, financing constraints are proxied by the firm's stock of cash (the idea being that firms that are financing constrained keep more cash on hand, all else equal).

We also test for whether smaller firms tend to be more vulnerable to credit constraints. This model is fitted to the financial statement data of the publicly listed nonfinancial firms in four countries in the LAC region (Brazil, Chile, Mexico, and Peru). Similar analysis for individual countries in the region has documented the presence of financing constraints in the period before 2003. Our analysis focuses on the period 2003–07, to examine whether the gains on macro stability and strengthened balance sheets had diminished the importance of financing credit constraints.

The analysis confirms that financing constraints remain very much a factor affecting corporate investment in the LAC region, especially for smaller firms. In general, cash stock has a highly significant and positive effect on investment in most cases, suggesting that credit constraints are important. When firm size is included in the regression, the estimated coefficient is large and positive. Importantly, the results suggest that smaller listed companies in the LAC region face substantially higher financing constraints than larger firms, a result consistent with findings from other country-specific studies

**Firm Level Cost of Financing in Emerging Markets 1/**

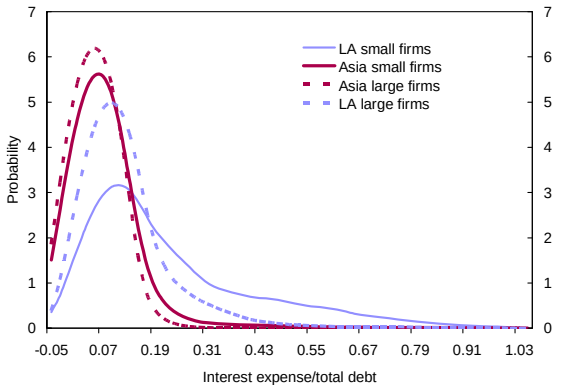
*(In percent)*




Sources: Worldscope; and IMF staff calculations.
1/ Median firm value in finance expense/total debt.

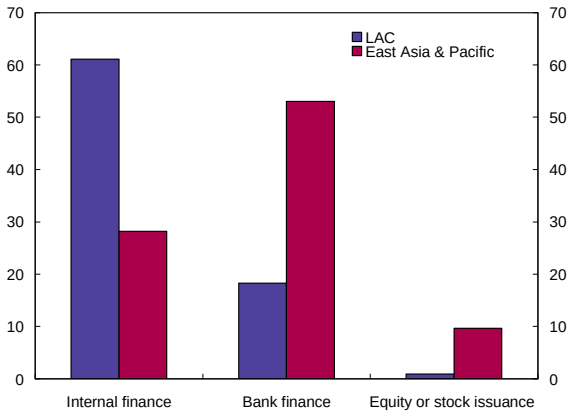
**Distribution of Cost of Debt in Listed Firms, 2003–07 1/**

*(in percent)*



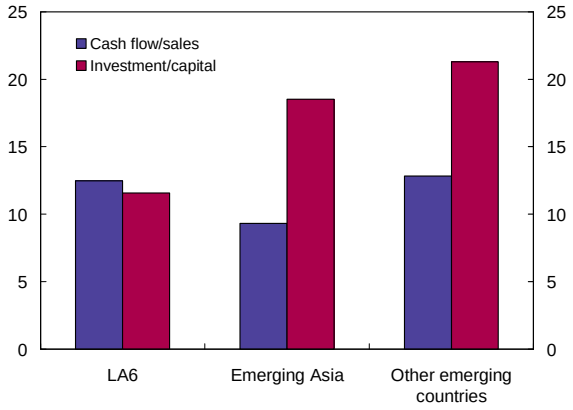

Sources: Worldscope; and IMF staff calculations.
1/ Small and large firms are defined as having total assets below 25 percentile and above 75 percentile, respectively, of all firms' asset values in the same region.

**Sources of Financing**
*(In percent of total investment financing)*




Source: World Bank Enterprises Surveys.

**Investment and Financing Constraints**
*(In percent)*




Sources: Worldscope; and IMF staff calculations.

**Investment and Financing Constraints 1/**

| Explanatory Variables | Estimated Coefficients | |
|---|---|---|
| | Fixed effects | S-GMM 2/ |
| Net sales | 0.085 *** | -0.005 |
| Cash stock | -0.021 * | 0.008 *** |
| Small dummy*cash stock | 0.537 *** | 0.502 *** |
| Log (total assets) | 0.14 | 0.937 *** |
| No. of observations | 2,921 | 2,079 |

Source: IMF staff estimates.

1/ Estimates of empirical model with investment-to-capital ratio as dependant variable.
2/ Estimates from the system generalized method of moments estimator.
***, * represent significance at 1%, 10% level, respectively.

(including for Chile by Forbes, 2007). In addition, investment is found to be an increasing function of firm size (total assets), suggesting higher investment rates for larger firms beyond the impact of financing constraints.

The finding that smaller firms are more affected by financing constraints suggests that such constraints could be even more important in the LAC region than we are able to detect in our sample of publicly listed firms. Firms outside our sample of listed companies are likely to be even smaller, and therefore even more affected.

## Conclusions

The analysis in this chapter raises two principal policy issues concerning further increasing private investment in the LAC region.

First, it is crucial at the current juncture to preserve the region's disinflation gains. Any sustained increase in inflation or price level volatility would likely undermine investment, and therefore growth prospects.

Second, the size and persistence of financing constraints, especially for smaller firms in the region, gives additional impetus to the need to deepen financial systems, strengthen capital market development and credit institutions, and promote access to finance. Priorities include strengthening the financial infrastructure (e.g., ratings agencies, transparent and better accounting standards) and implementing sound legal frameworks (property rights, foreclosure process and bankruptcy reform); improving intermediation and lowering obstacles to increased bank and capital market funding for mid-sized and smaller firms; and implementing regulations to facilitate technological innovations that help low-income families and small firms gain access to financial services (see de la Torre, 2007, and Rojas-Suarez, 2007).

Furthermore, while they are not the specific focus of analysis in this chapter, broader structural policies to boost productivity will remain

additional policy imperatives to boost investment and growth. These cover a wide range of areas, including actions to increase labor market flexibility, improve the ease of doing business, and strengthen competition.

# Appendix 6.1. Estimation Methods

## Determinants of Aggregate Real Private Investment

There is a substantial literature arguing that long-run aggregate investment is determined by returns on investment and uncertainty associated with investment returns (see Roache, 2006, for further discussion). Other factors that are considered include proxies for business climate, financial development, and cost of borrowing. Given that unit root tests show these are all nonstationary time series (except for the real interest rate and inflation volatility), we test for the existence of a long-run co-integrating relationship. Investment is found to be co-integrated with real output, *Y* (proxy for returns), and inflation, $\pi$ (proxy for uncertainty), respectively. Accordingly, we estimated an error correction model for investment where other financial and macro factors affecting private investment in the short run are represented by *Z*.

$$\Delta I_t = \mu + \sum_i a_i \Delta Y_{t-i} + bZ + c(I_{t-1} - Y_{t-1} - \pi_{t-1}) + \varepsilon_t$$

We estimated the above error correction model for a panel of the 18 largest Latin American and Caribbean countries over 1980–2007 and 1990–2007 to account for the very high and lower inflation episodes. The model was estimated using the Pooled Mean Group methodology (Pesaran, Shin, and Smith, 1999), which allows for a country-invariant long-run co-integration relationship and country-specific short-run dynamics in a panel setting. The results of the estimated model over the two periods are shown below.

**Dynamic Panel Estimates of Macro Model**
*(1980-2007)*

| Variables | (1) | (2) | (3) |
|---|---|---|---|
| **Long run** | | | |
| GDP 1/ | 1.058 *** | 1.121 *** | 1.086 *** |
| | [0.0514] | [0.0538] | [0.0589] |
| Inflation | -0.00115 * | -0.00038 *** | -0.002 |
| | [0.000636] | [0.0000] | [0.00113] |
| **Error correction** | -0.262 *** | -0.261 *** | -0.326 *** |
| | [0.0574] | [0.0551] | [0.0655] |
| **Short run** | | | |
| *In first differences* | | | |
| GDP 1/ | 2.426 *** | 2.933 *** | 3.019 *** |
| | [0.583] | [0.529] | [0.553] |
| Public investment 1/ | -0.135 ** | | |
| | [0.0613] | | |
| External debt/GDP | -0.576 | | |
| | [0.407] | | |
| National savings 1/ | | 0.074 | |
| | | [0.0787] | |
| Terms of trade (in log) | | | -0.0108 |
| | | | [0.118] |
| Private credit 1/ | 0.214 *** | 0.084 | 0.114 |
| | [0.0787] | [0.0909] | [0.0808] |
| *In levels* | | | |
| Inflation volatility | -1.130 ** | 0.000 | -1.626 ** |
| | [0.531] | [1.255] | [0.742] |
| Real interest rate | | | -0.003 |
| | | | [0.00258] |
| Observations | 414 | 416 | 359 |

Source: IMF staff estimates.

Note: Error correction with long-run co-integration;
Standard errors in brackets; *** p<0.01, ** p<0.05, * p<0.1.
1/ In logarithm of real values.

## The Role of Financing Constraints in Firm-Level Investment

We employed a parsimonious model where cashflow measures and sales are used as proxies for credit constraints and the marginal profitability of capital, respectively. Other financial variables are also used to capture aspects of financing structure that may determine the external financing premium. Given the importance of the size effect, we applied three definitions to establish whether a firm is small or not. The first size cutoff is defined relative to the size of firms in the 25th percentile of country *i*'s own firm size distribution. Alternate size cutoffs are also used based on how firms in country *i* compare in size with firms at the 25th percentile of the size distribution in Brazil and separately in Mexico. As such, the model estimated is

$$\frac{I_{i,t}}{K_{i,t-1}} = \alpha_i + \beta_1 * \frac{Sales_{i,t}}{K_{i,t-1}} + \beta_2 * \frac{Cash_{i,t-1}}{K_{i,t-1}} + \beta_3 * Cash_{i,t-1} * Small_i + \beta_4 * Z_{i,t} + f_i + d_t + \varepsilon_{i,t}.$$

The variables are scaled by aggregate capital stock (see Gilchrist and Himmelberg, 1998, for a motivation). The annual firm-level financial

statement data for Brazil, Chile, Mexico, and Peru for 2003–07 are taken from the Economatica database. While investments by these publicly listed firms account for between 5 and 30 percent of the aggregate private investments in respective countries, their dynamics mirror closely that of the aggregate private investments, suggested by high sample correlation coefficients.

We first estimated the model using a fixed-effects (OLS) estimator, which helps address the potential endogeneity bias related to unobserved time-invariant firm-specific effects (such as quality of management and country effects). However, since OLS estimators will be biased if an unobserved shock is serially correlated or there are effects from lagged investment, we further used a GMM-difference estimator developed by Arellano and Bond (1991) and others. This estimator first-differences each of the variables to eliminate the firm-specific effects, and then uses lagged levels of the variables as instruments. Results are shown below.

Details of associated robustness and specification tests are presented in Chai and Haksar (2008).

**Dynamic Panel Estimates of Macro Model**
*(1990-2007)*

| Variables | (4) | (5) | (6) |
|---|---|---|---|
| **Long run** | | | |
| GDP 1/ | 1.090 *** | 1.082 *** | 1.005 *** |
| | [0.0507] | [0.0482] | [0.106] |
| Inflation | -0.00959 *** | -0.00104 | -0.0276 *** |
| | [0.00141] | [0.00163] | [0.00537] |
| **Error correction** | -0.308 *** | -0.328 *** | -0.229 *** |
| | [0.0709] | [0.0674] | [0.0707] |
| **Short run** | | | |
| *In first differences* | | | |
| GDP 1/ | 2.658 *** | 3.557 *** | 3.732 *** |
| | [0.717] | [0.609] | [0.632] |
| Public investment 1/ | -0.162 ** | | |
| | [0.0753] | | |
| External debt/GDP | -0.421 | | |
| | [0.476] | | |
| National savings 1/ | | 0.131 | |
| | | [0.129] | |
| Terms of trade (in log) | | | -0.067 |
| | | | [0.209] |
| Private credit 1/ | 0.163 | 0.003 | 0.012 |
| | [0.120] | [0.143] | [0.108] |
| *In levels* | | | |
| Inflation volatility | -0.375 | 0.475 | -0.759 |
| | [0.634] | [1.287] | [0.811] |
| Real interest rate | | | -0.00641 * |
| | | | [0.00345] |
| Observations | 298 | 298 | 280 |

Source: IMF staff estimates.

Note: Error correction with long-run co-integration;
Standard errors in brackets; *** p<0.01, ** p<0.05, * p<0.1.
1/ In logarithm of real values.

**Fixed Effect OLS Estimates**

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Sales | 0.0463 *** | 0.0856 *** | 0.0853 *** | 0.0839 *** | 0.0856 *** |
| | [0.0172] | [0.00141] | [0.00162] | [0.00269] | [0.00142] |
| Cash stock | 0.465 *** | -0.022 ** | -0.0211 * | -0.0192 * | -0.022 ** |
| | [0.0424] | [0.0109] | [0.0108] | [0.0113] | [0.0108] |
| Small firm dummy 1 | | 0.537 *** | | | 0.537 *** |
| | | [0.0109] | | | [0.0109] |
| Small firm dummy 2 | | | 0.536 *** | | |
| | | | [0.0109] | | |
| Small firm dummy 3 | | | | 0.531 *** | |
| | | | | [0.0119] | |
| Total assets | | | | | 0.14 |
| | | | | | [0.0983] |
| Observations | 2921 | 2921 | 2921 | 2921 | 2921 |
| Number of code | 761 | 761 | 761 | 761 | 761 |
| $R^2$/Hansen P | 0.900 | 0.997 | 0.997 | 0.991 | 0.997 |

Source: IMF staff estimates.

Note: *** p<0.01, ** p<0.05, * p<0.2.
Robust standard errors in brackets.

**System GMM Estimates**

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Sales | -0.0164 | -0.00661 | -0.00669 | -0.0109 | -0.0049 |
| | [0.0143] | [0.00677] | [0.00676] | [0.0119] | [0.00709] |
| Cash stock | 0.0144 * | 0.00789 *** | 0.00807 *** | 0.00492 | 0.00758 *** |
| | [0.00780] | [0.00270] | [0.00273] | [0.00461] | [0.00277] |
| Small firm dummy 1 | | 0.557 *** | | | 0.502 *** |
| | | [0.0558] | | | [0.0165] |
| Small firm dummy 2 | | | 0.568 *** | | |
| | | | [0.0715] | | |
| Small firm dummy 3 | | | | 0.354 ** | |
| | | | | [0.155] | |
| Tradable sector dummy | | | | | |
| Commodities sector dummy | | | | | |
| Total assets | | | | | 0.937 *** |
| | | | | | [0.336] |
| Observations | 2079 | 2079 | 2079 | 2079 | 2079 |
| Number of code | 675 | 675 | 675 | 675 | 675 |
| $R^2$/Hansen P | 0.260 | 0.400 | 0.310 | 0.560 | 0.239 |

Source: IMF staff estimates.

Note: *** p<0.01, ** p<0.05, * p<0.2.
Robust standard errors in brackets.

## Western Hemisphere

### Main Economic Indicators

| | Output Growth (annual rate in percent) | | | | | | Inflation (e.o.p. rate in percent) 1/ | | | | | | Ext. Current Account (in percent of GDP) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1995-2004 Avg. | 2005 | 2006 | 2007 | 2008 Proj. | 2009 Proj. | 1995-2004 Avg. | 2005 | 2006 | 2007 | 2008 Proj. | 2009 Proj. | 1995-2004 Avg. | 2005 | 2006 | 2007 | 2008 Proj. | 2009 Proj. |
| **North America 2/** | **3.1** | **2.9** | **3.0** | **2.2** | **1.5** | **0.3** | **3.3** | **3.3** | **3.2** | **2.9** | **4.0** | **2.0** | **-3.0** | **-4.9** | **-5.0** | **-4.5** | **-3.9** | **-3.0** |
| United States | 3.1 | 2.9 | 2.8 | 2.0 | 1.6 | 0.1 | 2.5 | 3.7 | 2.2 | 4.1 | 3.1 | 1.6 | -3.3 | -5.9 | -6.0 | -5.3 | -4.6 | -3.3 |
| Canada | 3.3 | 2.9 | 3.1 | 2.7 | 0.7 | 1.2 | 1.9 | 2.3 | 1.3 | 2.4 | 2.9 | 1.9 | 0.8 | 1.9 | 1.4 | 0.9 | 0.9 | 0.0 |
| Mexico | 2.7 | 3.1 | 4.9 | 3.2 | 2.1 | 1.8 | 15.4 | 3.3 | 4.0 | 3.7 | 5.7 | 3.3 | -1.9 | -0.6 | -0.2 | -0.6 | -1.4 | -2.2 |
| **South America 2/** | **2.5** | **5.3** | **5.6** | **6.5** | **5.5** | **3.6** | **10.4** | **6.8** | **5.4** | **7.1** | **9.4** | **8.0** | **-1.5** | **2.8** | **2.9** | **1.3** | **-0.1** | **-1.0** |
| Argentina | 1.3 | 9.2 | 8.5 | 8.7 | 6.5 | 3.6 | 4.9 | 12.3 | 9.8 | 8.5 | 9.0 | 9.0 | -0.5 | 2.0 | 2.6 | 1.7 | 0.8 | -0.6 |
| Bolivia | 3.3 | 4.4 | 4.8 | 4.6 | 5.9 | 5.0 | 5.0 | 4.9 | 4.9 | 11.7 | 13.0 | 9.9 | -3.8 | 6.5 | 11.3 | 13.1 | 12.1 | 7.4 |
| Brazil | 2.5 | 3.2 | 3.8 | 5.4 | 5.2 | 3.5 | 8.6 | 5.7 | 3.1 | 4.5 | 6.3 | 4.5 | -2.4 | 1.6 | 1.3 | 0.1 | -1.8 | -2.0 |
| Chile | 4.8 | 5.6 | 4.3 | 5.1 | 4.5 | 3.8 | 4.2 | 3.6 | 2.6 | 7.8 | 8.5 | 4.9 | -1.8 | 1.2 | 4.7 | 4.4 | -1.1 | -0.9 |
| Colombia | 2.4 | 5.7 | 6.8 | 7.7 | 4.0 | 3.5 | 12.0 | 4.9 | 4.5 | 5.7 | 7.2 | 4.9 | -2.1 | -1.3 | -1.8 | -2.9 | -2.2 | -1.9 |
| Ecuador | 2.8 | 6.0 | 3.9 | 2.5 | 3.0 | 3.0 | 31.4 | 3.1 | 2.9 | 3.3 | 9.5 | 4.0 | -1.8 | 0.8 | 3.9 | 2.3 | 5.6 | 1.5 |
| Paraguay | 1.5 | 2.9 | 4.3 | 6.8 | 5.5 | 4.2 | 8.9 | 9.9 | 12.5 | 5.9 | 8.6 | 5.0 | -1.7 | 0.8 | 1.5 | 1.9 | 1.4 | 0.5 |
| Peru | 3.6 | 6.7 | 7.7 | 8.9 | 9.2 | 7.0 | 4.9 | 1.2 | 1.1 | 3.9 | 5.8 | 3.5 | -3.7 | 1.4 | 3.0 | 1.4 | -2.0 | -1.8 |
| Uruguay | 0.9 | 6.6 | 7.0 | 7.4 | 6.5 | 5.5 | 14.0 | 4.9 | 6.4 | 8.5 | 7.0 | 6.5 | -1.1 | 0.0 | -2.4 | -0.8 | -2.6 | -1.9 |
| Venezuela | 1.3 | 10.3 | 10.3 | 8.4 | 6.0 | 2.0 | 35.1 | 14.4 | 17.0 | 22.5 | 32.0 | 35.0 | 6.5 | 17.7 | 14.7 | 8.8 | 8.5 | 3.4 |
| **Central America 2/** | **3.7** | **4.7** | **6.2** | **6.6** | **4.6** | **4.2** | **7.5** | **8.0** | **6.0** | **8.6** | **11.0** | **7.0** | **-4.7** | **-4.9** | **-4.8** | **-6.9** | **-9.1** | **-8.7** |
| Costa Rica | 4.3 | 5.9 | 8.8 | 7.3 | 4.0 | 3.5 | 12.4 | 14.1 | 9.4 | 10.8 | 13.0 | 9.0 | -3.9 | -5.2 | -4.9 | -5.8 | -7.8 | -6.6 |
| El Salvador | 3.0 | 3.1 | 4.2 | 4.7 | 3.0 | 2.6 | 4.0 | 4.3 | 4.9 | 4.9 | 9.0 | 6.0 | -2.4 | -3.3 | -3.6 | -5.5 | -6.1 | -5.3 |
| Guatemala | 3.4 | 3.3 | 5.2 | 5.7 | 4.5 | 4.0 | 7.4 | 8.6 | 5.8 | 8.7 | 9.8 | 6.5 | -5.2 | -4.5 | -5.0 | -5.0 | -5.8 | -5.9 |
| Honduras | 3.7 | 6.1 | 6.3 | 6.3 | 4.2 | 4.0 | 13.4 | 7.7 | 5.3 | 8.9 | 12.1 | 8.4 | 0.3 | -3.0 | -4.7 | -10.0 | -13.9 | -10.5 |
| Nicaragua | 4.3 | 4.3 | 3.9 | 3.8 | 3.0 | 3.5 | 8.5 | 9.6 | 9.5 | 16.9 | 17.1 | 9.2 | -20.6 | -14.6 | -13.6 | -18.3 | -23.9 | -21.1 |
| Panama | 4.4 | 7.2 | 8.5 | 11.5 | 8.3 | 7.8 | 0.9 | 3.4 | 2.2 | 6.4 | 9.6 | 4.8 | -5.3 | -4.9 | -3.2 | -8.0 | -11.7 | -13.9 |
| **The Caribbean 2/** | **3.8** | **5.7** | **7.8** | **5.6** | **3.7** | **2.9** | **10.2** | **8.4** | **6.0** | **9.1** | **13.3** | **7.6** | **-3.2** | **-0.1** | **-0.7** | **-1.7** | **-5.3** | **-4.4** |
| The Bahamas | 3.2 | 2.5 | 3.4 | 2.8 | 1.0 | 1.2 | 1.7 | 1.2 | 2.3 | 2.9 | 5.7 | 2.0 | -10.4 | -14.3 | -25.0 | -21.9 | -15.1 | -12.8 |
| Barbados | 2.2 | 4.3 | 3.3 | 3.3 | 1.7 | 1.0 | 2.5 | 7.4 | 5.6 | 4.8 | 14.5 | -2.7 | -4.0 | -12.8 | -8.7 | -7.2 | -9.9 | -9.1 |
| Belize | 5.5 | 3.1 | 4.7 | 1.2 | 4.0 | 2.5 | 1.8 | 4.2 | 2.9 | 4.1 | 4.0 | 2.5 | -11.5 | -13.6 | -2.1 | -4.2 | -4.1 | -3.0 |
| Dominican Republic | 4.9 | 9.3 | 10.7 | 8.5 | 4.7 | 2.8 | 13.0 | 7.4 | 5.0 | 8.9 | 14.3 | 7.7 | -0.8 | -1.4 | -3.6 | -5.4 | -13.5 | -12.4 |
| ECCU 3/ | 2.6 | 5.3 | 6.0 | 4.4 | 3.2 | 2.9 | 1.8 | 4.4 | 2.2 | 6.0 | 6.4 | 2.6 | -16.8 | -22.2 | -30.8 | -36.4 | -34.5 | -28.6 |
| Guyana | 2.4 | -1.9 | 5.1 | 5.4 | 4.6 | 4.5 | 5.4 | 8.3 | 4.2 | 14.0 | 9.0 | 7.0 | -12.0 | -14.8 | -19.4 | -18.2 | -22.2 | -18.7 |
| Haiti 4/ | 1.8 | 1.8 | 2.3 | 3.2 | 2.5 | 4.0 | 17.1 | 14.8 | 12.4 | 7.9 | 16.0 | 9.5 | -1.0 | 2.6 | -1.4 | -1.1 | -3.0 | -2.9 |
| Jamaica | 0.5 | 1.4 | 2.5 | 1.2 | 0.7 | 0.9 | 11.5 | 12.6 | 5.7 | 16.8 | 18.3 | 12.0 | -6.0 | -10.6 | -11.7 | -16.4 | -16.0 | -12.8 |
| Suriname | 3.2 | 4.5 | 4.8 | 5.5 | 6.5 | 4.8 | 15.4 | 15.8 | 4.7 | 8.4 | 15.0 | 9.5 | -7.2 | -4.3 | 1.8 | 2.9 | 1.3 | 0.8 |
| Trinidad & Tobago | 7.6 | 6.1 | 12.2 | 5.5 | 5.0 | 4.5 | 3.8 | 7.2 | 9.1 | 7.6 | 11.5 | 8.5 | 2.0 | 23.7 | 25.2 | 25.8 | 22.3 | 19.7 |
| Memorandum item: **Latin America and the Caribbean 2/** | **2.6** | **4.7** | **5.5** | **5.6** | **4.6** | **3.2** | **11.4** | **5.9** | **5.0** | **6.3** | **8.5** | **6.6** | **-1.9** | **1.3** | **1.5** | **0.4** | **-0.8** | **-1.6** |

Sources: IMF *World Economic Outlook;* and IMF staff estimates.

1/ End-of-period rates, i.e. December on December. These will generally differ from period average inflation rates quoted in the IMF *World Economic Outlook* , although both are based on identical underlying projections.

2/ Weighted average. For output and inflation, weighted by PPP GDP; for external current account, dollar-weighted GDP.

3/ Eastern Caribbean Currency Union. For inflation, dollar-weighted GDP. For output and current account, ECCU aggregate.

4/ Fiscal year data.

## Latin America and the Caribbean
## Main Fiscal Indicators 1/

| | Public Sector Revenue (in percent of GDP) | | | | | Public Sector Primary Expenditure (in percent of GDP) | | | | | Overall Balance (in percent of GDP) | | | | | Primary Balance (in percent of GDP) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 2006 | 2007 | 2008 Proj. | 2009 Proj. | 2005 | 2006 | 2007 | 2008 Proj. | 2009 Proj. | 2005 | 2006 | 2007 | 2008 Proj. | 2009 Proj. | 2005 | 2006 | 2007 | 2008 Proj. | 2009 Proj. |
| **Latin America and the Caribbean 2/** | **31.2** | **32.0** | **32.3** | **32.2** | **31.5** | **27.7** | **28.7** | **29.4** | **29.3** | **29.5** | **-1.2** | **-1.0** | **-1.0** | **-0.9** | **-1.4** | **3.5** | **3.3** | **3.0** | **2.9** | **2.0** |
| **South America and Mexico 2/** | **28.8** | **32.6** | **32.9** | **32.8** | **32.1** | **28.2** | **29.2** | **29.9** | **29.8** | **30.1** | **-1.2** | **-0.9** | **-1.0** | **-0.9** | **-1.4** | **3.6** | **3.4** | **3.0** | **3.0** | **2.0** |
| Argentina | 29.4 | 29.9 | 31.6 | 33.1 | 32.5 | 25.0 | 25.9 | 29.5 | 30.2 | 30.1 | -1.8 | -1.1 | -2.3 | -0.9 | -1.2 | 4.4 | 4.0 | 2.1 | 2.9 | 2.4 |
| Bolivia | 30.9 | 34.3 | 34.0 | 36.0 | 34.6 | 30.2 | 27.3 | 29.8 | 31.8 | 30.5 | -2.2 | 4.5 | 1.7 | 2.2 | 2.0 | 0.8 | 7.0 | 4.2 | 4.2 | 4.0 |
| Brazil | 42.5 | 43.3 | 43.5 | 42.4 | 42.3 | 38.1 | 39.4 | 39.5 | 38.1 | 38.5 | -3.0 | -3.0 | -2.3 | -2.2 | -1.7 | 4.4 | 3.9 | 4.0 | 4.3 | 3.8 |
| Chile | 25.9 | 27.8 | 29.5 | 28.6 | 28.3 | 20.4 | 19.2 | 19.9 | 21.5 | 22.4 | 4.7 | 7.9 | 9.0 | 6.7 | 5.4 | 5.6 | 8.6 | 9.6 | 7.1 | 5.9 |
| Colombia | 26.1 | 32.7 | 33.0 | 31.3 | 31.7 | 22.7 | 29.2 | 29.0 | 28.2 | 29.9 | 0.0 | -0.8 | -0.8 | -1.0 | -1.4 | 3.4 | 3.4 | 4.0 | 3.0 | 1.9 |
| Ecuador | 24.2 | 27.4 | 28.8 | 34.9 | 34.7 | 21.4 | 21.6 | 24.8 | 31.3 | 32.5 | 0.7 | 3.7 | 2.2 | 2.2 | 0.3 | 2.9 | 5.8 | 4.1 | 3.6 | 2.1 |
| Mexico | 21.1 | 21.9 | 22.2 | 22.4 | 21.7 | 19.5 | 19.7 | 21.0 | 21.4 | 21.4 | -1.4 | -0.6 | -1.4 | -1.5 | -2.0 | 1.6 | 2.2 | 1.3 | 1.0 | 0.2 |
| Paraguay | 23.3 | 24.6 | 23.6 | 23.1 | 23.6 | 20.5 | 20.9 | 20.1 | 21.5 | 22.1 | 0.9 | 0.8 | 1.5 | 0.2 | 0.1 | 2.8 | 3.7 | 3.5 | 1.6 | 1.5 |
| Peru | 24.2 | 25.3 | 25.7 | 26.6 | 26.2 | 22.5 | 21.2 | 20.8 | 22.0 | 22.3 | -0.3 | 2.2 | 3.3 | 3.0 | 2.1 | 1.6 | 4.1 | 5.1 | 4.5 | 3.7 |
| Uruguay | 31.8 | 31.8 | 33.8 | 32.4 | 33.8 | 27.9 | 28.0 | 30.2 | 29.7 | 30.8 | -0.7 | -0.6 | 0.0 | -0.3 | -0.1 | 3.9 | 3.8 | 3.6 | 2.7 | 3.1 |
| Venezuela | 37.6 | 37.3 | 33.1 | 34.9 | 28.9 | 30.6 | 36.7 | 34.1 | 34.0 | 33.9 | 4.1 | -1.5 | -2.6 | -0.8 | -6.4 | 7.1 | 0.6 | -1.0 | 0.9 | -5.1 |
| **Central America 2/** | **21.6** | **22.9** | **23.7** | **23.5** | **23.4** | **20.8** | **21.5** | **21.5** | **22.0** | **22.4** | **-2.1** | **-1.2** | **-0.1** | **-0.6** | **-1.1** | **0.5** | **1.1** | **2.0** | **1.3** | **0.8** |
| Costa Rica | 35.4 | 37.5 | 38.2 | 38.9 | 38.9 | 31.9 | 32.4 | 32.9 | 35.0 | 36.0 | -3.1 | -0.5 | 0.9 | 0.1 | -0.9 | 2.0 | 3.0 | 4.0 | 2.9 | 1.9 |
| El Salvador | 16.5 | 17.2 | 17.1 | 17.5 | 17.7 | 17.3 | 17.6 | 16.6 | 17.4 | 17.5 | -3.0 | -2.9 | -1.9 | -2.3 | -2.2 | -0.8 | -0.5 | 0.5 | 0.0 | 0.2 |
| Guatemala | 12.0 | 12.8 | 13.1 | 12.9 | 12.8 | 11.5 | 12.8 | 12.6 | 11.6 | 12.3 | -0.9 | -1.4 | -1.0 | -0.2 | -0.9 | 0.5 | 0.0 | 0.5 | 1.3 | 0.5 |
| Honduras | 24.2 | 24.2 | 24.6 | 25.1 | 25.0 | 25.7 | 26.5 | 26.8 | 27.3 | 27.1 | -1.4 | -1.9 | -1.6 | -1.5 | -1.5 | -1.5 | -2.3 | -2.2 | -2.3 | -2.2 |
| Nicaragua | 28.7 | 30.4 | 31.2 | 30.6 | 30.0 | 28.1 | 28.8 | 28.8 | 30.4 | 29.5 | -1.6 | 0.2 | 0.9 | -1.8 | -1.2 | 0.8 | 2.2 | 2.4 | 0.0 | 0.5 |
| Panama | 22.3 | 24.9 | 27.9 | 25.0 | 24.0 | 20.5 | 20.1 | 21.0 | 21.2 | 21.6 | -2.6 | 0.5 | 3.5 | 0.7 | -0.3 | 1.8 | 4.8 | 6.9 | 3.8 | 2.4 |
| **The Caribbean 2/** | **23.2** | **23.7** | **24.4** | **24.5** | **24.3** | **18.5** | **20.3** | **20.9** | **22.6** | **21.4** | **-1.5** | **-1.6** | **-1.5** | **-2.1** | **-1.2** | **4.7** | **3.7** | **3.3** | **2.6** | **3.5** |
| Dominican Republic | 15.6 | 16.2 | 17.6 | 16.8 | 17.0 | 14.5 | 15.8 | 15.9 | 18.0 | 16.4 | -3.0 | -3.1 | -1.4 | -3.8 | -1.6 | 1.0 | 0.4 | 1.7 | -0.4 | 1.8 |
| Jamaica | 30.2 | 29.9 | 31.1 | 30.2 | 31.4 | 18.8 | 21.0 | 22.3 | 22.4 | 22.5 | -4.2 | -5.2 | -4.1 | -4.7 | -2.9 | 11.5 | 8.9 | 8.8 | 7.7 | 8.9 |
| Trinidad and Tobago | 33.6 | 35.1 | 34.8 | 37.7 | 35.3 | 25.2 | 27.4 | 29.7 | 32.3 | 30.9 | 6.0 | 6.8 | 1.6 | 4.7 | 2.2 | 8.7 | 8.9 | 3.7 | 6.5 | 4.1 |
| ECCU 3/ | 29.6 | 30.6 | 30.1 | 29.9 | 29.3 | 29.8 | 32.0 | 31.0 | 29.8 | 29.1 | -4.4 | -5.6 | -4.7 | -4.1 | -4.1 | -0.2 | -1.4 | -0.9 | 0.1 | 0.2 |

Source: IMF staff calculations.

1/ Figures for overall public sector, including general government and public enterprises.
2/ PPP GDP weighted average.
3/ East Caribbean Currency Union.

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