World Economic and Financial Surveys

Regional Economic Outlook

Western Hemisphere
Managing Transitions and Risks

APR **16**

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The *Regional Economic Outlook: Western Hemisphere* is published annually in the spring to review
developments in the Western Hemisphere. Both projections and policy considerations are those
of the IMF staff and do not necessarily represent the views of the IMF, its Executive Board, or
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Preface

Executive Summary

The global economy remains in transition, reflected in a slower pace of global activity. Recovery in advanced economies continues to be modest and uneven. In the *United States*, an expanding economy driven by consumption has enabled an interest rate lift-off, marking a first step toward gradual monetary normalization. But recovery elsewhere, notably, in Japan and the euro area, remains fragile. With further monetary easing in Europe and Japan, influences from major central banks over global financial conditions are diverging. In emerging market economies, growth continues to slow on a broader basis—led by slower but more sustainable growth in China, while stress continues in several large economies mired in recession. Growing concerns of slower global growth and lack of policy space have contributed to generally tighter financial conditions and heightened market volatility. At the same time, commodity prices remain weak, with prospects that they will remain lower for longer. Risks stemming from these ongoing transitions could derail global growth if not managed well. This increases the urgency for broad-based policy responses to strengthen growth and secure resilience. Although added demand support is currently not needed in the United States, a credible medium-term fiscal consolidation plan would provide greater policy space if growth were to weaken. In *Canada*, a new fiscal stimulus package should provide welcome support to growth that has remained sluggish as the economy navigates lower oil prices.

Against this backdrop, economic activity in *Latin America and the Caribbean* has been hard hit and is likely to contract for the second consecutive year in 2016. The regional recession, however, masks the fact that most countries continue to grow, modestly but surely. Differences in growth outcomes are shaped by varying influences of external and domestic factors. The ongoing U.S. recovery continues to support activity in Mexico, Central America, and the Caribbean, but China's manufacturing-based slowdown has reduced the demand for exports from South America. At the same time, further declines in commodity prices have added to the accumulated terms-of-trade shock for commodity exporters. With heightened financial market volatility and tighter financial conditions in the region, corporate vulnerabilities are rising. In the context of more fragile external conditions, adjustment has been relatively smooth in countries where macro policy frameworks had improved over the past two decades. However, in a handful of countries, policy missteps, domestic imbalances and rigidities have led to sharp declines in private demand.

Growth prospects over the next five years will likely remain subdued, particularly for those facing lower commodity prices and weak investment. Throughout the region, policies and economic reforms should be tailored to manage this transition. Exchange rate flexibility remains important in supporting ongoing adjustment in the external accounts. Where further accommodation might be warranted, macro policy space is limited. In particular, fiscal policy space is constrained by high debt and new realities of slower growth and lower revenues, including from commodities. At the same time monetary policy faces trade-offs. Although exchange rate pass-through to inflation has declined relative to the past, large and persistent depreciations have put upward pressure on consumer prices. Given weak domestic demand, monetary policy can remain accommodative in countries with credible central banks and well-anchored inflation expectations, but should be geared toward preserving central bank credibility in countries facing rising medium-term inflation expectations. Overall, structural reforms are imperative to address the region's declining productive capacity.

In *South America*, policies should be tailored toward facilitating a smooth adjustment in response to the new reality of lower commodity prices. Fiscal consolidation should continue to contain rising debt and preserve or build buffers, but it should safeguard public investment to support growth. Countries with flexible exchange rate regimes have experienced large and persistent depreciations, and current account adjustments are ongoing.

Despite the decline in exchange rate pass-through, inflation on average has increased, creating tensions for monetary policy. The regional outlook will start to look more promising only when the domestic challenges facing the contracting economies have been resolved.

In *Central America*, a favorable outlook has triggered both fiscal and current account adjustment, but further efforts are needed to institutionalize fiscal discipline, build stronger fiscal buffers, and boost potential growth. Accelerating regional cooperation in prudential supervision and anti–money laundering would help contain risks. While low commodity prices continue to support the tourism-based countries in the *Caribbean*, growth prospects are deteriorating for commodity-based economies. Addressing fiscal vulnerabilities and strengthening the financial sector remain overarching objectives for most *Caribbean* countries.

This issue of the *Regional Economic Outlook* features three analytical chapters, assessing corporate vulnerabilities in Latin America, analyzing the degree of exchange rate pass-through in the region, and evaluating the state of economic infrastructure and trends in public and private infrastructure investment in Latin America and the Caribbean. Key findings are:

- Firms in Latin America are facing tighter financial market conditions at the global level along with lower potential growth and challenging macroeconomic adjustments at home. Changes in external conditions—particularly measures of global risk aversion—constitute a dominant driver of corporate risk in the region and present a risk going forward. Macroeconomic conditions, such as the pace of currency depreciation and higher sovereign spreads, and weak firm fundamentals have also contributed to an increase in corporate risk since 2011, underscoring the importance of robust policy frameworks and rigorous monitoring of systemic corporate risks.

- The sizable currency depreciations observed across many Latin American countries during the past few years have placed upward pressure on inflation, but their impact has been more muted than in the past. Improvements in monetary frameworks over the past two decades have led to substantial and generalized declines in exchange rate pass-through to consumer prices. Vigilance is nonetheless warranted in economies where second-round effects remain sizable. In countries with well-anchored medium-term inflation expectations, policymakers can afford to take a more accommodative stance.

- Inadequate infrastructure has been widely viewed as one of the principal barriers to growth in Latin America and the Caribbean. The region's infrastructure network has been upgraded over the past decade, but still compares relatively poorly with their export rivals. For most countries in the region, the efficiency of public investment needs to be improved, notwithstanding improvements in fiscal institutions and frameworks for public-private partnerships in some large economies.

1. Global Economy in Transition and the Outlook for the United States and Canada

As the world economy undergoes key transitions, the pace of global activity has slowed amid higher financial market volatility. In advanced economies, a modest recovery continues, but unevenly. An expanding U.S. economy, led by consumption and job creation, has enabled interest rate lift-off toward gradual monetary normalization. This transition suggests diverging influences from major central banks over global financial conditions and appreciation pressures on the U.S. dollar. In emerging market economies, growth continues to slow, led by China as it rebalances and by continued stress in several large economies in recession. Financial conditions have tended to tighten and uncertainty has risen amid concerns of slower growth and lack of policy space. Alongside this, commodity prices remain weak—notably, in oil markets where a supply glut has led to appreciably lower prices since last year. Consequently, Canada's economy is likely to see continued sluggish growth before gradually strengthening as it navigates lower oil prices. The main global risks stem from these ongoing transitions and could derail growth if not managed well. Policy priorities include managing vulnerabilities and rebuilding resilience to transition risks while supporting near-term growth, and enhancing productivity and potential growth through crucial structural reforms.

Global Transitions

Against the backdrop of a global economy in transition, growth has weakened amid tighter financial conditions and lower commodity prices. Specifically, global growth disappointed in the final quarter of 2015 and weakness in activity indicators persisted into early 2016. Overall, as discussed in the April 2016 *World Economic Outlook* (WEO), global growth is projected to be 3.2 percent in 2016 and 3.5 percent in 2017, reflecting a more gradual pickup in activity than projected in the October 2015 WEO. Along with the weaker pace of activity, heightened risk aversion and

tighter financial conditions act as headwinds. With a modest recovery in advanced economies and a protracted decline in growth in emerging market and developing economies, global demand and activity are expected to remain subdued in 2016 before some pickup in 2017 (Figure 1.1).

Key underlying transitions continue to shape this global outlook, with important implications for the Western Hemisphere: (1) a gradual slowdown and rebalancing of economic activity in China, away from investment and manufacturing toward consumption and services; (2) durably lower prices for oil and other commodities; and (3) changing influences over global financial conditions with lift-off from zero interest rates in the United States, which plays a dominant role in driving financial conditions in the region, while other major advanced economy central banks continue to ease monetary policy. Downside risks to the global outlook surround these ongoing transitions, and if these key challenges are not successfully managed, global growth could weaken further.

Subdued Growth and Outlook

In advanced economies, growth in 2015:Q4 was generally weaker than anticipated, given softening domestic demand. Although accommodative monetary policy and lower oil prices should provide support to domestic demand, weak external demand, currency appreciation—especially in the United States—and somewhat tighter financial conditions will weigh on growth. Growth is projected at 1.9 percent and 2.0 percent in 2016 and 2017, respectively, a slightly slower pickup than was forecast in October. Specifically:

- Growth remains solid in the United States, supported by still easy financial conditions and strengthening housing and labor markets. But with tighter financial conditions in the wake of recent market volatility, a stronger dollar weighing on manufacturing, and lower

Figure 1.1. Weaker Global Growth, Lower Commodity Prices, and China Rebalancing

1. Real GDP Growth
(Percent; annual rate)

	2014	2015	Projections 2016	Projections 2017
World	**3.4**	**3.1**	**3.2**	**3.5**
Advanced economies	1.8	1.9	1.9	2.0
United States	2.4	2.4	2.4	2.5
Euro area	0.9	1.6	1.5	1.7
Japan	0.0	0.5	0.5	−0.1
Emerging market and developing economies	4.6	4.0	4.1	4.6
China	7.3	6.9	6.5	6.2
Russia	0.7	−3.7	−1.8	0.8

2. Global Commodity Prices
(Index: 2005 = 100)
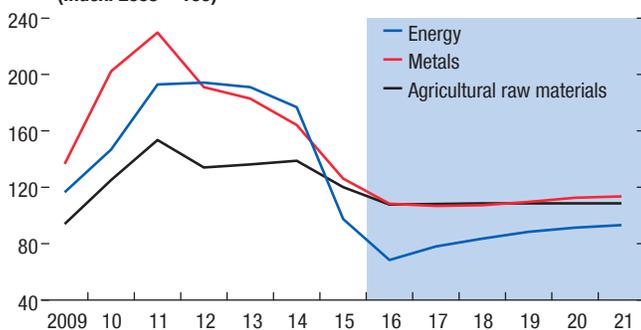
3. China: Growth, Consumption, and Investment
(Percent of GDP)
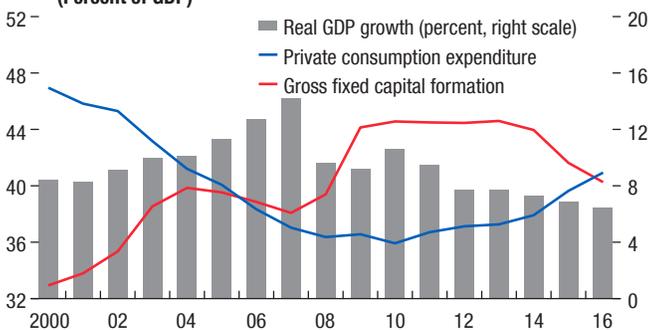
Sources: IMF, World Economic Outlook database; and IMF staff calculations.

oil prices curtailing energy investment, U.S. growth this year is expected to be weaker by ¼ percentage point compared with previous projections. Elsewhere in North America, Canada is projected to return to stronger growth but more gradually than previously anticipated given lower oil prices, as the rest of the economy strengthens supported by expansionary monetary and fiscal policies and a more competitive currency.

- In the euro area, a modest pickup in activity is projected in 2016–17 with growth between 1.5 percent and 1.7 percent, supported by lower oil prices, supportive fiscal policies, and further unconventional easing by the European Central Bank, outweighing a weakening in net exports. Activity is expected to decelerate in Spain, though growth is still relatively strong, and in Portugal. Political uncertainty, including from the refugee surge and possible exit of the United Kingdom from the European Union, are key domestic risks.

- In Japan, slightly firmer growth of about 0.5 percent is expected in 2016 on the back of fiscal stimulus, lower oil prices, and relaxed financial conditions—including from quantitative and qualitative easing with a negative interest rate by the Bank of Japan. A weak fourth quarter, stronger yen, weaker demand from emerging market economies, and declining equity markets suggest higher downside risks to growth.

The picture for growth in emerging market and developing economies is diverse. Overall, growth in China is evolving broadly as envisaged, but with a faster-than-expected deceleration in manufacturing and slowdown in imports and exports. These developments imply spillovers to other economies through trade, as well as weaker commodity prices and confidence. More generally, manufacturing activity and trade remain weak globally, reflecting not only developments in China, but also subdued global demand and investment more broadly—in particular, a decline in investment in extractive industries. Stress in several large emerging market economies, notably Brazil and Russia, is expected to continue. Against this backdrop, a recovery in emerging market (and global) growth is likely to be delayed to 2017–18.

Cheaper Commodities, Tighter Financial Conditions

In commodity markets, prices for metals, fuel, and food-related commodities remain weak amid subdued global demand. Oil prices declined markedly during the fourth quarter of 2015,

largely reflecting a glut in oil supply, as well as tepid growth in oil demand. Specifically, sustained increases in production by members of the Organization of the Petroleum Exporting Countries and resilience in unconventional production have helped push oil prices to recent lows in early 2016. Though there has been some rebound in prices over the first quarter, the legacy of past oil investment and new production coming on line may keep prices at relatively low levels over the next few years. However, curtailed investment affecting future oil capacity and secular trend growth in oil demand suggest some medium-term recovery in oil prices (see Box 1.1).

Financial conditions have generally tightened in the wake of recent market volatility and weaker sentiment about growth prospects and concerns about lack of policy space. Setbacks to growth and confidence, amid disruptions in asset markets, have increased risks to global financial stability, as discussed in the April 2016 *Global Financial Stability Report*. In asset markets, a broad-based sell-off across equity markets in early 2016 lowered stock prices noticeably below their recent highs though they have since recovered to some degree. Nevertheless, markets appear to have become more risk averse amid concerns about economic growth, including ongoing stress in large emerging market economies mired in deep recessions and financial risks in China as its economy makes the transition to more balanced and sustainable growth. In bond markets, spreads for riskier borrowers—sovereign and corporate—have tended to widen and external financing conditions have tightened for emerging market economies. Capital flows to these economies have been declining from their peaks reached after the global financial crisis, although flows to Latin America have been resilient so far (Figure 1.2). While there have been large changes in asset prices, notably in the exchange rate, the change in the volume of portfolio flows to the region has been relatively muted, perhaps owing to weaker local currencies.

Transition Risks

Unless key transitions in the world economy are navigated well, the anticipated pickup in global

Figure 1.2. Weaker Capital Flows to Emerging Markets

Net Capital Flows
(Billions of U.S. dollars)
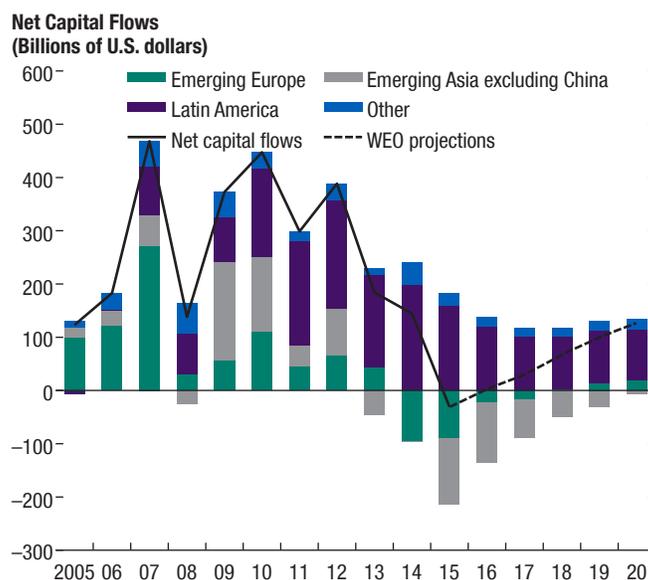
Source: IMF, World Economic Outlook (WEO) database.
Note: Excludes official reserves.

growth may fail to materialize. Prominent risks include the following:

- Bumps along China's needed transition path to more balanced growth associated with a hard landing in its credit and asset markets can lead to wider international spillovers through trade, commodity prices, and confidence. See Chapter 2 for scenario analysis of related downside risks for Latin America.

- Further declines in commodity prices can worsen the outlook for already-fragile commodity producers. On the upside, the recent decline in oil prices may provide a stronger boost to demand in oil importers than currently envisaged, including through consumers' possible perception that prices will remain lower for longer.

- Finally, adverse corporate balance sheet effects and funding challenges could arise from potential further dollar appreciation and tighter global financing conditions as the United States exits from extraordinarily accommodative monetary policy, while monetary easing continues in Europe and Japan.

More broadly, a sudden rise in global risk aversion, regardless of the trigger, could lead to further sharp depreciations in emerging market currencies and to possible financial strains. In Latin America, for example, vulnerabilities at the firm level have risen alongside higher corporate indebtedness. In this setting, systemic risks, including currency mismatches, should be monitored closely (see Chapter 3). And in an environment of higher risk aversion and market volatility, even idiosyncratic shocks in a relatively large emerging market or developing economy could generate broader contagion effects across markets, not only through trade and financial linkages but also through a reassessment of risks ("wake-up calls").

Global Policy Priorities

With a more fragile conjuncture, threat of a broader slowdown and limited policy options in many economies may require bolder multilateral actions.[1] With higher downside risks facing most economies, the urgency of broad-based policy responses to safeguard near-term growth and to secure resilience has increased. In advanced economies, where inflation rates remain well below central banks' targets, accommodative monetary policy remains essential. Where conditions allow, near-term fiscal policy should be more supportive of the recovery, especially through investment. Fiscal consolidation, where warranted by high public debt, should be growth friendly.

In emerging market and developing economies, policy priorities are more varied given the diversity in conditions. Policymakers should manage vulnerabilities and rebuild resilience against potential shocks while lifting growth and ensuring continued income convergence. In general, allowing for exchange rate flexibility will continue to be important for cushioning against adverse external shocks and it has been actively used in Latin America. Several countries, including the three largest economies in the region, have experienced sizable depreciations relative to their

post–global financial crisis peaks, with the bulk of the adjustment taking place in 2015 (Figure 1.3). In some cases, substantial currency depreciation is limiting the scope for monetary policy easing depending on the extent of exchange rate pass-through and monetary policy credibility (see Chapter 4).

To address possible risks faced by emerging markets going forward, especially commodity exporters with strong fundamentals but high vulnerability, there may be a need to consider strengthening the global financial safety net, including new financing mechanisms. Policymakers need to press on with structural reforms to alleviate infrastructure bottlenecks, facilitate a dynamic and innovation-friendly business environment, and bolster human capital. In Latin America, for example, considerable scope remains for improving infrastructure networks, which, over time, should support growth (see Chapter 5).

The United States: Consumption as Engine of Growth

In the United States, private consumption has been the main engine of growth and continued to expand solidly. Despite a sharp slowdown in the fourth quarter, the U.S. economy grew at a respectable 2.4 percent pace in 2015, driven by steady household spending. With the labor market deemed near full employment, the Federal Reserve raised interest rates smoothly in December of last year, while inflationary pressures remain restrained. External headwinds to U.S. growth produced some output volatility, including via a stronger dollar and cheaper oil. External factors pose the key downside risks to the U.S. outlook.

U.S. labor market performance has been a pillar of support for consumer spending as the expansion continues. During the past year, growth in payrolls averaged a quarter of a million jobs per month—a healthy clip by historical standards. The unemployment rate dropped by ¾ percentage point, to end the year at 5 percent—only a few tenths of a percentage point above its long-term equilibrium level. Healthy job creation translated into higher

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[1]See April 2016 *World Economic Outlook* (Chapter 1) for further details.

Figure 1.3. Real Effective Exchange Rates
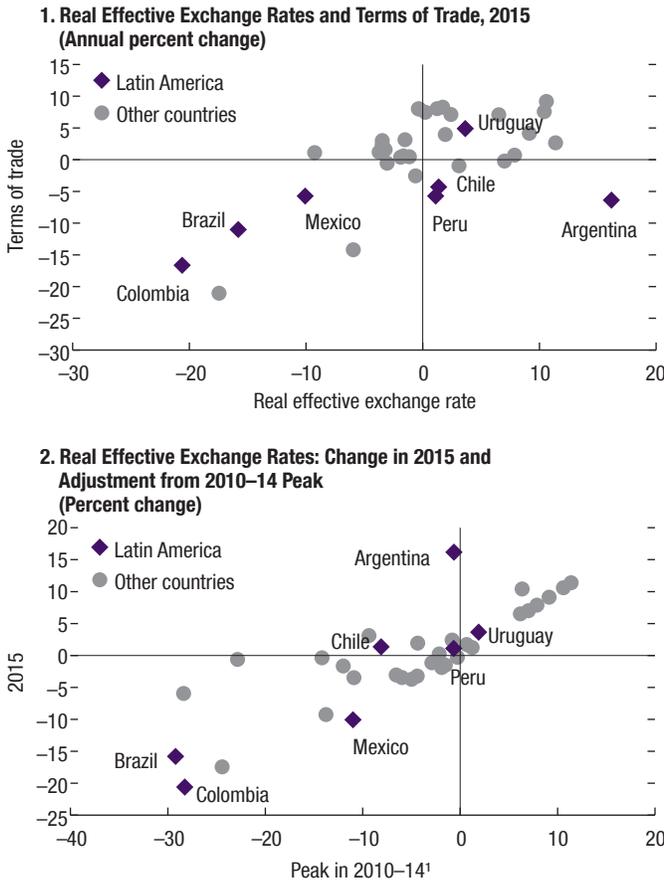
1. Real Effective Exchange Rates and Terms of Trade, 2015
(Annual percent change)

2. Real Effective Exchange Rates: Change in 2015 and Adjustment from 2010–14 Peak
(Percent change)

Sources: IMF, Information Notice System database; IMF, World Economic Outlook database; and IMF staff calculations.
[1] Refers to the change in the maximum real effective exchange rate during 2010–14 to 2015.

Figure 1.4. U.S. Consumption as Engine of Growth

1. United States: Contribution to GDP Growth
(Percent change from previous quarter; seasonally adjusted annual rate)

2. United States: Housing Activity Rebounding
(Seasonally adjusted annual rate)

3. United States: Saving Rate, Income, and Consumption
(Percent)
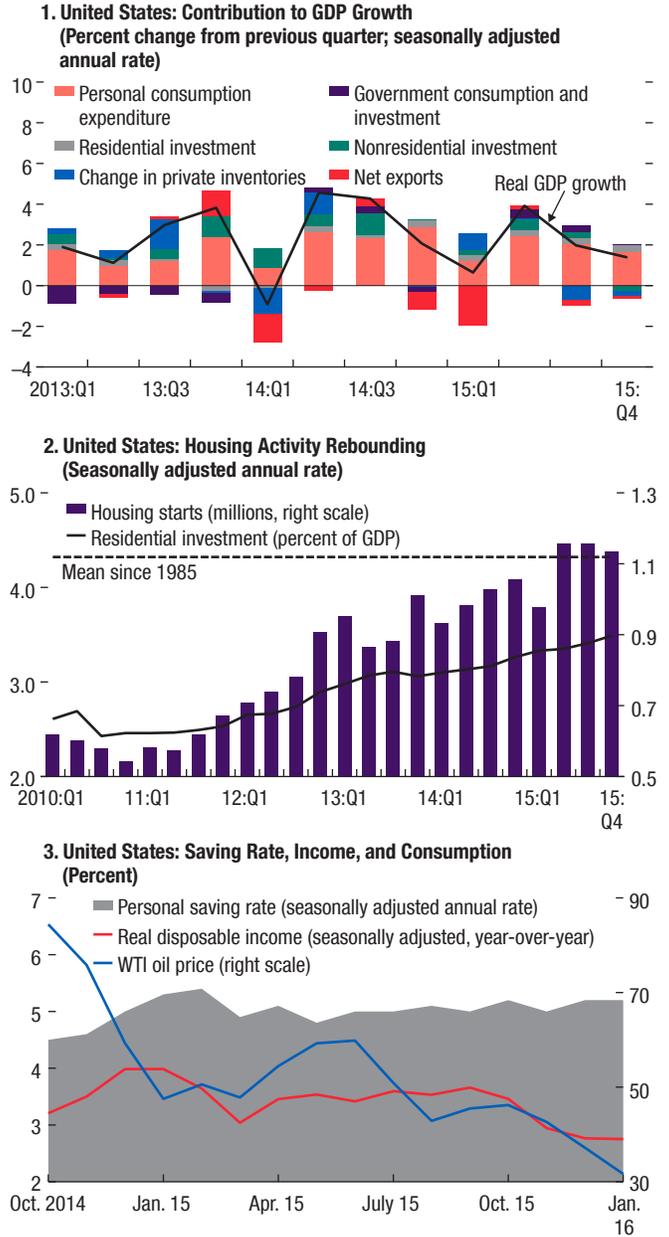
Sources: U.S. Bureau of Economic Analysis; U.S. Census Bureau; and U.S. Energy Information Administration.
Note: WTI = West Texas Intermediate.

personal disposable income, further underpinning rising household spending (Figure 1.4).

The housing market continues to recover. Its strength is supported by the younger cohorts—which have been gaining a stronger foothold in the labor market and spurring household formation—and by a lower stock of foreclosed homes (which is reverting to its precrisis level). As a result, house prices rose at a healthy pace in the last two quarters of the year, coupled with strong growth in housing starts and permits—which are still recovering from postcrisis lows (Figure 1.4).

Notwithstanding strong payroll growth, there has been little sign of price pressures until only recently. Inflation has been restrained by lower

import prices, a stronger dollar, and the recent fall in energy prices, although some of these effects are fading. Core personal consumption expenditure (PCE) inflation, a measure closely followed by the central bank, is still running below the Federal Reserve's mandate of 2 percent. More recently, core inflation has edged higher

but wages have not accelerated. In part this is due to surplus labor, which is restraining wage growth from picking up meaningfully. In fact, labor force participation rates are still below what demographic trends would imply, suggesting that a sizable number of workers who left the labor market have not yet returned.

Less favorable or less predictable effects from external shocks to U.S. growth have worked through global commodity and currency markets. In oil markets, in particular, noticeably cheaper oil failed to lift U.S. consumption further, contrary to most expectations, as income windfalls boosted saving instead; meanwhile, U.S. investment in the energy sector dropped sharply. Specifically:

•   Unlike past episodes of major oil price declines, a subsequent boost to U.S. consumption did not materialize. On average, households increased their saving rate from 4.8 percent in 2013 and 2014 to about 5.1 percent in the last quarter of 2015 (Figure 1.4). Although disaggregated data on who saved the oil windfalls (about 1 percent of GDP) are not yet available, it is likely that lower-income households that benefited the most from lower energy prices were also the ones eager to boost saving to pay down debt after the crisis.

•   The effect of the oil price drop on energy producers, in contrast, was immediate. Given the nature of shale oil production, energy investment is very sensitive to oil price movements. Indeed, the collapses in spot and futures oil prices led energy investment to fall dramatically throughout 2015. As a result, the short-term impact of cheaper oil, on balance, has been negative for U.S. growth.

In currency markets, a stronger U.S. dollar has emerged, appreciating further in the last two quarters of the year and bringing the total appreciation of the real effective exchange rate to 15 percent in 2015. This in part reflects the relative strengthening of the economy compared to most trading partners. At the same time, however, the negative effects of the strong dollar

have been quite visible. External demand for U.S. products has decreased and U.S. consumers have increasingly replaced domestic products with imports. As a result, net exports have subtracted about ½ percentage point from growth in 2015. A similar subtraction from trade is expected in 2016 given the downgraded growth outlook in partner countries. The drop in goods exports has weakened manufacturing substantially, and it is expected to remain weak so long as the dollar is strong.

Solid Outlook but External Risks

Given underlying economic and policy fundamentals, the outlook for U.S. growth remains solid. Real GDP is expected to grow at 2.4 percent in 2016 and 2.5 percent in 2017, with consumption remaining as an engine of growth. Drivers of robust household spending include a further strengthening of the labor market, a recovering housing market, lower oil prices, and a pickup in wage growth, boosting current and expected real disposable incomes. Net exports will be a substantial drag on GDP growth as a result of a strong dollar and weak overseas activity.

Investment should become a stronger driver of growth. Energy investment's drag on growth will carry over to 2016, but it will be modest— given that the industry has already shrunk dramatically and reverted to pre-shale investment levels. Outside mining, oil, and manufacturing, investment is expected to grow at a healthy pace supported by solid consumer demand, an aging capital stock, and substantial corporate cash holdings. This is against the backdrop of benign prospects for the housing market given the expected rebound in household formation and relatively loose financial conditions with mortgage rates hovering near record low levels.

The stance of macroeconomic policies should remain supportive. A halt in fiscal consolidation and still very accommodative monetary policy this year should help sustain growth. Indeed, because of limited signs of inflationary pressures, IMF staff expects that the stance of monetary policy

would remain accommodative through 2016 (see the next section). In addition, various fiscal agreements in late 2015 imply that the stance of fiscal policy in 2016 is expected to remain broadly neutral, following a few years of consolidation.

Risks to the outlook are tilted to the downside, mainly because of external factors. On the positive side, however, private consumption could grow at a stronger pace than forecasted, thanks to solid job and income gains and lower oil prices. Private investment could also recover at a higher pace. On the downside, though, risks are mostly associated with the following:

- A further appreciation of the dollar, possibly in coincidence with emerging market turmoil or in response to a market reassessment of cyclical divergences between the U.S. economy and key trading partners, could lead to a sharper contraction in manufacturing and exports, and possibly trade tensions.

- A sharp weakening of the Chinese economy would affect U.S. trade flows—even though exports to China constitute only about 7 percent of total exports. If that weakening leads to a sizable depreciation of the renminbi, U.S. imports from China would likely be higher.

- A tightening of domestic financial conditions, owing to equity market volatility and a deterioration of corporate credit in the high-yield bond market, would affect investment. The size of the sector, however, is relatively small and risks are concentrated in the energy sector. Overall, the exposure of banks to energy (less than 5 percent of bank assets) seems well contained and losses absorbable.

Monetary Policy after Lift-Off

The December lift-off by the Federal Reserve was uneventful, and long-term yields are at levels similar to those at the time of the October 2015 WEO. The increase in the federal funds (policy) rate—reflecting the Federal Reserve's view of a stronger U.S. economy—was taken in stride by

markets, domestically and internationally, because the policy action had been well communicated and largely anticipated. Financial conditions in the corporate bond market tightened in late 2015 and early 2016, in part owing to continued pressure on the energy sector, while financial market volatility increased mainly due to external factors. Overall, domestic financial conditions tightened marginally and remain relatively loose, especially for households.

Looking ahead to monetary policy normalization, subsequent rate hikes are expected to be very gradual. Hence, the stance of monetary policy would remain highly accommodative in 2016. Indeed, the Federal Reserve's decision to keep the rate unchanged in March was welcome given higher economic uncertainty and a more modest growth outlook relative to December. The policy decision substantiates that the central bank is pursuing a data-dependent approach and has validated more subdued market expectations for only one rate increase in 2016. With regard to risks, though, these interest rate expectations may be too subdued if inflation rises faster than anticipated and exceeds the inflation target.

Further monetary tightening actions should be gradual, well communicated, and based on clear evidence of rebounding economic activity, firmer wage or price pressures, and an assessment that inflation is set to rise steadily toward the Federal Reserve's 2 percent medium-term inflation objective. With excess capacity in global manufacturing, dollar strength, and lower energy prices, coupled with some slack in the labor market, stronger evidence may be required that PCE core inflation is set to return to target within the policy horizon before further monetary normalization can proceed (Figure 1.5).

Fiscal Policy and Structural Priorities

With respect to fiscal policy, the federal government had a deficit of 2½ percent of GDP in 2015—the lowest since 2007. The deficit is projected to widen to above 3 percent towards the end of the decade on the back of age-related and

Figure 1.5. Subdued Inflation and Gradual Monetary Tightening

United States: Policy Rate and Inflation
(Percent)
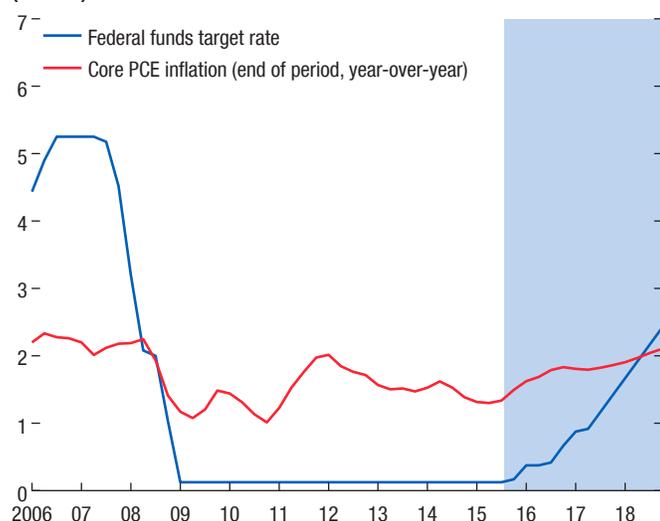
Sources: U.S. Bureau of Economic Analysis; Federal Reserve Board; and IMF staff estimates.
Note: PCE = personal consumption expenditure.

Figure 1.6. Fiscal Stance Moving Into Neutral

United States: Fiscal Impulse
(Percent of GDP)
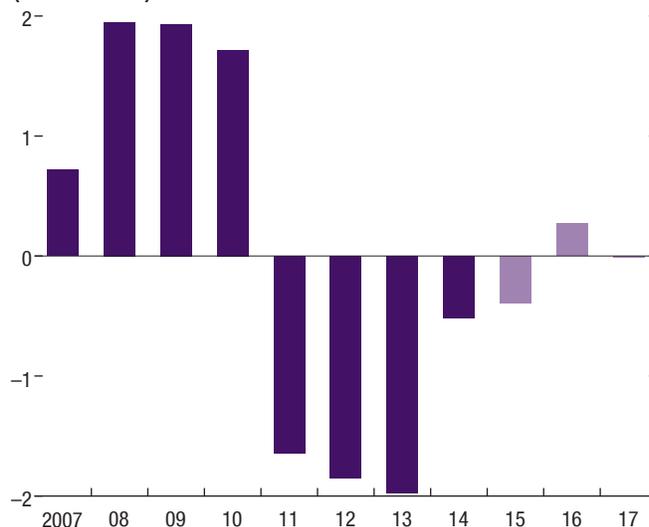
Sources: IMF, World Economic Outlook database; and IMF staff estimates.
Note: The fiscal impulse is the negative of the change in the primary structural balance. Light bars refer to projections.

entitlement spending pressures and given various agreements made in 2015 on spending and taxes.[2] At the general government level, the change in the structural primary balance is expected to be close to zero in both 2016 and 2017, reflecting a broadly neutral fiscal stance (Figure 1.6).

Although the neutral stance of fiscal policy in the short term is appropriate, public finances in the long term are not sustainable under the current trajectory of policies. Building on recent bipartisan agreements, a new credible medium-term consolidation plan would also help create near-term fiscal policy space. Policies are needed to boost longer-

term potential output through investments in infrastructure, raising educational outcomes, improving the tax structure, and developing and expanding a skilled labor force (including through immigration reform, job training, and providing child-care assistance for working families). Specific policy recommendations include the following:

- *Taxes*—Simplify the income tax system, broaden the base and raise the earned income tax credit, change the tax treatment for multinationals, introduce a carbon tax and a federal-level value-added tax, and raise the federal gas tax.

- *Social security*—Raise the retirement age, increase progressivity of benefits, and index benefits and contributions to consumer price inflation.

- *Health care*—Introduce a cost-sharing system with beneficiaries, contain overuse of expensive treatments, and eliminate tax breaks for generous employer-sponsored health plans.

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[2]Congress overcame several hurdles in the last quarter of 2015 to pass bills that were signed into law by the president: (1) the Bipartisan Budget Act of 2015 provides a total of ½ percent of GDP of sequester relief in 2016 and 2017, split evenly between defense and nondefense spending; (2) the "Omnibus" spending appropriation act of 2015 finalized the appropriations for the Bi-Partisan Budget Act of 2015 and also laid out spending until 2025 (cumulatively worth $1.1 trillion or 6½ percent of GDP); and finally (3) the tax act of 2016 (Protecting Americans from Tax Hikes, or the PATH Act) provides a cumulative tax break of $622 billion or 3½ percent of GDP for 2016–25.

Figure 1.7. Financial Assets Outside U.S. Banks

United States: Assets, 2015:Q4
(Percent of total domestic financial assets)
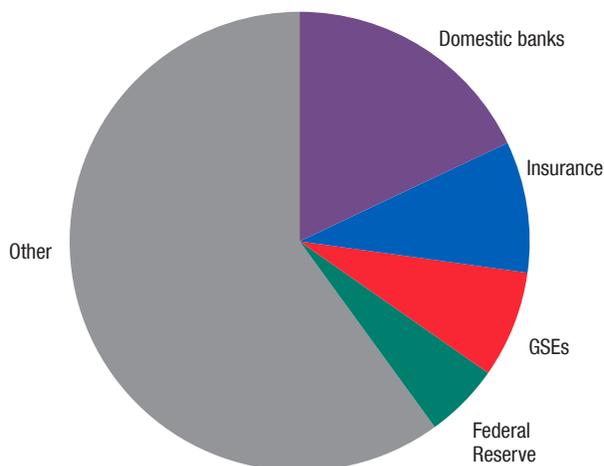
Sources: Federal Reserve Board; and IMF staff calculations.
Note: GSEs = government-sponsored enterprises.

- Introduce skills-based *immigration reform* to expand the skilled labor force.

To safeguard financial stability, completing regulatory reforms that began with the Dodd-Frank Act and monitoring risks shifting into less-regulated areas of the financial sector is essential.[3] Banks are well capitalized and profitability remained high in 2015. However, the large size of the nonbanking sector—with total assets of about 230 percent of GDP in 2014—is a source of systemic risk in conjunction with increased risk taking during the past low-interest-rate period. In particular, life insurers have taken on additional credit risk on their balance sheets. As vulnerabilities in high-yield bond and leveraged loan markets are elevated, shocks could spread through the financial sector with redemption runs in the asset-management sector as potential propagation channels. Systemic risks appear relatively low, however, given the comparatively small size of the below-investment-grade securities market (Figure 1.7).

[3]Detailed recommendations have been made in the 2015 U.S. Financial Sector Assessment Program report.

Canada: Navigating Lower Oil Prices

Lower oil prices have hit the Canadian economy hard. A sharp cut in capital spending in energy took a heavy toll on business investment[4] and led to a technical recession in the first half of 2015 (−0.6 percent annualized rate), despite solid private consumption. Output growth subsequently rebounded to 1.6 percent in the second half, as exports picked up (Figure 1.8). As a result, overall output growth in 2015 was 1.2 percent, a sharp deceleration from 2014 and the slowest expansion since the 2008–09 recession.

The marked decline in oil prices last year has set in motion some rebalancing toward the non-resource sectors of the economy, facilitated by a weaker Canadian dollar—which depreciated by 15 percent in real effective terms over the past two years—as well as the solid U.S. recovery and accommodative monetary policy. From the supply side, the services sector (accounting for about 70 percent of total output) was the key driver of GDP growth (Figure 1.8). In the energy sector, oil companies were maintaining production levels so long as oil prices remained higher than their marginal operating costs—which was the case until toward the end of 2015. However, lower oil prices hit hard many oil-related industries such as support activities and engineering construction.

Despite this rebalancing, the response of non-commodity exports to a weaker exchange rate and accommodative policies has been weaker than in past episodes (Figure 1.8).[5] The sluggish recovery probably reflects, in part, reduced capacity in non-resource sectors which will take time to rebuild, given past erosion in external competitiveness for non-resource-exporting industries during the oil boom (see IMF 2013).

[4]Energy sector capital expenditures accounted for one-fifth of total capital expenditures in 2015.
[5]Between 1991 and 1993, the exchange rate depreciated by 14 percent in real effective terms, and non-energy goods exports grew by a strong 30 percent. Although the size of the exchange rate depreciation is comparable between 2013 and 2015, exports have increased by only 11 percent over this period.

Figure 1.8. Canada Navigating Lower Oil Prices

1. Canada: Contributions to GDP Growth
(Percent change from previous quarter; seasonally adjusted annual rate)

- Government consumption and inventories[1]
- Residential investment
- Private consumption
- Net exports
- Business investment
- Real GDP growth

2. Canada: Output by Industry
(Three-month moving average; index: January 2013 = 100)

- Non-oil and gas goods sector (share, 21%)
- Oil, gas, and supporting activities (share, 10%)[2]
- Services sector (share, 69%)

3. Canada: Non-Commodity Goods Exports[3]
(Index: 1991:Q4 = 100 or 2013:Q2 = 100; seasonally adjusted)

- Current
- Early 1990s

Source: Statistics Canada.
[1] Includes statistical discrepancies.
[2] Includes extraction, support activities, and engineering construction.
[3] Non-commodity goods exports are chemical products, machinery, electronics, motor vehicles, aircraft, and consumer goods. Current: from 2013:Q3 to 2015:Q4; early 1990s: from 1991:Q4 to 1994:Q1.

At the provincial level, economic activity diverged along the lines of their resource dependence. British Colombia, Ontario, and Quebec (accounting for nearly 70 percent of national GDP) are showing signs of improvements in economic activity. These provinces are net importers of oil and benefit from

lower oil prices. In contrast, economies in large resource-rich provinces—Alberta and Saskatchewan (accounting for 25 percent of national GDP)—are weakening, with unemployment rates approaching 2008–09 recession levels. Alberta is also expecting a large fiscal deficit this year.

With respect to inflation, headline and core inflation are within the Bank of Canada's target range (1–3 percent). Two opposing factors are at play with respect to consumer prices: pass-through from a weaker Canadian dollar is adding to inflationary pressures, while lower energy prices and slack in the economy are placing downward pressures on inflation.

Macrofinancial Spillovers

The effects of the lower oil price are spilling over to the real economy through a complex set of macrofinancial transmission channels. In the corporate sector, for example, oil companies' credit worthiness has deteriorated, with a larger number of companies estimated to have moved into non-investment-grade status (Figure 1.9). So far, strains in oil companies have not spilled over to the broader corporate sector, but there is emerging evidence that a higher number of companies face tighter liquidity conditions and higher borrowing costs, as indicated in various business lending surveys.

Trends in the housing market have "trifurcated." In the Greater Toronto and Greater Vancouver areas, house prices are growing fast, at about 10 percent and 20 percent year-over-year, respectively. In contrast, house prices are falling in Calgary (Alberta) and Regina (Saskatchewan), consistent with weakening economic fundamentals in these resource-rich provinces. Elsewhere, house prices are rising at a moderate pace (Figure 1.10).

The direct exposure of the banking system to the oil sector is limited but indirect exposures (through households and supporting businesses) are more substantial.[6] Furthermore, household indebtedness has grown to more than 165 percent of disposable

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[6] The six largest banks extend only about 2 percent of their total loan book to the oil sector. However, they extend about 13 percent of total loans to oil-producing regions, and collectively, mortgage

Figure 1.9. Lower Ratings for Energy Firms

Canada: Oil and Gas Companies EDF-Implied Credit Ratings
(Percent share of companies)
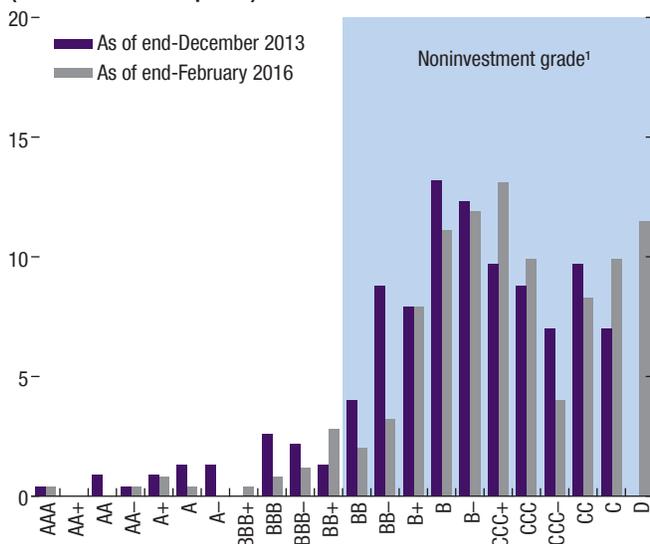
Source: Moody's Credit Edge.
Note: EDF = expected default frequency.
[1] About 60 percent of market assets as of February 2016 (up from 32 percent at end-2013).

Figure 1.10. Divergent Trends in Housing Markets

Canada: House Price Index, Metropolitan Areas
(Year-over-year percent change)
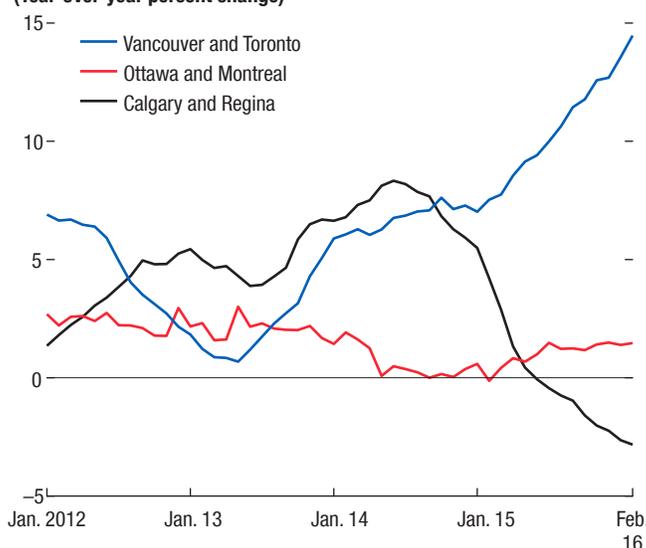
Source: Canadian Real Estate Association.
Note: Indices are weighted by population.

income—with a growing proportion of debt held by younger households—and represents a key financial vulnerability for the Canadian economy. In the wake of negative income shocks, for example, a high debt burden carries potential nonlinear effects that could overwhelm households' debt servicing capacity and lead to higher mortgage defaults. Under this scenario, banks' asset quality and capital would take a hit, although large banks are profitable, with well-diversified revenue sources, and government guarantees on insured mortgages would mitigate bank losses. Thus, losses would be manageable and, in this regard, markets view spillover risks to large banks as likely to be well contained.

Subdued Outlook, Risks Tilted to the Downside

Looking ahead, output growth is projected to recover moderately to 1.5 percent in 2016 and 1.9 percent in 2017. A decline in investment in

and consumer loans are a substantial 55 percent of total loans (see Bank of Canada, *Financial System Review*, December 2015).

the energy sector will continue to be a drag on the economy. Oil prices in the range of $35 to $50 a barrel, projected for the foreseeable future, are significantly below long-term break-even costs for unconventional oil extraction activities in Canada, and further substantial cuts in capital spending are expected in 2016.

On the flipside, several countervailing factors will likely lift output. First, non-resource exports and investment are expected to improve, in line with the robust expansion in the U.S. economy and the more competitive Canadian exchange rate. Second, private consumption will remain solid given firm employment growth in non-resource provinces and accommodative monetary policy. Finally, the government just announced new infrastructure spending in the 2016 federal budget.

Overall, however, the balance of risks is tilted to the downside:

- As a net oil exporter, Canada will continue to face headwinds from persistently low oil prices. If oil prices stay at current low levels for an extended period, or fall further, oil companies would cut not only capital spending but also production.

- As an open economy, Canada is susceptible to weaker growth in key trading partners, especially in the United States (where about three-quarters of Canada's exports are directed) and to a lesser extent, in emerging Asia (about 8 percent of Canada's exports). A stronger U.S. expansion, though, would present an upside risk for Canada.

- A sharp correction in the housing market (importantly, in Toronto and Vancouver, where house prices remain overvalued) could lead to adverse wealth effects, reducing domestic demand and worsening banks' asset quality. Nonetheless, the adverse impact on the banking system would be mitigated by a high level of bank capital and government guarantees on insured mortgages.

With regard to regional spillovers, a downturn in Canada could affect a number of Caribbean economies. Canadian banks have a dominant presence in the Caribbean banking system, accounting for up to 70–80 percent of total banking assets in, for example, The Bahamas and Barbados. Tourism in the Caribbean could also be affected, as the number of arrivals from Canada is the second largest after the United States.

Policy Priorities in Canada

The Bank of Canada has maintained its policy rate at 0.5 percent since July 2015 and has appropriately signaled that it will keep monetary policy accommodative given slack in the economy. The Bank of Canada has also recently updated its framework for unconventional policy tools (including negative policy interest rates and large-scale asset purchases). With the policy rate near zero, conventional monetary policy space may be quickly exhausted if the growth outlook were to deteriorate. While the Bank of Canada is prepared to deploy unconventional tools, fiscal policy can also play a supporting role given available policy space and low debt at the federal level.

In this context, the federal government announced a growth stimulus package of about 1¼ percent of GDP over the next two years. The package includes increased infrastructure spending, housing investment, transfers to families with children, and tax cuts for the middle class. The government is committed to expanding infrastructure projects by C$60 billion over the next 10 years. This will help provide near-term stimulus to the economy and contribute to Canada's longer-term potential growth.

To guard against housing risk, the authorities are introducing additional macroprudential measures. In December 2015 the authorities announced rule changes on mortgage finance: an increase in down payment requirements for insured mortgages (effective in February 2016), and an increase in securitization fees (effective in July 2016). They also proposed higher capital requirements for residential mortgages.

Box 1.1. Lower for Longer? Fallen Oil Prices and the Role of North American Shale

Since the October 2015 *World Economic Outlook*, oil markets have seen renewed downward pressure on crude oil prices, which have fallen 35 percent relative to what was assumed in earlier IMF staff projections. Notwithstanding some rebound in prices over the first quarter of 2016, oil prices remain at relatively low levels. West Texas Intermediate prices, for example, are trading around $40 a barrel after briefly reaching $27 in February 2016—the lowest levels seen since 2003. Factors behind the price collapse include a glut in supply, efficiency gains in production, and weaker demand—raising questions of whether oil prices will remain "lower for longer."

The advent of shale oil production—led by the United States—has added about 4 million barrels per day to the crude oil market since 2009, contributing to a supply glut. The Organization of the Petroleum Exporting Countries (OPEC) essentially accommodated this supply shock,[1] maintaining or raising levels of conventional production. Significant projected increases in Iranian oil exports will likely place added downward pressure on prices. Downward revisions to global growth, especially in emerging market economies, have also softened oil demand. Inventory levels are very high. Financial market turbulence and a strong dollar, meanwhile, have also contributed to lower oil prices.

Going forward, the secular drop in oil consumption in advanced economies, dampened growth prospects in emerging markets, and the resilience of shale oil producers to lower prices all point to a "lower for longer" scenario. First, shale oil production is still a relatively new technology and has experienced phenomenal efficiency gains in response to lower oil prices. Part of its resilience is also due to weak demand for the oil services industries, which reduced the costs to these nonconventional oil producers. That said, shale production has started to show some signs of weakness in the near term. The oil price decline has triggered drastic investment cuts in the sector and shale production is about 10 percent below its peak.

The emergence of the U.S. shale industry as a significant player will also likely affect the future path of oil prices. On the one hand, shale production can be stepped up rapidly so long as oil prices remain above breakeven prices in production. Breakeven prices have on average dropped from about US$60 to US$40 a barrel owing to operational efficiency gains. These gains are the results of technological progress, cost deflation, and concentration of resources on the most productive wells. Figure 1.1.1 shows that the current level of production can be sustained if oil prices are slightly above $40 assuming 10 percent cost deflation. Shale oil will also lead to shorter and more limited oil-price cycles because it requires lower sunk costs than conventional oil, and the lag between first investment and production is much shorter. That feature of shale will limit an upward swing in oil prices over the medium term. On the other hand, there are financial vulnerabilities in the shale industry. A wave of bankruptcies and layoffs could potentially limit the nimbleness of shale production because required skilled labor may be more difficult to mobilize swiftly. In addition, the cost discount from the oil services industry is likely to diminish once prices go back up; thus, break-even prices could be higher than current levels even with technological progress.

On balance, the current low price environment should result in a partial price reversal over the medium term. Oil futures point to moderately rising prices as shown in Figure 1.1.2. The current IMF baseline projects prices to average $34.60 in 2016, a decline of 32 percent from 2015, before climbing to $40.99 in 2017 and to $44.52 by 2020. Uncertainty around the baseline though has widened, as reflected by unusual price volatility in recent weeks. Geopolitical tensions in the Middle East could potentially cause oil market disruptions. But high oil inventories and a rapid response from U.S. shale producers by tapping drilled but uncompleted wells

Note: This box was prepared by Akito Matsumoto with research assistance from Vanessa Diaz Montelongo and Rachel Fan.
[1]Most recently, at a meeting in Doha on February 16, oil ministers from Qatar, Russia, Saudi Arabia, and Venezuela agreed to freeze output, and Iran and Iraq subsequently welcomed the initiative but without any commitment to stop or slow their scheduled production increases.

Box 1.1 *(continued)*

Figure 1.1.1. Shale Oil Production with Different Cost Scenarios

Source: Rystad Energy research and analysis.

Figure 1.1.2. Brent Futures Curve
(U.S. dollars per barrel; expiration dates on x-axis)

Sources: Bloomberg, L.P.; and IMF, World Economic Outlook (WEO) database.
Note: WEO future prices are baseline assumptions for each WEO vintage and derived from future prices. April 2016 WEO prices are based on February 26, 2016 closing.

should limit price spikes in the near future. A protracted period of cheap oil, however, could also lead to a significant recovery in prices as investment in extraction activities is cut back, affecting future oil supply. Such a decline in investment is already under way, especially outside OPEC.

In the longer run, increasing oil demand from emerging markets should more than offset decreasing demand from advanced economies. China and India are projected to be the top two contributors to global oil consumption growth. Rising incomes and expansion of the middle class in these economies will increase their demand for transportation services (Chamon, Mauro, and Okawa 2008). There are, however, uncertainties regarding how much the increased in demand will translate into actual fuel consumption considering the rapid developments in automotive technology and public transportation policies. China is attempting to shift away from fossil fuels because of air quality and other environmental concerns, but low oil prices may delay the transition toward more efficient and cleaner sources of energy (see the Commodities Special Feature in Chapter 1 of the April 2016 *World Economic Outlook*). The share of electric vehicle (including hybrid) sales in the United States has declined in 2015 along with falling fuel prices. In sum, future oil demand from emerging markets will depend not only on their income growth, but also on their energy policies.

2. Latin America and the Caribbean: Managing Transitions

As the global recovery continues to struggle to gain its footing, growth in Latin America and the Caribbean is expected to be negative for the second consecutive year in 2016. The regional recession masks the fact that most countries continue to grow, modestly but surely, with the contraction driven by developments in a few others. While the external environment has had a differentiated impact on the region—with South America heavily affected by the decline in commodity prices and Mexico, Central America, and the Caribbean benefiting from the U.S. recovery and, in most cases, lower oil prices—disparities in growth performance also reflect domestic factors. Countries with sound domestic fundamentals continue to adjust relatively smoothly, but domestic imbalances and rigidities have heavily amplified the effects of external shocks in others. In managing the transition to persistently lower commodity prices, policies should focus on preserving buffers and boosting long-term growth.

Diverse Growth Outcomes and Subdued Outlook

Global demand remains subdued, reflecting key transitions in the global economy related to the gradual slowdown and rebalancing in China, lower commodity prices, and tightened global financial conditions. Against this backdrop, economic activity in Latin America and the Caribbean has been hard hit and is projected to decline by 0.5 percent in 2016—marking two consecutive years of negative growth for the first time since the debt crisis of 1982–83 (Figure 2.1). The headline figure, however, masks the fact that many countries are handling the transition in an orderly fashion and continue to grow, modestly but surely, whereas a small number of economies—representing about half of the region's economy—face contracting

Note: This chapter was prepared by S. Pelin Berkmen and Yan Carrière-Swallow, with Leo Bonato and Roberto Garcia-Saltos, and with contributions from Sebastian Acevedo, Natalija Novta, and Iulia Teodoru. Allan Dizioli, Keiko Honjo, and Ben Hunt provided model simulations for Box 2.2. Genevieve Lindow provided excellent research assistance, and Ehab Tawfik provided excellent support for Box 2.1.

Figure 2.1. Growth Outlook

1. Projected Growth, 2016[1]

Growth Rates Comparison
- Negative 2016 growth
- Positive 2016 growth; below historical average
- Positive 2016 growth; above historical average

2. Real GDP Growth[2]
(Percent)

	2014	2015	Projections 2016	Projections 2017
LAC	**1.3**	**−0.1**	**−0.5**	**1.5**
South America	0.7	−1.4	−2.0	0.8
CAPDR	4.9	4.9	4.6	4.4
Caribbean				
Tourism-dependent	1.1	1.2	2.2	2.3
Commodity exporters	0.0	−0.9	−0.6	2.1
Memorandum items:				
LA6	1.4	−0.3	−0.3	1.6
Brazil	0.1	−3.8	−3.8	0.0
Mexico	2.3	2.5	2.4	2.6

Sources: IMF, World Economic Outlook database; and IMF staff calculations.
[1]Historical average refers to the average growth from 2000–13.
[2]Purchasing-power-parity GDP-weighted averages. For country group information, see page 107.

output largely as a result of domestic factors. Overall, medium-term growth is likely to remain subdued; commodity exporters need to reallocate capital and labor out of resource-intensive sectors

and other economies need to replenish their capital stocks. Significant heterogeneity in growth outcomes across the region are driven by differing influences of external conditions and domestic fundamentals.

Worsening External Conditions

External conditions have worsened since October 2015, shaped by three factors:

- *Weak external demand.* The global recovery has turned out to be slower than expected, constraining demand for the region's exports and making external adjustment more difficult despite sizable depreciations (Box 2.1). On the one hand, the ongoing recovery in the United States, though slower than previously projected (Chapter 1), continues to support activity in Mexico, Central America, and the Caribbean. On the other hand, China's manufacturing-based slowdown has provoked a sharper decline in imports relative to the more modest deceleration of its GDP, reducing demand for the region's exports, and particularly for commodities (Figure 2.2).

- *Further declines in commodity prices* have added to the marked downturn that began in global metals markets during 2011 and in oil markets during 2014. The accumulated commodity terms-of-trade shock has been severe for some (Colombia, Ecuador, and Venezuela), smaller for others (Argentina[1] and Mexico), and positive for net oil importers in Central America and the Caribbean. Foregone income varies according to the relative importance of commodities in the economy, being very large for Venezuela (about 17 percent of GDP), sizable for Chile, Colombia, and Ecuador (4–7 percent of GDP), and smaller for Argentina and Brazil (Figure 2.3). These terms-of-trade shocks will likely be highly persistent, because commodity prices are expected to remain low for some time (Chapter 1).

Figure 2.2. Export Destinations, 2015
(Percent share of exports)
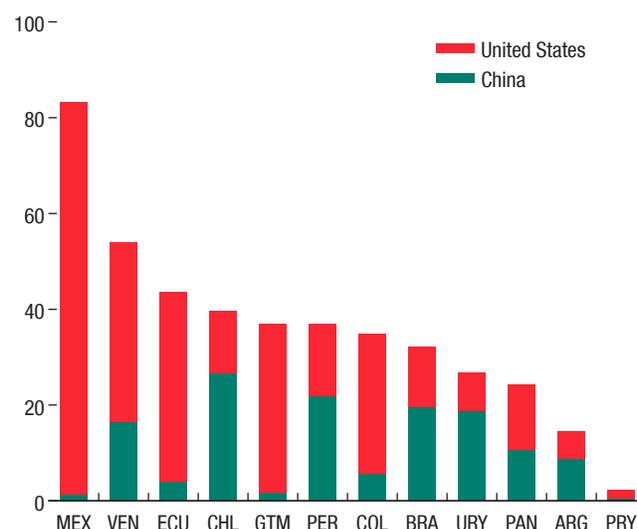
Source: IMF, Direction of Trade Statistics database.
Note: Data labels use International Organization for Standardization (ISO) country codes, see page 108.

Figure 2.3. Decline in Commodity Terms of Trade and Foregone Income
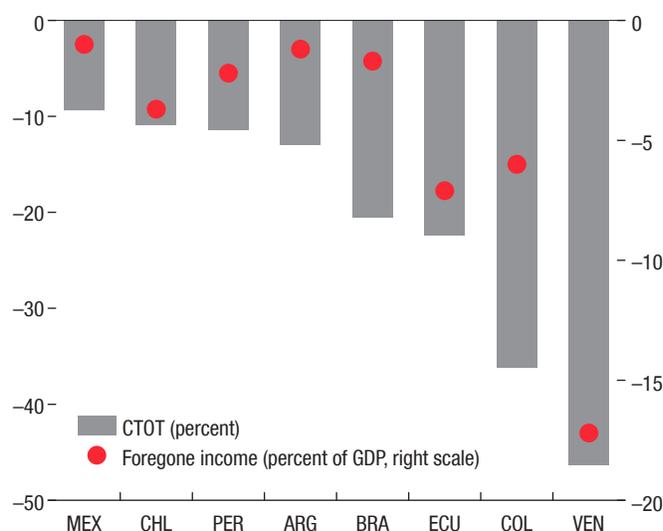
Source: Gruss (2014).
Note: The chart shows the difference in average commodity terms of trade (CTOT) indices in 2015 vis-à-vis the peak values attained in 2010–15. CTOT indices are constructed using international prices for 45 commodities and lagged country- and commodity- specific net export values (see Gruss 2014). When net export values are scaled by nominal GDP, a 1 percent decline in the index can be interpreted approximately as an income loss of 1 percent of GDP. Data labels use International Organization for Standardization (ISO) country codes, see page 108.

[1]See Annex 2.1.

Figure 2.4. Financial Market Conditions

Financial market volatility has increased

1. Sovereign Credit Spreads[1]
(Basis points; spread over U.S. Treasuries)

Brazil — Chile — Colombia — Mexico — Peru — Uruguay

2. Sovereign Credit Spreads (continued)[1]
(Basis points; spread over U.S. Treasuries)

Argentina — Bolivia — Ecuador — Paraguay — Venezuela (right scale)

3. Corporate Spreads[2]
(Basis points; spread over sovereign)

Latin America — Argentina — Brazil — Chile — Colombia — Mexico — Peru

4. Equity Indices
(Index: January 2011 = 100)

Brazil — Chile — Colombia — Mexico — Peru

Sources: Bloomberg, L.P.; and IMF staff calculations.
[1]Refers to J.P. Morgan Emerging Market Bond Index Global; U.S.-dollar-denominated sovereign bonds.
[2]Refers to J.P. Morgan Corporate Emerging Markets Bond Index Broad Diversified; U.S.-dollar-denominated corporate bonds.

- *Volatile financial conditions.* Accommodative monetary policy and strong financial systems have been supporting financing conditions throughout the region, and the impact of the Federal Reserve rate hike has so far been limited. However, regional financial conditions tightened markedly in early 2016, triggered by global financial market volatility and weaker growth prospects. In recent months, public and private funding costs have continued to fluctuate, including swings in sovereign and corporate spreads as well as equity prices, reflecting the impact of both global and domestic factors (Figure 2.4). About one-third of the rise in corporate spreads over 2015 can be explained by the increase in global volatility, and another third by increased sovereign risk and sharp depreciations,

particularly for highly leveraged companies (Figure 2.5 and Chapter 3). Capital flows to the region have been more resilient than those to other emerging market economies (April 2016 *World Economic Outlook*, Chapter 2), but their volatility has increased, with declines that were seen in 2015 reversing since late February (Figure 2.6).

Wide Variation in External Adjustments

In the face of changing external conditions, many countries have continued to experience exchange rate adjustments (Figure 2.7). A few distinguishing characteristics of the current episodes stand out: (1) in some cases, recent depreciations against the

Figure 2.5. Contribution to Changes in Corporate-Implied CDS Spreads, 2014:Q3–15:Q3
(Basis points)
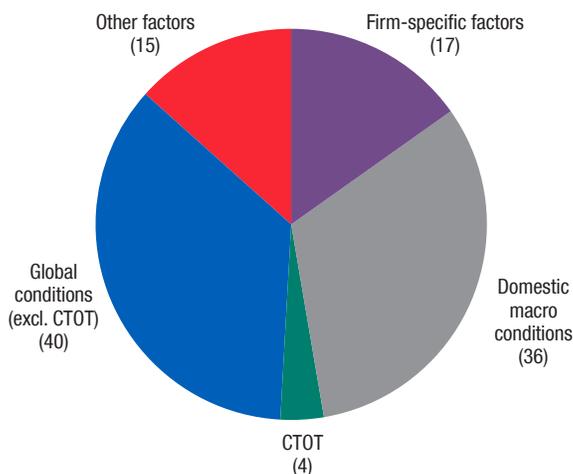
Source: Caceres and Rodrigues Bastos (2016).
Note: The total increase of 113 basis points between 2014:Q3 and 2015:Q3 corresponds to the average increase across firms in Argentina, Brazil, Chile, Colombia, Mexico, Panama, and Peru. CDS = credit default swap; CTOT = commodity terms of trade.

Figure 2.6. Gross Capital Flows: Liabilities
(Billions of U.S. dollars; four-quarter moving average)
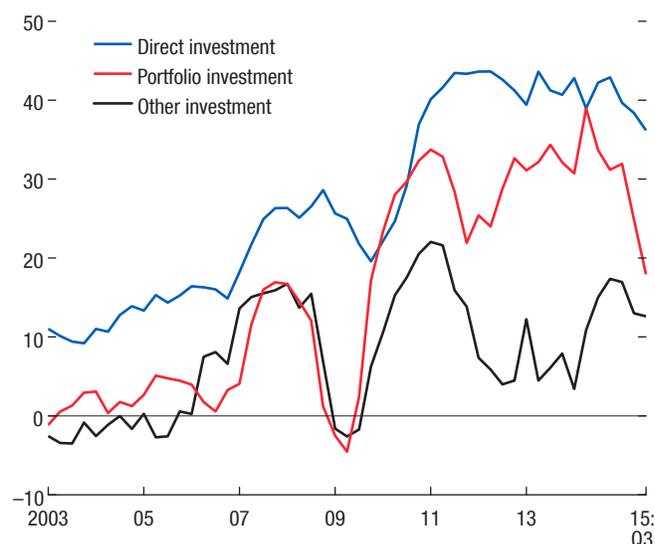
Sources: IMF, Balance of Payments Statistics Yearbook database; and IMF staff calculations.
Note: Total of Brazil, Chile, Colombia, Mexico, Peru, and Uruguay.

U.S. dollar have been among the largest in decades, far exceeding those that followed the global financial crisis in size and persistence; (2) in real effective terms these depreciations have been more pronounced for some (such as Brazil and Colombia), where they are among the largest and most sustained episodes since the early 1980s (see Box 2.1, Figure 2.1.1); and (3) in many cases, depreciations can be attributed mostly to deteriorating terms of trade and external demand (Box 2.1).

Current account deficits remain large in many economies, including for the region as a whole. While Chile stands out as an example of relatively swift external adjustment following successive shocks, external positions in some countries have deteriorated since 2013 and will likely require further adjustment in the medium term to preserve external buffers (Figure 2.8).

The contribution of net exports to growth is increasingly positive, but this partly reflects import compression, with exports remaining relatively modest for most countries, due in part to weak partner demand (Figure 2.9). Historically, exports from the region tend to respond markedly to

changes in external demand, in some cases declining about one for one after one year (Box 2.1). While the weak global outlook is projected to continue weighing on external demand for South American exports, depreciated currencies are expected to provide some boost this year. Overall, persistently low commodity prices, a fragile global growth outlook, large current account deficits, and initial signs of declining inflows make it likely that downward pressure on exchange rates will continue.

Domestic Fundamentals Have Weighed on Economic Prospects

Although external conditions weigh on the regional outlook, growth outcomes have varied widely across countries, depending on domestic factors. In certain countries, the slowdown in growth can largely be accounted for by the terms-of-trade shock. In these cases, a relatively smooth adjustment reflects improvements to policy frameworks that were implemented over the past 20 years, which solidified domestic price stability while permitting increased exchange rate flexibility

Figure 2.7. External Adjustment
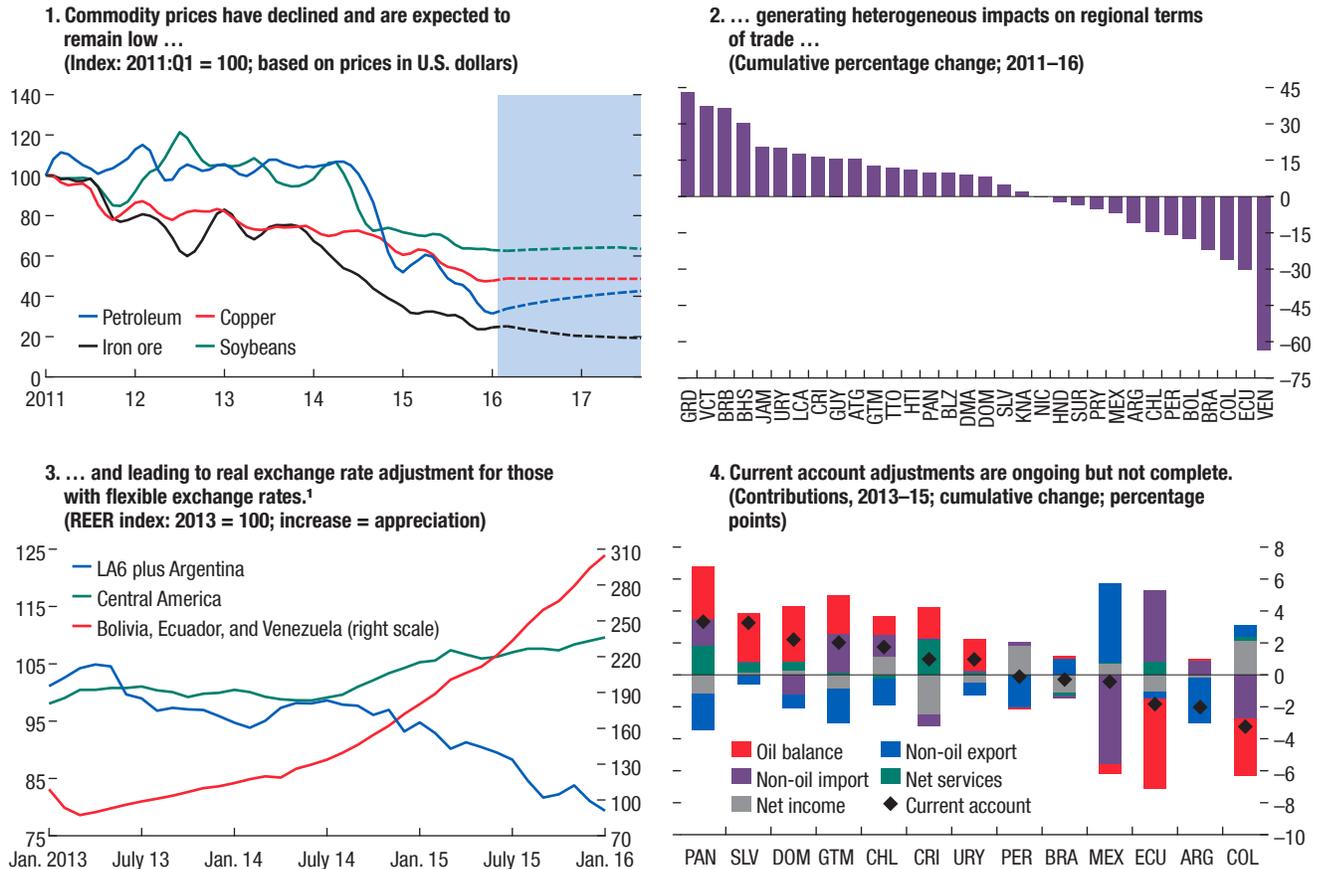
1. Commodity prices have declined and are expected to remain low …
(Index: 2011:Q1 = 100; based on prices in U.S. dollars)

2. … generating heterogeneous impacts on regional terms of trade …
(Cumulative percentage change; 2011–16)

3. … and leading to real exchange rate adjustment for those with flexible exchange rates.[1]
(REER index: 2013 = 100; increase = appreciation)

4. Current account adjustments are ongoing but not complete.
(Contributions, 2013–15; cumulative change; percentage points)

Sources: IMF, Information Notice System database; IMF, World Economic Outlook database; and IMF staff calculations.
Note: Central America = Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama; REER = real effective exchange rate. For International Organization for Standardization (ISO) country codes used in data labels, see page 108. For country group information, see page 107.
[1]Purchasing-power-parity GDP-weighted averages.

and sustainable fiscal policy with the space to respond to external shocks. These credible monetary and fiscal frameworks have allowed Chile, Colombia, Mexico, and Peru to implement countercyclical policies anchored by medium-term consolidation strategies, smoothing the impact of external shocks on growth (Figure 2.10).

However, in a handful of cases, domestic factors have been the main source of sharp declines in private demand—particularly investment (Figure 2.11). Various domestic factors contributed to heightened uncertainty and suppressed private domestic demand, including: (1) in Brazil, deteriorating fiscal dynamics amid inconsistent policy signals and difficulties implementing adjustment, tighter financing conditions, sharp overdue increases

in energy prices to correct prior policy errors, and political uncertainty; (2) in Venezuela, long-standing policy distortions and fiscal imbalances; and (3) in Ecuador, macroeconomic policy rigidities.

Business and consumer confidence in the region remain low, weighing heavily on domestic demand. But on the positive side, relatively tight labor markets—as indicated by low unemployment rates (except for Brazil)—continue to support consumption (Figure 2.12). Although real wages have been declining as a result of rising inflation, the next round of wage negotiations could reverse this trend in some cases.

Trends for real sector credit growth have diverged across countries, slowing for some and remaining

Figure 2.8 REER Depreciation and Current Account Balance
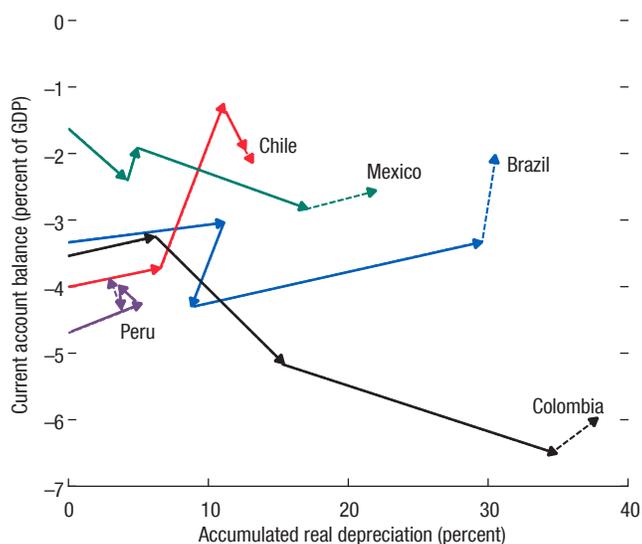
Sources: IMF, Information Notice System database; IMF, World Economic Outlook database; and IMF staff calculations.
Note: Each arrow represents movements over a calendar year since the peak of the real exchange rate in 2013. The dashed lines correspond to forecasts for 2016. REER = real effective exchange rate.

Figure 2.9. Contributions to Real GDP Growth
(Year-over-year percent change)
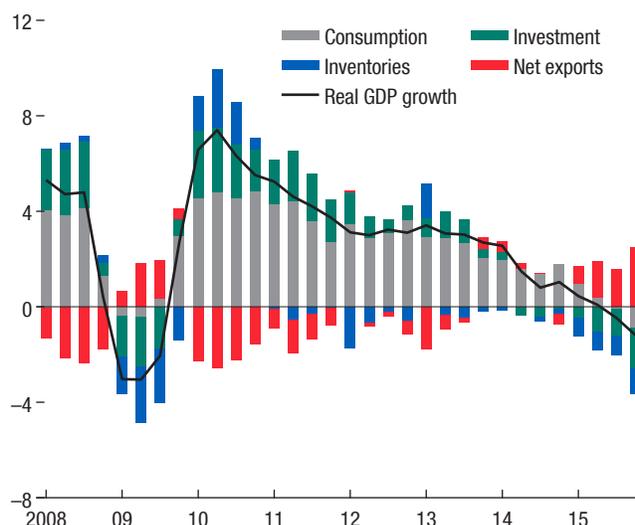
Sources: Haver Analytics; IMF, World Economic Outlook database; and IMF staff calculations.
Note: Seasonally adjusted. Purchasing-power-parity GDP-weighted averages of Brazil, Chile, Colombia, Honduras, Mexico, Nicaragua, Paraguay, and Peru. Inventories include statistical discrepancies.

robust for others, but on average private sector credit relative to GDP remains above its long-term trend, except for Brazil (Figure 2.13). Overall, nonperforming loans have remained low, despite the pickup in some countries.

Risks Are Tilted to the Downside

The region remains particularly vulnerable to a *stronger-than-expected slowdown in China*—the destination for 15 percent to 25 percent of exports from Brazil, Chile, Peru, Uruguay, and Venezuela—and to further declines in commodity prices. A slowdown in China would contribute to lower commodity prices and increase corporate risks across the region (Chapter 3). Indeed, bouts of turbulence since mid-2015 underscores the risk that China's needed transition path to more balanced growth could be bumpy, leading to spillovers through trade, commodity prices, and financial channels. If such a slowdown translates into a reevaluation of emerging market growth prospects and an increase in global risk aversion, regional risk premiums could increase, and the decline in capital inflows could accelerate, given growing financial

Figure 2.10. Real GDP Growth, Disagreement, and Commodity Terms of Trade
(Percent change)
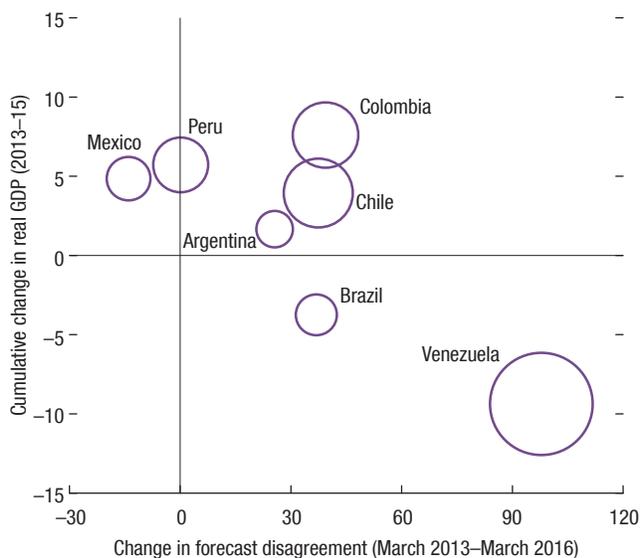
Sources: Consensus Forecasts; Gruss (2014); IMF, World Economic Outlook database; and IMF staff calculations.
Note: Bubble size refers to the change in commodity terms of trade since the 2011–15 peak. Forecast disagreement refers to the standard deviation across individual forecasts for real GDP growth at a fixed 12-month horizon, based on survey data reported by Consensus Forecasts.

Figure 2.11. Change in Private Investment, 2011–15
*(Percentage points of GDP)*

Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Figure 2.12. Domestic Indicators

1. Unemployment Rate[1]
(Percent; seasonally adjusted)

2. Real Wage Growth[2]
(12-month percentage change; seasonally adjusted)

3. Confidence Indices
(Index: 2011 = 100)

Sources: Haver Analytics; and IMF staff calculations.
[1]Argentina's data refer to June 2015 and June 2014.
[2]Purchasing-power-parity GDP-weighted average of Brazil, Chile, Colombia, Ecuador, Mexico, Peru, and Uruguay. Peru data are minimum wage real index.
[3]Purchasing-power-parity GDP-weighted average of Brazil, Chile, Colombia, and Mexico.
[4]Purchasing-power-parity GDP-weighted average of Brazil, Chile, Colombia, Mexico, and Peru.

spillovers from China (see the April 2016 *Global Financial Stability Report*, Chapter 2). A scenario analysis incorporating these factors suggests that regional growth could be lower by about half a percentage point if these risks materialize (Box 2.2).

A further deterioration of the situation in *Brazil* could lead to a sudden repricing of regional assets, reduced demand for exports among trading partners in the region (in particular Argentina, Paraguay, and Uruguay), and higher risk premiums. Similarly, a meltdown in *Venezuela* could increase financing needs for some countries in Central America and the Caribbean (for example, Grenada, Haiti, Jamaica, and Nicaragua) through oil cooperation agreements and reduced export revenue. Trade flows to neighboring countries and other trading partners may also be affected. These effects could be partly mitigated by low global oil prices and relatively limited trade linkages.

The investment recovery could be slower than projected if tighter financial conditions and lower growth prospects lead to balance sheet adjustments among companies that are increasingly indebted in foreign currency (Figure 2.14). Although corporations have weathered growth slowdowns, commodity price declines, and sharp depreciations so far—helped by increased use of currency hedging strategies—margins have

been stretched thin. Going forward, high global financial volatility, increasing sovereign spreads, low commodity prices, and sharp exchange rate depreciations could contribute to further

Figure 2.13. Credit Developments

Diverse trends in credit growth, and no immediate pressures from nonperforming loans.

1. Real Credit to the Private Sector[1]
(Year-over-year percent change)

2. Estimated Credit Gaps[2]
(Percent of GDP)

3. Nonperforming Loans[3]
(Percent of total loans; index: 2011:Q4 = 100)
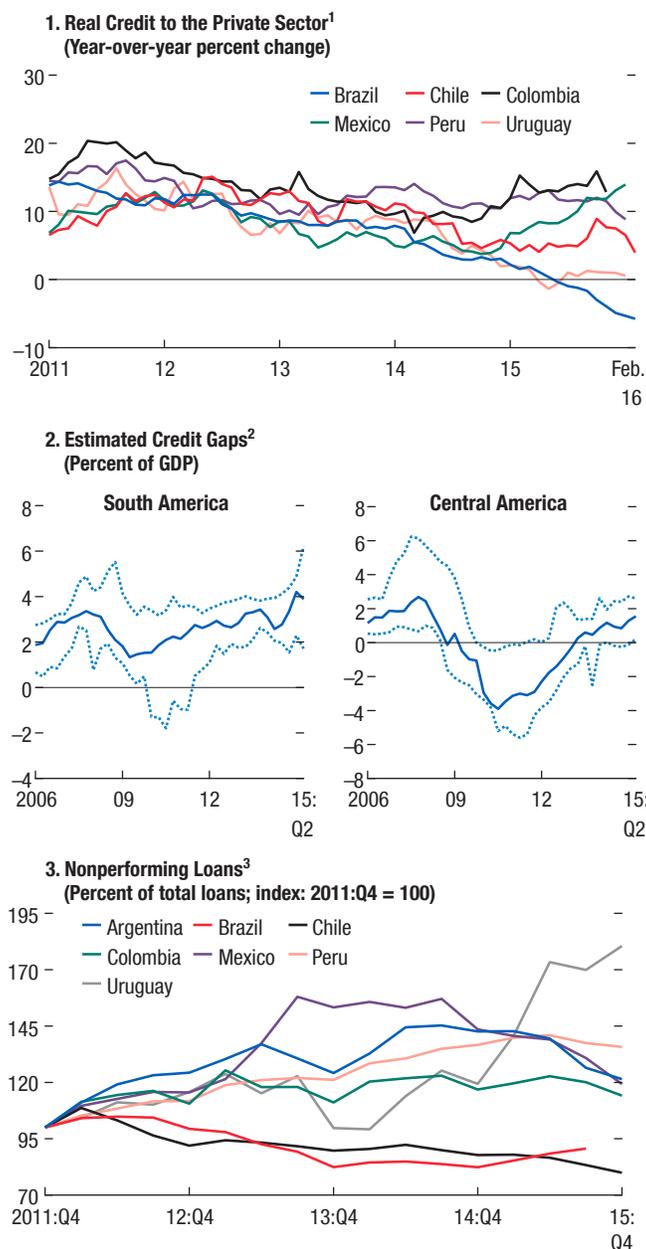
Sources: Haver Analytics; IMF, International Financial Statistics database; national authorities; and IMF staff calculations.
Note: South America = Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela; Central America = Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama.
[1]Deflated by consumer price index inflation.
[2]Solid blue line shows the median, dotted lines show the 25th and 75th percentiles of estimated credit gaps across individual countries in each regional group.
[3]The increase in nonperforming loans (NPLs) in Uruguay is from a low base, and NPLs currently stand at 2.3 percent of total loans.

increases in corporate risk and the cost of capital, particularly for commodity-related companies (Chapter 3).

Corporate sector vulnerabilities and sharp growth slowdowns could create stress in the financial sector. While there are no immediate pressures from nonperforming loans in most countries, weak economic activity, the ongoing slowdown in credit growth in some countries, continued large depreciations, high global financial volatility, and increasing sovereign spreads could reduce wholesale funding, raise banks' funding costs, and reduce their asset quality and profitability (Figure 2.13).

Policy Challenges and Trade-Offs

Potential growth is likely to remain much lower than in 2000–12, particularly for those countries facing lower commodity prices and weak investment (Figure 2.15), where there is a need to reallocate labor and capital out of resource-intensive sectors. Such an adjustment is not easy, will take time, and is likely to come with its share of bumps and anxieties. Throughout, policies and economic reforms should be tailored to manage this transition. An assessment of whether this should involve supportive fiscal and monetary policy is clouded by the uncertainty surrounding estimates of the output gap during a period of declining potential growth. While the estimated output gaps in most cases remain negative, labor market indicators show limited slack in many cases, and inflation has repeatedly surprised to the upside.

Where further accommodation might be warranted, policy space is limited (Figure 2.16). In particular, fiscal policy space is constrained by a combination of (1) high debt levels, (2) lower commodity revenues that are not expected to recover, (3) increases in primary expenditures during the commodity boom, (4) higher financing costs, and (5) a fiscal stance that requires adjustment to stabilize public debt. Even though inflation rates have been persistently above target

Figure 2.14. Corporate Bond Debt

Corporate leverage has increased and is concentrated in commodity-based sectors

1. Nonfinancial Corporate Bond Debt, Currency Composition
**(Billions of U.S. dollars)**
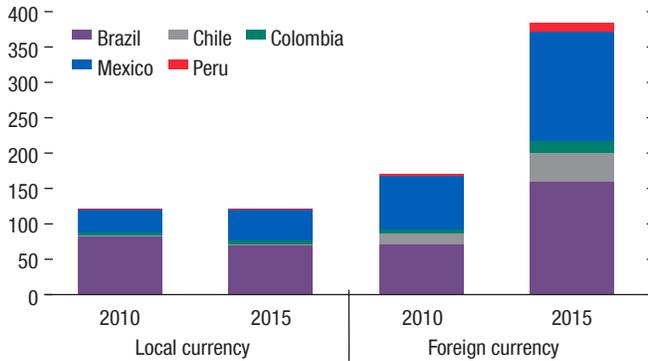
2. Nonfinancial Corporate Bond Debt, Sectoral Composition[1]
(2015, Billions of U.S. dollars)
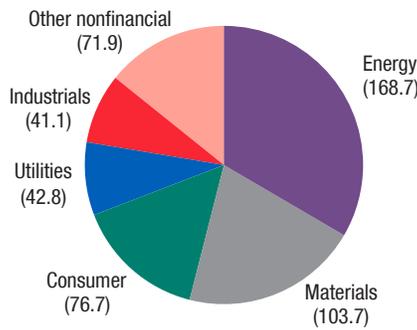
Sources: Bloomberg, L.P.; Dealogic; and IMF staff calculations.
[1]Includes Brazil, Chile, Colombia, Mexico, and Peru.

Figure 2.15. Estimates of Medium-Term Growth by Forecast Vintage, 2000–16
(Percent)

World Economic Outlook Vintage

Source: IMF, World Economic Outlook database.
Note: Reflects projected real GDP growth for Latin America and the Caribbean for the last year ($t + 5$) of the forecast horizon.

in some countries, there is space to maintain accommodative monetary policy where medium-term inflation expectations remain well-anchored.

Fiscal policy: Since the global financial crisis, the use of expansionary policies has led to an increase in public debt. For commodity exporters, falling commodity prices have reduced revenues, adding to fiscal deficits (Figure 2.17). Projected trajectories for debt-to-GDP ratios have been revised upward repeatedly, partly reflecting downward growth surprises, a trend that could erode policy credibility, if it continues (Figure 2.18). Sovereign borrowing costs have increased somewhat across the region, reflecting higher debt levels (caused in part by the valuation

effects of depreciations), fluctuations in global risk aversion, and weak growth prospects. Many countries have committed to medium-term consolidation plans, but primary balances are expected to remain below debt-stabilizing levels for some time. With space limited in most cases, the priority for fiscal policy is to preserve remaining fiscal buffers in countries with relatively low debt levels, and to consolidate further in more indebted countries. The speed of consolidation in each case will depend on the degree of remaining fiscal space, the need to preserve credibility, and the state of the business cycle.

Monetary and exchange rate policies: Exchange rate flexibility continues to be critical to helping economies adjust to persistently lower commodity prices. Most countries in the region have let their currencies adjust to the terms-of-trade shock, while in a few cases exchange rate rigidities have led to appreciations in real effective terms (for example, Bolivia, Ecuador, and Venezuela). But depreciations

Figure 2.16. Policy Space in Latin America

No policy space ● (red)   Unclear case ● (yellow)   Policy space ● (green)

	Argentina	Bolivia	Brazil	Chile	Colombia	Ecuador	Paraguay	Peru	Uruguay	Venezuela	Mexico	Dominican Republic	Guatemala
Fiscal Policy Space[1]													
2015 General government gross debt (percent of GDP)[2]	Red	Yellow	Red	Green	Red	Green	Green	Green	Red	Yellow	Red	Green	Green
2015 Primary balance gap (percent of GDP)[3]	Red	Red	Red	Red	Yellow	Red	Red	Red	Yellow		Red	Green	Green
Change in EMBIG spread, 2010 to latest[4]	Green		Red	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Green
Monetary Policy Space[5]													
Latest inflation rate	Red	Green	Red	Red	Red		Yellow	Red	Red	Red	Green	Green	Yellow
Short-term expectations													
2017 Consensus Forecast	Red		Yellow	Yellow	Yellow		Green	Yellow	Red	Red	Yellow	Green	Green
One-year market-based inflation (breakeven rate)			Red	Green							Green		
Medium-term expectations													
Three-year Consensus Forecasts	Red		Yellow	Green	Yellow		Yellow			Red	Yellow		
Five-year market-based inflation (breakeven rate)			Red	Yellow							Green		
Memorandum:													
Monetary policy rate[6]													
Latest	34.0	…	14.3	3.5	6.5	…	6.0	4.3	…	…	3.8	5.0	3.0
Number of hikes since September 2015	…	…	0	2	7	…	1	4	…	…	2	0	0
Cumulative change since September 2015	8.2	…	0.0	0.5	2.0	…	0.3	1.0	…	…	0.8	0.0	−0.3
Ex ante real interest rate[7]	4.6	…	7.3	0.1	1.7	…	1.5	1.0	…	…	0.3	2.2	−0.6
Real neutral rate	…	…	7.5	1–1.5	2–2.5	…	2.5	2.5	…	…	…	3.2	1.5

Sources: Consensus Forecasts; Haver Analytics; IMF, World Economic Outlook database; and IMF staff estimates.
Note: EMBIG = J.P. Morgan Emerging Markets Bond Index Global.
[1]Based on a subset of indicators.
[2]For Argentina, federal government debt. For Dominican Republic, consolidated public sector debt. For Uruguay, general government gross debt includes central bank debt. Red: >49 percent of GDP; Yellow: 35–49 percent of GDP; Green: <35 percent of GDP.
[3]Debt-stabilizing primary balance is based on staff reports. Red: >1 percent of GDP; Yellow: 0–1 percent of GDP; Green: <0 percent of GDP.
[4]Red: >150 basis points; Yellow: 50–150 basis points; Green: <50 basis points. On average, for emerging markets, EMBIG spread has increased by 150 basis points for the relevant period.
[5]Red: above the inflation target range; yellow: within the target range but above the mid-point; green: below the mid-point.
[6]Argentina's monetary policy rate refers to the three-month Letras del Banco Central (LEBAC) rate.
[7]Difference between the monetary policy rate and the 12-month-ahead inflation expectation.

have created tensions for monetary policy, even for the region's most well-established inflation-targeting central banks. Although the pass-through from exchange rates to inflation has been declining over time, large, persistent, and recurring depreciations have placed upward pressure on consumer prices (Figure 2.19 and Chapter 4).

Inflation on average has increased—particularly for South America—and some central banks in the region face a trade-off. On the one hand, domestic demand is weak, with some uncertainty around output gaps, and fiscal policy space is limited or nonexistent. On the other hand, headline inflation is above target and expected to remain so in the near term. Central banks were able to postpone rate increases despite persistently above-target inflation, but they have recently tightened to ensure that medium-term inflation expectations remain anchored. Where central banks enjoy strong credibility and exchange rate pass-through is limited, monetary policy can remain accommodative if

Figure 2.17. Fiscal Outcomes and Policy

1. Fiscal Revenues from Commodities
(Percent of GDP)

2. General Government Debt[1]
(Percent of fiscal year GDP)

Legend:
- Gross debt (change in 2008–16)
- Gross debt, 2008
- ▲ Net debt, 2016

Countries: Brazil, Uruguay, Argentina, Mexico, Colombia, Peru, Chile

3. Debt and EMBIG Spreads[2]

EMBIG, latest (basis points)
- Brazil
- Mexico
- Colombia
- Chile
- Peru
- Uruguay

General government gross debt, 2015 (percent of GDP)

4. Debt-Stabilizing Primary Balance[3]
(Percent of GDP)

Legend:
- Primary balance
- — Debt-stabilizing primary balance

91.7% 26.2% 40.3% 52.1% 24.9%

Brazil Chile Colombia Mexico Peru

Sources: Bloomberg, L.P.; IMF, World Economic Outlook database; national authorities; and IMF staff calculations.
Note: EMBIG = J.P. Morgan Emerging Market Bond Index Global. Data labels use International Organization for Standardization (ISO) country codes, see page 108.
[1]For definitions of government coverage, see Table 2.2.
[2]Latest EMBIG spreads data refer to March 2016 average.
[3]Number next to the red line refers to the 2021 debt-to-GDP ratio.

needed to support demand, so long as medium-term inflation expectations remain well anchored. However, where rising inflation risks de-anchoring long-term inflation expectations, monetary policy should be geared toward preserving central bank credibility and preempting the emergence of self-fulfilling expectations. In all cases, clear communication of the drivers of inflation and the central bank's policy reaction function is of utmost importance to anchor inflation expectations.

Financial policies: Continued vigilance in monitoring corporate balance sheets and asset quality

of banks is warranted given rising corporate leverage, modest growth prospects, and high dollarization in certain countries. Although large depreciations have not led to stresses in the corporate debt market despite increased foreign currency exposure, deleveraging pressures will likely increase as a result of a protracted period of low growth and higher funding costs. Adequate consolidated supervision, in cases in which financial and nonfinancial companies are interlinked, is important. In that context, regulators should ensure adequate bank capital buffers to contain potential spillovers from

Figure 2.18. General Government Debt by *World Economic Outlook* Vintage
(Percent of fiscal year GDP)

Fall 2012 — Fall 2013 — Fall 2014 — Fall 2015 — Spring 2016
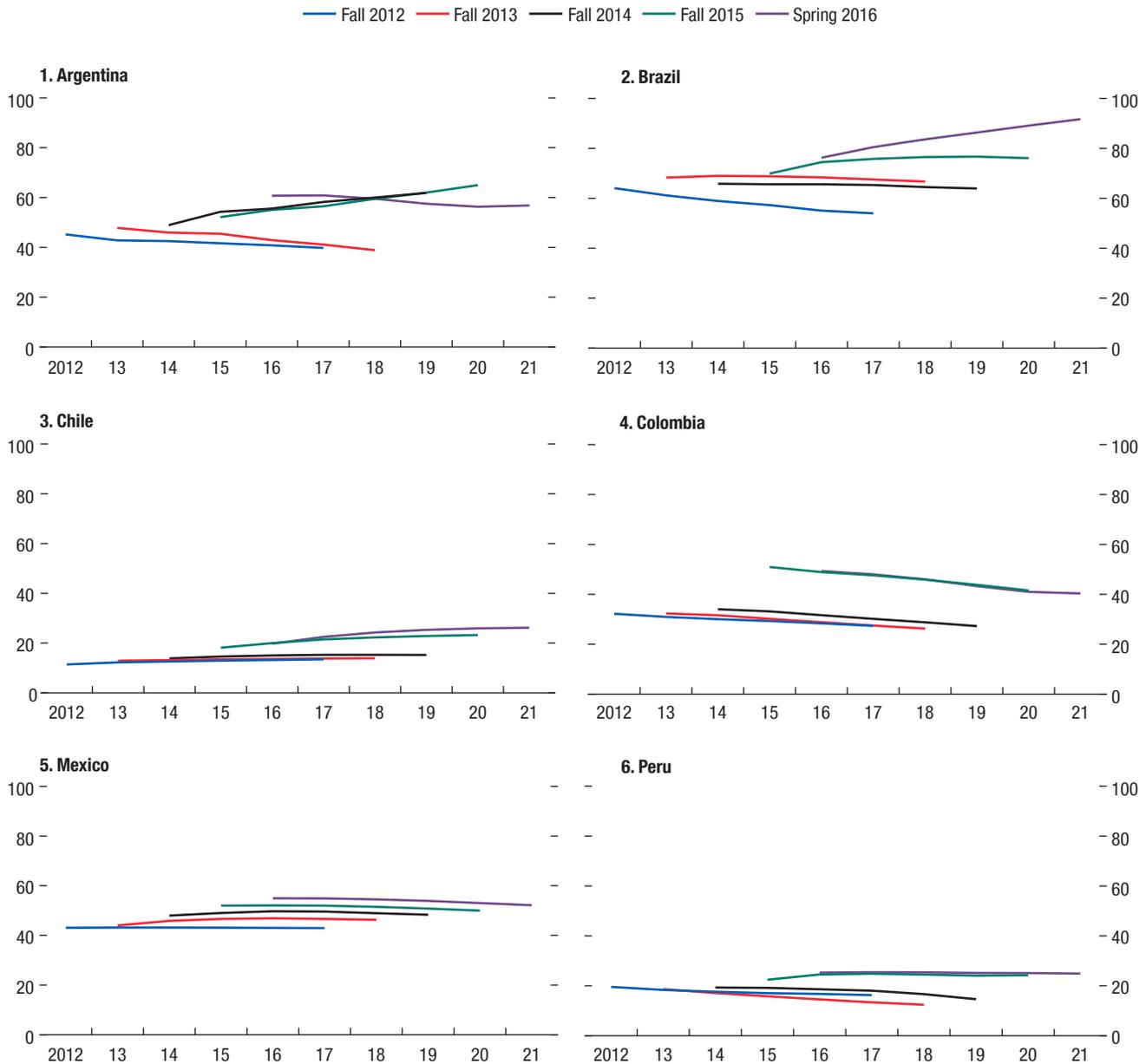
the corporate sector. These buffers could be supplemented by macroprudential tools to contain any potential buildup of risks related to currency mismatches. For countries with high nonperforming loans (for example, in the Eastern Caribbean Currency Union), continued efforts to clean bank balance sheets are important for maintaining financial stability and access to credit. In countries where the financial cycle is in its down phase, loosening of macroprudential tools could only be warranted if the health of the financial system is not put at risk.

Structural policies: Over the medium term, growth in Latin America and the Caribbean

Source: IMF, World Economic Outlook database.

Figure 2.19. Monetary Policy

1. Estimated Contribution of Exchange Rate Depreciations to 2015 Inflation
(Percent; annualized)

- CPI inflation
- Contribution from NEER (right scale)

2. Inflation Comparison, 2015[1]
(Average; annual percent change)

South America average

Central America average

3. Monetary Policy[2]
(Percent)

- Inflation target range
- 2016 expected inflation (March 2016 CF)
- CF inflation expectation, 5-year forecast
- Inflation breakeven rate, 5-year

| Brazil (-) | Chile (+50 bps) | Colombia (+175 bps) | Mexico (+75 bps) | Peru (+75 bps) | Uruguay (...) |

Sources: Bloomberg, L.P.; Consensus Forecasts; Haver Analytics; national authorities; and IMF staff calculations.
Note: Asia = emerging and developing Asia; bps = basis points; CF = Consensus Forecasts; CPI = consumer price index; Europe = emerging and developing Europe; NEER = nominal effective exchange rate; MENA = Middle East and North Africa; SSA = sub-Saharan Africa. For International Organization for Standardization (ISO) country codes used in data labels, see page 108. For country group information, see page 107.
[1]South America average excludes Venezuela. Argentina refers to Buenos Aires inflation.
[2]Numbers in parentheses refer to the change in policy rate between September 2015 and March 2016.

is expected to remain below historical trends. While underlying reasons vary across countries, there are common elements: (1) inadequate infrastructure networks (see Chapter 5), (2) shortcomings in quality of education, (3) relatively low export diversity and complexity, (4) inadequate financial market development, and (5) lower commodity prices for commodity exporters.[2] Structural policies aimed at resolving some of these bottlenecks could create synergies in raising potential output. Policies aimed at improving infrastructure include strengthening public investment management processes, improving regulatory frameworks to provide incentives for private participation, and deepening financial markets (Chapter 5). These policies can also help ensure energy availability and eliminate transport bottlenecks. Similarly, education policies supporting human capital can also improve export complexity and diversification. Policies targeted at bolstering property rights, an efficient legal system, good corporate governance, and lowering corruption would both increase financial depth and improve competitiveness, also contributing to further export diversification. In all cases, expectations should be realistic: previous experience shows that structural reforms targeted at product and labor markets do boost medium-term growth, but the benefits materialize gradually over time. Meanwhile, some structural reforms may impose short-term costs. Overall, speedy implementation of structural policies is key to addressing the region's declining potential growth, but careful consideration should be given to sequencing and building broad consensus around the priority of fostering sustainable, inclusive growth.

South America

Developments and Outlook

Most economies in South America are managing the transition to lower commodity prices in

[2]See *Regional Economic Outlook: Western Hemisphere*, April 2015 and October 2015; *World Economic Outlook*, October 2015 (Chapter 2) and April 2016 (Chapter 3); and Bruns and Luque (2015).

an orderly manner, with a policy mix that is supporting high employment and modest growth, but further balance of payments adjustments are needed to contain risks in some cases.

Chile's sound macroeconomic framework allowed for countercyclical policies during 2014–15. Growth is expected to slow to 1.5 percent in 2016, reflecting subdued confidence and sluggish investment in the mining sector, and to accelerate to 2.1 percent in 2017, partly reflecting further resolution of uncertainty related to the reform agenda. Slower wage growth and peso weakening are expected to bring inflation down from 4.3 percent in 2015 to within the official target band in 2016–17. Risks are balanced but a delayed recovery in confidence could constrain the pickup. Despite relatively high leverage, firms have managed macroeconomic adjustment well so far—with largely hedged foreign exchange exposures—but deleveraging pressures are rising because of a protracted period of low demand and moderate competitiveness gains.

Peru's economy has strengthened faster than projected in the October 2015 *Regional Economic Outlook: Western Hemisphere*, and closed 2015 with substantial recovery. Growth is expected to rise further in 2016 (3¾ percent), boosted by ongoing investment in the mining sector but also reflecting resilience in other sectors. With potential growth estimated to decline from 4 percent in 2015 to 3.5 percent in the medium term because of weaker long-term prospects for the mining sector, the output gap is expected to become increasingly positive, placing upward pressure on inflation. *Colombia* continues to grow at a relatively healthy rate, but output is projected to decelerate from 3.1 percent in 2015 to 2.5 percent in 2016, as a result of needed policy tightening and less favorable global financial conditions. With this tightening, the current account deficit is expected to gradually reach a sustainable level.

Growth in *Bolivia* is expected to remain strong (3.8 percent in 2016), but is mainly supported by a high level of public investment and a sizable fiscal deficit. At the same time, the current

account balance has worsened substantially on the back of robust real import growth, real currency appreciation, and lower gas export prices. In *Uruguay*, the economy is slowing (1.4 percent in 2016), while inflation remains above target, despite the tight monetary policy stance. *Paraguay's* economy is expected to remain relatively resilient, with growth of about 3 percent in 2016 and 2017, despite a loss of momentum in trade-related sectors last year. Agricultural production, led by soy, is expected to be strong again in 2016, providing support to growth alongside accommodative monetary policy and a neutral fiscal stance.

However, some countries are contracting, mostly on account of a combination of weak domestic fundamentals and harsher external conditions.

In *Brazil,* a combination of macroeconomic fragilities and political problems has dominated the economic outlook. Economic activity has been contracting because of low business and consumer confidence, high domestic policy uncertainty, weakening export prices, tightening financial conditions, and low competitiveness. The deteriorating fiscal position and public debt dynamics played a role in the collapse in sentiment, especially as the fiscal adjustment targets put forward early in 2015 were repeatedly trimmed down, triggering a rise in market interest rates and eventually the downgrade of the sovereign credit rating below investment grade (Figure 2.18). Economic activity contracted by 3.8 percent in 2015 and is projected to decline again in 2016 at the same rate. With many of the large shocks from 2015–16 expected to have run their course, and helped by a weaker currency, sequential growth is projected to turn positive during 2017; nevertheless, output on average will likely remain unchanged from the previous year. The main domestic risks for Brazil are linked to the continued political tensions, which are affecting the ability of the government to pass reforms, including those necessary to restore the sustainability of public finances, and more generally heightening policy uncertainty. This could delay the recovery in investment. Although financial soundness indicators appear solid,

continued economic strains may over time affect borrower performance. Inflation is expected to decline, but the decline could be gradual, especially if exchange rate depreciation pass-through is stronger than expected.

In *Argentina*, the new government has embarked on an ambitious, much-needed transition to remove macroeconomic imbalances and distortions that had stifled investment and eroded competitiveness. Foreign exchange controls were scaled back in December 2015, resulting in an initial 40 percent devaluation of the peso that largely closed the gap between official and parallel exchange rates; several constraints on international trade have been removed; export taxes on agriculture products have been eliminated or reduced; and utilities tariffs have been raised to contain the fiscal impact of energy subsidies, with mechanisms aimed at mitigating the impact on the more vulnerable segments of the population. The exchange rate, which had remained relatively stable during the first month of free flotation, has depreciated by about 10 percent since mid-January, inducing the central bank to first intervene in foreign exchange markets and then strongly increase interest rates to contain depreciation pressures. Still, the peso depreciation and the increase in tariffs have resulted in a significant increase in inflation in the first months of 2016. After many years of litigation, the authorities have reached an agreement with a number of creditors that paves the way for the country's return to international capital markets. This is an important step toward allowing Argentina to restore its financial position and access external savings to finance the cost of the transition toward a more consistent macroeconomic policy framework.

GDP growth in 2015 was driven by a generous fiscal stimulus and buoyant activity in the construction and agriculture sectors. Economic activity has slowed in recent months, and although the suspension of publication of some key official statistics makes forecasts particularly uncertain, GDP growth is expected to contract by about 1 percent in 2016. This is because the positive contribution from net exports following the foreign exchange liberalization is expected to be more than offset by a contraction in domestic demand as the adjustment to the new relative prices and changes in policies takes place. The new policy framework, however, has improved the medium-term outlook, with GDP growth expected to rebound to about 2¾ percent in 2017. Risks to the outlook remain on the downside given the unfavorable external environment and domestic challenges, in particular the risk that sustained inflationary pressures could require a tighter monetary policy stance to get to the announced inflation target.

Venezuela's economic conditions have deteriorated, with policy distortions and fiscal imbalances remaining unaddressed. Both exports and imports have been declining as a result of the renewed declines in oil prices. Available foreign exchange has been mostly used to finance imports of basic goods, at the expense of intermediate and capital goods. Owing to lack of intermediate goods, widespread price and other administrative controls and regulations, and the worsening business climate, productive capacity has plummeted. Real GDP fell by about 6 percent in 2015, according to the central bank, and is expected to fall by an additional 8 percent in 2016. Fueled by the monetization of the large fiscal deficit, an increase in the parallel market exchange rate, and the scarcity of basic goods, inflation is expected to exceed 700 percent in 2016. The recent depreciation of the official exchange rate and increase in domestic fuel prices were too modest to resolve the external and domestic imbalances that stem from these distortions.

Macroeconomic rigidities prevented a smooth adjustment in *Ecuador*, whose economy is expected to contract this year by 4½ percent, amid continued decline in oil prices, real exchange rate appreciation, and tight financing conditions, which—in the forecasts—are assumed to require further fiscal measures. The outlook remains highly uncertain and is dependent on the extent of shocks and particularly on the availability of external financing.

Policy Priorities

Policies should be tailored to facilitate a smooth adjustment toward the new reality of lower commodity prices.

Fiscal consolidation efforts should continue to contain rising debt levels and preserve buffers. In *Brazil*, laying out a consolidation strategy aimed at restoring fiscal sustainability and communicating and executing it consistently is essential, given rising debt levels (estimated to increase to 91¾ percent of GDP in 2021) and large overall fiscal deficits (above 5 percent of GDP). With limited room for discretionary cuts, tax measures are necessary in the short term, but the most important challenge is addressing rigidities and unsustainable mandates on the spending side, including in the social security system. Resisting pressures to provide stimulus is important given the lack of fiscal space. In *Argentina*, the authorities' announcement of multiyear fiscal targets has been a step in the right direction, and it will be important to articulate further the underlying policies necessary to achieve these targets. In *Venezuela*, a fiscal adjustment is needed to reduce monetary financing of the deficit. Some countries in the region still have relatively low debt levels (for example, *Chile* and *Peru*) and have already embarked on fiscal adjustments (for example, *Mexico*), even beyond the requirements of fiscal rules (for example, *Colombia*). With higher funding costs and current primary deficits above debt-stabilizing levels, the focus in these countries should be on preserving fiscal buffers. Overall, given the increases in primary expenditures during the commodity boom, spending should be focused on high-priority areas to support growth (such as effective public infrastructure spending in *Paraguay* and *Peru*). Preserving fiscal buffers is also important to contain risks stemming from rising contingent liabilities. The region's state-owned enterprises in commodity-related sectors are highly leveraged and currently cutting back on their capital investment, which contributes to lowering potential output. This in turn suppresses their profitability further (Figure 2.20).

Figure 2.20. State-Owned Enterprises

Contingent liability risks stemming from state-owned enterprises are increasing

1. **Debt-to-Assets Ratio**
   (Percent)

2. **Return on Assets**
   (Percent)

3. **Top Global Energy Companies: Average Capital Expenditure[1]**
   (Billions of U.S. dollars)
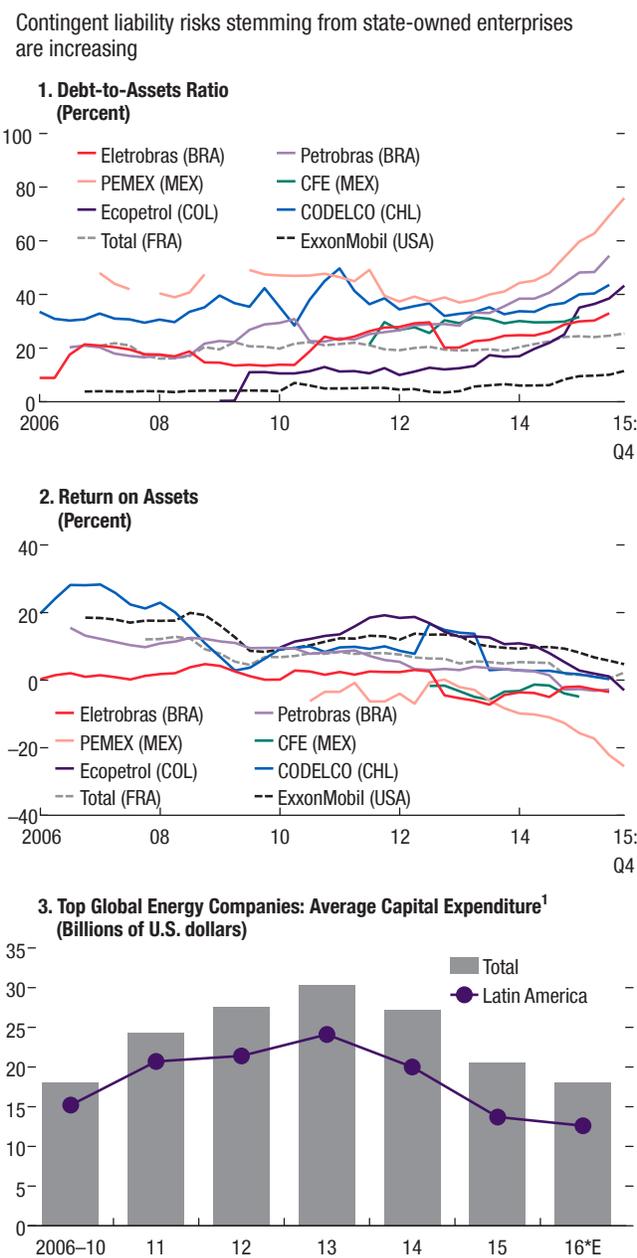
Source: Bloomberg, L.P.
Note: CFE = Comisión Federal de Electricidad; CODELCO = Corporación Nacional del Cobre de Chile; PEMEX = Petróleos Mexicanos. Data labels use International Organization for Standardization (ISO) country codes, see page 108.
[1]Total includes ExxonMobil, Chevron, Royal Dutch Shell, PetroChina, China Shenhua, Petrobras, Pemex, and Ecopetrol. Latin America includes Petrobras, PEMEX, and Ecopetrol. Capital expenditure is defined as purchase of fixed assets, excluding investments held for purely investment purposes and under the equity method. *E: median estimate for 2016 based on Bloomberg forecasts, strategic reports from individual companies, and other media releases. Data for some companies in 2015 are partly based on estimates when data for 2015:Q4 are not yet available.

Monetary policy space is greater in those countries where inflation expectations remain well anchored, but trade-offs are becoming more pronounced where expectations are rising. In *Brazil*, while a rate hike would help arrest persistently high inflation expectations, the economy continues to contract and there is large uncertainty about the size of the output gap. On balance, the reduction in inflation toward the 4.5 percent target by 2017 will require a tight monetary policy stance. In *Argentina*, given the still high level of inflation, efforts to disinflate are appropriate, despite the expected contraction in output this year. Well-anchored medium-term inflation expectations in *Chile* grant the policy space to postpone further hikes as the output gap is expected to close only gradually. In *Peru* and *Colombia*, trade-offs have diminished because output is deemed at or near capacity, and inflation expectations are rising above target, creating a case for tightening monetary policy.

Exchange rate flexibility continues to facilitate the needed adjustment to lower terms of trade, and pass-through to inflation has been relatively modest given the size and persistence of depreciations (Chapter 4). Where large depreciations put pressure on inflation and short-term inflation expectations, monetary policy should remain focused on preserving credibility and keeping medium-term inflation expectations well anchored.

The regional outlook will only start to look more promising when the domestic challenges facing the contracting economies have been resolved and, more broadly, structural policies are implemented. Resolution of uncertainties could unlock repressed investment demand, providing a support for other policies. In *Brazil*, implementation of the infrastructure concessions program is key to supporting potential growth over the medium term. In *Venezuela,* restoring macroeconomic stability would require eliminating distortions (for example, price controls and foreign exchange misalignment) and reforming regulatory frameworks across the board, in addition to reducing monetary financing. Special efforts

should be made to create a sound safety net to protect the most vulnerable. *Argentina* has embarked on an essential macroeconomic transition. The new administration has begun dismantling the series of controls that distorted key relative prices and inhibited economic activity over the past few years. Continuing the implementation of reforms within a consistent and well-communicated policy framework will help build further confidence and boost investment, creating the conditions for a stronger and more sustainable pace of economic growth. Improving the climate for doing business by reducing regulatory uncertainty and enhancing the legal framework will help support growth in *Bolivia*.

Mexico, Central America, and the Dominican Republic

Developments and Outlook

Against the backdrop of continued recovery in the United States, the growth outlook for *Mexico* and *Central America* remains relatively robust. *Mexico* is expected to continue to grow at a moderate 2.4 percent in 2016, supported by healthy private domestic demand and spillovers from a strong U.S. economy, although poor performance of U.S. industrial production—more relevant for Mexico than U.S. services—has increased downside risks to growth. The depreciation of the peso and lower electricity prices should boost manufacturing production and exports. Inflation fell sharply in 2015 despite the sharp depreciation, partly because of one-off factors (for example, expiration of tax base effects and telecommunications reform). The recent decline in oil prices will have only a limited effect on public finances in 2016 because the oil price risk has been hedged for this year. However, if the oil price shock is persistent, it would increase the fiscal consolidation burden in the medium term (Figure 2.21).

Countries in *Central America* have benefited from low oil prices and the ongoing U.S. recovery.

Figure 2.21. United States and Mexico: Growth Comparison
(Four-quarter percent change)
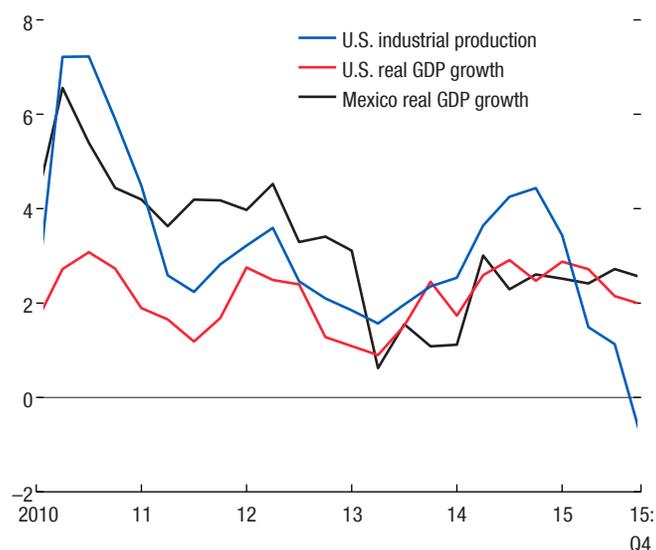
Sources: Haver Analytics; IMF, World Economic Outlook database; and IMF staff calculations.

Figure 2.22. CAPDR: Contributions to Real GDP Growth
*(Year-over-year percent change)*
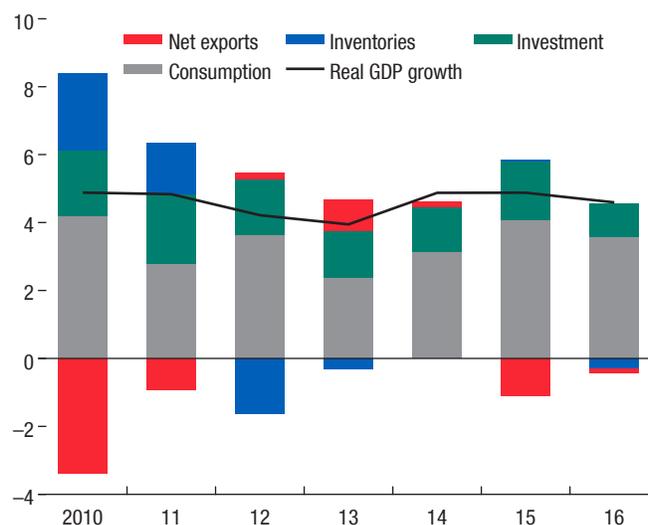
Sources: IMF, World Economic Outlook database; national authorities; and IMF staff calculations.
Note: Seasonally adjusted. Purchasing-power-parity GDP-weighted averages of Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, and Panama. Inventories include statistical discrepancies.

Output growth for the region has remained at its 10-year average (4½ percent in 2015) and close to potential, while lower oil prices have pushed headline inflation to historic lows (Figure 2.22). These factors have led to an increase in remittances inflows, real disposable income, and employment, boosting private domestic consumption. They have also contributed to better overall fiscal outturns through higher revenues and smaller current account deficits. Looking ahead, although Central America is expected to weather the general slowdown among emerging market economies well, the recent tightening of global financial conditions, and the region's unfinished structural reform agenda, along with their protracted security and governance issues are all likely to temper medium-term growth.

Within this relatively strong growth outlook, there is a degree of country heterogeneity. *Panama* and the *Dominican Republic* remain the star growth performers at about 6 percent in 2015, despite some slowdown in Panama associated with a lower public investment and

slower activity in the Colon Free Zone due to difficulties in trade relations with Colombia and Venezuela. Growth in *Nicaragua* and *Costa Rica* decelerated owing to the impact of adverse weather conditions for the main agricultural export crops and the closure of an Intel manufacturing plant (Costa Rica). The income windfall from lower commodity prices allowed households in *Guatemala* to raise consumption and firms to repay some of their debt. Despite closing output gaps (Box 2.3), the sustained decline in oil prices has driven headline inflation to historic lows—well below some central banks' targets—leading some central banks to reduce their policy rates.

Current accounts have been adjusting on account of lower oil prices and steady remittances inflows in some countries, also supporting higher reserve accumulation. In 2015, private remittances are estimated to have risen by about 8 percent across the region, with Guatemala and Honduras recording the largest increases. At the same time the fuel import bill across the region declined by about 40 percent in 2015. These factors

Figure 2.23. CAPDR: Fiscal Indicators

1. Fiscal Deficit
(Percent of GDP)

2. Composition of Fiscal Consolidation, 2013–15
(Percent of GDP)
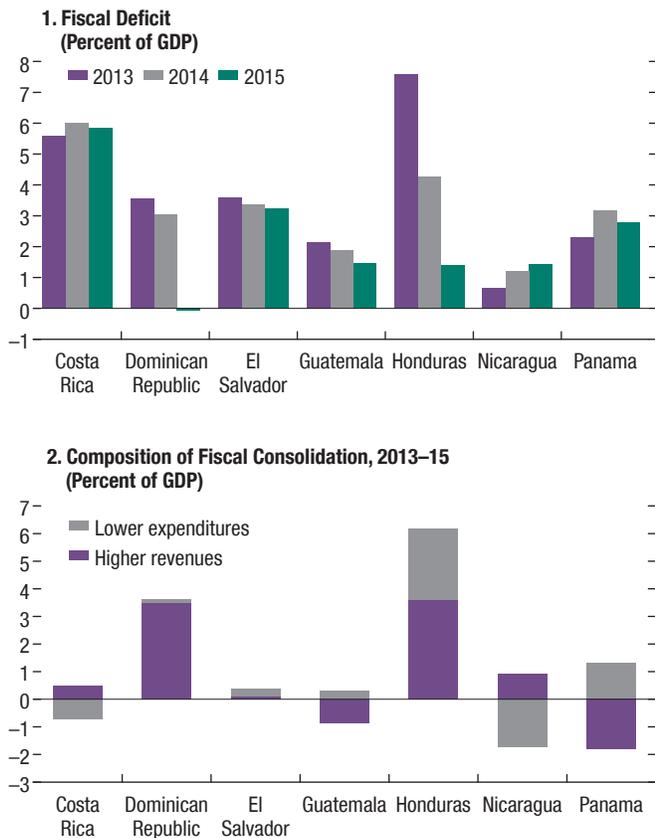
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Overall fiscal balance for the Dominican Republic in 2015 includes the grant element of the debt buyback operation with Petróleos de Venezuela, S.A. amounting to 3.1 percent of GDP. CAPDR = Central America, Panama, and the Dominican Republic.

contributed to significant external adjustments for some countries: for example, Guatemala's current account deficit declined by 1¾ percentage points of GDP in 2015.

Similarly, for most countries, fiscal positions continued to improve in 2015, with increased revenues (Figure 2.23). The Dominican Republic restructured its debt under the PetroCaribe agreement with a buyback, reducing its public debt by 3.1 percent of GDP.

The regional financial system appears sound, but dollarization continues to be a key source of vulnerability. For most countries, credit growth appears to be prudent and liquidity remains ample. Balance sheet buffers remain

adequate, with bank capital well above regulatory requirements, low nonperforming loans, and profitable banks. That said, there has been a pickup in foreign currency credit growth in some countries, including in sectors without natural foreign currency hedges, despite already high levels of dollarization.

In the future, despite the still favorable external backdrop, the recent tightening of financial conditions may temper economic performance in the region. In 2016, output growth in the region is expected to be slightly lower than in 2015, at 4.5 percent, with inflation remaining low, at less than 4 percent. Growth in Panama and the Dominican Republic, although decelerating, is still projected to remain the highest in the region—in excess of 5 percent— with headline inflation within the central bank target range (Dominican Republic). In Panama, growth would be supported by the expansion of the Panama Canal. In Guatemala, growth is expected to remain robust at 4 percent in 2016, and medium-term growth prospects are enhanced by the new government's anticorruption agenda, with the main goal of reforming the tax and customs agency that has been plagued with corruption scandals. The planned initiatives—aimed at strengthening the government procurement process, improving the accountability of congress, enhancing the independence of the judiciary, and increasing the transparency of funding to political parties—will further support the rule of law and improve the business climate. In Costa Rica, growth is expected to recover close to its estimated potential of 4 percent in 2016, supported by dissipation of the one-off effects of Intel's withdrawal, domestic monetary stimulus, and sustained real credit expansion. El Salvador is expected to grow by 2.5 percent, slightly above potential, and is projected to remain the region's worst growth performer, but also to have the lowest rate of inflation. Inflation is projected to be highest in Nicaragua at about 6 percent, owing to a projected expansionary fiscal policy in the run-up to general elections later in the year.

Policy Priorities

In *Mexico*, given lower commodity revenues and higher than average debt levels for emerging market economies, continued efforts to increase fiscal space are appropriate. In particular, it is critical to reverse the past trend of repeated shifts in the debt trajectory above and beyond what has been committed each year to avoid eroding fiscal policy credibility and raising financing costs, which could make future adjustments more difficult (see Figure 2.18). Regarding monetary policy, with limited exchange rate pass-through and subdued inflation dynamics, the central bank could afford to postpone further policy rate hikes.

In *Central America*, although a favorable outlook has triggered both fiscal and current account adjustment, further efforts are needed to institutionalize fiscal discipline and boost fiscal buffers and potential growth. In particular, the priorities include the following:

Building stronger fiscal buffers given the still favorable external environment. In the past three years, countries in Central America have experienced better-than-anticipated terms of trade (Figure 2.24), translating into higher national incomes. Not all the countries, however, used this opportunity to strengthen the fiscal stance and reduce public debt. In fact, Costa Rica, Nicaragua, and Panama followed procyclical policies by increasing their fiscal deficit, unlike Honduras. Now is the time for countries in Central America to rebuild fiscal buffers, in particular by reducing tax exonerations and exemptions and improving the targeting of fiscal subsidies. Greater emphasis needs to be placed on adopting multiyear fiscal frameworks and enhancing fiscal transparency, for instance through the enactment of fiscal responsibility legislation such as the initiatives that are currently discussed in Costa Rica, El Salvador, and Honduras.

Accelerating regional cooperation to strengthen financial supervision. Given the supranational structure and cross-border activities of financial conglomerates that operate in the region, initiatives aimed at strengthening regional cooperation in prudential supervision and anti–money laundering are warranted.

Figure 2.24. CAPDR: Growth and Terms of Trade by Forecast Vintage

1. Real GDP Growth Across *World Economic Outlook* Vintages (Percent)

2. Annual Change in Terms of Trade Across *World Economic Outlook* Vintages (Percent)
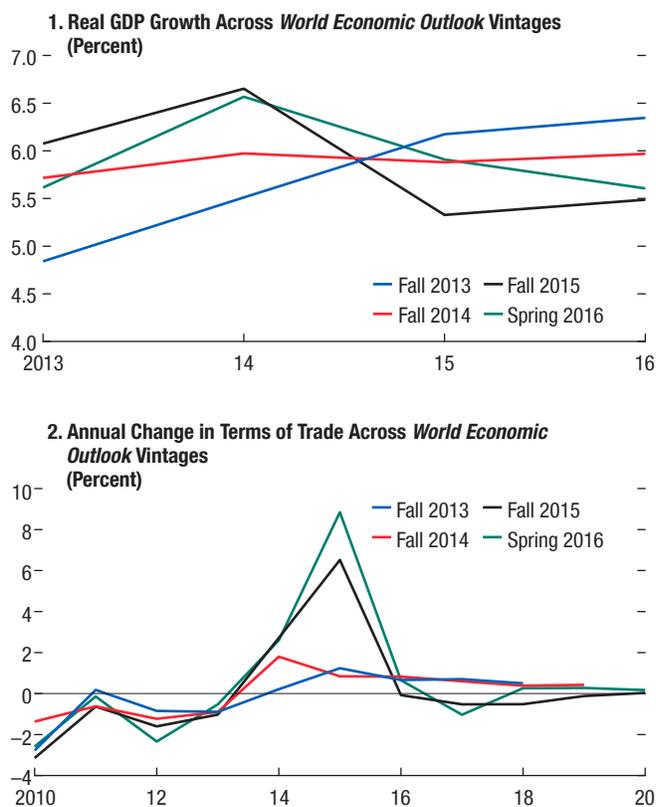
Source: IMF, World Economic Outlook database.
Note: CAPDR = Central America, Panama, and the Dominican Republic. For country group information, see page 107.

Raising potential growth. Central American economies have experienced a reduction in potential growth from about 5 percent—the average growth rate before the global financial crisis—to 4 percent over the medium term (Box 2.3). This may be the result of structural constraints to capital and employment growth, and low total factor productivity growth, perhaps originated in insufficient efforts to foster technological progress and subpar development of a more stable institutional, regulatory, and legal environment. Lower potential growth will also make it difficult to rebuild fiscal buffers. Structural reforms must be directed at improving business conditions, product and labor markets,

the quality of education, and enhancing the capacity for innovation.

The Caribbean

Developments and Outlook

The protracted period of low commodity prices continues to be favorable for the tourism-based countries in the Caribbean. Combined with steady tourist inflows from the United States (Figure 2.25), lower energy prices have allowed a significant reduction of external imbalances. Fiscal deficits in many of these countries have also been reduced, reflecting both higher revenues—on the back of stronger economic activity—and deliberate adjustment efforts. Growth prospects continue to be favorable for the tourism-based economies. Tourist arrivals have been on the rise since early 2015 in most countries, led by *Barbados*, *Grenada*, *St. Kitts and Nevis*, and *St. Lucia*. These inflows are expected to continue and possibly expand as economic activity in the origin countries gradually gains strength. In the short term, however, concerns related to the outbreak of the Zika virus may have an adverse effect on tourism inflows. Although the number of cases has been limited so far, the risk of the virus spreading could have significant negative consequences on tourism arrivals and economic growth, reversing the recent economic recovery.

In contrast, growth prospects are deteriorating for commodity-based economies. After a period of significantly higher growth, these countries are falling behind the tourism-based economies on average, although there is a wide cross-country heterogeneity regarding the size of the negative shock. *Suriname* and *Trinidad and Tobago* are most affected because they depend on exports of fossil fuels and other commodities whose prices are falling rapidly. For *Belize* and *Guyana*, however, positive offsets from other parts of the economy— tourism in the former and oil imports in the latter—dampen the negative impact. External imbalances have widened significantly in these economies, where current account deficits reached

close to 8 percent of GDP on average in 2015.[3] As a result, international reserves have declined while exchange rate intervention has been used to stem depreciation pressures on the pegged exchange rates. Suriname devalued its currency by 20 percent in November 2015 as reserves continued to drain. Fiscal balances have also deteriorated in some commodity exporters, partly reflecting a countercyclical policy response. In some cases, the weakening fiscal position is undermining long-term sustainability. With key commodity prices expected to stay low for some time, the outlook remains challenging for some commodity exporters.

Overall, growth in the Caribbean region is expected to register about 3½ percent in 2016 and 2017. Immediate downside risks from real effective exchange rate appreciation, further U.S. monetary policy tightening, and failure to contain the Zika virus epidemic outweigh the upside risk related to citizenship by investment programs. Other risks include potential tourist diversion to Cuba and natural disasters.

Policy Priorities

Addressing fiscal vulnerabilities remains an overarching objective for most Caribbean countries, and important efforts have been made. Some countries have strengthened their overall fiscal balances in 2015 (notably, The Bahamas, Grenada, Guyana, and Haiti). In addition, Jamaica finalized the buyback of PetroCaribe debt, instantly reducing its debt by 10 percent of GDP in 2015, and Grenada successfully completed a debt restructuring operation, which would lower its debt by 13 percent of GDP by 2017. Despite this progress, public debt remains high, particularly in tourism-dependent economies. These economies should use the opportunity offered by still favorable external financial

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[3]Following a major effort supported by IMF technical assistance to create international investment positions accounts and improve external current account data, preliminary revisions of 2014 data show large improvements in Eastern Caribbean Currency Union countries' current accounts, reaching in some cases 10 percent of GDP. The revisions are currently being assessed in light of the substantive methodological changes.

Figure 2.25. Economic Activity in the Caribbean

1. Real GDP Growth
(Year-over-year percent change)

— Tourism-dependent
— Commodity exporters

2. Tourist Arrivals, 2014:H1–2015:H1
(Cumulative percentage change)

Caribbean average[1]

3. Overall Fiscal Balance
(Percent of fiscal year GDP)

— Tourism-dependent
— Commodity exporters

4. Current Account[2]
(Percent of GDP)

— Tourism-dependent
— Commodity exporters
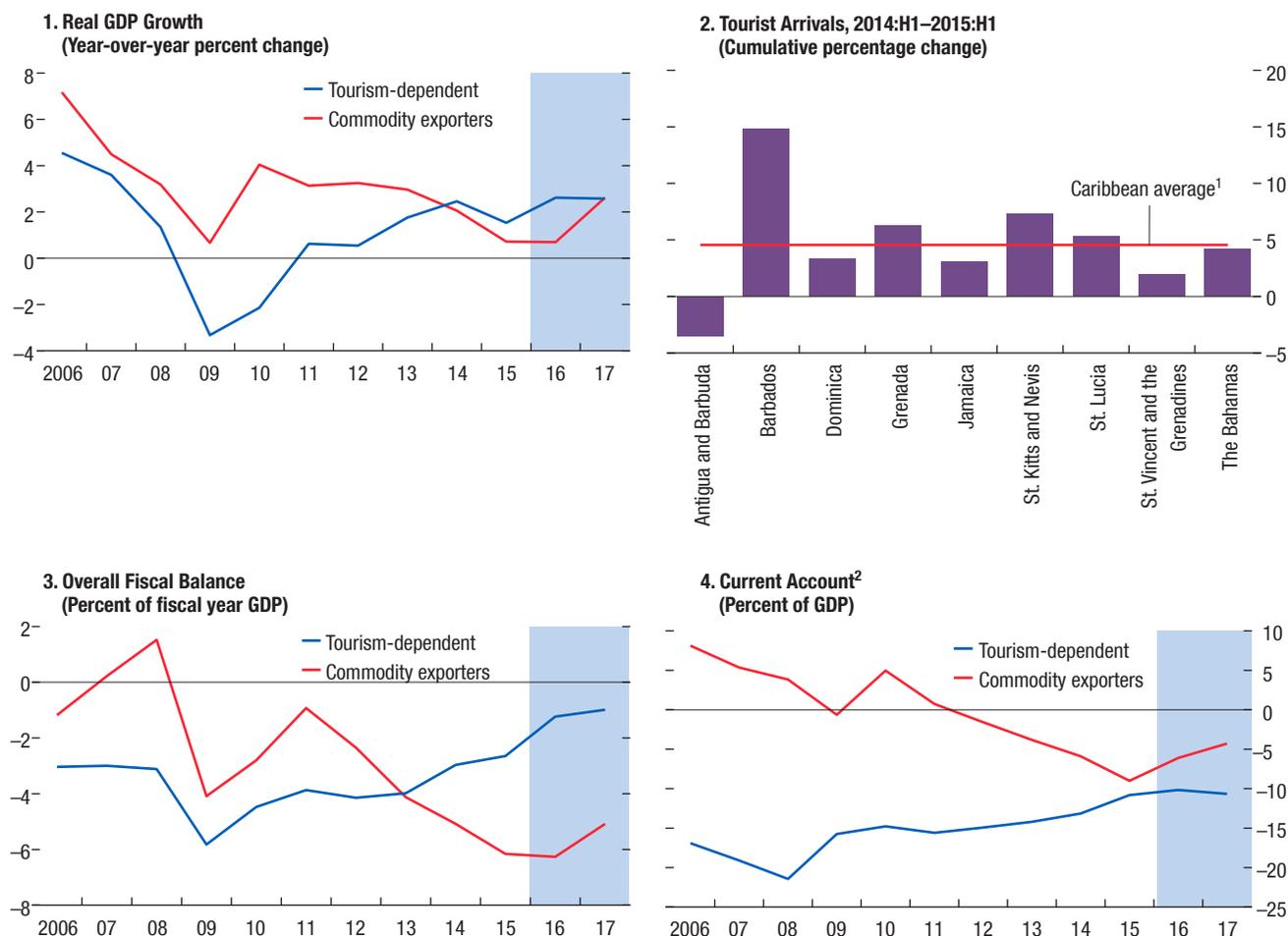
Sources: Caribbean Tourism Organization; Eastern Caribbean Central Bank (ECCB); IMF, World Economic Outlook database; national authorities; and IMF staff calculations.
Note: For country group information, see page 107. Aggregates are simple averages.
[1]Caribbean average includes Antigua and Barbuda, The Bahamas, Barbados, Dominica, Grenada, Jamaica, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines.
[2]Data for the Eastern Caribbean Currency Union countries do not reflect ECCB provisional estimates for 2014 following a fundamental revision in balance of payments methodology. The ECCB will release final numbers for 2014 in November 2016.

conditions to make significant inroads toward ensuring debt sustainability.

In this regard, countries prone to natural disasters should explicitly consider the costs associated with these events in their macroeconomic and fiscal frameworks, while their investment in public infrastructure should aim at improving the economy's resilience to disasters (Box 2.4). Also, Eastern Caribbean Currency Union (ECCU)

countries, after committing to new regional debt targets by 2030, should articulate a credible plan to attain those targets. For some commodity exporters, fiscal adjustment is also necessary for maintaining macroeconomic stability and addressing the new vulnerabilities created by low commodity prices. For those countries that have the fiscal space to cushion the negative shock, containing fiscal deficits to preserve sustainability and avoid undermining confidence will be important.

Where appropriate, commodity exporters should consider allowing more exchange rate flexibility to help their economies adjust to the new equilibrium and prevent the drain of international reserves.

Tourism-based economies should take advantage of the current tourism upswing to push through structural measures that would improve the quality of the tourism product while lowering costs. Consumers already pay a premium to holiday in the Caribbean when compared with beach-goers in other parts of the world (Figure 2.26). As measured in the "Week-@-the-Beach" index—borrowing from *The Economist*'s Big Mac Index—a typical basket of goods and services consumed during a one-week beach holiday costs about 50 percent more in the Caribbean, on average, than in some destinations in Central America or

Cuba.[4] For some Caribbean countries classified as "high-end" destinations, where consumer price elasticities are lower or negligible, efforts are needed to ensure that product and service quality remain commensurate with their high-end brand (Laframboise and others 2014). In lower-cost destinations, where price elasticities are greater, a focus on lowering the costs of energy, labor, and transportation is key. These countries should also be proactive in managing the Zika virus, including by prioritizing its containment.

Strengthening the financial sector continues to be necessary. Banks in the ECCU are still burdened by high nonperforming loans, a legacy

[4]Note that this index does not incorporate non-price factors; for example, tourist attractions or security issues.

Figure 2.26. Week at the Beach Index: Travelocity
(Three-star hotel average; index: The Bahamas = 100)
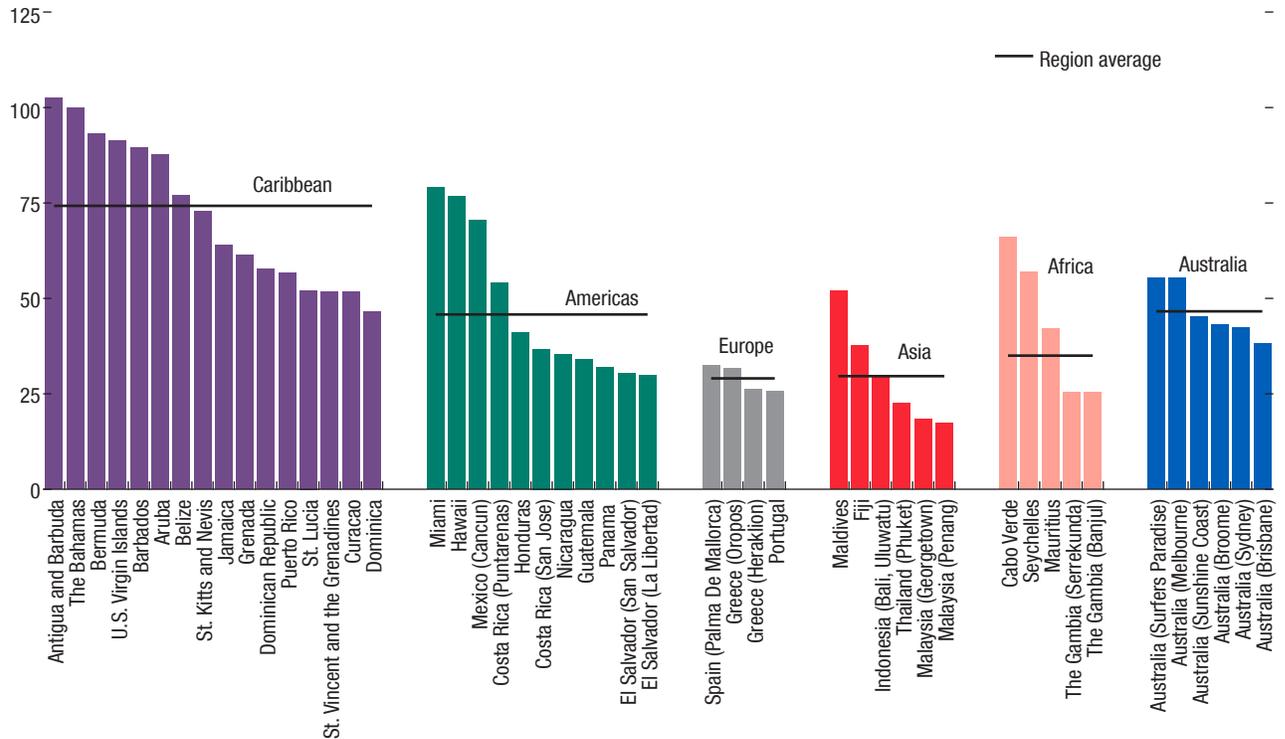
Sources: Room rate: see http://www.travelocity.com/, average room rate is from January 9 to January 16, 2016, access date: December 3, 2015. Taxi, meals, water, beer, coffee: see http://www.numbeo.com/cost-of-living/ and http://www.worldcabfares.com/index.php, access date: December 3, 2015.

of the global financial crisis, and are unable to fully support the economy. The ECCU strategy for indigenous bank resolution has advanced, with the completion of legal reforms and asset quality reviews, and the resolution of a troubled bank in Antigua in November 2015. The Eastern Caribbean Central Bank (ECCB) continues to work with the Government of Anguilla in its consultations with the U.K. government to implement the resolution strategy in Anguilla. Progress in cleaning up banks' balance sheets, however, continues to be hindered by delays in implementation at the national level and in some cases by a lengthy foreclosure process. The ECCB is stepping up its efforts with the establishment of a regional asset management company, expected in April 2016, and with the implementation of an action plan based on the results of the recently completed asset quality review. Restoring the health of the banking sector requires completing the implementation of the regional strategy and strengthening the legal foreclosure and insolvency frameworks. Another key issue is de-risking by global banks, which may potentially disrupt bank operations in many Caribbean countries. The impact of de-risking has been limited so far because local banks have been able on the whole to maintain their correspondent banking relationships or find new ones, but the risk of disruptions to trade and remittances—resulting in lower bank profitability—remains significant. Although the IMF, in cooperation with other international organizations, is working to assist these countries in defining the appropriate policy response, efforts to increase transparency in banking systems and achieve full compliance with Financial Action Task Force and prudential standards would be helpful.

Many long-standing impediments constrain potential growth and raise unemployment in Caribbean countries. Efforts should continue to advance energy reform, which is needed to reduce dependence on fossil fuels, improve efficiency, and reduce costs (McIntyre and others 2016). Improving the business environment is also necessary to enhance productivity; addressing costs at ports and customs would eliminate a key competitive disadvantage. Finally, refocusing education systems is necessary to strengthen educational attainment and mitigate labor skills mismatches.

Box 2.1. External Adjustment and the Role of the Real Exchange Rate

Following a marked deterioration in their terms of trade, commodity exporters with flexible exchange rates have faced large currency depreciations against the U.S. dollar. In many cases, these depreciations have been large with respect to each country's recent history (Figure 2.1.1). In bilateral terms versus the U.S. dollar, the depreciations in Brazil, Chile, Colombia, and Mexico are among the largest in the past 20 years. In real effective terms, they have been larger and markedly more persistent than those following the global financial crisis—a reflection of the more permanent nature of the recent terms-of-trade shock. In Brazil and Colombia, real effective depreciations are among the largest in the past 35 years.

In general, large drops in the relative value of the currency are expected to lead to external rebalancing, reducing imports as residents lose purchasing power abroad, and boosting exports as competitiveness rises. But in many countries, exports have been flat and current account deficits on the rise. How can these developments be reconciled?

There are several possible reasons why exports have not seen a larger boost following the exchange rate depreciations. First, structural factors such as a lack of diversification or factor market rigidities could make exports slow to respond in the face of exchange rate movements. Second, external demand has decelerated markedly—particularly for South American exporters that do considerable trade with China (Figure 2.1.2). Finally, the U.S. dollar has appreciated against the vast majority of emerging market currencies, such that Latin American exporters have gained less competitiveness than their dollar exchange rates would suggest.

To disentangle the dynamics of external adjustment in LAC over the past 20 years, we estimate country-by-country vector autoregressive models that include demand from trading partners, the commodity terms of trade, the real effective exchange rate, and the volume of exports. We impose small open economy restrictions on the external variables, and identify shocks using a recursive ordering. In most Latin American countries, export volumes tend to respond vigorously to changes in external demand, rising at least one for two after one year, and somewhat more in the following year (Figure 2.1.3). Export volumes have also responded to shocks to the real exchange rate, with a 10 percent depreciation triggering an increase of between 2 percent and 5 percent in Brazil, Chile, and Colombia, and of more than 8 percent in Peru.

The estimated structural shocks are used to undertake a historical decomposition of recent developments. Since the end of the commodity super cycle, the deterioration of external demand and the commodity terms of trade explain the majority of the exchange rate depreciations in Brazil, Chile, Colombia, and Mexico. We also find that the recent deceleration of external demand has placed a strong drag on the export performance of Brazil, Chile, and Peru, and somewhat of a drag on that of Colombia. Meanwhile, strong external demand has boosted real exports in Mexico during 2015.

Chapter 3 of the October 2015 *World Economic Outlook* studied the link between exchange rates and international trade around the world, finding that (1) a 10 percent depreciation of the real exchange rate leads to a 1.5 percent of GDP increase in real net exports, (2) much of this adjustment takes place within one year, and (3) there is little evidence of a change over time. Might structural factors prevent Latin American exports from responding the same way? We compute corresponding estimates for Latin America and the Caribbean (LAC), and find that trade in the region displays sensitivity to exchange rate depreciations that is similar to what is found for the rest of the world (Figure 2.1.4).

Note: This box was prepared by Yan Carrière-Swallow. Ehab Tawfik provided excellent research assistance. We thank Daniel Leigh and Marcos Poplawski-Ribeiro for kindly sharing the data and code used to replicate results from IMF (2015a).

Box 2.1 *(continued)*

Figure 2.1.1. Recent Exchange Rate Movements in Historical Perspective
(Index: current episode start date = 100; + = appreciation; 18 months on horizontal axis)

Sources: IMF, Information Notice System database; IMF, International Financial Statistics database; and IMF staff calculations.

[1]Confidence bands report the empirical distribution of changes in the exchange rate, based on all 18-month trajectories for the given country since January 1995 (bilateral exchange rates with respect to the U.S. dollar) and January 1980 (real effective exchange rates, REER).

[2]The worst episode corresponds to the largest year-over-year REER depreciation since January 1980, with start date varying by country: March 1998 (Brazil), March 1982 (Chile), March 1985 (Colombia), October 1981 (Mexico), and September 1984 (Peru).

Box 2.1 *(continued)*

Figure 2.1.2. Diverging External Demand: Growth Rate of Trading Partners' Total Imports
(Annual percent change)
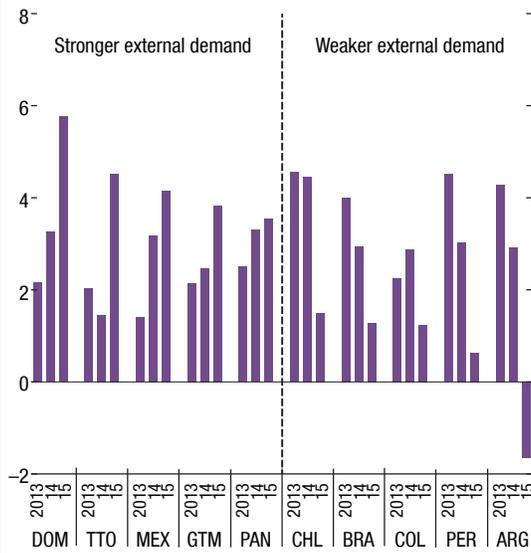
Source: IMF staff calculations.
Note: Data labels use International Organization for Standardization (ISO) country codes, see page 108.

Figure 2.1.3. Response of Export Volumes to External Demand and REER Shocks
(Elasticity)
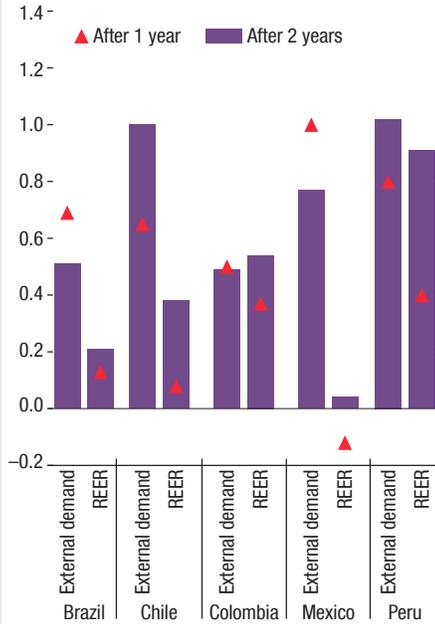
Source: IMF staff calculations.
Note: REER = real effective exchange rate.

Figure 2.1.4. Trade Elasticities
(Ten-year rolling windows ending in year t)

1. Exchange Rate Pass-Through to Export Prices
2. Price Elasticities of Export Volumes
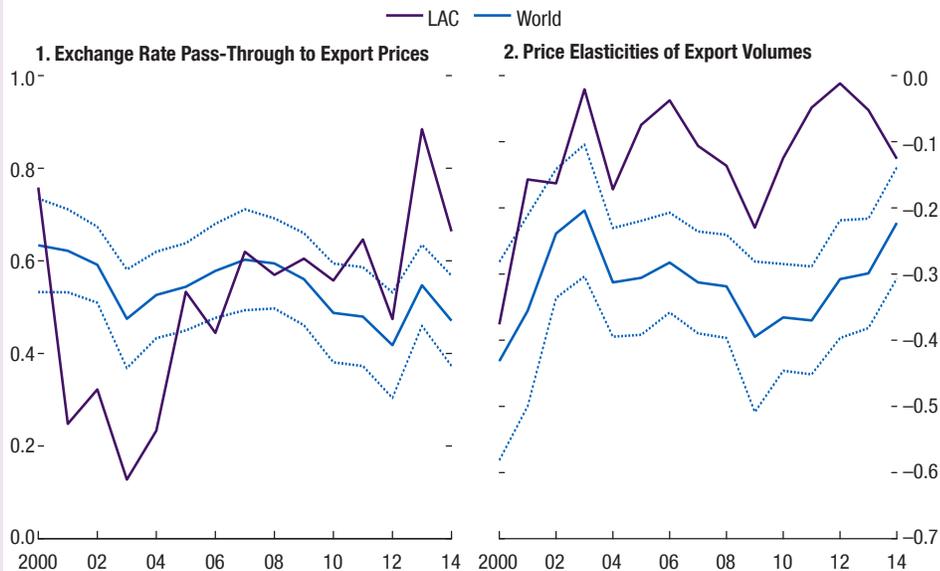
Source: IMF staff calculations.
Note: Figure is based on panel estimates using producer-price index-based real effective exchange rate and export prices relative to foreign producer prices. World sample spans 88 advanced and emerging market and developing economies from 1990 to 2014. Dashed lines denote 90 percent confidence intervals. LAC = Latin America and the Caribbean.

Box 2.2. Downside Risk Scenarios

China is expected to decelerate to a more sustainable level of growth, which will include a gradual rebalancing from investment to consumption (Chapter 1). But what if the transition is bumpier than expected? This box considers a risk scenario in which China suffers a cyclical slowdown as a result of a sudden bout of financial market turmoil. In such a scenario, a broad set of financial and real estate assets fall in value and corporate risk premiums increase, triggering capital outflows and a depreciation of the currency of about 15 percent and generating a large fall in investment and output. No policy response is assumed, apart from automatic stabilizers. Although the shock is cyclical, its impact on the Chinese economy is quite persistent, pushing growth below the baseline by 2 percent in 2016 and 2017. This substantial reduction in Chinese demand pushes global commodity prices down, with the largest reduction felt in minerals and fuel, and smaller corrections in world food prices. Through direct trade linkages and broader commodity price effects, this generates heterogeneous effects throughout Latin America, even among commodity exporters.

In addition, such a large financial shock in China could trigger an increase in global risk aversion that causes a repricing of sovereign debt in emerging markets, including Latin America. Under such a stress scenario, the Chicago Board Options Exchange Volatility Index (VIX) is assumed to increase by about one standard deviation—equivalent to what was observed in August 2015. Here again, the sensitivity of Latin American sovereign spreads to this VIX shock varies considerably across countries. While the impact is estimated to be quite large in Brazil, Colombia, Peru, and Uruguay (+100 basis points), it is expected to be more modest in Chile, Mexico, and Paraguay (+50 basis points).

Figure 2.2.1. China Slowdown and Global Risk Aversion Shocks: Estimated Impact on GDP Growth
(Percent change)

Source: IMF staff calculations.

The impact of these events is analyzed using a variant of the IMF's G20MOD model that has been modified to include additional granularity about Latin American economies. The model takes into account the bilateral trade linkages between countries, and allows for markets and policies to respond endogenously following the shock. Based on model simulations, the cyclical slowdown in China could reduce growth in Latin America and the Caribbean by about ¼ percentage point in 2016 relative to the *World Economic Outlook* baseline. In addition, an increase in sovereign risk premiums triggered by higher global risk aversion would cut growth by another ¼ percentage point (Figure 2.2.1). The overall impact declines in 2017 but is still negative (total of about 0.2 percentage point).

Note: This box was prepared by S. Pelin Berkmen and Yan Carrière-Swallow. Model simulations were performed by Allan Dizioli, Keiko Honjo, and Ben Hunt.

Box 2.3. Potential Growth and Output Gap in Central America

Potential output growth across Central America has declined in recent years and is expected to continue at a similar rate, owing to weak investment, somewhat stagnant employment creation, and low growth in total factor productivity (TFP—Figures 2.3.1 and 2.3.2). Low TFP may reflect reduced investment in innovation through research and development associated with the crisis, as well as continued weaknesses in the institutional, regulatory, and legal environments. For most countries, this decline started after the global financial crisis, except in Panama. Although potential growth has recovered somewhat in the past two years in the Dominican Republic, Guatemala, and El Salvador, it is still well below precrisis rates (only in Nicaragua has it fully recovered to precrisis rates). El Salvador has the lowest potential growth in Central America (1.8 percent), and all economies except Panama exhibit lower potential growth compared with the average of other emerging markets (5.4 percent).

This slowdown follows an earlier pickup in potential growth from about $3\frac{1}{3}$ percent in 2001 to $5\frac{1}{3}$ percent in 2007, with Costa Rica, the Dominican Republic, and Panama driving much of the increase. Capital accumulation and the acceleration in TFP explain the increase in potential growth in Costa Rica, the Dominican Republic, Nicaragua, and Panama, and somewhat for Honduras. In El Salvador and Guatemala the drivers were employment creation and less of a drag from TFP. Abstracting from measurement errors, productivity shortfalls in El Salvador, Guatemala, Honduras, and Nicaragua may reflect lags in investment in research and development and in the adoption and development of new technologies, lower human capital growth, and a weak business environment. Also, shifts of resources to higher-productivity sectors, and greater diversification of exports and economic complexity likely contributed to the high TFP growth in Costa Rica, the Dominican Republic, and Panama. Capital goods imports were booming in most of these economies in the mid-2000s and as a consequence physical capital was overhauled, which supported an increase in potential growth in most economies (this was not the case in El Salvador and Nicaragua). Employment creation, through higher working-age population growth (resulting from lower mortality rates and higher life expectancy, or high population growth), explains the increase in potential growth in El Salvador and Guatemala.

Figure 2.3.1. Potential Output Growth
(Percent)

Source: IMF staff calculations.
Note: Data labels use International Organization for Standardization (ISO) country codes, see page 108.

From a cyclical perspective, there are no indications of significant economic slack in Central America, apart from Costa Rica. Headline inflation has been declining since 2012 in most Central American economies, especially more recently with lower oil prices lowering transport and electricity prices. Core inflation has fallen in most Central American economies, with the exception of Nicaragua where it has picked up since last year. In Costa Rica, growth slowed further in 2015, owing to the lingering effect of Intel's withdrawal and adverse weather conditions for the main agricultural export crops, resulting in a moderate output gap (Figure 2.3.3).

Note: This box was prepared by Iulia Teodoru. Potential output estimates are based on the use of a multivariate filter—see Laxton and Tetlow (1992), Kuttner (1994), Benes and others (2010), and Blagrave and others (2015)—that incorporates information on the relationship between cyclical unemployment and inflation (Phillips curve) and between cyclical unemployment and the output gap (Okun's law).

Box 2.3 *(continued)*

Figure 2.3.2. Determinants of Potential Output Growth
(Percent; contributions to potential output growth; average for the period)

Legend: Capital, Labor, Total factor productivity, Potential output growth

Source: IMF staff calculations.

Figure 2.3.3. Output Growth
(Percent)

Source: IMF staff calculations.
Note: Data labels use International Organization for Standardization (ISO) country codes, see page 108.

Box 2.4. Incidence and Effects of Natural Disasters in the Caribbean

The Caribbean region is one of the most disaster-prone areas in the world. As measured by disasters per square kilometer, of the 21 islands in the Caribbean, 19 rank among the top-50 countries worldwide in frequency of natural disasters. Furthermore, the countries in the Eastern Caribbean Currency Union (ECCU) are all in the top 25.[1] From 1950 to 2014, more than 350 disasters have afflicted the region, most of which (63 percent) were tropical cyclones (usually hurricanes), and floods (25 percent).[2] This leaves the Caribbean extremely vulnerable to frequent disasters; on average there is a 29 percent probability that a country will be hit by at least one disaster in any given year.

The costs of these disasters are high. The Caribbean has experienced annual average damages equivalent to 1.7 percent of GDP, affecting on average 1 percent of the population since the 1950s. The effects of these disasters on growth and debt are considerable. For example, Strobl (2012) finds that the average hurricane reduces output by nearly 1 percent. Acevedo (2014) shows a similar result for severe storms, and a smaller impact of moderate storms on growth of ½ a percentage point (Figure 2.4.1). Economic activity usually rebounds one year after the disaster because of reconstruction; however, this rebound is generally short-lived and smaller than the initial shock, resulting in a negative cumulative impact on GDP. The impact on debt is more dramatic, with the debt-to-GDP ratio increasing by almost 5 percentage points the year a storm strikes an ECCU country (Acevedo 2014).

Possible policy interventions could mitigate the impact on output. Noy (2009) finds that higher levels of human capital, better institutions, more openness to trade, and higher levels of government spending reduce the macroeconomic costs of a natural disaster. Furthermore, larger foreign exchange reserves and domestic credit levels also help a country to withstand the effects of natural disasters.

A critical first step is for countries in the Caribbean to recognize the natural disaster risks they face and internalize the costs in their macroeconomic and fiscal projections. This will help create the necessary fiscal space to build buffers against future shocks and to invest in building physical resilience, and in adaptation measures such as early warning systems and better building codes. It will also be important to expand the role of insurance, both in the private and public sectors, to spread risks.

Note: This box was prepared by Sebastian Acevedo.
[1] The countries that are members of the ECCU are Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines.
[2] Data on natural disasters from EM-DAT (http://www.emdat.be/).

Box 2.4 *(continued)*

Figure 2.4.1. Effects of Natural Disasters on Growth and Debt

Mean response ----- Confidence interval

1. Response of GDP Growth to a Storm Shock
(Percentage points)

2. Response of Debt-to-GDP Ratio Growth to a
Storm Shock
(Percentage points)

Time (years)
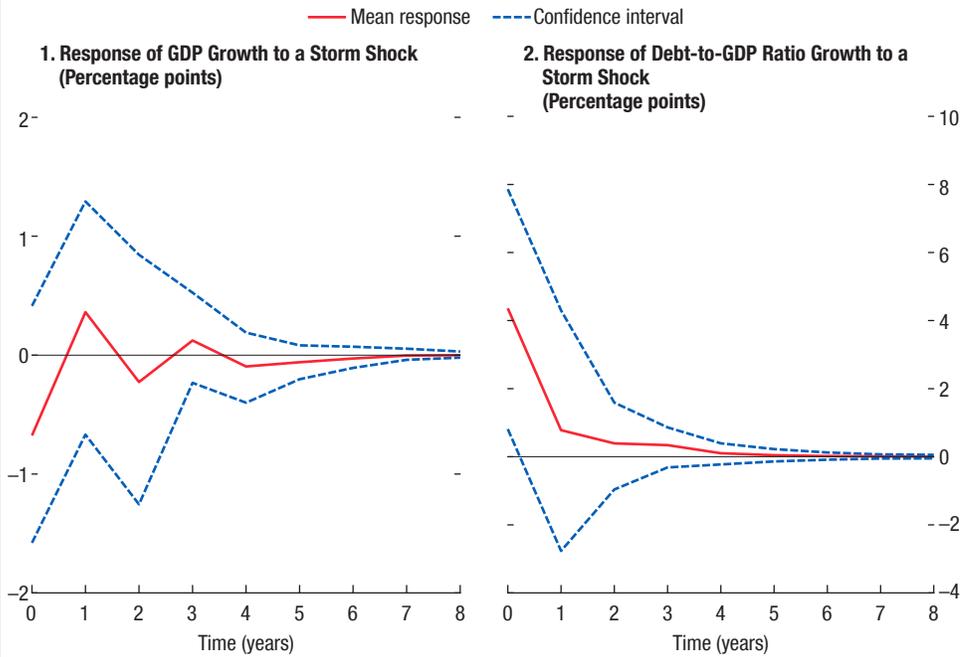
Source: Acevedo (2014).
Note: The panels depict the response of real GDP growth and the percent change in the debt-to-GDP ratio to a moderate storm shock (red line), estimated from a panel vector autoregressive model for 12 Caribbean countries over 40 years. Panel 2 shows the results for the Eastern Caribbean Currency Union. A number below zero indicates a slowdown in real growth or a decrease in debt-to-GDP ratio compared to the baseline, and a positive number shows real growth above the baseline, or an increase in the debt-to-GDP ratio.

Annex 2.1. Disclaimer

The GDP data for Argentina before 2015 reflect official data, while for 2015 the data reflect IMF staff estimates. On February 1, 2013, the IMF issued a declaration of censure, and in June 2015 called on Argentina to implement additional specified actions to address the quality of its official GDP data according to a specified timetable. The new government that took office in December 2015 has announced its determination to improve the quality of GDP statistics. The Managing Director will report to the Executive Board on this issue again by July 15, 2016. At that time, the Executive Board will review the issue in line with IMF procedures.

The consumer price data for Argentina before December 2013 reflect the CPI for the Greater Buenos Aires Area (CPI-GBA), while from December 2013 to October 2015 the data reflect the national CPI (IPCNu). Given the differences in geographical coverage, weights, sampling, and methodology of the two series, and the authorities' decision in December 2015 to discontinue the IPCNu, the average CPI inflation for 2014, 2015, and 2016 and end-period inflation for 2015 are not reported in the April 2016 *World Economic Outlook*. On February 1, 2013, the IMF issued a declaration of censure and in June 2015 called on Argentina to implement additional specified actions to address the quality of its official CPI data according to a specified timetable. The new government that took office in December 2015 has stated that it considers that the IPCNu is flawed and announced its determination to discontinue it and to improve the quality of CPI statistics. It has temporarily suspended the publication of CPI data to review sources and methodology. The Managing Director will report to the Executive Board on this issue again by July 15, 2016. At that time, the Executive Board will review the issue in line with IMF procedures.

Table 2.1. Western Hemisphere: Main Economic Indicators[1]

	Output Growth (Percent)					Inflation[2] (End of period, percent)					External Current Account Balance (Percent of GDP)				
	2013	2014	2015 Est.	2016 Proj.	2017 Proj.	2013	2014	2015 Est.	2016 Proj.	2017 Proj.	2013	2014	2015 Est.	2016 Proj.	2017 Proj.
North America															
Canada	2.2	2.5	1.2	1.5	1.9	1.0	1.9	1.3	1.4	2.0	–3.2	–2.3	–3.3	–3.5	–3.0
Mexico	1.3	2.3	2.5	2.4	2.6	4.0	4.1	2.1	3.3	3.0	–2.4	–1.9	–2.8	–2.6	–2.6
United States	1.5	2.4	2.4	2.4	2.5	1.3	0.6	0.8	0.8	2.2	–2.3	–2.2	–2.7	–2.9	–3.3
Puerto Rico[3]	0.0	–0.1	–1.3	–1.3	–1.4	0.8	0.1	–0.2	–0.6	1.2	…	…	…	…	…
South America															
Argentina[4]	2.9	0.5	1.2	–1.0	2.8	10.9	23.9	…	25.0	20.0	–0.7	–1.4	–2.8	–1.7	–2.2
Bolivia	6.8	5.5	4.8	3.8	3.5	6.5	5.2	3.0	5.0	5.0	3.4	0.2	–6.9	–8.3	–7.1
Brazil	3.0	0.1	–3.8	–3.8	0.0	5.9	6.4	10.7	7.1	6.0	–3.0	–4.3	–3.3	–2.0	–1.5
Chile	4.0	1.8	2.1	1.5	2.1	2.8	4.7	4.4	3.5	3.0	–3.7	–1.3	–2.0	–2.1	–2.7
Colombia	4.9	4.4	3.1	2.5	3.0	1.9	3.7	6.8	5.3	3.3	–3.3	–5.2	–6.5	–6.0	–4.3
Ecuador	4.6	3.7	0.0	–4.5	–4.3	2.7	3.7	3.4	0.8	0.0	–1.0	–0.6	–2.9	–2.3	–0.2
Guyana	5.2	3.8	3.0	3.4	3.5	0.9	1.2	–1.8	2.1	2.1	–14.3	–12.6	–4.8	–5.2	–7.6
Paraguay	14.0	4.7	3.0	2.9	3.2	3.7	4.2	3.1	4.5	4.5	1.7	–0.4	–1.8	–1.2	–1.1
Peru	5.9	2.4	3.3	3.7	4.1	2.9	3.2	4.2	3.4	2.5	–4.3	–4.0	–4.4	–3.9	–3.3
Suriname	2.8	1.8	0.1	–2.0	2.5	0.6	3.9	25.0	26.0	8.0	–3.8	–8.0	–15.6	–8.0	0.8
Uruguay	5.1	3.5	1.5	1.4	2.6	8.5	8.3	9.4	9.1	8.1	–4.9	–4.3	–3.9	–3.9	–3.7
Venezuela[5]	1.3	–3.9	–5.7	–8.0	–4.5	60.0	68.5	180.9	720.0	2200.0	2.0	1.4	–7.6	–6.6	–2.5
Central America															
Belize	1.5	3.6	1.5	2.5	2.7	1.6	–0.2	–0.7	0.8	2.3	–4.4	–7.6	–10.2	–6.8	–6.7
Costa Rica	1.8	3.0	3.7	4.2	4.2	3.7	5.1	–0.8	3.0	3.0	–5.0	–4.7	–4.0	–4.2	–4.3
El Salvador	1.8	2.0	2.4	2.5	2.6	0.8	0.5	1.0	1.9	2.0	–6.5	–4.7	–3.2	–3.0	–4.1
Guatemala	3.7	4.2	4.0	4.0	3.9	4.4	2.9	3.1	4.0	4.0	–2.5	–2.1	–0.5	–0.7	–1.0
Honduras	2.8	3.1	3.6	3.5	3.7	4.9	5.8	2.4	4.0	5.4	–9.5	–7.4	–6.4	–5.9	–5.9
Nicaragua	4.5	4.7	4.5	4.5	4.3	5.7	6.5	3.1	6.1	6.8	–11.1	–7.1	–8.8	–8.8	–10.0
Panama[6]	6.6	6.1	5.8	6.1	6.4	3.7	1.0	0.3	0.8	2.0	–9.8	–9.8	–6.5	–6.1	–5.0
The Caribbean															
Antigua and Barbuda	1.5	4.2	2.2	2.0	2.4	1.1	1.3	0.9	1.4	2.2	–14.8	–14.5	–10.0	–6.2	–7.0
The Bahamas	0.0	1.0	0.5	1.5	1.5	1.0	0.2	2.0	0.8	1.1	–17.7	–22.3	–11.7	–9.8	–8.9
Barbados	0.0	0.2	0.5	2.1	2.3	1.1	2.3	–0.7	0.4	1.9	–9.1	–8.9	–5.2	–4.6	–5.1
Dominica	0.6	3.9	–4.3	4.9	3.5	–0.4	0.5	–0.1	–0.1	1.8	–13.3	–13.1	–14.1	–16.6	–19.2
Dominican Republic	4.8	7.3	7.0	5.4	4.5	3.9	1.6	2.3	3.3	4.0	–4.1	–3.2	–1.9	–1.7	–2.2
Grenada	2.4	5.7	4.6	3.0	2.5	–1.2	–0.6	–1.2	–0.1	2.8	–23.2	–15.5	–15.1	–12.2	–13.8
Haiti[7]	4.2	2.7	1.0	2.3	3.3	4.5	5.3	11.3	10.4	7.0	–6.3	–6.3	–2.4	–1.9	–2.3
Jamaica	0.2	0.5	1.1	2.2	2.5	9.5	6.4	3.0	5.3	6.5	–8.8	–7.1	–4.3	–2.9	–2.6
St. Kitts and Nevis	6.2	6.1	6.6	4.7	2.8	1.0	–0.6	–2.9	0.2	1.3	–6.6	–7.6	–13.0	–18.4	–19.1
St. Lucia	0.1	0.5	1.6	1.4	1.9	–0.7	3.7	–2.1	–0.7	2.3	–11.2	–6.7	–7.5	–7.9	–8.6
St. Vincent and the Grenadines	2.3	–0.2	1.6	2.2	3.1	0.0	0.1	–1.7	1.1	1.7	–30.9	–29.6	–24.8	–21.3	–20.0
Trinidad and Tobago	2.3	–1.0	–1.8	–1.1	1.8	5.7	8.5	1.5	4.6	4.7	7.3	4.6	–5.4	–4.4	–3.7
Memorandum															
Latin America and the Caribbean	**3.0**	**1.3**	**–0.1**	**–0.5**	**1.5**	**4.5**	**5.0**	**6.2**	**5.0**	**4.2**	**–2.6**	**–3.1**	**–3.6**	**–2.8**	**–2.4**
South America[8]	5.2	2.3	0.9	–0.1	1.2	4.4	4.9	5.6	4.8	4.1	–1.4	–2.0	–4.2	–3.8	–2.9
CAPDR[9]	3.7	4.3	4.4	4.3	4.2	3.9	3.3	1.6	3.3	3.9	–6.9	–5.6	–4.5	–4.3	–4.6
Caribbean															
Tourism-dependent[10]	1.5	2.4	1.6	2.7	2.5	1.2	1.5	–0.3	0.9	2.4	–15.1	–13.9	–11.7	–11.1	–11.6
Commodity exporters[11]	3.0	2.1	0.7	0.7	2.6	2.2	3.3	6.0	8.4	4.2	–3.8	–5.9	–9.0	–6.1	–4.3
Eastern Caribbean Currency Union[12]	1.7	2.9	2.2	2.6	2.5	0.0	1.2	–1.0	0.2	2.1	–16.8	–14.3	–12.2	–11.7	–12.5

Sources: IMF, World Economic Outlook database; and IMF staff calculations and projections.

[1] Regional aggregates are purchasing-power-parity GDP-weighted averages unless otherwise noted. Current account aggregates are U.S. dollar nominal GDP weighted averages. CPI series excludes Argentina and Venezuela. Consistent with the IMF, *World Economic Outlook*, the cut-off date for the data and projections in this table is March 25, 2016.

[2] End-of-period (December) rates. These will generally differ from period average inflation rates reported in the IMF, *World Economic Outlook*, although both are based on identical underlying projections.

[3] The Commonwealth of Puerto Rico is classified as an advanced economy. It is a territory of the United States but its statistical data are maintained on a separate and independent basis.

[4] See Annex 2.1 for details on Argentina's data.

[5] Projecting the economic outlook in Venezuela is complicated by the lack of any Article IV consultation since 2004 and delays in the publication of key economic data.

[6] Ratios to GDP are based on the "2007-base" GDP series.

[7] Fiscal year data.

[8] Simple average of Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela. CPI series exclude Argentina and Venezuela.

[9] Simple average of Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

[10] Simple average of The Bahamas, Barbados, Jamaica, and ECCU member states.

[11] Simple average of Belize, Guyana, Suriname, and Trinidad and Tobago.

[12] Eastern Caribbean Currency Union (ECCU) members are Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines, as well as Anguilla and Montserrat, which are not IMF members.

Table 2.2 Western Hemisphere: Main Fiscal Indicators[1]

	Public Sector Primary Expenditure (Percent of GDP)					Public Sector Primary Balance (Percent of GDP)					Public Sector Gross Debt (Percent of GDP)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
			Est.	Projections				Est.	Projections				Est.	Projections	
North America															
Canada	37.0	35.8	37.2	38.0	37.5	−1.2	0.0	−0.7	−1.8	−1.5	86.1	86.2	91.5	92.3	90.6
Mexico[2]	25.5	25.3	24.8	22.7	21.8	−1.2	−1.9	−1.3	−0.5	0.2	46.4	49.5	54.0	54.9	54.9
United States[3]	33.6	33.1	33.2	33.3	32.9	−2.4	−2.1	−1.8	−1.8	−1.6	104.8	105.0	105.8	107.5	107.5
Puerto Rico[4]	...	20.2	19.8	20.1	19.8	...	−0.9	−0.1	−0.1	0.5	52.3	53.9	53.1	56.0	57.7
South America															
Argentina[5]	34.4	36.9	42.6	40.6	38.8	−2.4	−3.4	−6.1	−4.8	−3.3	41.5	45.1	56.5	60.7	60.9
Bolivia[6]	37.5	42.3	40.9	39.6	38.4	1.6	−2.4	−5.6	−5.7	−5.4	32.5	33.0	39.7	45.6	48.3
Brazil[7]	31.6	32.9	33.6	33.2	32.8	1.7	−0.6	−1.9	−1.7	−1.4	60.4	63.3	73.7	76.3	80.5
Chile	22.6	23.3	25.2	25.8	26.8	−0.4	−1.4	−2.1	−2.8	−2.7	12.8	15.1	17.1	19.8	22.5
Colombia[8]	26.4	26.9	25.9	24.9	24.7	1.2	0.3	0.3	0.2	0.3	37.8	44.3	49.4	49.3	48.0
Ecuador[9]	42.9	43.0	37.9	31.6	27.6	−3.6	−4.3	−3.9	−1.1	3.3	25.9	31.2	34.5	38.0	37.9
Guyana[10]	29.1	30.2	28.6	32.4	31.4	−2.5	−3.8	−0.2	−3.7	−3.8	56.8	50.9	48.8	51.9	54.1
Paraguay	22.7	22.7	23.4	23.2	23.0	−0.7	0.1	−1.4	−1.4	−1.1	17.0	20.2	23.8	26.6	27.3
Peru	20.5	21.5	21.5	21.4	20.9	1.7	0.7	−1.3	−1.1	−0.1	20.3	20.7	23.1	25.3	25.5
Suriname[11]	32.2	31.3	28.3	25.5	25.7	−6.4	−7.0	−7.4	−4.4	−1.3	31.4	29.2	43.3	45.4	43.1
Uruguay[12]	29.1	29.3	28.3	29.0	28.8	0.4	−0.6	0.0	−0.5	−0.2	60.2	61.2	61.8	63.0	64.0
Venezuela[13]	35.0	38.3	37.8	37.3	36.7	−11.5	−11.9	−15.4	−23.4	−24.7	52.4	48.5	48.8	36.0	27.1
Central America															
Belize[10]	27.9	30.4	30.3	28.6	26.4	−0.2	−1.2	−2.6	−1.4	0.5	75.2	75.3	76.3	92.4	92.0
Costa Rica[10]	16.5	16.7	17.2	16.9	17.0	−2.8	−3.1	−3.0	−2.4	−1.5	36.0	39.3	42.4	45.0	47.3
El Salvador[14]	19.6	18.9	19.3	19.5	19.7	−1.2	−1.0	−0.8	−1.1	−1.2	55.3	56.8	58.9	59.5	61.8
Guatemala[10]	12.2	11.9	10.7	11.1	11.1	−0.6	−0.4	0.1	−0.2	−0.1	24.6	24.2	24.3	24.2	24.3
Honduras	28.5	26.6	25.6	25.5	25.5	−7.1	−3.8	−0.4	−0.6	−0.3	45.7	46.4	47.4	48.6	49.8
Nicaragua[14]	23.7	23.9	25.6	25.8	25.8	−0.2	−0.7	−1.0	−0.5	−0.5	29.8	29.5	31.2	31.6	32.2
Panama[15]	22.6	21.9	21.4	20.7	19.7	−0.5	−1.5	−1.1	−0.8	0.4	35.0	37.1	38.8	38.9	37.4
The Caribbean															
Antigua and Barbuda[16]	20.5	20.3	27.1	17.6	17.5	−1.7	−0.2	−5.6	6.7	7.1	95.5	98.2	102.1	95.6	88.1
The Bahamas[10]	20.4	20.3	21.5	21.8	22.1	−4.2	−3.2	−1.7	0.3	0.5	56.3	60.9	65.7	66.9	67.6
Barbados[17]	40.5	38.1	37.8	37.1	36.2	−6.6	−2.5	−2.3	−0.7	0.5	94.7	98.4	103.0	105.7	106.6
Dominica[16]	31.0	31.1	30.8	36.4	35.8	−1.0	−2.9	1.0	−0.2	2.4	74.7	81.1	82.4	83.1	81.3
Dominican Republic[14]	15.8	15.6	15.1	15.1	15.1	−1.2	−0.5	2.9	−0.5	−0.7	34.6	34.4	34.3	35.1	35.9
Grenada[16]	24.8	25.6	23.3	21.5	20.9	−3.9	−1.1	2.2	3.1	3.5	106.8	100.8	92.7	88.3	78.3
Haiti[10]	27.6	25.0	21.7	20.8	21.0	−6.7	−5.9	−2.3	−1.2	−1.3	21.5	26.5	30.4	35.2	36.2
Jamaica[16]	19.5	18.8	20.5	20.9	20.5	7.6	7.5	7.3	7.0	7.1	139.7	135.6	124.3	123.1	116.1
St. Kitts and Nevis[16]	29.2	29.7	29.1	27.3	26.5	16.0	12.2	7.7	5.4	3.4	100.4	80.2	65.5	59.6	56.0
St. Lucia[16]	27.4	25.4	27.6	27.8	27.8	−2.1	0.1	0.3	0.7	0.6	78.6	79.7	83.0	86.0	87.9
St. Vincent and Grenadines[16]	28.8	29.8	26.5	28.2	27.9	−4.1	−1.5	−0.2	0.1	0.3	74.7	80.6	73.6	80.3	81.7
Trinidad and Tobago[18]	34.2	35.3	38.0	37.7	36.0	−0.4	−2.3	−7.7	−8.0	−7.0	39.5	40.9	51.1	62.8	69.4
Memorandum															
Latin America and the Caribbean	**29.3**	**30.3**	**30.6**	**29.0**	**28.2**	**−0.3**	**−1.7**	**−2.7**	**−2.5**	**−1.7**	**48.2**	**51.0**	**56.4**	**57.3**	**58.6**
South America[19]	30.3	31.7	31.7	30.6	29.9	−1.2	−2.3	−3.7	−4.2	−3.5	36.1	38.3	42.8	44.1	44.2
CAPDR[20]	19.9	19.4	19.3	19.2	19.1	−1.9	−1.6	−0.5	−0.9	−0.5	37.3	38.2	39.6	40.4	41.2
Caribbean															
Tourism-dependent[21]	26.9	26.6	27.1	26.5	26.1	0.0	0.9	1.0	2.5	2.8	91.3	90.6	88.0	87.6	84.8
Commodity exporters[22]	30.9	31.8	31.3	31.1	29.9	−2.4	−3.6	−4.5	−4.3	−2.9	50.8	49.1	54.9	63.1	64.7
Eastern Caribbean Currency Union[16,23]	27.3	26.5	27.8	27.9	25.8	0.2	1.4	0.4	1.0	3.1	85.2	82.9	80.7	80.7	77.2

Sources: IMF, World Economic Outlook database; and IMF staff calculations and projections.

[1]Definitions of public sector accounts vary by country, depending on country–specific institutional differences, including on what constitutes the appropriate coverage from a fiscal policy perspective, as defined by the IMF staff. All indicators reported on fiscal year basis. Regional aggregates are purchasing–power–parity GDP–weighted averages, unless otherwise noted. Consistent with the IMF, *World Economic Outlook*, the cut–off date for the data and projections in this table is March 25, 2016.

[2]Includes central government, social security funds, nonfinancial public corporations, and financial public corporations.

[3]For cross–country comparability, expenditure and fiscal balances of the United States are adjusted to exclude the items related to the accrual basis accounting of government employees' defined benefit pension plans, which is counted as expenditure under the 2008 System of National Accounts (2008 SNA) recently adopted by the United States, but not so in countries that have not yet adopted the 2008 SNA. Data for the United States in this table may thus differ from data published by the U. S. Bureau of Economic Analysis.

[4]The Commonwealth of Puerto Rico is classified as an advanced economy. It is a territory of the United States, but its statistical data are maintained on a separate and independent basis.

[5]Federal government and provinces; includes interest payments on a cash basis. Primary expenditure and primary balance include the federal government and provinces. The primary balance excludes profit transfers from the central bank of Argentina. Gross debt is for the federal government only.

[6]Nonfinancial public sector, excluding the operations of nationalized mixed–ownership companies in the hydrocarbon and electricity sectors.

[7]Nonfinancial public sector, excluding Petrobras and Eletrobras, and consolidated with the Sovereign Wealth Fund (SWF). The definition includes Treasury securities on the central bank's balance sheet, including those not used under repurchase agreements. The national definition of general government gross debt includes the stock of Treasury securities used for monetary policy purposes by the Central Bank (those pledged as security in reverse repo operations). It excludes the rest of the government securities held by the Central Bank. According to this definition, general government gross debt amounted to 58.9 percent of GDP at end–2014.

[8]Nonfinancial public sector reported for primary balances (excluding statistical discrepancies); combined public sector including Ecopetrol and excluding Banco de la República's outstanding external debt reported for gross public debt.

[9]Public sector gross debt includes liabilities under advance oil sales, which are not treated as public debt in the authorities' definition.

[10]Central government only. Gross debt for Belize includes both central government and government–guaranteed debt.

[11]Primary expenditures for Suriname exclude net lending. Debt data refer to central government and government–guaranteed public debt.

[12]Uruguay is the only country in the sample for which public debt includes the debt of the central bank, which increases public sector gross debt.

[13]Projecting the economic outlook in Venezuela is complicated by the lack of any Article IV consultation since 2004 and delays in the publication of key economic data.

[14]General government. The outcome for the Dominican Republic in 2015 reflects the inclusion of the grant element of the debt buyback operation with Petróleos de Venezuela, S.A. amounting to 3.1 percent of GDP.

[15]Ratios to GDP are based on the "2007–base" GDP series. Fiscal data cover the nonfinancial public sector excluding the Panama Canal Authority.

[16]Central government for primary expenditure and primary balance; public sector for gross debt. For Jamaica, the public debt includes central government, guaranteed, and PetroCaribe debt.

[17]Overall and primary balances include off–budget and public–private partnership activities for Barbados and the nonfinancial public sector. Central government for gross debt (excludes NIS holdings).

[18]Central government for primary expenditure. Consolidated public sector for primary balance and gross debt.

[19]Simple average of Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela.

[20]Simple average of Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

[21]Simple average of The Bahamas, Barbados, Jamaica, and ECCU member states.

[22]Simple average of Belize, Guyana, Suriname, and Trinidad and Tobago.

[23]Eastern Caribbean Currency Union (ECCU) members are Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines, as well as Anguilla and Montserrat, which are not IMF members.

Table 2.3. Western Hemisphere: Selected Economic and Social Indicators, 2006–15[1]

	2015				2006–15 Average					2015		Latest available		
	GDP[2] (US$ billions)	Population (Millions)	GDP per capita (PPP$)	Nominal output share of LAC region[2] (Percent)	Real GDP growth (Percent)	CPI inflation[3] (Percent)	Current account (Percent of GDP)	Domestic saving (Percent of GDP)	Trade openness[4] (Percent of GDP)	Gross reserves[5] (Percent of GDP)	Unemployment rate (Percent)	Poverty rate[6]	Gini coefficient[6]	Sovereign credit rating[7]
North America														
Canada	1,552.4	35.8	45,553	...	1.7	1.7	–1.9	22.0	63.6	5.1	6.9	...	31.3	AAA
Mexico	1,144.3	127.0	17,534	22.6	2.4	4.0	–1.5	21.2	62.3	15.2	4.3	11.4	51.8	BBB+
United States	17,947.0	321.6	55,805	...	1.4	1.8	–3.4	17.0	28.7	0.7	5.3	...	47.6	AAA
Puerto Rico[8]	101.6	3.5	37,952	...	–0.9	2.0	...	...	...	...	12.0	...	...	...
South America														
Argentina[9]	585.6	43.1	22,554	11.6	4.3	...	0.4	19.6	32.1	4.0	6.5	5.0	42.4	SD
Bolivia	33.2	11.5	6,465	0.7	5.0	6.0	4.7	24.1	72.7	35.1	4.0	14.4	48.1	BB
Brazil	1,772.6	204.5	15,615	35.1	2.8	5.9	–2.2	18.4	24.0	20.0	6.8	9.4	51.8	BB
Chile	240.2	18.0	23,460	4.8	3.8	3.7	–0.3	22.5	69.7	16.1	6.2	2.0	53.1	AA–
Colombia	293.2	48.2	13,847	5.8	4.6	4.2	–3.3	20.3	35.9	15.7	8.9	15.2	53.8	BBB
Ecuador	98.8	16.3	11,264	2.0	3.9	4.2	0.3	26.6	59.2	2.1	4.8	10.5	46.7	B
Guyana	3.2	0.8	7,509	0.1	4.4	4.0	–11.2	7.9	129.8	19.0	...	...	...	...
Paraguay	28.1	7.0	8,708	0.6	5.1	5.5	0.9	16.9	99.1	20.2	6.1	8.3	44.4	BB
Peru	192.1	31.9	12,195	3.8	5.9	3.2	–2.0	22.7	50.6	31.5	6.0	10.0	44.9	BBB+
Suriname	5.2	0.6	16,292	0.1	3.6	8.2	2.6	...	99.7	5.5	8.7	...	...	BB–
Uruguay	53.8	3.4	21,507	1.1	4.8	7.9	–3.3	17.5	54.1	29.1	7.6	2.3	38.1	BBB
Venezuela[10]	239.6	30.9	16,673	4.7	2.1	47.7	3.5	26.9	53.5	6.8	7.4	4.9	39.8	CCC
Central America														
Belize	1.8	0.4	8,373	0.0	2.5	1.5	–4.9	11.7	126.8	24.8	12.0	...	...	B–
Costa Rica	52.9	4.8	15,482	1.0	4.1	6.1	–4.9	16.7	66.2	14.8	8.3	4.6	51.6	BB+
El Salvador	25.8	6.4	8,303	0.5	1.8	2.6	–4.6	10.0	66.3	10.6	5.3	12.7	44.4	B+
Guatemala	63.9	16.3	7,738	1.3	3.7	4.9	–2.6	12.9	61.3	11.8	...	40.7	53.8	BB
Honduras	20.3	8.4	4,869	0.4	3.6	5.9	–7.6	18.4	89.5	18.4	4.0	39.6	52.5	B
Nicaragua	12.2	6.3	4,997	0.2	3.8	8.0	–11.3	16.4	97.6	20.4	7.1	29.3	46.7	B+
Panama	52.1	4.0	21,765	1.0	7.6	3.8	–8.2	31.1	78.5	6.5	5.1	9.9	50.7	BBB
The Caribbean														
The Bahamas	8.7	0.4	25,167	0.2	0.3	2.0	–14.5	12.5	95.8	10.3	13.4	...	...	BBB
Barbados	4.4	0.3	16,575	0.1	0.6	4.3	–8.2	7.0	96.3	12.3	12.2	...	...	B
Dominican Republic	67.5	10.0	14,984	1.3	5.6	5.0	–5.3	19.8	58.5	7.8	5.9	13.9	46.8	B+
Haiti	8.6	10.7	1,750	0.2	2.0	7.8	–3.4	25.5	66.9	22.3	...	...	...	...
Jamaica	13.9	2.8	8,759	0.3	0.1	9.4	–10.5	12.2	89.5	20.9	13.5	...	...	B
Trinidad and Tobago	24.6	1.4	32,635	0.5	2.1	7.4	14.2	27.8	95.1	40.0	3.6	...	...	A–
Eastern Caribbean Currency Union	5.8	0.6	16,401	0.1	1.3	2.1	–19.6	7.6	95.5	24.6	...	...	...	...
Antigua and Barbuda	1.3	0.1	23,476	0.0	1.2	2.0	–17.5	11.9	108.1	24.7	...	...	...	...
Dominica	0.5	0.1	10,788	0.0	1.6	1.6	–17.4	0.0	86.8	26.3	...	...	...	...
Grenada	1.0	0.1	13,128	0.0	0.8	1.8	–23.7	0.3	77.8	19.2	...	...	...	...
St. Kitts and St. Nevis	0.9	0.1	24,808	0.0	2.1	2.4	–15.7	18.8	86.0	31.0	...	...	...	...
St. Lucia	1.4	0.2	11,739	0.0	1.1	2.3	–17.2	10.2	103.7	21.6	...	...	...	...
St. Vincent and the Grenadines	0.8	0.1	10,956	0.0	0.9	2.5	–28.4	–3.2	85.3	22.9	...	2.9	40.2	...
Latin America and the Caribbean	5,052.5	615.8	15,377	100.0	3.2	4.9	–1.6	20.2	42.8	15.6	...	11.3	49.8	...

Sources: IMF, International Financial Statistics database; IMF, World Economic Outlook database; Inter–American Development Bank (IDB); national authorities; Socio–Economic Database for Latin America and the Caribbean (CEDLAS and The World Bank); and IMF staff calculations.

[1]Estimates may vary from those reported by national authorities on account of differences in methodology and source. Regional aggregates are purchasing–power–parity (PPP) GDP–weighted averages, except for regional GDP in U.S. dollars and population where totals are computed. CPI series exclude Argentina and Venezuela. Consistent with the IMF, *World Economic Outlook*, the cut–off date for the data and projections in this table is March 25, 2016.

[2]At market exchange rates.

[3]End–of–period, 12–month percent change.

[4]Exports plus imports of goods and services in percent of GDP.

[5]Latest available data from IMF, International Financial Statistics database.

[6]Data from Socio–Economic Database for Latin America and the Caribbean (SEDLAC), based on the latest country–specific household surveys. In most cases, the surveys are from 2013 or 2014, though the vintage for Nicaragua (2009) is less recent. Poverty rate is defined as the share of the population earning less than US$2.50 per day. For Venezuela, poverty rate is defined as a share of the population in extreme poverty per national definition (INE). Gini index for aggregate is population–weighted average from the IDB. Data for the United States are from the U.S. Census Bureau; those for Canada are from Statistics Canada.

[7]Median of long–term foreign currency ratings published by Moody's, Standard & Poor's, and Fitch.

[8]The Commonwealth of Puerto Rico is classified as an advanced economy. It is a territory of the United States but its statistical data are maintained on a separate and independent basis.

[9]See Annex 2.1 for details on Argentina's data.

[10]Projecting the economic outlook in Venezuela is complicated by the lack of any Article IV consultation since 2004 and delays in the publication of key economic data.

3. Understanding Corporate Vulnerabilities in Latin America

Firms in Latin America are facing tighter financial market conditions at the global level amid lower potential growth and challenging macroeconomic adjustments at home. This chapter quantifies the impact of company-specific, country-specific, and global factors in driving nonfinancial corporate risk. The analysis suggests that all three factors play a role, albeit to varying degrees and with different implications across countries in the region. Overall, macroeconomic domestic factors, such as the pace of currency depreciation and higher sovereign spreads, have contributed to an increase in corporate risk since 2011, underscoring the importance of robust policy frameworks. The analysis also finds that external conditions—in particular measures of global risk aversion (such as the Chicago Board Options Exchange Volatility Index, VIX)—constitute a dominant driver of corporate risk. Thus, a sustained reversal of the still benign global market conditions could place significant added pressure on firms in the region. Finally, weak firm fundamentals, such as high leverage and low profitability, are also associated with elevated corporate risks. All things considered, solid macroeconomic policy frameworks must be complemented by appropriate monitoring of systemic risks in the corporate sector and, when needed, by policies that facilitate corporate balance sheet repair that will help limit financial spillovers from corporate woes in the coming years.

High commodity prices and robust global growth, in a setting of favorable financial conditions, have powered growth in Latin America and the Caribbean (LAC) for much of the past decade, but there is now consensus that this twin-engine growth process has come to an end. As the region adjusts to a harsher external reality, characterized by lower commodity prices, tighter financial conditions, and weaker external demand, several challenges and risks have surfaced. A key risk relates to the health of nonfinancial firms. This chapter quantifies the relative contributions

of firm-specific fundamentals, domestic macroeconomic conditions, and global factors to corporate risk dynamics. Findings shed light on conjunctural policy questions—such as how much corporate vulnerabilities can rise owing to different factors. The results also inform medium-term policies conducive to corporate sector growth and investment, which are at the core of reigniting vigorous growth in the region.

Setting the Stage

Firms from financially integrated LAC economies have benefited from a favorable funding environment over the past decade, weathering well a brief period of acute pressure during the global financial crisis. In particular, enhanced access to international capital markets in the context of relaxed global financial conditions allowed the lengthening of debt maturities while lowering borrowing costs. This has enabled companies to pursue new investment plans, improve cash buffers, and pay down more expensive debt. In principle, all of these are positive developments for a savings-scarce region characterized by low investment rates. However, the favorable funding environment also bred risks.[1] Corporate leverage has increased, often fueled by foreign currency bond debt, which increased from US$170 billion (4.3 percent of combined GDP) in 2010 to more than US$380 billion (10.5 percent of combined GDP) in 2015 in five major economies of Latin America (LA5—Brazil, Chile, Colombia, Mexico, and Peru).

The macroeconomic adjustment unfolding across the region has implied persistently weaker domestic currencies and lower potential growth, complicating balance sheet adjustments—such as deleveraging and reducing foreign exchange mismatches—in the corporate sector. Against

[1]See Rodrigues Bastos, Kamil, and Sutton (2015).

Figure 3.1. Market CDS and Implied CDS Spreads
(Log basis points; demeaned)
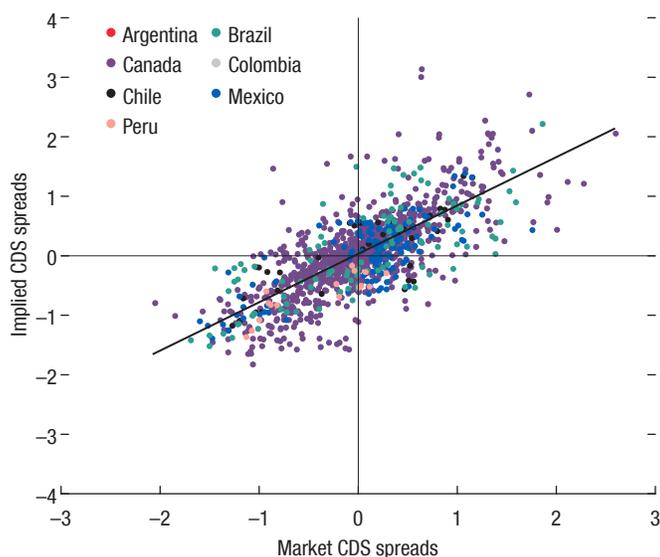
Sources: Bloomberg, L.P.; Markit Ltd.; and IMF staff calculations.
Note: Period 2005–15. Implied CDS spreads available for approximately 1,200 firms. Each point represents, for each company, the difference of the log of credit default swap (CDS) spreads at the end of each quarter and its corresponding average over the period 2005:Q1 to 2015:Q3.

Figure 3.2. Implied CDS Spreads: Nonfinancial Corporates in Latin America
(Basis points)
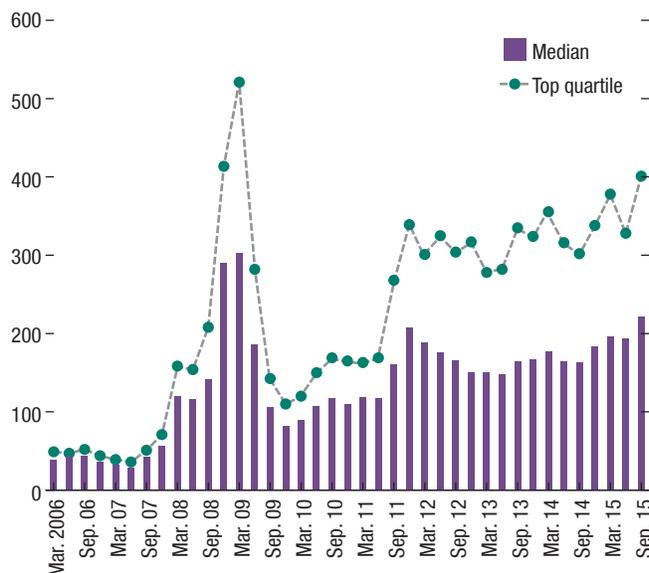
Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: Implied credit default swap (CDS) spreads from Bloomberg, L.P. Chart based on approximately 500 companies from Argentina, Brazil, Chile, Colombia, Mexico, Panama, and Peru.

this backdrop, vulnerability concerns are coming to the fore. It is, therefore, important to develop a systematic understanding of the drivers of corporate risk.

Credit default swap (CDS) spreads would be an ideal candidate to measure corporate risk, because they provide a comparable yardstick across firms, but they are available only for a small number of firms in LAC. Thus, this chapter uses implied CDS spreads as proxy for corporate risk, which closely track their market counterpart and are available for a much larger set of companies (Figure 3.1).[2]

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[2]The implied CDS spreads used in the analysis are calculated by Bloomberg, based on a theoretical framework proposed by Merton (1974) that uses observable information to calculate a company's distance to default. Bloomberg augments the frameworks' basic inputs (share price, market capitalization, and share price volatility) with financial information on total debt and interest coverage. In addition, Bloomberg applies statistical tests to evaluate and calibrate its model accuracy in predicting actual defaults. Data on market CDS spreads and actual default probabilities are used to back out the market-assumed recovery rate—see Bloomberg Credit Risk: Framework, Methodology and Usage (2015). The search for "implied measures"

Implied CDS spreads show that corporate risk for the median Latin American firm has been on the rise in 2014–15 (Figure 3.2), but this increase was not particularly different from other episodes observed in the past four years. In contrast, the global financial crisis of 2008–09 caused a more acute but short-lived spike in corporate risk. Furthermore, 2011—the peak year in most commodity prices—marks the start of growing heterogeneity in risk evolution across countries; Argentina and Brazil have since started to persistently display higher corporate risk levels, accompanied by concerns regarding their policy frameworks. This heterogeneity has also grown among the other countries over the past couple of years (Figure 3.3), in line with country-specific macroeconomic shocks.

Firm fundamentals—leverage, profitability, capitalization, and liquidity—have deteriorated alongside indicators of rising corporate risk since

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that can capture intrinsic corporate risk has become fairly common given the limited number of market-based CDS spreads and other difficulties such as low liquidity and lack of homogeneity in other instruments, including corporate bonds.

Figure 3.3. Implied CDS Spreads: Nonfinancial Firms in Latin America by Country
(Basis points, median)
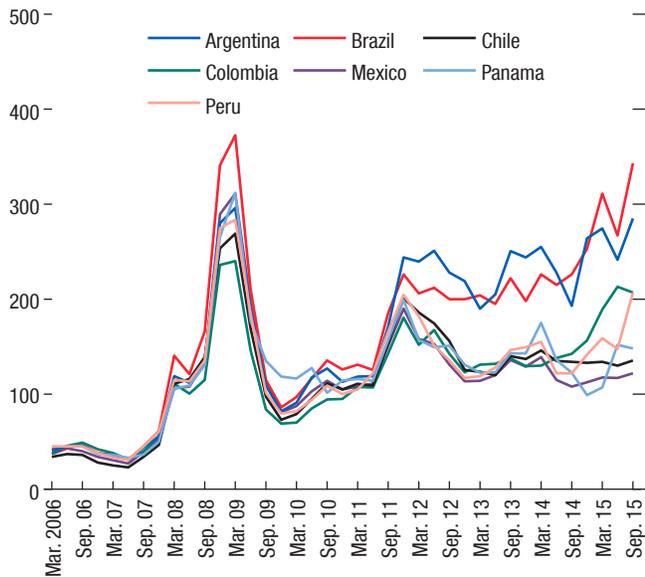
Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: CDS = credit default swap.

2010 (Annex Table 3.1), with a marked weakening in recent years, particularly with regard to higher leverage and lower profitability. This is possibly attributed to strong exchange rate depreciations, the widespread issuance of foreign currency debt, and dimmed growth prospects across the region.

Many would have considered the combination of exchange rate depreciations, commodity price declines, and deceleration in economic activity observed in the region during 2015 as being sufficient to trigger widespread corporate distress. Although there has been some stress across firms in LAC countries, the impact has not been systemic. This could reflect high levels of international reserves providing policy ammunition to central banks and reassurance to markets that foreign exchange liquidity would not suddenly dry up. In addition, corporate cash buffers were sizable in recent years, and at the same time Latin America firms might be making more active use of financial hedges.[3] However,

margins have been stretched thin, and future risks are elevated.

Data and Empirical Strategy

The analysis in this chapter is based on a large dataset covering the period 2005–15 and containing company-specific financial information, along with country and global variables.[4] The sample includes more than 500 nonfinancial firms from seven Latin American countries—Argentina, Brazil, Chile, Colombia, Mexico, Panama, and Peru. Furthermore, we perform additional analysis by including a similar number of firms from Canada. Although the analysis centers on Latin American firms, the inclusion of Canadian companies allows the investigation of the role of common regional shocks by providing a benchmark of a commodity-exporting advanced economy located in the same hemisphere.

Simple correlations among key variables suggest the presence of important relationships (Annex Table 3.2). An increase in corporate risk is associated with an increase in leverage, share price volatility, sovereign CDS spreads, the VIX, and the pace of exchange rate depreciation. Lower implied CDS spreads are associated with higher profitability, capitalization, liquidity, share price, and price-to-book ratios, as well as with higher commodity prices.[5]

Annex Table 3.2 also shows significant cross-correlation among several variables in the data set, pointing to potential issues of multicollinearity. Hence, it is critical to adopt empirical strategies that rely on a relatively small number of explanatory variables while still covering key dimensions of the data. One approach is thus to

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[3]Other conditions have also played a role. A significant part of the dollar debt buildup has been accumulated in the tradable sector and by quasi-sovereigns, so natural hedges and implicit government

backing have been important mitigating factors (see Caceres and Rodrigues Bastos 2016).

[4]The sources are Bloomberg, L.P., Thomson Reuters Datastream, Haver Analytics, Markit Ltd., and the World Economic Outlook database. The frequency is quarterly and we consider different ways of consolidating daily and monthly data. The sample is mainly composed of publicly listed firms.

[5]These pair-wise correlations are broadly consistent whether we consider implied CDS spreads (more than 1200 companies) or actual CDS spreads (less than 50 companies) as our measure of corporate risk, notwithstanding the significant differences in data availability.

group data along blocks of variables that capture different dimensions of corporate risk, and to consider them simultaneously in econometric estimations. This allows one to balance parsimony and representativeness, which is used to generate a historical decomposition of *direct* sources of corporate risk. Another approach is to selectively exclude blocks of variables, generating more compact models, which enable us to capture the *direct and indirect* impact from specific variables of interest (for instance, exchange rate).[6] We use this approach for scenario analysis later on.

The core econometric specification is a panel-data model similar to what has been used in the literature for studying corporate risk dynamics.[7] The dependent variable, log of implied CDS spreads, is treated as a function of four different dimensions included in the following blocks of explanatory variables: (1) firm-specific fundamentals (accounting-based), (2) firm-specific market-based measures, (3) country-level macroeconomic factors, and (4) global conditions.[8] Algebraically:

$$Y_{i,t} = \alpha + \beta_1 F_{i,t} + \beta_2 M_{i,t} + \beta_3 C_{j,t} + \beta_4 G_t + \beta_5 D_{rt} + \mu_i + \epsilon_{i,t}$$

where $Y_{i,t}$ denotes the log of implied CDS spread of company i at time t, our measure of corporate risk; $F_{i,t}$ and $M_{i,t}$ denote, respectively, firm-specific accounting-based variables (that is, "fundamentals") and market-based variables; $C_{j,t}$ denotes macroeconomic variables in country j at

time t, whereas G_t represents the global variables; μ_i denotes the company-specific fixed effects; and $\epsilon_{i,t}$ is the error term. D_{rt} represents time dummies for two different subperiods: financial crisis (2008:Q1 to 2010:Q4) and the subsequent period (2011:Q1 to 2015:Q3). They capture changes in dynamics induced by "level shifts," beyond what could be explained by variables in our data set. In addition, these dummies are allowed to be different between Canada and the group of LAC countries (thus the subscript for the region r), allowing one to investigate common LAC-regional factors driving risk.

Results

The econometric results (Annex Table 3.3) confirm that all four dimensions matter for corporate risk dynamics. In block 1 (firm fundamentals), higher capital ratios, higher liquidity ratios, and higher profitability all lead to a reduction in corporate risk. Conversely, leverage is positively associated with risk at the firm level. Block 2 (market-based variables) indicates that higher share price volatility and lower price-to-book ratios increase risk. Even though these variables are linked to the calibration of the implied CDS spreads itself, including them in the core regression is not tautological. In fact, the variables in block 2 are also relevant in explaining actual CDS spreads dynamics. Moreover, these variables are incorporated with a lag in the estimation model and, most importantly, these market-based variables help us gauge how much other blocks influence corporate risk after accounting for them.[9]

Block 3 (macroeconomic conditions) suggests that higher sovereign CDS spreads and sharp currency depreciations lead to higher corporate risk. Moreover, the negative impact of such sharp depreciations is stronger for companies that exhibit higher levels of leverage. Importantly, we found that year-over-year changes in the exchange rate play a more important role in explaining

[6]Caceres and Rodrigues Bastos (2016) provide a detailed discussion of the analysis presented in this chapter.

[7]See, for instance, Das, Hanouna, and Sarin (2009), Doshi and others (2013), Tang and Yan (2013), and Cavallo and Valenzuela (2007).

[8]In the specification shown in this chapter, firm fundamentals include profitability, capitalization, leverage, and liquidity, each derived as the first principal component of alternative measures such as debt to equity, debt to assets, return on equity, return on assets, different cash ratios, and others. The firm's relative size is also included as an additional control. Firm's market-based measures include share price, share price volatility, and price-to-book ratio. Domestic macroeconomic conditions include inflation, sovereign CDS spreads, and exchange rate. Global variables include the commodity terms of trade (CTOT—Gruss 2014) and the VIX—though we treat the former separately. The implied corporate CDS spread is taken at the last business day of the quarter to mitigate endogeneity concerns while the other daily-frequency variables included in the right-hand side are averages for the respective quarter. See Caceres and Rodrigues Bastos (2016) for further details.

[9]Finally, the exclusion of block 2 does not alter in any meaningful way the elasticities obtained for the variables in other blocks (see Annex Table 3.3 and Caceres and Rodrigues Bastos 2016).

corporate spreads than the exchange rate level per se. This suggests that companies are not necessarily affected by underlying trends in the level of the exchange rate (for instance, when the exchange rate is continuously depreciating, albeit smoothly), as balance sheets would tend to adjust. Instead, corporate risk tends to suffer from a sharp and sudden depreciation.

We also find that higher inflation is associated with higher corporate risk, possibly reflecting the quality of policy frameworks. However, other domestic factors such as real GDP growth does not appear to play a *direct* role in driving risk, suggesting that its impact is possibly embedded in other channels such as profitability or share prices which, in fact, are shown to matter for risk.[10] In block 4 (global factors), higher global risk aversion *proxied* by the VIX and lower commodity prices are found to matter for corporate risk. Other global measures such as global output growth are not found to play a *direct* role in driving risk which, once again, could be linked to its correlation with commodity prices and the VIX.[11,12] The findings are robust to alternative grouping strategies and explanatory variable choice, as discussed in Caceres and Rodrigues Bastos (2016).

The time dummies for the two periods (2008:Q1– 2010:Q4 and 2011:Q1–2015:Q3) are significant and statistically the same for all countries in our sample, except for Canada. This result suggests that all countries experienced a repricing of risk—not attributable to any of our explanatory variables—during these periods. Moreover, this risk premium is larger for the LAC region compared with Canada.[13,14]

Next, the estimated model for LAC firms is used to quantify and compare the role of the various underlying driving factors in explaining the *changes* in corporate risk (Figures 3.4 and 3.5). The goal is not to understand the *equilibrium level* of corporate risk. This would call for disentangling structural determinants such as corporate governance, judicial quality, and other slow-moving determinants, which are controlled through fixed effects in our estimation. Instead, we would like to identify and compare the main time-varying components that have been triggering changes in risk during recent years. To that end, we contrast two subperiods: (1) the global financial crisis (2007:Q1–2009:Q2), and (2) the period of economic deceleration that LAC has been facing, partly led by weakening commodity prices (2011:Q4–2015:Q3). The choice of these two periods is based on the observed dynamics of corporate risk. Period 1 reflects a sharp, albeit short-lived, impact from the global financial crisis. The starting point for period 2 marks the onset of a more gradual but sustained increase in risk that has lasted through 2015.[15]

The crisis period points to the dominant role of common, global factors driving up corporate risk. Average corporate risk increased by more than 350 basis points in period 1. As shown by our decomposition exercise (see Figures 3.4 and 3.5), the increase in the VIX alone contributed to about one-fourth of the total increase in risk, a similar result across different countries in our sample. Country-specific factors also contributed importantly to the increase in risk: the increase in sovereign CDS spreads explained about 11 percent on average (ranging from 6 percent in Brazil to 33 percent in Panama). However, the

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[10]Indeed, the estimated elasticity derived from a simple regression of corporate spreads on real GDP growth (alone) is negative and highly significant.

[11]We use a country-specific index of net commodity terms of trade (CTOT) produced by Gruss (2014).

[12]Magud and Sosa (2015) also found a key role of macroeconomic variables in explaining investment in LAC, particularly commodity prices, even after controlling for firm-specific fundamentals.

[13]Note that the estimation results pertaining to blocks 1, 2, 3, and 4 remain broadly the same whether we exclude or not the Canadian firms from the sample (see Annex Table 3.3).

[14]Based on our measure of corporate risk, sectors such as energy, consumer (discretionary), and industrials have shown higher levels of risk over the past couple of years. However, our core model appro-

priately accounts for this heterogeneity, and the estimation results do not exhibit any systematic sectoral differences. Company fixed effects capture both industry and country-time invariant features. Furthermore, risk evolution among a handful of large commodity-related quasi-sovereign firms in Latin America appear broadly in line with corresponding country and sectoral trends, with the exception of Brazilian quasi-sovereign firms, which have experienced a larger increase in corporate risk in recent years.

[15]Chapter 2 features the same decomposition applied to a shorter period of time (2014:Q3–2015:Q3). That analysis showed that both global and domestic factors have put upward pressure on corporate risk over the most recent period.

Figure 3.4. Decomposition of Corporate Risk in Latin America
(Log basis points, median)

- Firm fundamentals (Block 1)
- Firm market-based (Block 2)
- Domestic conditions (Block 3)
- Global conditions (Block 4 excl. CTOT)
- Sample composition
- Commodity terms of trade
- Level shift
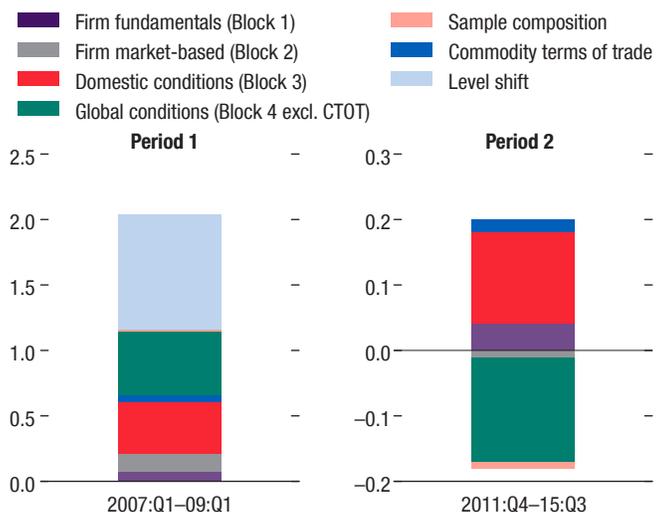
Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: CTOT = commodity terms of trade. This decomposition is based on the estimation results for the sample of Latin American firms only (see Model (2) in Annex Table 3.3).

direct contribution of firm-specific factors has been more limited: explaining less than 10 percent (roughly equivalent to 35 basis points) for the entire sample, and as little as 4 percent (about 10 basis points) in the case of Chile.

The postcrisis period (period 2), from 2011:Q4 to 2015:Q3, paints a much different and more heterogeneous story, with deteriorating country fundamentals playing a more prominent role. Global factors, in particular the VIX, have generated a downward pressure on corporate risk in the region, unlike in period 1. The decline in commodity prices since 2011 has not been a major direct factor pushing up corporate risk, despite the important negative impact of lower commodity prices on overall economic prospects. In Panama, the only net commodity importer in our sample, lower commodity prices are pushing

Figure 3.5. Contribution to Changes in Implied CDS Spreads in Selected Countries over Periods 1 and 2
(Log basis points, median)
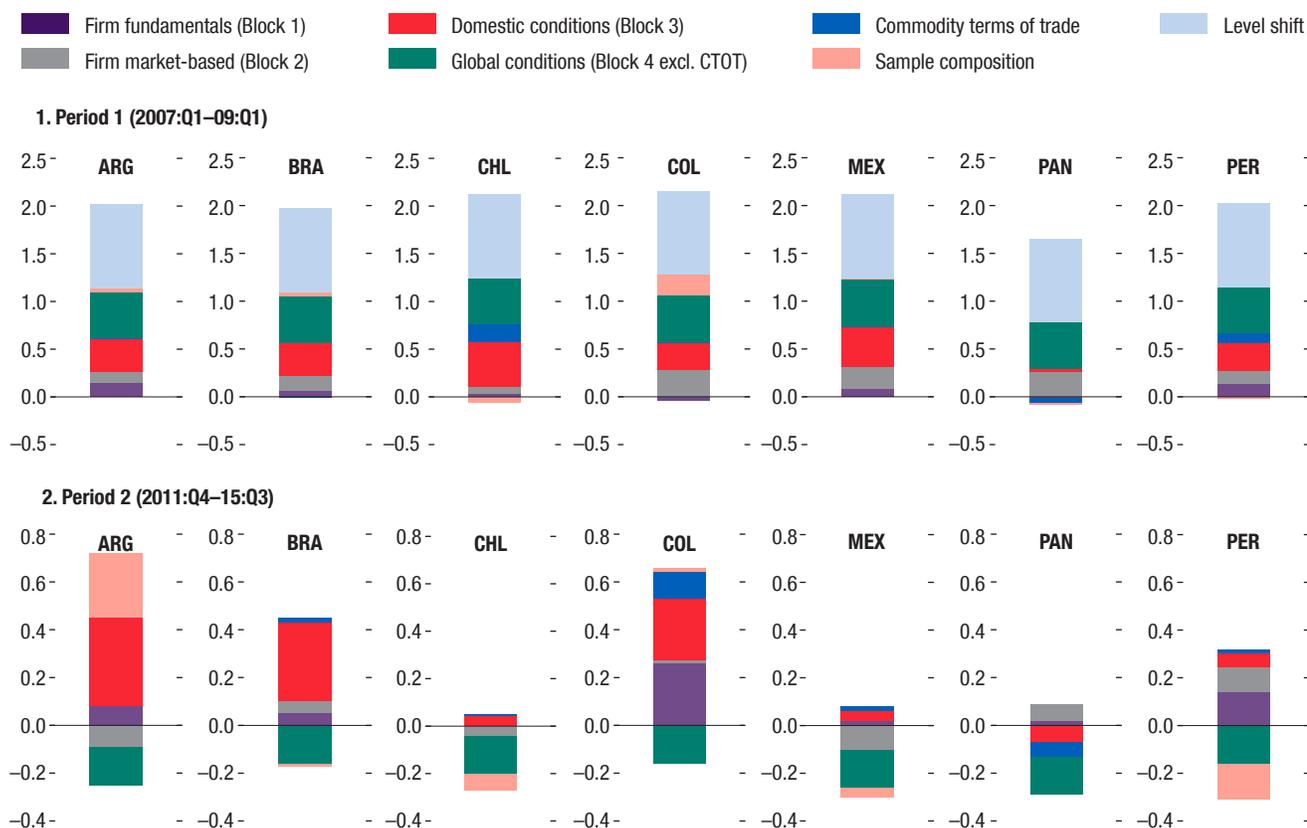
- Firm fundamentals (Block 1)
- Firm market-based (Block 2)
- Domestic conditions (Block 3)
- Global conditions (Block 4 excl. CTOT)
- Commodity terms of trade
- Sample composition
- Level shift

Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: CDS = credit default swap; CTOT = commodity terms of trade. This decomposition is based on the estimation results for the sample of Latin American firms only (see Model (2) in Annex Table 3.3). Data labels use International Organization for Standardization (ISO) country codes, see page 108.

corporate risk down. Overall, deteriorating country-specific conditions have been a key factor increasing corporate risk in LAC, particularly through rapid exchange rate depreciations and increases in sovereign CDS spreads, though the relative importance varies across countries. The deterioration in firm-specific fundamentals has played some role in pushing corporate risk upward, though not to the same extent across all the countries.

Examining the risk decomposition during period 2 across countries yields important insights into their specific challenges at the current juncture. Deterioration in domestic macroeconomic conditions in Argentina and Brazil has played a leading role in pushing corporate risk higher. In Chile, Mexico, and Panama, changes in corporate risk during this period are rather muted. Colombia's corporate risk has been pressured on multiple fronts, including commodity prices, macroeconomic conditions (including sharp exchange rate depreciation), and also by firm fundamentals. In Peru, firm-specific variables explain the lion's share of upward pressure on measures of corporate risk.

To assess the potential pressure on corporate risk arising from shocks to selected variables, we reestimate the panel leaving only fixed effects, time-period dummies, and the individual variable of interest. This way, rather than comparing the *direct* contribution of different drivers, we allow the estimated coefficients to reflect more fully both the *direct* and *indirect* impact on corporate risk. Then we use these coefficients to construct scenarios to explore the sensitivity of corporate risk to hypothetical shocks as shown in Annex Table 3.1.

The results highlight the potentially severe impact of an extreme, though historically plausible, scenario. A crisis scenario is constructed using the estimated LAC dummies for the two subperiods, and assuming a new level-shift deterioration in the CDS spreads similar to the one observed during the global financial crisis, in addition to any deterioration caused by the other variables in the model. Corporate risk increases would range from

about 180 basis points in Mexico to 500 basis points in Brazil.[16]

A VIX shock of 30 points—about half of what took place during the global financial crisis—would also lead to substantial stress among firms, once again with the strongest impact in Brazil (280 basis points) and the mildest in Mexico (100 basis points). To construct scenarios for domestic macroeconomic conditions, we arbitrarily set stressed levels for the exchange rate and sovereign CDS spreads across different LAC economies as shown in Annex Table 3.1. The results suggest that slippages in domestic policy frameworks can be costly for firms in several countries.

Policy Takeaways

Overall, our findings suggest the following:

- Sovereign CDS spreads—thus the soundness of policy frameworks—matter for corporate risk. Macroeconomic stability and credible policies are an important defense against additional upward pressures on corporate spreads. Reining in risks to fiscal sustainability and inflation, particularly in Argentina and Brazil, is crucial to contain spillovers to sovereign CDS spreads, which impacts corporate risk.

- Policies should encompass not only a solid macroeconomic framework but also close monitoring of corporate balance sheets and income flows. Given the dominant role of global factors in driving corporate risk, a reversal of the still benign external environment can increase corporate risks substantially, as evidenced by the recent episodes of market volatility (see Chapter 2). This calls for a comprehensive strategy at both the macroeconomic and microeconomic levels. In addition, supporting firms' capacity to promote medium-term adjustments is

[16]Because the dependent variable is in logs and the starting levels of corporate CDS is different across countries, additive shocks will produce a nonlinear effect on the final CDS change. In particular, countries that start out from a higher average corporate CDS level, like Brazil, will experience a stronger deterioration in risk.

essential. In particular, orderly deleveraging through market-based solutions should be the first line of defense in highly indebted companies. Public sector equity should not be used to stave off needed adjustments, but policymakers should stand ready to provide liquidity to solvent firms. In the case of insolvent companies, restructuring and bankruptcy legislation should minimize both administrative costs and economic losses related to default.

- Financial regulators also have a critical role to play. Adequate consolidated supervision, in cases where financial and nonfinancial firms are highly interlinked, is important (Box 3.1). In that context, regulators should ensure adequate bank capital buffers to contain potential spillovers from the corporate sector. Furthermore, the findings suggest that sharp exchange rate depreciations put pressure on corporate risk, particularly if leverage is high and currency exposures not hedged. This

calls for enhanced monitoring of corporate balance sheets and the use of macroprudential tools (for instance, higher capital and liquidity requirements for foreign-currency-related exposures) to contain any potential buildup of risks related to currency mismatches.

- Companies should factor in the new realities in their business and debt management strategies. An uncertain funding environment creates challenges, which calls for an effective debt management approach that balances cash preservation, cost of capital, funding risks, and continuity of profitable longer-term investment opportunities. Measures to incentivize private equity activity and foreign investor participation can be powerful to help firms navigate through the difficult environment. Commodity-based companies, often systemically important, should ensure sound practices and viable business models given their higher spreads and sensitivity to commodity prices.

Box 3.1. Corporate Solvency Risk and Bank Exposure in Latin America

Companies thrive in a healthy economy, and thriving companies are good business for banks. The converse is, of course, also true. In this box, we assess the impact of changes in macroeconomic conditions on *nonfinancial* corporate solvency risk, and its implications for the banking sector in LA5 countries—Brazil, Chile, Colombia, Mexico, and Peru. In particular, we estimate the potential effect on bank provisions and capital from an increase in corporate solvency risk. Banks in LA5 countries have a sizable exposure to corporate lending, ranging from 8 percent of GDP in Mexico to 35 percent of GDP in Chile (Figure 3.1.1).

Using a new database and methodology, this analysis provides further evidence supporting the main results of the chapter. The analysis uses the Bottom-Up Default Analysis (BuDA) tool developed by Duan, Miao, and Chan-Lau (2015) to estimate corporate solvency risk, as measured by the median probability of default in the sector. For a given baseline macroeconomic scenario, the model projects a set of common and firm-specific risk factors that have a good track record of predicting the probability of default.[1] As this varies, there is a corresponding shift in the loss distribution of the loan portfolio, which requires banks to adjust provisions and capital to cushion against changing losses (Figure 3.1.2). Provisions provide buffers against expected losses and capital against unexpected losses. In the absence of detailed loan data for banks, the loss distribution of the portfolio is calculated assuming each loan is small relative to the entire portfolio and has the same characteristics, with defaults depending on the correlation of firm asset values. Under the one-factor Vacisek (1991) model, and as suggested in BCBS (2011), the asset correlation is set between 12 percent and 24 percent, depending on the probability of default of the loan.

Since 2014, the macroeconomic environment in LA5 has deteriorated. The most acute effects have been felt in Brazil, Colombia, and Peru, where firm probabilities of default have been rising since 2014. Based on the December 2015 *World Economic Outlook* baseline, protracted difficulties in Brazil suggest that probabilities of default will continue to rise through 2016 to levels not seen since 2008. Colombia and Peru see a smaller spike in probabilities of default, while in Chile and Mexico probabilities of default remain low through 2016 and 2017 (Figure 3.1.3).

The macroeconomic drivers of the expected increase in firm probabilities of default can be further decomposed. In Brazil, the sharp contraction in domestic GDP, the decline in metal prices, and the depreciation of the *real* are the key drivers (Figure 3.1.4). In Colombia, it is the fall in global oil prices and the depreciation of the *peso*, while in dollarized Peru, the dominant macroeconomic factor pushing up firm probabilities of default is the exchange rate depreciation. In Chile and Mexico, good

Figure 3.1.1. Nonfinancial Corporate Debt by Instrument
(Percent of GDP, 2014)
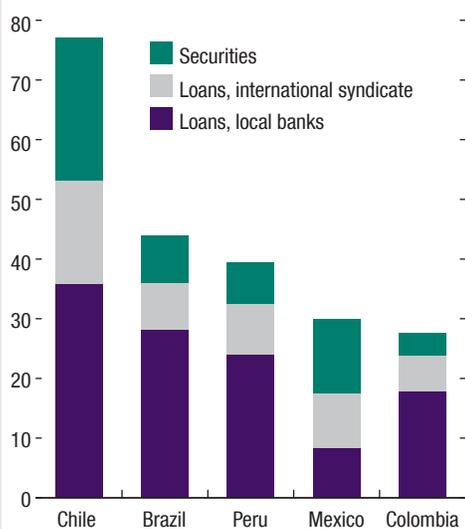
Sources: Bank for International Settlements; Dealogic; IMF, International Financial Statistics database; and IMF staff calculations.

This box was prepared by Jorge Antonio Chan-Lau, Cheng Hoon Lim, Daniel Rodríguez-Delgado, Bennett Sutton, and Melesse Tashu.

[1]The model uses two common risk factors (a country's stock index and a representative three-month short-term interest rate) and six firm-specific risk factors, including distance-to-default, liquidity (cash/total assets), profitability (net income/total assets), size (relative to median), market-to-book–value ratio, and idiosyncratic volatility.

Box 3.1 *(continued)*

Figure 3.1.2. Credit Loss Probability Distribution
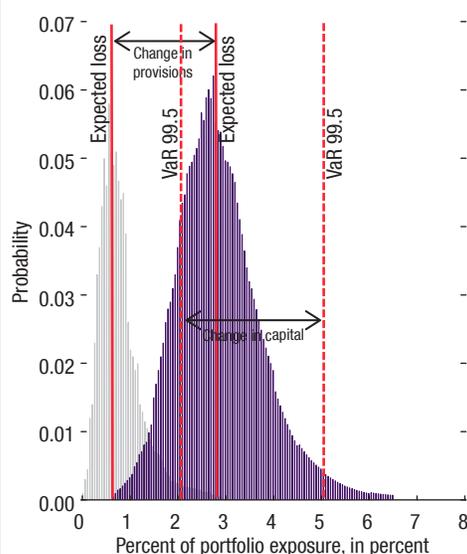
Source: IMF staff calculations.
Note: VaR = value at risk.

Figure 3.1.3. Probabilities of Default in the Nonfinancial Corporate Sector
(Median probability across firms in each country, basis points)
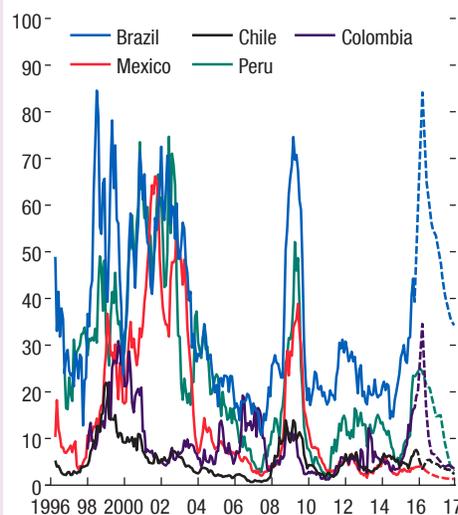
Sources: Credit Research Initiative at the Risk Management Institute (National University of Singapore), and IMF staff calculations.

performance on domestic GDP offsets the negative effects of the decline in oil prices and the exchange rate to limit the overall increase in firm probabilities of default.

The rise in probabilities of default shifts the distribution of credit losses to the right, making larger losses more likely. Collectively, banks in LA5 may need to raise provisions and capital by about ½ percent of GDP, on average during 2016–17.[2] There are, however, large variations across countries. Banks in Brazil, for instance, might need to raise provisions and capital by up to a combined 2¼ percent of GDP, whereas in Peru, the estimate is smaller at about 1¼ percent of GDP. These estimates are, of course, contingent on the macroeconomic baseline and the initial level of provisions and capital. A weaker macroeconomic baseline would imply higher required provisions and capital. However, the required increase may be less than our estimates if the regulatory capital framework is stringent and banks have set aside buffers consistent with their internal risk management framework, or if current total loss absorbing buffers are higher than calculated in Table 3.1.1

The above analysis offers several policy implications for preserving macrofinancial stability. In line with the results presented in the rest of the chapter, the estimated probabilities of default show that the nonfinancial corporate sector's performance in Brazil, Colombia, and Peru is likely to deteriorate in the near term, leading to the buildup of corporate solvency risk. Under these circumstances, near-term priorities should focus on ensuring the adequacy of buffers in the banking system, in terms of both provisions and capital. Regular stress tests of the banking system, currently performed in central banks and regulatory agencies, could have an important role in guiding the supervisory process.

[2]Banks are assumed, at the beginning of the projection period (end-October 2015), to hold reserves and capital consistent with the average "through-the-cycle" probability of default over the past 12-month period.

Box 3.1 *(continued)*

Figure 3.1.4. Contributions to Changes in Projected Corporate Probabilities of Default
(Median probability of default, basis points)
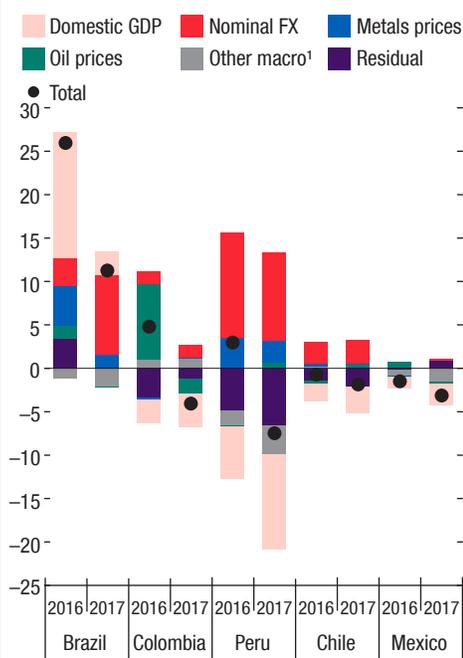
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Changes compared with the scenario in which the values of macroeconomic variables are fixed at their October 2015 levels. FX = foreign exchange.
[1] Includes effects of advanced economies' growth and U.S. interest rates.

Table 3.1.1 LA5: Required Provisions and Economic Capital
(Percent of GDP)

	Provisions		Economic Capital	
	2015[1]	2016–17[2]	2015[1]	2016–17[2]
Brazil	1.3	2.2	3.7	5.1
Chile	1.4	1.1	7.6	6.1
Colombia	1.2	1.3	4.7	4.1
Mexico	0.4	0.3	2.3	1.7
Peru	0.6	0.8	4.4	5.5

Source: IMF staff calculations.
Note: LA5 = Brazil, Chile, Colombia, Mexico, and Peru.
[1] Provisions (capital), as of October 2015, against corporate loans, estimated as total provisions (capital) multiplied by the ratio of commercial to total loans.
[2] Average.

Annex 3.1. Descriptive Statistics and Econometric Results

Annex Table 3.1. Evolution of Implied CDS Spreads and Selected Firm Fundamentals in Latin America and Canada

	ARGENTINA						BRAZIL						CHILE						COLOMBIA					
	2010:Q1		2011:Q3		2015:Q3		2010:Q1		2011:Q3		2015:Q3		2010:Q1		2011:Q3		2015:Q3		2010:Q1		2011:Q3		2015:Q3	
	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median
Implied CDS spreads (basis points)	45	91.0	46	171.0	52	285.0	177	97.0	190	185.5	196	343.0	91	79.0	96	153.5	108	135.5	9	70.0	13	143.0	24	207.0
Debt to equity (percent)	69	28.0	71	35.0	47	54.4	246	58.2	283	57.6	214	76.7	136	42.3	143	46.1	144	53.3	36	16.7	34	18.1	12	70.2
Debt to asset (percent)	70	15.2	71	18.0	49	21.4	277	26.3	312	27.5	236	33.0	136	22.8	144	25.2	147	27.2	36	10.9	34	11.3	12	32.2
Net debt to equity (percent)	69	13.5	71	24.1	47	25.6	239	37.4	278	38.3	214	52.4	133	30.7	141	35.3	143	41.6	36	5.2	34	10.2	12	56.8
Net debt to EBITDA (ratio)	56	0.6	55	0.9	42	1.0	168	1.4	195	1.5	182	2.5	78	2.0	102	1.8	128	2.2	3	0.1	10	2.4	6	3.0
Return on asset (percent, 12-month roll.)	67	4.7	71	5.0	49	5.9	256	4.7	270	3.5	250	1.8	136	3.8	133	4.6	149	2.9	21	3.7	31	3.1	17	2.9
Return on equity (percent, 12-month roll.)	66	8.5	71	10.2	42	14.7	207	14.4	234	10.4	215	7.6	132	9.9	129	9.6	139	7.1	21	5.7	31	5.3	11	5.8
Cash to current liabilities (ratio)	71	0.3	72	0.2	51	0.2	277	0.4	309	0.4	258	0.4	140	0.3	145	0.2	150	0.2	36	0.3	35	0.4	18	0.3
EBITDA to interest payments (ratio)	62	4.3	62	5.3	41	3.2	227	4.5	237	3.6	197	2.3	116	9.1	123	6.9	141	7.1	14	2.8	19	4.1	6	1.9
Price-to-book ratio (ratio)	56	1.0	61	1.4	53	2.4	195	1.9	215	1.4	197	1.0	131	1.3	133	1.5	133	0.9	15	1.5	14	1.8	29	1.0

	MEXICO						PANAMA						PERU						CANADA					
	2010:Q1		2011:Q3		2015:Q3		2010:Q1		2011:Q3		2015:Q3		2010:Q1		2011:Q3		2015:Q3		2010:Q1		2011:Q3		2015:Q3	
	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median	Obs	Median
Implied CDS spreads (basis points)	68	87.5	71	151.0	80	122.0	4	116.5	6	157.0	9	148.0	57	82.0	55	166.0	43	207.0	769	174.0	889	287.0	1084	411.0
Debt to equity (percent)	87	40.9	93	45.8	94	53.6	8	57.7	13	81.4	2	129.0	116	26.7	113	20.4	94	35.5	1105	1.3	1169	2.0	843	19.1
Debt to asset (percent)	90	22.8	94	23.2	96	27.2	8	26.8	13	36.6	2	40.3	117	13.8	114	14.3	94	20.3	1159	1.7	1205	2.0	878	12.8
Net debt to equity (percent)	86	27.8	93	33.0	94	38.9	8	42.5	13	48.5	2	94.3	116	14.1	113	10.1	94	22.8	1087	-6.5	1157	-6.8	839	7.8
Net debt to EBITDA (ratio)	78	1.2	83	1.3	91	1.7	3	2.0	7	2.1	2	3.5	82	0.7	59	0.3	67	1.5	446	1.2	517	1.2	476	1.8
Return on asset (percent, 12-month roll.)	83	4.1	88	4.4	95	2.6	3	10.0	8	6.9	2	4.3	102	6.3	111	8.7	99	2.5	1038	-4.9	1132	-4.0	1132	-5.2
Return on equity (percent, 12-month roll.)	82	8.7	84	8.7	91	6.7	3	13.1	8	16.3	2	12.3	101	13.9	109	14.7	93	4.2	946	-5.8	1056	-4.7	818	-5.7
Cash to current liabilities (ratio)	89	0.4	94	0.4	97	0.3	6	0.5	11	0.2	2	0.5	118	0.3	116	0.2	99	0.2	1158	0.8	1211	0.9	1151	0.4
EBITDA to interest payments (ratio)	86	6.1	88	6.9	92	7.1	7	2.6	12	6.3	2	6.7	105	10.5	79	14.1	69	7.4	721	1.7	728	3.8	451	2.2
Price-to-book ratio (ratio)	79	1.5	80	1.5	90	1.9	8	1.7	9	2.1	14	1.7	72	1.3	73	1.3	66	0.8	1048	1.6	1151	1.6	1147	0.9

Sources: Bloomberg, L.P.; and IMF staff calculations.
Note: CDS = credit default swap; EBITDA = earnings before interest, taxes, depreciation, and amortization; obs = number of observations.

Annex Table 3.2 Unconditional Cross-Correlation of Variables Included in the Core Estimation Model

		Implied CDS spreads (log) (A)	Actual CDS spreads (log) (B)	Profitability (principal component) (C)	Capitalization (principal component) (D)	Leverage (principal component) (E)	Liquidity (principal component) (F)	Size (percent of country's GDP) (G)	Share price (H)	Share price volatility (I)	Price-to-book ratio (J)	CPI inflation (year over year) (K)	Sovereign CDS spread (log) (L)	Exchange rate change (year over year) (M)	Commodity terms-of-trade index (log) (N)	VIX (log) (O)
Implied CDS spreads (log)	(A)	1														
Actual CDS spreads (log)	(B)	0.713 ***	1													
Profitability, principal component	(C)	−0.440 ***	−0.263 ***	1												
Capitalization, principal component	(D)	−0.294 ***	−0.325 ***	0.352 ***	1											
Leverage, principal component	(E)	0.102 ***	0.284 ***	0.030 ***	−0.406 ***	1										
Liquidity, principal component	(F)	−0.017 ***	0.090 ***	−0.224 ***	0.234 ***	−0.381 ***	1									
Size (percent of country's GDP)	(G)	−0.086 ***	0.070 **	0.095 ***	0.005	0.086 ***	−0.087 ***	1								
Share price	(H)	−0.009 *	−0.049 *	−0.007 *	0.020 ***	−0.040 ***	−0.005	−0.005	1							
Share price volatility	(I)	0.618 ***	0.479 ***	−0.480 ***	−0.165 ***	−0.168 ***	0.223 ***	−0.136 ***	−0.038 ***	1						
Price-to-book ratio	(J)	−0.125 ***	−0.146 ***	−0.148 ***	−0.264 ***	0.008 *	0.159 ***	−0.017 ***	0.000	0.012 **	1					
CPI inflation (y-o-y)	(K)	−0.082 ***	−0.030 *	0.212 ***	−0.045 ***	0.096 ***	−0.227 ***	0.051 ***	0.002	−0.187 ***	−0.034 ***	1				
Sovereign CDS (log)	(L)	0.100 ***	0.025	0.187 ***	−0.022 ***	0.093 ***	−0.242 ***	0.077 ***	0.010 **	−0.183 ***	−0.132 ***	0.648 ***	1			
Exchange rate change (y-o-y)	(M)	0.281 ***	0.218 ***	−0.008 *	−0.021 ***	0.057 ***	−0.058 ***	0.007 *	0.001	0.058 ***	−0.111 ***	0.199 ***	0.295 ***	1		
Commodity terms-of-trade index (log)	(N)	−0.039 ***	0.125 ***	0.025 ***	0.015 ***	0.002	0.035 ***	−0.007 *	0.006	−0.074 ***	0.025 ***	−0.017 ***	0.008 **	−0.124 ***	1	
VIX (log)	(O)	0.187 ***	0.351 ***	−0.028 ***	−0.008 *	0.000	−0.011 **	−0.003	−0.002	0.159 ***	−0.062 ***	0.092 ***	0.242 ***	0.209 ***	−0.069 ***	1

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

Note: CDS = credit default swap; CPI = consumer price index; VIX = Chicago Board Options Exchange Volatility Index; y-o-y = year over year.

*** $p<0.001$; ** $p<0.01$; * $p<0.1$.

Annex Table 3.3 Core Model: Estimation Results

	Core Model			Excluding Block #2			Excluding Blocks #3 and #4			Excluding Blocks #1 and #2		
	LAC + CAN	LAC	LA5	LAC + CAN	LAC	LA5	LAC + CAN	LAC	LA5	LAC + CAN	LAC	LA5
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Block 1: Firm-specific fundamentals:												
Profitability, principal component	-0.100***	-0.080***	-0.080***	-0.130***	-0.134***	-0.129***	-0.095***	-0.070***	-0.066***			
	(0.006)	(0.006)	(0.007)	(0.001)	(0.008)	(0.010)	(0.007)	(0.010)	(0.012)			
Capitalization, principal component	-0.089*	-0.370***	-0.366***	-0.165***	-0.310***	-0.353***	-0.065	-0.398***	-0.384***			
	(0.042)	(0.023)	(0.031)	(0.025)	(0.031)	(0.044)	(0.043)	(0.040)	(0.045)			
Leverage, principal component	0.112***	0.076***	0.080***	0.093***	0.081***	0.071**	0.115***	0.078***	0.083***			
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)			
Liquidity, principal component	-0.029***	-0.030*	-0.025*	-0.055***	-0.035**	-0.029*	-0.028***	-0.033**	-0.032*			
	(0.004)	(0.012)	(0.011)	(0.009)	(0.013)	(0.011)	(0.005)	(0.013)	(0.015)			
Size (percent of country's GDP)	0.021	0.005	0.006	0.019	0.007	0.007	0.025**	0.009	0.009			
	(0.011)	(0.006)	(0.006)	(0.010)	(0.005)	(0.005)	(0.009)	(0.007)	(0.007)			
Block 2: Firm-specific market variables:												
Share price	-3.60e-06	-4.80e-06	-4.65e-06				-1.55e-05***	-1.43e-05***	-1.36e-05***			
	(0.000)	(0.000)	(0.000)				(0.000)	(0.000)	(0.000)			
Share price volatility	0.008*	0.007***	0.007***				0.010***	0.012***	0.012***			
	(0.000)	(0.001)	(0.001)				(0.000)	(0.000)	(0.000)			
Price-to-book ratio	-0.050***	-0.050***	-0.047***				-0.055***	-0.066***	-0.067***			
	(0.001)	(0.003)	(0.003)				(0.003)	(0.004)	(0.004)			
Block 3: Domestic variables:												
CPI inflation (year over year)	0.023**	0.012	0.031**	0.014*	0.010	0.039**				0.004	0.0105	0.0416***
	(0.008)	(0.009)	(0.007)	(0.007)	(0.014)	(0.009)				(0.010)	(0.014)	(0.009)
Sovereign CDS Spreads (log)	0.008	0.115***	0.199***	0.0187	0.154***	0.253***				-0.0372	0.173***	0.278***
	(0.043)	(0.029)	(0.043)	(0.055)	(0.029)	(0.036)				(0.062)	(0.031)	(0.034)
Exchange rate change (year over year)	0.005***	0.004**	0.004**	0.009***	0.006***	0.006***				0.0122***	0.00765***	0.00721***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)				(0.001)	(0.001)	(0.001)
Block 4: Global variables:												
Commodity terms-of-trade index (log)	-1.568*	-1.726***	-0.877*	-1.587**	-1.938**	-0.636				-3.423**	-2.195*	-0.754
	(0.743)	(0.407)	(0.343)	(0.618)	(0.664)	(0.381)				(1.154)	(1.041)	(0.634)
VIX (log)	0.366***	0.378***	0.299***	0.552***	0.461***	0.351***				0.474***	0.399***	0.284***
	(0.022)	(0.051)	(0.056)	(0.059)	(0.059)	(0.0444)				(0.038)	(0.064)	(0.018)
Dummy variables:												
Dummy "crisis" (LAC)	0.983***	0.881***	0.853***	0.890***	0.837***	0.811***	1.232***	1.216***	1.223***	1.003***	0.893***	0.869***
	(0.056)	(0.024)	(0.042)	(0.034)	(0.031)	(0.049)	(0.036)	(0.036)	(0.041)	(0.038)	(0.036)	(0.049)
Dummy "crisis" (CAN)	0.285**			0.309**			0.495***			0.444***		
	(0.104)			(0.097)			(0.010)			(0.116)		
Dummy "recent" (LAC)	1.381***	1.290***	1.219***	1.326***	1.253***	1.174***	1.519***	1.506***	1.500***	1.441***	1.324***	1.245***
	(0.075)	(0.043)	(0.041)	(0.051)	(0.038)	(0.036)	(0.041)	(0.038)	(0.043)	(0.053)	(0.044)	(0.042)
Dummy "recent" (CAN)	0.463***			0.412***			0.556***			0.569***		
	(0.105)			(0.107)			(0.00791)			(0.121)		
Constant	2.886***	2.029***	1.854***	2.706***	1.803***	1.622***	3.845***	3.438***	3.431***	3.845***	3.438***	3.431***
	(0.093)	(0.066)	(0.089)	(0.073)	(0.084)	(0.150)	(0.014)	(0.035)	(0.038)	(0.014)	(0.035)	(0.038)
Number of Observations	24,798	11,237	10,128	30,972	14,396	12,806	24,799	11,238	10,128	24,799	11,238	10,128
R-squared	0.668	0.819	0.822	0.580	0.771	0.777	0.627	0.758	0.753	0.627	0.758	0.753
Number of Firms	1,337	515	454	1,522	593	524	1,337	515	454	1337	515	454

Source: IMF staff calculations.
Note: CAN = Canada; CDS = credit default swap; CPI = consumer price index; LA5 = Brazil, Chile, Colombia, Mexico, and Peru; LAC = Argentina, Brazil, Chile, Colombia, Mexico, Panama, and Peru; VIX = Chicago Board Options Exchange Volatility Index. Robust standard errors in parentheses.
*** $p<0.01$; ** $p<0.05$; * $p<0.1$.

Annex Table 3.4 Scenario Analysis

		Argentina	Brazil	Chile	Colombia	Mexico	Panama	Peru
Exchange rate scenario	**Shock**							
	Exchange rate in 2016:Q3	16.7	6.2	852.0	4918.5	23.1	1.0	4.2
	Impact							
	Change (bps) in implied CDS spreads between 2015:Q3 and 2016:Q3	133.3	117.2	20.0	61.9	38.6	0.0	58.5
Sovereign CDS spreads scenario	**Shock**							
	Change (bps) in sovereign CDS spreads in one quarter	5000	300	75	200	150	150	200
	Impact							
	Change (bps) in implied CDS spreads in one quarter	43.1	97.2	29.9	63.0	39.0	101.1	76.2
VIX scenario	**Shock**							
	Change (bps) in the VIX in one quarter	30	30	30	30	30	30	30
	Impact							
	Change (bps) in implied CDS spreads in one quarter	227.8	277.4	109.1	165.4	97.5	270.0	165.5
Crisis scenario	**Shock**	Unexplained regime-shift change (in log bps) identical to that observed during the global financial crisis						
	Impact							
	Change (bps) in implied CDS spreads in one quarter	415.9	506.5	199.2	302.0	178.0	493.1	302.1

Source: IMF staff calculations.
Note: bps = basis points; CDS = credit default swap; VIX = Chicago Board Options Exchange Volatility Index.

4. Exchange Rate Pass-Through in Latin America

Recent currency depreciations are expected to create inflation pressure across Latin America, though more modest than in the past. Improvements in monetary frameworks over the past two decades have led to substantial and generalized declines in exchange rate pass-through to consumer prices. In countries with credible monetary policy frameworks, policymakers have space to allow relative prices to adjust through exchange rate depreciation without compromising inflation objectives, as long as medium-term inflation expectations remain well anchored. Greater vigilance is warranted in economies that show evidence of sizable second-round effects.

Ongoing monetary normalization in the United States and sharp falls in global commodity prices have been followed by a significant weakening of emerging market currencies, especially in Latin America. The Brazilian real and the Colombian peso, for instance, have depreciated by about 60 percent against the U.S. dollar over the past two years (Figure 4.1)—a sharp and sustained depreciation that stands out from a historical perspective (see Chapter 2, Figure 2.1.1).[1]

Whereas past episodes of sharp depreciations in the region were often triggered by the sudden correction of pent-up imbalances, the recent episode largely reflects policy frameworks that allow exchange rates to respond to a changing external environment. The depreciations are facilitating the region's adjustment to the new reality of lower commodity prices, tighter global financial conditions, and lower world growth.[2]

Note: This chapter was prepared by Yan Carrière-Swallow, Bertrand Gruss, Nicolás Magud, and Fabián Valencia, under the guidance of Dora M. Iakova. Steve Brito and Alexander Herman provided excellent research assistance. See Carrière-Swallow and others (forthcoming) for technical details.

[1]Throughout this chapter we define the nominal bilateral exchange rate in local currency per U.S. dollar. We refer to a given depreciation of the domestic currency in bilateral (effective multilateral) terms as the extent of the *increase* in the bilateral (effective multilateral) exchange rate.

[2]See Chapter 3 of the April 2015 *Regional Economic Outlook: Western Hemisphere* for a discussion of the role of exchange rate flexibility in buffering the effect of commodity price shocks on public finances and facilitating a smoother external adjustment. See Chapter 3 of the

Figure 4.1. Selected Countries: Nominal Exchange Rate
(Index: 2014 = 100)
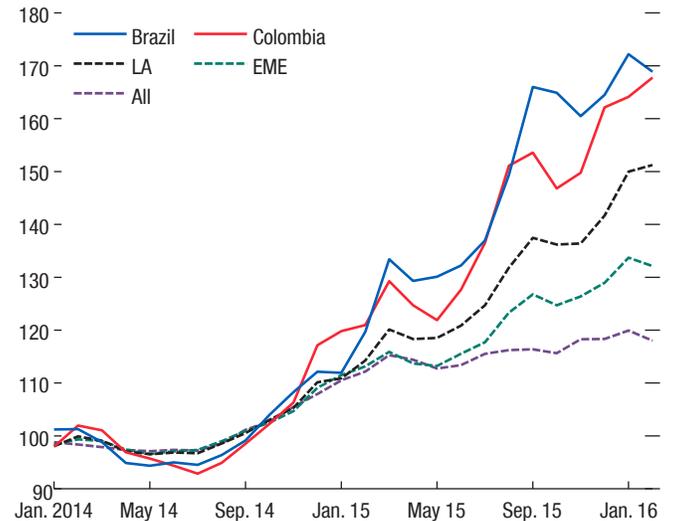
Sources: Bloomberg, L.P.; Haver Analytics; and IMF staff calculations.
Note: An increase in the exchange rate indices denotes a depreciation of the domestic currency against the U.S. dollar. "LA" and "EME" are based on the J.P. Morgan Latin America and Emerging Market currency indices, respectively. "All" is based on the J.P. Morgan Dollar Spot Currency Index, which reflects the value of a broad set of currencies against the U.S. dollar. EME = emerging market economies; LA = Latin America.

But, recalling the instability that accompanied large depreciations in the region during the 1980s and 1990s, should we be concerned that the current episodes might summon the old specter of high inflation?

Reassuringly, average inflation has remained stable in the region (Figure 4.2). This reflects the moderating effect of lower oil prices, and the fact that the depreciations are part of a global cycle of dollar strength that has made them more limited in nominal effective terms than U.S. dollar parities imply. However, low average inflation rates hide significant differences across countries. Whereas inflation has increased significantly in Brazil and Colombia, and to a lesser extent in Chile,

October 2015 *Regional Economic Outlook: Western Hemisphere* for an analysis of exchange rate flexibility and monetary autonomy in small open economies.

Peru, and Uruguay, it has declined in Mexico and some other Central American economies. Inflation expectations have also inched up in some countries, particularly at shorter horizons. In the context of uncertainty about the size and delay of exchange rate pass-through, policymakers in many countries remain concerned that inflation pressures may materialize or increase in the future.

Against this backdrop, this chapter explores the implications of the recent weakening of Latin American currencies for inflation dynamics. It seeks to answer the following questions: How sensitive are consumer prices to exchange rate movements? Has the sensitivity changed over time? What explains the differences across countries and over time? Can recent inflation developments be explained by changes in the nominal exchange rate? Should we expect to see a delayed impact on inflation later this year? And finally, what are the implications for monetary policy?

Exchange Rates and Consumer Prices: Historical Relationships

The sensitivity of domestic prices to changes in the exchange rate is generally referred to as exchange rate pass-through, and is an important input for the conduct of monetary policy. A change in the exchange rate normally triggers an adjustment in relative prices between tradable and nontradable goods, provoking a transitory *first-round effect* on inflation. However, this impact can get magnified if rigidities in the labor or product markets, or poorly anchored inflation expectations, lead to *second-round effects* on consumer prices. Generally speaking, policymakers should avoid responding to the normal adjustment of relative prices, but tighten monetary policy if there is evidence of second-round effects.

From a policy perspective, it is thus important both to quantify the overall pass-through to consumer prices, and to assess how much of this effect is due to first- versus second-round effects. Our empirical estimation of the overall impact of a currency depreciation on consumer prices is based on a standard specification (see, for instance,

Figure 4.2. Exchange Rates and Inflation during 2014–15
(Percent change in exchange rate, annualized, and difference in 12-month CPI inflation rate, between Dec. 2013 and Dec. 2015)
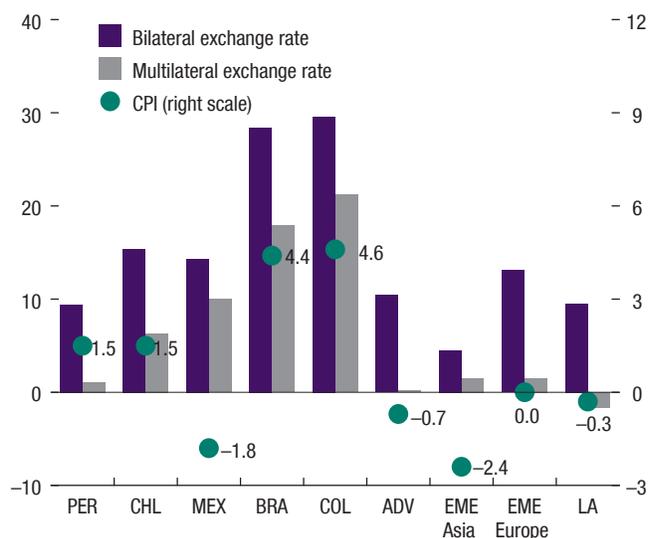
Sources: Haver Analytics; IMF, World Economic Outlook database; and IMF staff calculations.
Note: "Bilateral exchange rate" denotes the nominal exchange rate in local currency per U.S. dollar; "Multilateral exchange rate" refers to an import-weighted nominal effective exchange rate (see Annex 4.1); and "CPI" denotes the aggregate consumer price index. "ADV" and "EME" denote the average for advanced and emerging market economies, respectively, and "LA" the average for Latin American countries (see list of countries in Annex Table 4.1). Data labels use International Organization for Standardization (ISO) country codes, see page 108.

Campa and Goldberg 2005; and Gopinath 2015). The cumulative response is estimated in panel and country-specific settings using Jordà's (2005) local projection method (LPM):[3]

$$p_{i,t+h-1} - p_{i,t-1} = \alpha^h + \sum_{j=0}^{J} \beta_j^h \Delta NEER_{i,t-j} +$$

$$\sum_{j=1}^{J} \rho_j^h \Delta p_{i,t-j} + \gamma_j^h \Delta X_{i,t} + \mu_i^h + \varepsilon_{i,t}^h \qquad (4.1)$$

where $p_{i,t}$ denotes the natural logarithm of the domestic price level in country i at period

[3]As shown in Jordà (2005), the main advantages of LPM are simplicity, flexibility, and robustness to misspecification compared with standard vector autoregression (VAR) models. Implementation requires running a separate regression for each horizon h of interest, with the cumulative impulse response provided directly by the estimate of β_0^h. Most of our analysis focuses on the cumulative response after two years ($h = 24$), which is typically considered a measure of long-run pass-through. To improve efficiency, we follow Jordà's (2005) recommendation of including the residual from horizon $h - 1$ as an additional regressor in the estimation for horizon h. Because the error term may be serially correlated, we use Newey-West standard errors. We include six lags in our regressions.

t; *NEER* the natural logarithm of the trade-weighted nominal effective exchange rate;[4] Δ a first difference operator; μ$_i$ country fixed effects (included only in panel regressions); and ε$_{i,t}$ a random disturbance. The vector *X* includes a set of control variables (and their lags) that are deemed likely to affect both the exchange rate and inflation, to reduce concerns about omitted variable bias.[5] In our application, *X* includes: international oil and food prices in U.S. dollars; the cost of production in countries from which country *i* imports (proxied by the import-weighted producer price index of trading partners; see Annex 4.1);[6] and local demand conditions (proxied by the cyclical component of industrial production).[7] Our baseline sample uses monthly data from January 2000 to December 2015 and includes 31 advanced and 31 emerging market economies (see Annex 4.1 for the list of countries included).

The bars in Figure 4.3 show the cumulative response of consumer prices two years after a 1 percent increase in the nominal effective exchange rate. Pass-through in Latin America is comparable with estimates for other regions. For the region as a whole, average pass-through to consumer prices is less than 0.3, which is higher than emerging Asia (close to 0.2) but significantly lower than emerging Europe (about 0.5).

[4]Rather than the usual nominal effective exchange rate metrics that are weighted by total trade, we follow Gopinath (2015) and construct an index that is weighted by lagged import flows, and allow these weights to vary each year (see Annex 4.1).

[5]The inclusion of these variables aims at controlling for the effect they have on the dependent variable. Because we are relying on a reduced-form specification, we do not take a stand on the underlying source of variation in the exchange rate. The responses we report should thus be interpreted as reflecting the average constellation of shocks that moved the exchange rate during the estimation sample.

[6]Earlier studies have used world inflation or trade-weighted consumer prices to control for changes in exporting countries' production costs. The drawback of that approach is the preponderance of nontraded goods and services in consumer price indices. Using trade-weighted export prices is also problematic, because these may already reflect exporters' pricing decisions. In line with Gopinath (2015), we use an import-weighted foreign producer price index to mitigate these problems (see Annex 4.1).

[7]The cyclical component of industrial production is computed using a Hodrick-Prescott (HP) filter with smoothing coefficient equal to 129,600 on monthly data. We deal with the end-point bias by linearly extrapolating the HP trend from 2013 to the last two years in the sample.

Figure 4.3. Exchange Rate Pass-Through Estimates
(Percent)
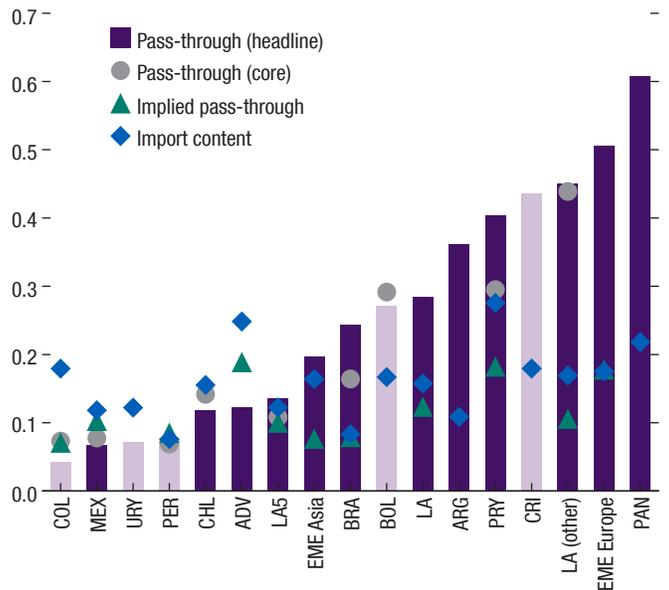
Source: IMF staff calculations.
Note: The figure shows the cumulative exchange rate pass-through to headline and core (where available) consumer prices two years after a 1 percent increase in the nominal effective exchange rate. Pass-through estimates for individual countries are obtained from country-specific regressions while average regional pass-through correspond to panel model estimates. "Implied pass-through" corresponds to the product of the cumulative exchange rate pass-through to import prices after two years and the country-specific "import content" of domestic consumption (as reported in Figure 4.4). "LA5" denotes estimates from a panel regression for Brazil, Chile, Colombia, Mexico, and Peru; while "LA (other)" corresponds to a panel of the remaining Latin American economies. Solid bars denote statistically significant responses at the 10 percent confidence level. Data labels use International Organization for Standardization (ISO) country codes, see page 108. ADV = advanced economies; EME = emerging market economies.

The estimates show substantial variation across countries. Considering only statistically significant responses among Latin American countries, the estimated pass-through ranges from 0.07 in Mexico to above 0.6 in Ecuador, Guatemala, Honduras, and Panama. The region's largest economies with longstanding inflation-targeting regimes, Brazil, Chile, Colombia, Mexico, and Peru (LA5), exhibit an average pass-through estimate of 0.14 that is in line with estimates for advanced economies and significantly below the rest of Latin America (close to 0.45).[8,9]

[8]Whenever we refer to an average pass-through for a group of countries, we cite estimates from panel regressions, whereas estimates for individual countries stem from country-specific time-series regressions. The specification, in terms of lag structure and control variables, is however identical in both types of regressions.

[9]Albagli, Naudón, and Vergara (2015) estimate a pass-through of about 0.2 for the LA5 economies, which is higher than that

A Benchmark for Exchange Rate Pass-Through

How can we tell whether a given pass-through estimate merely reflects first-round effects—related to relative-price adjustments—or rather suggests evidence of second-round effects? One can think of the exchange rate pass-through process to consumer prices as occurring in two stages. In the first stage, variations in the exchange rate affect local-currency prices of imported goods at the border. In the second stage, changes in import prices are reflected in consumer prices, measured by the consumer price index (CPI).

Under the assumption of complete exchange rate pass-through to import prices, the import content of final household consumption provides a *benchmark* for the expected first-round effects of a depreciation on consumer prices. Like Burstein, Eichenbaum, and Rebelo (2005) and Gopinath (2015), we measure the total import content of households' final demand using input-output tables.[10] Figure 4.4 shows that the average import content in consumption expenditure in Latin America has steadily increased since 2000, but remains lower than in advanced and emerging market economies from other regions. The import content also varies significantly across Latin American countries, with the average share over 1997–2012 ranging from only about 7 percent in Brazil and Peru to above 20 percent in Honduras, Panama, and Paraguay.

Of course, pass-through to import prices might be incomplete, in which case the import

Figure 4.4. Import Content of Households' Final Demand

1. Total Import Content in Households' Consumption Expenditure
(Percent)

2. Direct and Indirect Import Content in Households' Consumption Expenditure
(Percent, average 1997–2012)
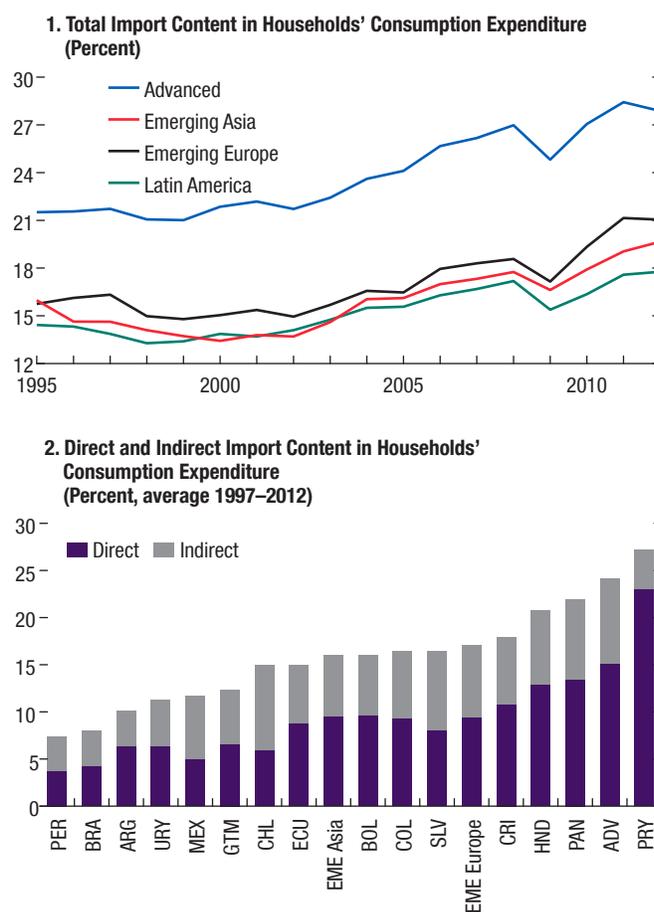
Sources: Eora MRIO; and IMF staff calculations.
Note: The direct import content corresponds to imports of final consumption goods, while the indirect import content accounts for the value of imported inputs used in domestically produced goods that are consumed by domestic households. Data labels use International Organization for Standardization (ISO) country codes, see page 108. ADV = advanced economies; EME = emerging market economies

content of consumption would overstate first-round effects.[11] To address this issue, we also construct an *alternative benchmark* as the product of the import share and an empirical estimate of exchange rate pass-through to import prices—obtained by replacing consumer prices as the dependent variable in equation (1) with import

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for other emerging market economies and much higher than for advanced economies. Three methodological features of their work contribute to the difference between our findings: (1) they estimate the pass-through against the U.S. dollar rather than in multilateral terms, (2) they focus on pass-through following autonomous shocks to the exchange rate—that is, exchange rate shocks that were not triggered by external factors such as commodity prices, and (3) the regional averages they report are weighted by GDP, while our panel estimates are simple average effects.

[10]The total import content of domestic consumption includes both (1) the direct import content (that is, imports of final consumption goods) and (2) the indirect import content, which accounts for the value of imported inputs used in domestically produced goods that are consumed by domestic households. See Annex 4.1 for more details.

[11]The empirical literature has indeed found substantial evidence of incomplete pass-through to import prices (see, for instance, Campa and Goldberg 2005), for example, as a result of local-currency pricing, market structure, substitution among alternative domestic and foreign products, and perceptions about the persistence of exchange rate changes.

prices where these are available. This alternative benchmark is generally expected to be smaller than or equal to the first benchmark.[12]

How Do Pass-Through Estimates Compare with These Benchmarks?

For Latin America as a whole, the pass-through estimate reported previously (about 0.3, see Figure 4.3) is much larger than both benchmark measures (between 0.12 and 0.16).[13] This suggests that depreciations in the region have inflation effects that go beyond the expected first-round relative-price adjustments, perhaps by affecting medium-term inflation expectations, and thus the price- and wage-setting behavior of households and firms. There is also evidence that suggests important second-round effects in other emerging market economies, because their average pass-through estimates also exceed the benchmarks. But this is not the case for advanced economies: their average pass-through is only 0.12, while their average import content is 0.25 and the implied pass-through, considering also the sensitivity of prices at the border, is 0.19.

The average for Latin America masks a significant degree of heterogeneity across countries. For the large inflation targeters in the region, there seems to be little evidence of second-round effects. Indeed, the average pass-through estimate is in line with or below our benchmarks. The exception is Brazil, where the estimated pass-through of 0.24 in 2000–15 far exceeds its benchmark of about 0.08, suggesting that second-round effects have been pervasive in the past. To check whether changes in administered prices might be affecting our estimates of pass-through, we reestimate the model using core prices. The conclusion

holds: with the exception of Brazil, pass-through estimates to core inflation are in line with benchmarks in the other economies.

In much of the rest of the region, second-round effects appear important, with estimated pass-through significantly above benchmarks, and comparable to the results for emerging Europe. In Argentina, the pass-though estimate is about 0.36 while its import-content benchmark is close to 0.11, and in Ecuador, where the import share is roughly comparable, the pass-through estimate is close to 0.7.[14] The differences with benchmarks in our sample are particularly large among Central American economies, such as El Salvador, Guatemala, and Honduras.[15]

In the region's highly dollarized economies, including Costa Rica, Guatemala, Paraguay, Peru, and Uruguay, the U.S. dollar exchange rate may have more bearing on domestic pricing decisions than the multilateral exchange rate. For these countries, we also report pass-through estimates after 12 months from changes in the bilateral exchange rate (Figure 4.5). In Uruguay, the pass-through from bilateral exchange rate movements is much larger than from changes in the multilateral exchange rate, probably reflecting its high degree of transaction dollarization, and in line with the LA5 average and its benchmark. Both pass-through estimates are comparable in the case of Paraguay and Peru. For Costa Rica and Guatemala, the pass-through from the bilateral exchange rate is much lower than the pass-through from the multilateral rate, but still higher than benchmarks.[16]

[12]Although some point estimates for pass-through to import prices are slightly above one in our sample (similarly to findings in, for instance, Choudhri, Faruqee, and Hakura 2005; and Ca'Zorzi, Hahn, and Sánchez 2007), full pass-through cannot be rejected in those cases. It should be noted, however, that there is significant variation across countries in the procedures used to construct import price indices, which could influence estimates of pass-through at the border and thus our alternative benchmark.

[13]The benchmark and alternative benchmark are denoted as "Import content" and "Implied pass-through," respectively, in Figure 4.3.

[14]The sample for Argentina uses data from January 2000 to December 2010, before a gap between the official and the parallel exchange rate emerged. CPI data after December 2006 correspond to private analysts' estimates.

[15]It should be noted that our estimates reflect historical average effects, and thus do not fully capture improvements in policy frameworks that may have occurred over time.

[16]The standard errors from pass-through estimates using the bilateral exchange rage are substantially larger than for estimates using multilateral exchange rates. In fact, the estimates are insignificant at the 10 percent confidence level in all five countries reported in Figure 4.5. The response using bilateral exchange rates in other Latin American countries is either insignificant or similar to the one using multilateral rates—except in Argentina, where the pass-through when using the bilateral exchange rate is about 0.1 lower than when using the multilateral exchange rate.

Figure 4.5. Bilateral versus Multilateral Exchange Rate Pass-Through
(Percent)
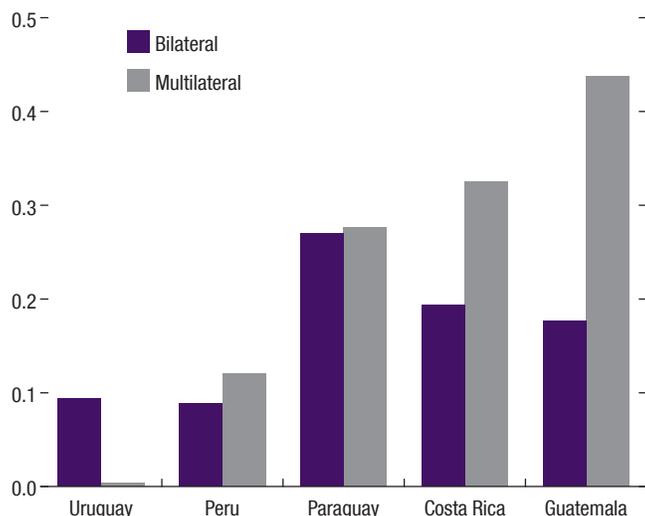
Source: IMF staff calculations.
Note: The figure shows the cumulative exchange rate pass-through to headline consumer prices one year after a 1 percent increase in the nominal exchange rate vis-à-vis the U.S. dollar ("Bilateral") or the nominal effective exchange rate ("Multilateral"; see Annex 4.1).

Have Departures From Benchmark Pass-Through Estimates Narrowed over Time?

We run separate panel regressions over rolling samples of 12 years starting in 1995, 1999, and 2003, and find that the exchange rate pass-through to consumer prices has systematically decreased in all regions (Figure 4.6). The decline is particularly pronounced among emerging market economies, where the average pass-through is much closer to benchmark estimates in the most recent period. In Latin America, the average pass-through has fallen to only one-third of its 1995–2006 level and, among the LA5 economies, it has fallen below 0.10.

Remarkably, this decline in pass-through has taken place despite an increase in the import content of consumption over time. Although the average pass-through to import prices has also declined, the lion's share of the improvement has occurred in the reaction of consumer prices.

Figure 4.6. Exchange Rate Pass-Through Over Time
(Percent)
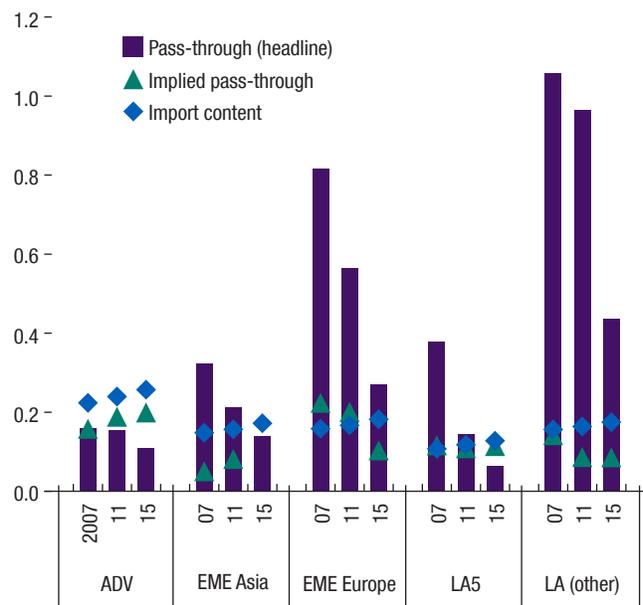
Source: IMF staff calculations.
Note: The figure shows the average cumulative exchange rate pass-through to headline consumer prices two years after a 1 percent increase in the nominal effective exchange rate from panel regressions estimated by region over different rolling samples of 12 years, ending on the year indicated in the figure. "Implied pass-through" corresponds to the product of the cumulative exchange rate pass-through to import prices after two years and the country-specific "import content" of domestic consumption (as reported in Figure 4.4). ADV = advanced economies; EME = emerging market economies; LA5 = Brazil, Chile, Colombia, Mexico, and Peru; LA (other) = other Latin American economies.

Determinants of Exchange Rate Pass-Through: The Role of Monetary Policy

We have documented that exchange rate pass-through varies substantially across countries and has declined markedly over time. What factors might account for these differences? We center our attention on the role that monetary policy has played in attenuating second-round inflation effects following depreciations. In an unstable monetary environment, the impact of currency depreciation on inflation can be amplified by changes in inflation expectations that, in turn, affect price and wage setting decisions. By anchoring medium-term inflation expectations, central banks limit this mechanism and thus reduce the degree and persistence of exchange rate pass-through.

We explore this question following a two-stage procedure similar to Choudhri and Hakura (2006). First, we estimate the degree of exchange rate pass-through *country by country* using equation (4.1).[17] To account for time variation, we estimate these country-specific regressions over rolling samples of 12 years starting in January 1995, obtaining a vector of pass-through estimates for each country in our sample. Second, we regress the full set of country- and time-specific pass-through estimates on a number of potential determinants that have been identified in the literature.[18] To this end, we include the import content of consumption, average inflation, inflation volatility, average depreciation, exchange rate volatility, the persistence of changes in the nominal effective exchange rate, and volatility of inflation forecasts.[19] We then augment the regressions with a proxy for central bank credibility.[20]

The second-stage results are reported in Table 4.1, with all variables found to be statistically significant when introduced separately in the regression. The exchange rate pass-through increases with the level of inflation, its volatility, and with the volatility of inflation expectations. The results also suggest that the larger and the more persistent the change in the exchange rate, or the lower its volatility, the larger the

pass-through.[21,22] These results provide indirect evidence of nonlinearities in exchange rate pass-through, some of which have been documented in the literature (for example, Frankel, Parsley, and Wei 2012; Caselli and Roitman 2016). Note that these conclusions largely hold even when all regressors are included simultaneously, despite being highly correlated. However, once we include our proxy for central bank credibility, only credibility and the import content of consumption remain highly significant. Average depreciation remains somewhat significant, but its coefficient is much smaller. Overall, we take this as strong evidence that pass-through decreases with the degree of anchoring of inflation expectations.[23]

The magnitude of the correlation between our proxy of central bank credibility and pass-through is also economically important. An increase of one unit in the credibility index—equivalent to a move from the 25th percentile to the median of central bank credibility within our sample—is associated with a drop in the estimated pass-through of 0.08.

The strong result for the central bank credibility index suggests that a more predictable central bank reaction function is associated with lower average exchange rate pass-through to consumer prices, and one that is closer to its benchmarks. The vanishing significance of most of the determinants once central bank credibility is introduced, also suggests that the nonlinearities discussed above are largely reflecting the same underlying factor: unanchored inflation expectations.

[17]Specifically, we focus on the cumulative exchange rate pass-through to headline inflation after two years.

[18]The set of first-stage estimates used in the second stage is restricted to those that were significant at a 10 percent confidence level. This is a rough approximation to a weighted least squares approach, where insignificant estimates receive a lower weight than more significant ones. The second-stage regression also includes time dummies to control for potential common drivers of pass-through across countries over this period.

[19]All variables are evaluated for the corresponding time period of the estimation window.

[20]Strictly speaking, the index captures the degree of anchoring of inflation expectations at a 12-month fixed horizon using data from Consensus Forecasts surveys (see Annex 4.1). At a sufficiently long horizon, predictable and credible monetary policy should be reflected in low forecast disagreement. Ideally, we would use forecasts at a longer horizon, but these are only available for a handful of countries and at lower frequency.

[21]We tested more formally for asymmetries in exchange rate pass-through by separating depreciations from appreciations in equation (4.1). The results for panel regressions suggest that, in emerging markets, depreciations are associated with a significantly larger pass-through than appreciations. For the LA5 economies, the pass-through from a 1 percent depreciation is about 0.17 after two years (slightly above the average 0.14 response), while it is only 0.04 in the case of an appreciation.

[22]The result on the exchange rate volatility is in line with the hypothesis that a given exchange rate change is less likely to be passed to import prices when such fluctuations are common and transitory (as in Krugman 1989; Froot and Klemperer 1989; and Taylor 2000) and with empirical findings in Frankel, Parsley, and Wei (2012) for advanced economies.

[23]Albagli, Naudón, and Vergara (2015) also find a significant correlation between pass-through and a proxy for central bank credibility based on deviations of inflation from target.

Table 4.1 Second-Stage Estimation Results

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Import share	0.9918***	0.7486***	1.0062***	0.5902***	0.5649**	0.8131***	0.8022***	0.8455***	0.7644***
	(0.1920)	(0.1879)	(0.1904)	(0.1970)	(0.2240)	(0.1933)	(0.1632)	(0.2133)	(0.1890)
Average inflation	0.0293***							0.0273**	−0.0203
	(0.0043)							(0.0122)	(0.0130)
Inflation volatility		0.0227***						0.0237**	−0.0102
		(0.0037)						(0.0093)	(0.0104)
Average depreciation			0.0320***					0.0323***	0.0179*
			(0.0044)					(0.0103)	(0.0098)
Exchange rate volatility				−0.0018*				−0.0068***	−0.0021
				(0.0010)				(0.0014)	(0.0015)
Persistence of exchange rate					1.8574***			0.0307	−1.3675**
					(0.6057)			(0.5818)	(0.5689)
Volatility of inflation forecasts						0.0218***		−0.0386***	0.0260*
						(0.0048)		(0.0135)	(0.0155)
Central bank credibility							−0.0714***		−0.0808***
							(0.0116)		(0.0234)
Number of Observations	425	425	425	425	317	421	292	314	240
R-squared	0.4384	0.4265	0.4463	0.3797	0.3691	0.4042	0.4188	0.5083	0.4376

Source: IMF staff calculations.
Note: The dependent variable is the cumulative exchange rate pass-through to headline consumer prices after two years from the first-stage estimates of equation (4.1) for each country over rolling samples of 12 years starting on January of each year since 1995. Only pass-through estimates significant at the 10 percent confidence level are used in the second stage. "Import share" is the average import content of households' consumption expenditure documented in Figure 4.4 over the first-stage estimation sample. "Average inflation" and "Inflation volatility" are the mean and the standard deviation of the monthly percent change in the headline consumer price index, annualized. "Average depreciation" and "Exchange rate volatility" denote the mean and the standard deviation of the monthly percent change in the nominal effective exchange rate, annualized. The "Persistence of exchange rate" is computed by estimating an autoregressive AR(1) process on the monthly nominal effective exchange rate over rolling windows of 24 months and then taking the average autoregressive coefficient over the first-stage estimation window. The "Volatility of inflation forecasts" is the standard deviation of average one-year-ahead inflation forecasts from Consensus Economics over the first-stage estimation sample. The "Central bank credibility" index is constructed from the dispersion among Consensus Economics forecasts, with a higher value denoting lower dispersion (see Annex 4.1). Time fixed effects are included in all specifications.
Standard errors in parentheses.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Over the past two decades, many central banks have adopted inflation targeting precisely to make their decision-making process more explicit and predictable. We explore the relationship between the level of pass-through and monetary regimes by estimating equation (4.1) separately for panels of inflation targeters and others.[24] The results suggest that the exchange rate pass-through is smaller among inflation targeters than noninflation targeters (0.1 versus 0.4), with a larger gap when the sample is constrained to emerging market economies (Figure 4.7). The pass-through estimates for inflation targeters are also much closer to the import-content

benchmark than those for noninflation targeters, suggesting that second-round effects are less pervasive among the former. Indeed, inflation expectations are better anchored in economies with inflation targeting regimes than in those with other policy regimes, based on our proxy, and this difference is particularly stark among emerging markets.

Although causal relationships cannot be inferred from these regressions, the estimated correlations suggest that credible monetary policy—supported by an institutional framework that allows central banks to fulfill their mandate independently of fiscal considerations and political pressures—may effectively lower the exchange rate pass-through to consumer prices.

[24]The period of estimation is narrowed to the past 12 years since many emerging markets adopted inflation targeting in the early 2000s.

Figure 4.7. Policy Regimes and Exchange Rate Pass-Through
*(Percent)*
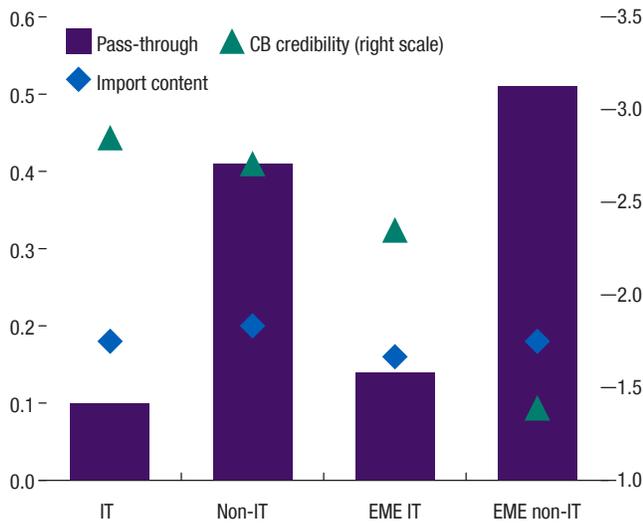
Source: IMF staff calculations.
Note: The figure shows the average cumulative exchange rate pass-through to headline consumer prices two years after a 1 percent increase in the nominal effective exchange rate from panel regressions by group of countries estimated between January 2003 and December 2015. "IT" refers to countries with an inflation-targeting framework in place; "EME" denotes emerging market economies. "CB credibility" is the average central bank credibility index, as described in Annex 4.1, for each group of countries. "Import content" is as defined in Figure 4.4.

Recent Inflation through the Lens of Pass-Through Estimates

How much of recent inflation dynamics in Latin America can be explained by currency weakness? In this section, we assess the contribution of changes in the multilateral exchange rate to observed inflation over the past three years. To this end, we use country-specific pass-through estimates for horizons up to 24 months, as well as the actual monthly change in the nominal effective exchange rate between January 2011 and December 2015.[25]

Figure 4.8 summarizes the results of this exercise for the large inflation targeters in Latin America. It suggests that the contribution of the exchange rate depreciation to inflation in Brazil, Chile, Colombia, and Mexico has been increasing over the past two years and was relatively large in 2015—ranging

[25]For this exercise, we use the impulse responses computed over a sample window from 2003 to 2015 to capture the lower exchange rate pass-through over the past decade—except for the case of Peru, where we use the full sample owing to concerns about the model's stability.

Figure 4.8. LA5: Estimated Contribution of Exchange Rates to CPI Inflation
(Percent)
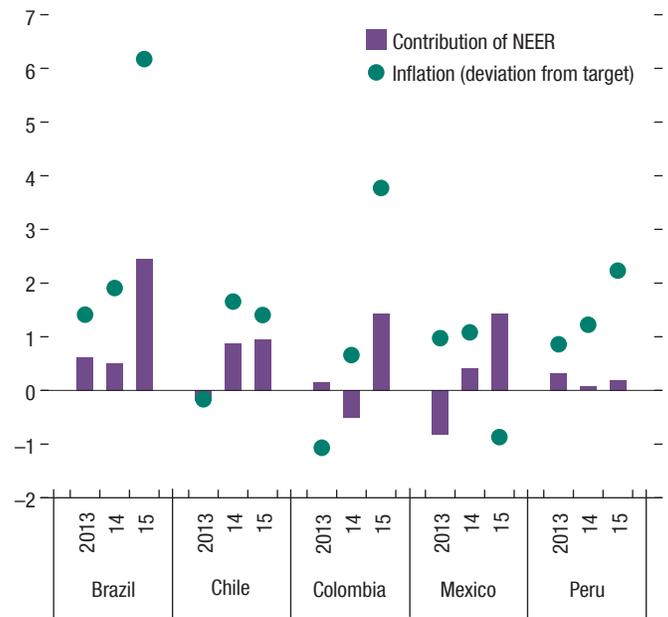
Source: IMF staff calculations.
Note: The bars show the contribution of the import-weighted nominal effective exchange rate ("NEER"; see Annex 4.1) to consumer price inflation, based on impulse responses from country-specific models. The dots show the deviation of end-of-year annual inflation from the center of the central bank's target range. LA5 = Brazil, Chile, Colombia, Mexico, and Peru.

from 1 percentage point in Chile to 2½ percentage points in Brazil. In Peru, the multilateral exchange rate has moved little over the past two years, exerting only a minor influence on inflation.

In Chile, the exchange rate depreciation can account for an important part of the deviation of inflation from its target that emerged over the past two years. In the other countries that have seen an increase in inflation, the results suggest that exchange rate pass-through has played a secondary role. In the case of Colombia and Peru, the increase in inflation can be partially explained by local supply shocks associated with El Niño that affected domestic food prices. In Mexico, the contribution from changes in the exchange rate has been positive since 2014 and was relatively large in 2015, but this effect was more than offset by other factors, including lower commodity prices, a negative output gap, and lower telecommunications service prices on the back of reforms in the sector.

What Can Be Expected in the Future?

The answer varies across countries in accordance with two factors: the path of the nominal effective exchange rate over the last year, and the delay with which the exchange rate affects consumer prices. Although depreciations among metal exporters largely took place in 2013–14, those of oil exporters happened more recently. We also find significant differences in how quickly a change in the exchange rate affects consumer prices. Figure 4.9 shows the estimated cumulative exchange rate pass-through after 12 and 24 months for the large inflation targeters in Latin America. The pass-through in Brazil and Chile is very gradual, with a cumulative effect after two years that is twice as large as in the first year. In Mexico, the pass-through peaks and stabilizes after one year, while it declines in the second year in Colombia and Peru—and, moreover, the cumulative effect after two years in these two cases is not statistically significant owing to large standard errors.[26]

Together, these findings generally suggest that past depreciation will have only a relatively small additional price effect. In Brazil, however, the response of inflation tends to be slow and the recent depreciation has been particularly large, suggesting a larger remaining impact on consumer prices during 2016. Note that these results are not forecasts of inflation and correspond only to the expected contribution of the exchange rate. Indeed, the other factors in our model will likely continue to counteract inflation pressures in most countries over the coming year.

Conclusion and Policy Implications

The sizable currency depreciations observed across many Latin American countries over the past few years have placed upward pressure on inflation, but their impact has been more muted than in

[26]These differences could reflect several factors, including the reaction of monetary policy. If, for instance, monetary policy reacted strongly enough following movements in inflation triggered by depreciations, the short-term pass-through may be partly reversed over time—potentially ending up below first-round effects.

Figure 4.9. LA5: Exchange Rate Pass-Through Dynamics
(Percent)
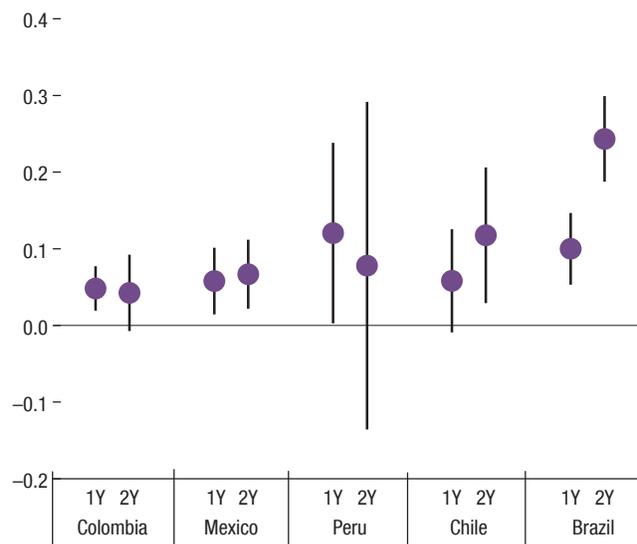
Source: IMF staff calculations.
Note: The figure shows the average cumulative exchange rate pass-through to headline consumer prices prices one year (1Y) and two years (2Y) after a 1 percent increase in the nominal effective exchange rate estimated for January 2000 to December 2015. The vertical black lines denote 90 percent confidence intervals. LA5 = Brazil, Chile, Colombia, Mexico, and Peru.

the past. The improvement of macroeconomic policy frameworks in many countries in the region over the past two decades, which have established strong nominal anchors, has led to a much lower pass-through of exchange rate depreciations to consumer prices. A direct implication of this result is that it may now be easier for monetary policy to stabilize inflation and real activity, while at the same time allowing the exchange rate to play a key role in adjusting to external shocks. However, second-round effects on inflation remain significant in some countries, particularly in Central America.

Given the magnitude of recent currency movements and the gradual nature of pass-through, some further pressure on consumer prices is likely. Although the appropriate policy reaction is necessarily country specific, the results in this chapter suggest the following common implications:

- In countries with strong central bank credibility and well-anchored medium-term inflation expectations, second-round effects

from movements in the exchange rate are likely to be limited. Therefore, policymakers can allow relative prices to adjust through exchange rate depreciation when faced with an external shock without compromising inflation objectives. Nonetheless, it is important to emphasize that the exchange rate pass-through will remain low so long as monetary authorities continue to ratify the public's expectations that they will deliver their inflation objectives in the medium term.

- In countries where expectations are not well anchored and second-round effects from depreciations are sizable, monetary policy needs to be more proactive to preserve price stability. Over time, as these countries strengthen their policy frameworks and establish a strong track record of meeting their inflation targets, exchange rate pass-through is expected to decline further.

Annex 4.1. Technical Details

Import Content of Households' Consumption Expenditure

The share of import content in households' consumption is estimated from Eora multi-region input-output tables at the world level (see Lenzen and others 2012, 2013). The total value of imports in consumption for a given country and year includes both (1) *direct* imports—that is, imports of final consumption goods—and (2) *indirect* imports—which account for the value of imported inputs used to produce domestic goods absorbed by resident households. The import content of consumption is the sum of direct and indirect imports over households' total consumption expenditure. Direct imports correspond to demand of nonresident sectors' production from resident households in input-output tables. Indirect imports are computed by multiplying the value of output of each domestic sector absorbed by resident households by the share of imported inputs in that sector's output value, and then summing across sectors.

Nominal Effective Exchange Rate and Exporting Countries' Production Cost

The multilateral nominal effective exchange rate (NEER) used in this chapter is based on the bilateral exchange rate of each trading partner vis-à-vis the U.S. dollar, weighted by their import shares. More precisely, the monthly change in NEER for country i at time t is given by:

$$\Delta NEER_{i,t} = \sum\nolimits_{j=1}^{J} \omega_{ij,t}(\Delta e_{i,t} - \Delta e_{j,t}), \ i \neq j$$

where $e_{i,t}$ is the natural logarithm of country i's bilateral exchange rate (in local currency per U.S. dollar); Δ is the first difference operator; and $\omega_{ij,t}$ is the share of exports from country j to country i in country i's total imports as reported in the IMF's *Direction of Trade Statistics*, lagged one year.

Using the same trade weights $\omega_{ij,t}$, the monthly change in the cost of production in country i's import partners is proxied by:

$$\Delta mPPI_{i,t} = \sum\nolimits_{j=1}^{J} \omega_{ij,t} \Delta PPI_{j,t}, \ i \neq j$$

where $PPI_{j,t}$ is the natural logarithm of country j's producer price index.

Central Bank Credibility Index

Like IMF (2015b), we use the degree of anchoring of inflation expectations to construct an index of central bank credibility for country i at time t as:

$$CBC_{i,t} = 1/MA48(\sigma_{i,t})$$

where $MA48(\sigma_{i,t})$ denotes the four-year moving average of the standard deviation of inflation forecasts reported by Consensus Economics at a 12-month fixed horizon. A higher degree of disagreement among forecasters is associated with a lower value of the *CBC* index.

- The dispersion of forecasts serves as a proxy for credibility, since the more predictable a central bank's reaction function is, the less likely are forecasters to disagree about

the future path of inflation. Although the variability of shocks affecting the economy and general macroeconomic uncertainty can also lead to increased dispersion among forecasts, disagreement has been found to be closely related to de jure measures of central bank independence (see Dovern, Fritsche, and Slacalek 2012).

Annex Table A4.1 Sample of Countries

Latin America	Other Emerging Market Economies	Advanced Economies	
Argentina	Bulgaria	Australia	Korea
Bolivia	China	Austria	Latvia
Brazil	Hungary	Belgium	Luxembourg
Chile	India	Canada	Netherlands
Colombia	Indonesia	Czech Republic	New Zealand
Costa Rica	Lithuania	Denmark	Norway
Ecuador	Malaysia	Estonia	Portugal
El Salvador	Pakistan	Finland	Singapore
Guatemala	Philippines	France	Slovak Republic
Honduras	Poland	Germany	Slovenia
Mexico	Romania	Greece	Spain
Panama	Russia	Hong Kong SAR	Sweden
Paraguay	South Africa	Ireland	Switzerland
Peru	Thailand	Israel	United Kingdom
Uruguay	Turkey	Italy	United States
	Ukraine	Japan	

Source: IMF staff compilation.

5. Infrastructure in Latin America and the Caribbean

Inadequate infrastructure has been widely viewed as one of the principal barriers to growth and development in Latin America and the Caribbean (LAC). Despite the fact that the region's infrastructure network has been upgraded over the past decade and is broadly comparable with those in other emerging market economies, infrastructure quality across individual countries often compares poorly with their export rivals and, more importantly, considerable catch-up is still required relative to advanced economies. The improvement in infrastructure quality over the past decade reflected both an increase in public investment, facilitated by the commodity boom, and greenfield investment by the private sector, notably in sectors where regulatory impediments had been alleviated. Deepening domestic capital markets helped finance an increasing fraction of private investment in local currency. For most LAC countries, the efficiency of public investment remains below that achieved by advanced economies, notwithstanding improvements in fiscal institutions. Reasonably sound frameworks for public-private partnerships in some large economies should be replicated by others to crowd-in greater private participation.

In the past several years, many countries in the region have turned their attention to investment in infrastructure to support near-term demand and, more important, bolster the economy's productive capacity. In particular, investment in infrastructure increases the productivity of other factors of production, improves competitiveness, and expands export capacity. Insufficient infrastructure will usually be reflected in bottlenecks and other inefficiencies that create social dissatisfaction and hurdles to investment, which, in turn, will be a drag on current and prospective growth. This chapter explores the state of economic infrastructure and trends in public and private infrastructure investment in Latin America and the Caribbean (LAC) relative to comparable countries

in other regions;[1] policies and institutional frameworks that can affect the efficiency or "bang for the buck" in infrastructure investment, as well as crowd-in private participation while minimizing fiscal risks; and the key policy challenges that countries in LAC need to address to bolster the quality of infrastructure.

Stock and Quality of Infrastructure: Where Does LAC Stand?

On average, the stock of economic infrastructure—notably power generation capacity, road networks, and telephone lines—in LAC economies compares favorably with that of peers in other emerging market regions, but still lags behind advanced economies by most standard measures, with differences being most stark with respect to electricity generation capacity (Figure 5.1).[2] Infrastructure stocks have been rising in LAC countries, but the gains do not compare favorably with those in fast-growing regions (for example, emerging Asia). Similarly, infrastructure quality (Figure 5.2)—measured by *reductions* in electricity distribution losses, unpaved roads, and telephone faults—has also been improving in LAC countries, although infrastructure quality remains below that in Asia, particularly as it pertains to roads.

Although a proper standard for infrastructure is often hard to define, the proximity to the "ideal" of

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[1]The measurement of infrastructure and the analysis of "infrastructure gaps" should be interpreted with caution because of conceptual and data problems. Available indicators are sometimes based on indirect proxies or provide incomplete information, as when describing road networks by reference to the ratio of kilometers of roads to country surface area, or are based on subjective surveys of perception.

[2]We focus our comparisons in this section on advanced economies, emerging Asia, and sub-Saharan Africa, which provide a wide spectrum of experiences. Comparisons (using slightly different metrics) against other regions, such as the Commonwealth of Independent States, emerging and developing Europe, and the Middle East and North Africa, can be found in IMF (2014).

Figure 5.1. World: Infrastructure Stock Indicators

1. Electricity Generation Capacity (1990–2012)
(Kilowatt per 100 persons)

2. Road Density (2003–10 average)
(km of road per 100 square km)

3. Fixed-Telephone Subscriptions (1990–2012)
(Subscriptions per 100 persons)

Sources: Energy Information Administration; International Road Federation, World Road Statistics; International Telecommunications Union; World Bank; and IMF staff calculations.
Note: EMA = emerging Asia; EUR = advanced Europe; LAC = Latin America and the Caribbean; LAC6 = Argentina, Brazil, Chile, Colombia, Mexico, and Peru; SSA = sub-Saharan Africa; US & CAN = United States and Canada.

Figure 5.2. World: Infrastructure Quality Indicators

1. Electricity Distribution Losses (1990–2013)
(Percent of total electricity)

2. Unpaved Roads (1990–2013)
(Percent of total roads)

3. Telephone Faults (1990–2013)
(Annually reported faults per 100 fixed-telephone lines)

Sources: Energy Information Administration; International Road Federation, World Road Statistics; International Telecommunications Union; World Bank; and IMF staff calculations.
Note: EMA = emerging Asia; EUR = advanced Europe; LAC = Latin America and the Caribbean; LAC6 = Argentina, Brazil, Chile, Colombia, Mexico, and Peru; SSA = sub-Saharan Africa; US & CAN = United States and Canada.

universal access constitutes a clear benchmark, as it relates to the well-being of the population. In this dimension, LAC countries are in a better position than other emerging market and developing economies in terms of access to electricity, but not

so much concerning other measures such as rural access to roads (Figure 5.3).

Alternatively, the level and quality of infrastructure can be compared to a country's

Figure 5.3. World: Infrastructure Access Indicators
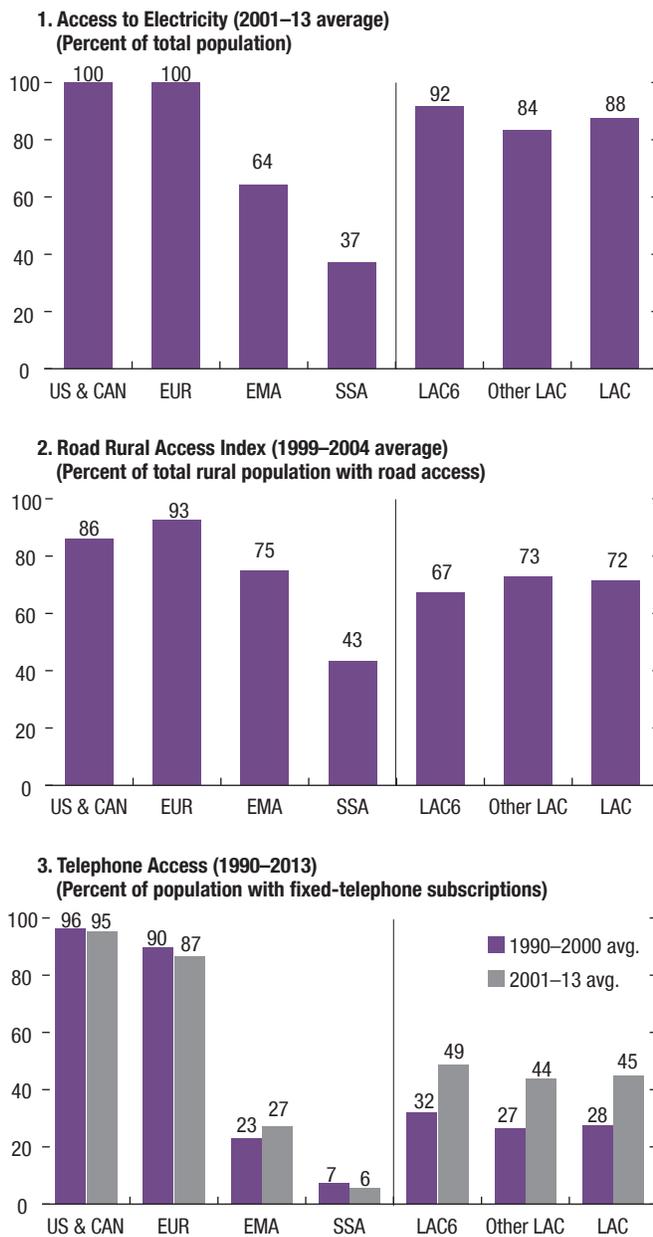
1. Access to Electricity (2001–13 average)
(Percent of total population)

2. Road Rural Access Index (1999–2004 average)
(Percent of total rural population with road access)

3. Telephone Access (1990–2013)
(Percent of population with fixed-telephone subscriptions)

Sources: Energy Information Administration; International Road Federation, World Road Statistics; International Telecommunications Union; World Bank; and IMF staff calculations.
Note: EMA = emerging Asia; EUR = advanced Europe; LAC = Latin America and the Caribbean; LAC6 = Argentina, Brazil, Chile, Colombia, Mexico, and Peru; SSA = sub-Saharan Africa; US & CAN = United States and Canada.

level of development, measured, for example, by income per capita. Economic development brings about the resources to raise infrastructure and, at the same time, improvements in infrastructure support future economic growth

(Box 5.1). Some countries (for example, Argentina, Bolivia, Brazil, Paraguay, and Venezuela), where infrastructure investment has been relatively moderate in the past decade, tend to show lower-than-expected infrastructure quality for their income levels in several areas (Figure 5.4). More generally, and with notable exceptions (for example, El Salvador, Guatemala, and Panama), LAC countries generally tend to lie below the regression line, particularly in the case of railroads. Regarding port infrastructure, countries in the Western Hemisphere are undertaking substantial investments to accommodate post-Panamax ships that will be able to pass through the new locks being constructed to expand the capacity of the Panama Canal (Box 5.2).

Infrastructure is also likely to be an important determinant of competitiveness. Producers will be more reluctant to develop a resource or invest in a project in a country lacking the transport or logistical infrastructure required to take the product to the point of shipment. Following that notion, country-specific benchmarks are created for the region's six largest economies (Argentina, Brazil, Chile, Colombia, Mexico, and Peru—LAC6) by identifying each country's top five competitors in each of its top five export products. The benchmark is the range of stock and quality of infrastructure in this rival group (Figure 5.5). On this metric, Chile stands out as being the only country with infrastructure quality similar to its trading rivals, although its position has also declined vis-à-vis its competitors, suggesting potential competitiveness concerns for the countries in the region. These comparisons are broadly coincident with time- and cost-to-export comparisons, but do not account fully for export competitiveness. Mexico, with many export-oriented firms located near its border with the United States, does better on time-to-export comparisons than it does on infrastructure quality. Peru is another counterexample, with relatively low cost of exporting. In this, as in other cases where exports include mining products, the existence of rents may allow companies to build proprietary infrastructure, and after such investments are sunk, their export

Figure 5.4. World: Infrastructure Quality Indicators Relative to GDP per Capita (2014)
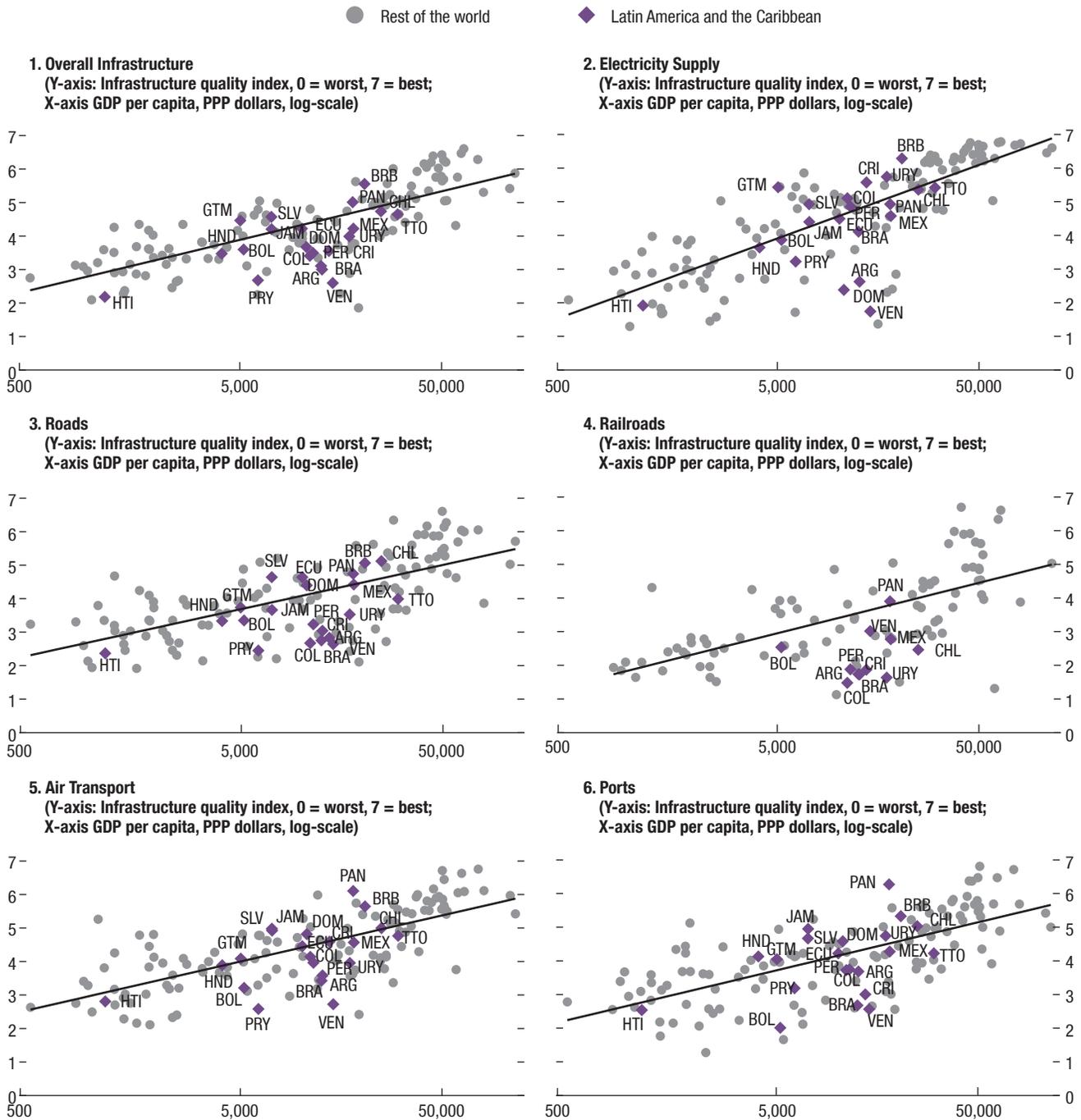
Sources: World Economic Forum; and IMF staff calculations.
Note: PPP = purchasing power parity. Data labels use International Organization for Standardization (ISO) country codes, see page 108.

Figure 5.5. LAC6 and Trade Rivals' Comparison

[ ] Country-specific rivals in exports markets   ◆ LAC6

1. Quality of Infrastructure (2007–15)
(Index: worst = 0, best = 7)

2. Ease of Doing Business: Cost to Export (2007–15)
(Constant U.S. dollars)

3. Time to Export (2007–14)
(Days)
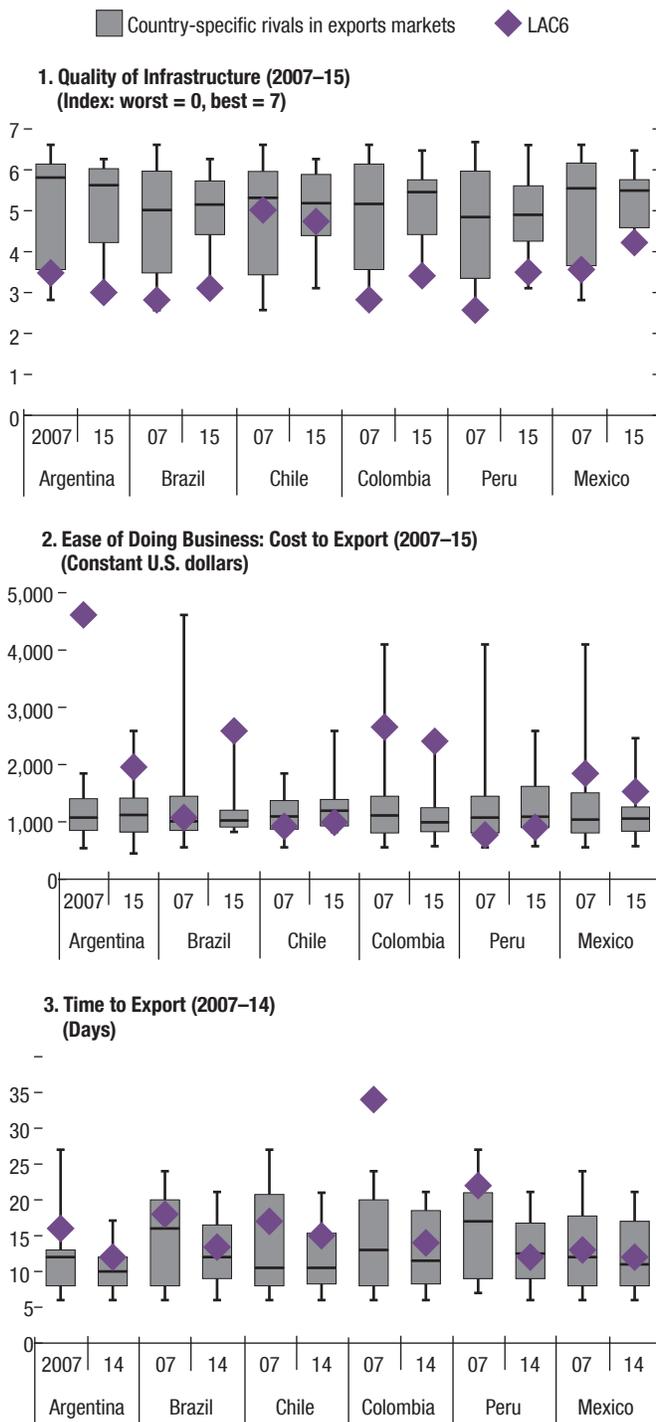
Sources: IMF staff estimates with World Economic Forum and UN COMTRADE data.
Note: Trade rivals sample defined as the top five exporters of each of the top five goods exported by the respective country. LAC6 = Argentina, Brazil, Chile, Colombia, Mexico, and Peru.

costs fall.[3] Also, these comparisons may not say much about the fitness of infrastructure to support other (new) export activities.

Evolution of Infrastructure Investment

Selected Determinants of Infrastructure Investment

With considerable variation among countries in the region with respect to the levels and quality of infrastructure, what factors explain these differences? Empirical analysis of some determinants of infrastructure investment is reported in full in Annex 5.1. A broad reading of the results suggests that, in addition to the dynamism of each economy, represented by its GDP growth, and regulatory frameworks, which were not modeled, the following factors matter:

- *The public sector's budget constraint.* Fiscal consolidation in the form of a higher primary fiscal surplus tends to reduce the indicator for telephone lines (although estimates are not statistically significant), but not necessarily other types of infrastructure; and higher public investment appears less important than one might expect in the regressions for road density and telephone lines. These results might, in part, reflect the increasing obsolescence of fixed telephone lines, and the increasing role of the private sector in the development of roads, discussed below. As explained in Annex 5.1, the estimated models also suggest that the way an increase in public investment is financed may matter.

- *Private sector participation.* An increase in private investment is generally associated with stronger infrastructure accumulation, especially in electricity generation. A negative association with fixed telephone lines may reflect again the obsolescence of fixed lines

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[3]The dollar cost chart should be interpreted with caution because it might be influenced by exchange rate changes.

and the role of private firms in developing mobile telephony.

- *Interdependence among types of infrastructure.* Power, road, and telephone infrastructure stocks are positively linked in many of the specifications. This suggests a tendency among countries to adopt broad-ranging infrastructure strategies.

- *Other determinants of infrastructure.* Infrastructure investment in LAC generally appears responsive to controls such as the level of income, the degree of urbanization, and openness to trade.

These results should be interpreted with caution given the dispersion of regression estimates. More important, these results should be seen in the light of the discussion that follows.

Fiscal Policy

Major shifts in the size and composition of infrastructure investment have taken place during the past several decades. Perrotti and Sanchez (2011) observe that investment in infrastructure as a percent of GDP peaked in the first part of the 1980s, with the majority of investment provided by the public sector. This was followed by a fall in overall infrastructure investment, with a shift in its composition toward more private investment, helped by a wave of privatizations in the 1990s. Country experiences have varied significantly, however, and not all countries have followed the same script. Although Chile and Mexico saw virtually no public investment in the early 1980s in the aftermath of their debt crises, public and private investment eventually recovered. In contrast, Brazil had reasonable levels of investment in the 1980s, followed by a decline in infrastructure investment since the 1990s (Garcia-Escribano, Góes, and Karpowicz 2015).

The state and stance of *public finances* have influenced the evolution of infrastructure investment across the region, with the *commodity supercycle* allowing investment in some resource-based countries in the LAC region to rise even as public finances strengthened. Although fiscal

consolidation tends to fall disproportionately on investment, the variation in public investment since the 1990s (Figures 5.6 and 5.7) does not show a simple relationship to government deficits (measured by public sector borrowing), particularly in the case of Peru (Vtyurina 2015). Notably, in the early- to mid-2000s, public investment rose in the region even as public finances were strengthening. When the great recession came, countries in LAC were typically able to accommodate the drop in revenues without resorting to cutting public investment. However, in many countries fiscal buffers have been eroded in the years since then (Celasun and others 2015), and it is thus likely that the sensitivity of public investment to possible revenue weakness may increase again in the period ahead. Meanwhile, since the mid-2000s, infrastructure (and overall) investment by the private sector has also been steadily rising; similar trends can be observed among other emerging market and developing economies, especially in sub-Saharan Africa.

In addition, *natural disasters* have repeatedly affected infrastructure in LAC, especially in the Caribbean. Hurricanes have periodically destroyed infrastructure and other structures in several small states. For example, in 2010, a large earthquake caused catastrophic damage in Haiti, subsequently leading to a large reconstruction effort. More recently, in 2015, Dominica was hit hard by Tropical Storm Erika, resulting in significant damage to the country's physical infrastructure (about 17 percent of roads and 6 percent of bridges were fully damaged, and 24 percent of roads and 44 percent of bridges were partially damaged). Caribbean countries are not alone in facing reconstruction challenges following natural disasters. Chile, for example, has had to respond to earthquakes (Iquique in 2014) and floods (Atacama in 2015).

Private Participation

Funding models influence the characteristics and evolution of private sector participation in infrastructure. Funding refers to the ultimate source of the funds that will pay for creating and operating a piece of infrastructure, with the basic

Figure 5.6. Fiscal Performance and Public Investment (1990–2013)

■ Public sector net borrowing ── Public investment (right scale)

1. Latin America
(Percent of GDP, simple averages)

2. United States and Canada
(Percent of GDP, simple averages)

3. Advanced Europe
(Percent of GDP, simple averages)

4. Emerging Asia
(Percent of GDP, simple averages)

5. Sub-Saharan Africa
(Percent of GDP, simple averages)
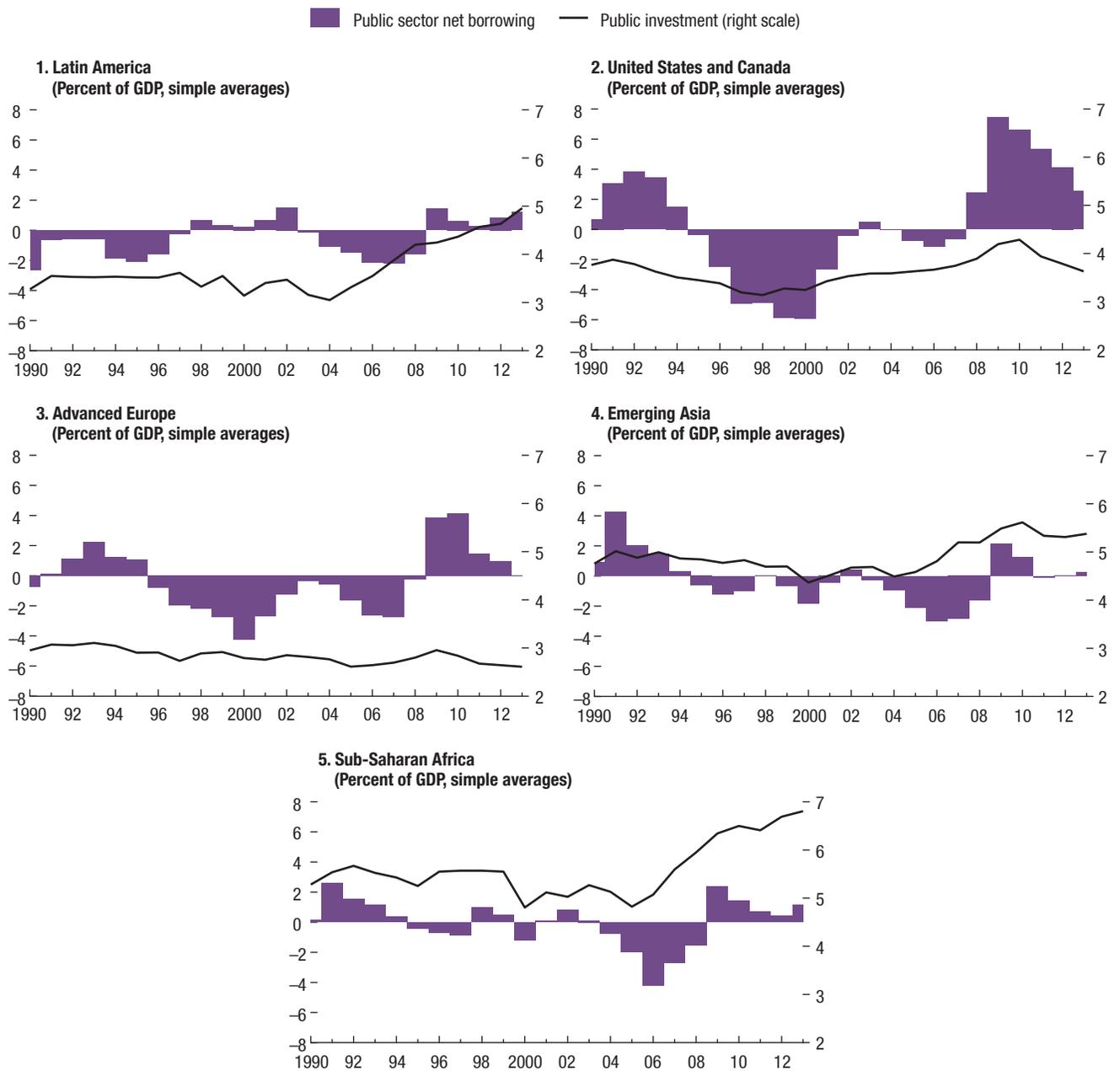
Sources: IMF, World Economic Outlook database; and IMF staff calculations.

funding decision being the fraction of the cost borne by the taxpayer as opposed to the direct user of infrastructure.[4] Although infrastructure typically

[4]Funding is thus different from financing, with the latter referring to the immediate sourcing of the cash needed to undertake a project, rather than to the ultimate origin of the resources needed to pay for its construction and operation.

has some characteristics of a public good (such as nonrivalry in the case of roads, at least up to a point), excludability is a characteristic that permits private participation. In practice, excludability depends not just on the availability of a technology for charging users, but also on the public's expectations regarding the obligations of the state

Figure 5.7. Latin America: Public Sector Net Borrowing and Investment (1990–2013)
(Percent of regional GDP)

Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Figure 5.8. Private Participation in Infrastructure Investment Commitment, by Region and Sector (1990–2013)
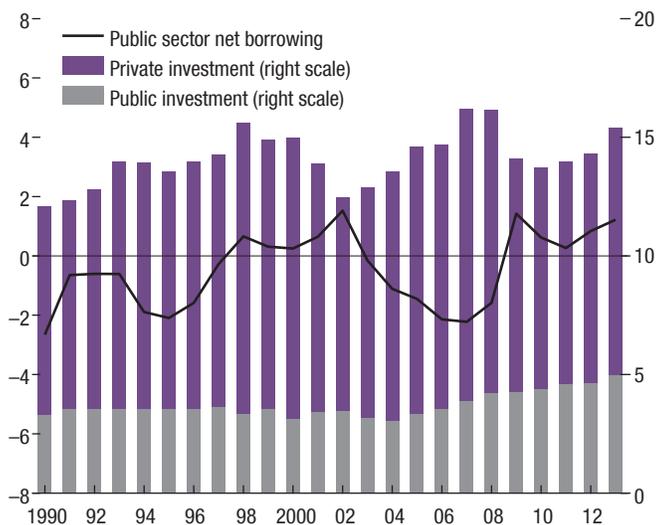
Sources: World Bank, Private Participation in Infrastructure database; and IMF staff calculations.

(that is, expectations of how the services from a given infrastructure project should be funded). In that regard, private investment in infrastructure appears to have concentrated in sectors in which collecting user fees has been technically feasible and has become viewed as politically acceptable. Electricity, telecommunications, and transportation are clearly in this category, and to a lesser extent, water and sewage, for which municipal provision remains important. These sectors have been the focus of private participation not just in Latin America, but also in emerging Asia (Figure 5.8).

An important contrast between LAC and Asia is the extent to which privatizations and concessions have played a role. Although privatizations were particularly important in LAC in the late 1990s, and concessions remain important today, Asia has experienced a much larger proportion of greenfield investment, especially after the Asian crises of the late 1990s (Figure 5.9).

Infrastructure Financing

Access to finance has been a constraint in both public and private investment. Infrastructure firms in LAC have invested at levels similar to

firms in emerging Asia and at higher levels than firms in advanced economies and sub-Saharan Africa. Debt financing is growing but remains very low in sub-Saharan Africa because of lower levels of financial development, higher levels of

Figure 5.9. Private Participation in Infrastructure Investment Commitment, by Region and Type of Contract (1990–2013)
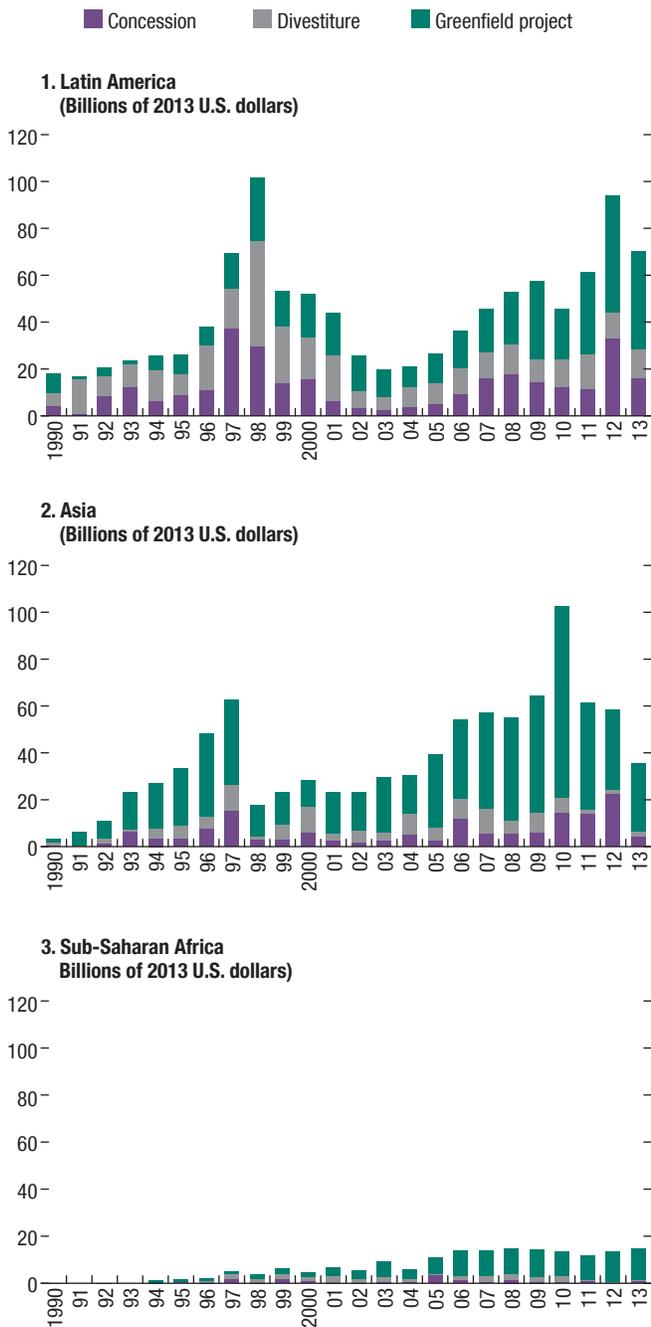
■ Concession   ■ Divestiture   ■ Greenfield project

1. Latin America
(Billions of 2013 U.S. dollars)

2. Asia
(Billions of 2013 U.S. dollars)

3. Sub-Saharan Africa
Billions of 2013 U.S. dollars)

Sources: World Bank, Private Participation in Infrastructure database; and IMF staff calculations.

risk, and more reliance on development banks for financing. In contrast, low levels of debt financing among advanced economies is associated with deeper financial markets, allowing greater access to

a broader range of financing options (for example, direct investment from institutional investors, such as pension and sovereign wealth funds).

Bonds versus Bank Loans

Infrastructure-focused firms across LAC are currently financing more investment by issuing bonds than in the past (Figure 5.10). The total volume of loans issued to infrastructure firms has remained broadly stable since the mid-1990s, while the volume of bonds issued has steadily increased to nearly half of total financing by the end of 2014. The switch toward bond financing over time appears to reflect economic development and greater integration into global financial markets. Brazil is complementing the long-term financing available from its state-owned development bank (BNDES) with new infrastructure bonds, which are also expected to contribute to a further deepening of the private fixed-income market (Box 5.3). On this point, the role of national development banks in LAC is relatively limited, with BNDES being an exception. Although BNDES also caters to other financing needs, it covers a significant fraction of infrastructure financing needs in Brazil (Frischtak and Davies 2014).

Local versus Foreign Currency Debt

More new debt is now denominated in local currency. Policy frameworks and fundamentals have gradually improved across the region during the past two decades, while real interest rates in advanced economies have trended down. Over this time, borrowing in domestic currency has increased with the deepening of domestic financial markets and likely also owing to the search for yields on the part of foreign investors; the volume of borrowing in foreign currency has remained broadly stable. The switch to financing in local currency has also likely been facilitated by improved public debt management strategies, with a lengthening of sovereign maturities and greater shares of sovereign debt denominated in local currency contributing to financial deepening (Arslanalp and Tsuda 2014).

Figure 5.10. Total Capital Raised by Infrastructure-Focused Companies (1990–2013)

- Foreign currency loans
- Foreign currency bonds
- Local currency loans
- Local currency bonds

1. LAC: Bonds, Loans, and Currency Breakdown
(Billions of constant 2013 U.S. dollars)

2. Bond and Loans Absolute Breakdown
(Percent of GDP, regional simple averages)

3. Bond and Loans Proportional Breakdown
(Percent of total financing, regional simple averages)
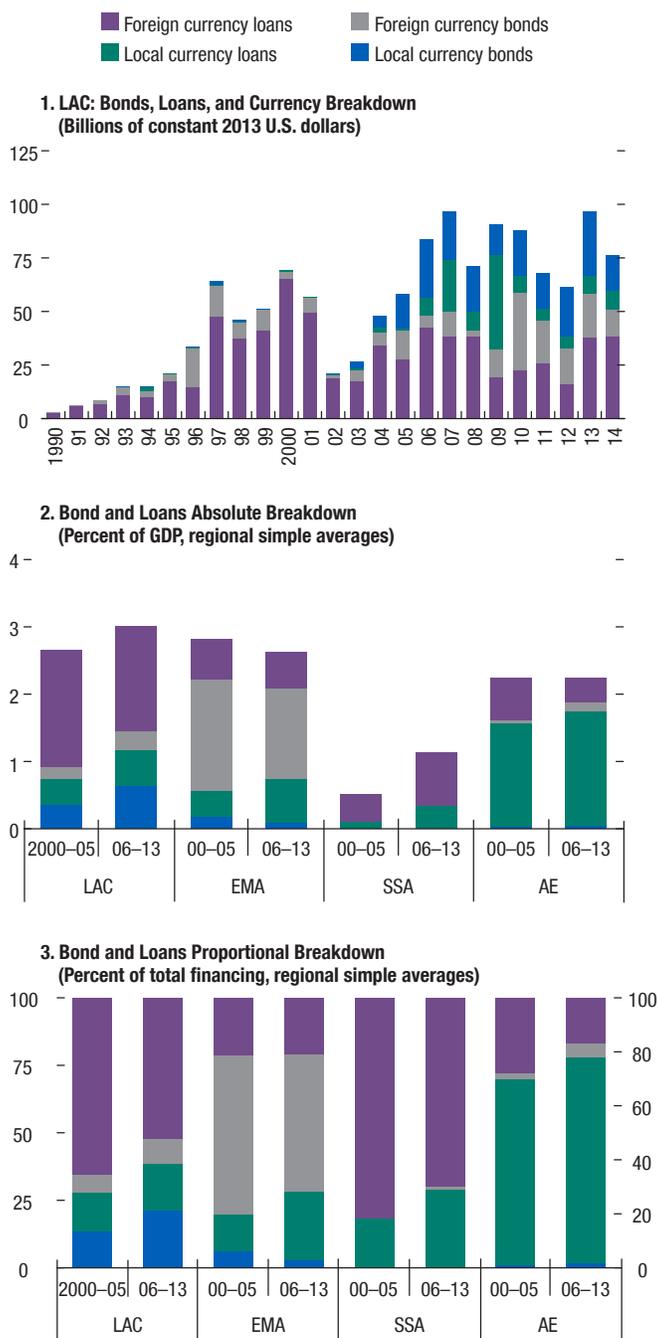
Sources: Dealogic; and IMF staff calculations.
Note: AE = advanced economies; EMA = emerging Asia; LAC = Latin America and the Caribbean; SSA = sub-Saharan Africa. Includes all bonds and syndicated loans to infrastructure-focused companies, defined as those falling in the following categories: (1) transportation; (2) construction/building; (3) telecommunications; (4) utilities; (5) water and sewage.

The trend toward local currency financing is evident globally, but the mix of bond versus loan financing differs across regions. Emerging Asia stands out with a relatively large share of infrastructure financing coming from bonds denominated in foreign currency. In contrast, debt financing by firms in advanced economies occurs mainly through local currency loans, rather than bonds, which may be a consequence of larger and more sophisticated banking systems, where risks can be more easily diversified and collateralized.

Development Financing and Current Constraints

For many LAC countries, infrastructure financing has also relied on resources from development banks and quasi-fiscal entities, official lenders, nontraditional sources and new initiatives. For example, the World Bank and the Inter-American Development Bank (IDB) have historically been key multilateral strategic partners providing budget and project support to the public sector. In recent years, the IDB has also increased its role in nonsovereign guaranteed activities. Bilateral and multilateral donors have provided resources, including through grants, such as for post-earthquake reconstruction of Haiti's infrastructure. For many countries in Central America and the Caribbean, energy cooperation agreements with Venezuela (for example, PetroCaribe) have included subsidized financing for oil imports that supported energy-related infrastructure and investments in other productive activities (Belize, Guyana, Haiti, and Nicaragua were the top recipients of PetroCaribe financing in 2014).

Donor fatigue, the decline in PetroCaribe financing associated with lower oil prices, and fiscal pressures have recently constrained the availability of finance for many countries. In response, some countries are increasingly exploring public-private partnership arrangements, new development partners (for example, China and Taiwan Province of China), and new initiatives (for example, raising resources through citizenship programs in a few Caribbean countries). In resource-based countries, lower

Figure 5.11. Efficiency Frontier

Infrastructure Hybrid Indicator (2013)
(X-axis: public capital stock, in U.S. dollars; Y-axis: infrastructure
indicator, higher = better)
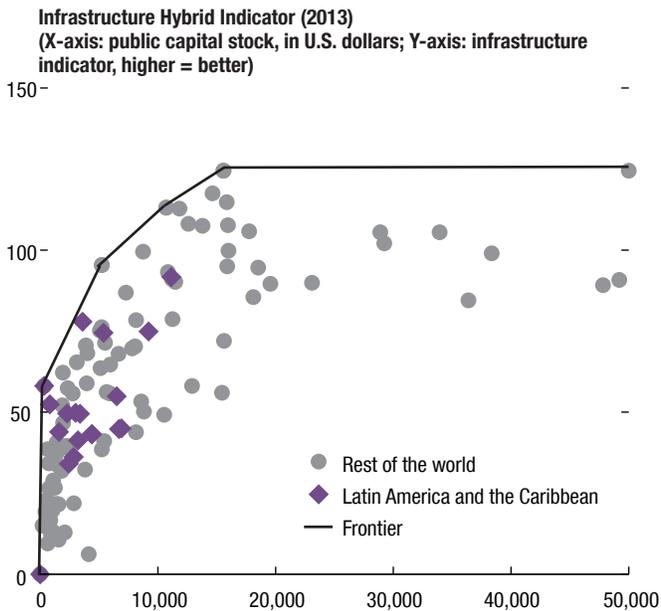
Sources: Center for International Comparisons (2013); IMF, World Economic Outlook database; OECD (2014); World Economic Forum (2014); World Bank, World Development Indicators database; and IMF staff calculations.

commodity prices have also put pressure on public capital spending. In some of these countries, public enterprises are expected to rely increasingly on production and exploration partnerships with private companies. In Mexico, the state-owned oil company, Pemex, is looking to securitize assets and use equity financing for some of its operations; good governance would require that the operations are recorded transparently in the public accounts.

Investment Efficiency

The chapter turns now to consider the payoffs to infrastructure investment. One approach to benchmarking value for money relative to peers is to construct an efficiency frontier, as developed in IMF (2015b—Figure 5.11). The vertical axis corresponds to the "output" dimension, representing the value of an aggregate or hybrid indicator of the access to, and quality of, a country's infrastructure. The horizontal axis corresponds to the "input" dimension, measuring the public capital stock,

estimated by the perpetual inventory method as cumulative real net public investment, as a proxy for infrastructure investment. (The output and input dimensions are both scaled by the country's population.) For any given level of input, the highest observed value of the hybrid indicator is taken to be part of the efficiency frontier, which has the familiar shape of a production function with diminishing returns. Most LAC countries are well below the efficiency frontier, with a few exceptions, such as Chile.

Countries' relative public investment efficiency can also be measured (Box 5.4). In particular, the ratio of a country's output indicator to that of a country on the efficiency frontier with a similar level of public capital and income per capita defines the Public Investment Efficiency Indicator (PIE-X).[5] The most efficient country receives a value of 1, whereas any value of the PIE-X below 1 can indicate that an "efficiency gap" exists. The distribution of the PIE-X in a LAC sample (of 17 countries) is broadly comparable with the distribution for emerging markets as a group. However, although the averages for these two groups are broadly similar, within-group variation in the PIE-X is larger for the group of emerging markets than for the LAC group.

Public Investment Management

Managing public investment is a challenging undertaking. A growing body of literature underscores the role that the legal, institutional, and procedural arrangements for public investment management, including risk management, play in determining the level, composition, and impact of public investment on the economy. IMF (2015b) develops a framework to make broad assessments of public investment management in a country.[6] This

[5]The computation of the PIE-X takes into account, in addition to the public capital input shown in Figure 5.12, a country's income per capita, and uses data enveloping analysis techniques, as detailed in IMF (2015b). In this fuller framework, the efficiency frontier is a surface in three-dimensional space.
[6]This assessment tool considers the practices and frameworks underpinning the entire investment process across the whole public sector.

Figure 5.12 Public Investment Management in Latin America and the Caribbean

	Ensuring Sustainable Levels of Public Investment					Ensuring Investment is Allocated to the Right Sectors and Projects					Delivering Productive and Durable Public Assets				
	Fiscal principles or rules	National and sectoral planning	Central-local coordination	PPPs	Regulation of infrastructure companies	Multiyear budgeting	Budget comprehen.	Budget unity	Project appraisal	Project selection	Investment protection	Availability of funding	Transparency of budget execution	Project management	Monitoring of public assets
Argentina															
The Bahamas															
Belize															
Bolivia															
Brazil															
Chile															
Colombia															
Costa Rica															
Dom. Rep.															
Ecuador															
Grenada															
Guatemala															
Honduras															
Jamaica															
Mexico															
Panama															
Paraguay															
Peru															
St. Lucia															

Scoring Rubric:

	= No or to a lesser extent
	= To some extent
	= To a greater extent

Sources: IMF staff calculations based on a public investment management survey designed by the IMF Fiscal Affairs Department (FAD), completed by country desks, FAD economists, and several country authorities.

Note: PPPs = public-private partnerships.

assessment tool considers the practices and frameworks underpinning the entire investment process, including planning, project selection, budgeting, execution, project management, and monitoring and maintenance of built assets. Based on a survey of relevant features of public investment management frameworks in the sample of LAC countries, Figure 5.12 provides a broad picture of the institutional strength. Most countries have room for improvement. General planning processes have received attention, but project selection still needs upgrading in many countries. Almost universally, the monitoring and maintenance of built assets is a weakness in LAC countries.

According to the survey, country experiences also provide useful lessons for integrating public investment with macroeconomic policy management. Countries should have a rigorous framework for scaling up public investment in the event of revenue windfalls to preserve macroeconomic stability, safeguard against

declines in investment efficiency, and ensure that the overall level of investment in the economy, including by the private sector, is consistent with absorptive capacity. Quasi-fiscal entities and development banks should be integrated into the budget process, and rules for transfers to the budget should be clarified. Projects should be well coordinated among line ministries, quasi-fiscal entities, and donors to improve efficiency and prevent duplication of efforts and funding of low-priority projects.

The strength of public investment management institutions appears to be correlated with indicators of investment efficiency. For example, Chile and Costa Rica, which have some of the highest PIE-X indicators for the region, appear to have some of the strongest public investment management frameworks among LAC countries. However, the correlation is not perfect: Mexico and Peru, with strong rules and practices (Box 5.5), rank lower in the PIE-X than Chile and Costa Rica do. This may, in some cases, be due

Figure 5.13. Public Investment Management

LAC, Emerging Markets, and Advanced Economies[1]
(Index, 0 = worst, 10 = best)

—— LAC   ----- EMs   ·—·—· AEs
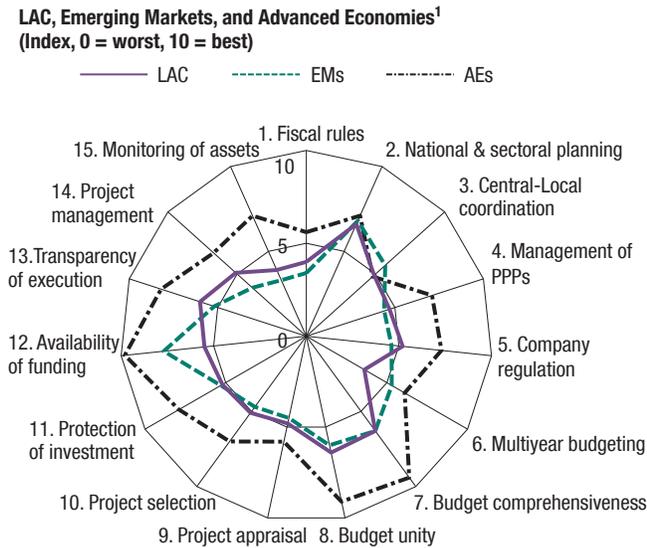
Source: IMF staff calculations.
Note: AEs = advanced economies; EMs = emerging markets; LAC = Latin America and the Caribbean; PPPs = public-private partnerships.
[1] Includes 25 advanced economies, 12 emerging market economies, and selected LAC (The Bahamas, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Grenada, Guatemala, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, and St. Lucia).

to the possibility of fast-tracking or exempting specific projects, which thus would not benefit from the full application of the more rigorous standard framework.[7]

More generally, a similar message emerges when comparing the average indicators of institutional strength in the region against other groups of countries (Figure 5.13). Although national and sectoral planning institutions are in place, there is much to improve in all other phases of investment. Interestingly, LAC does better than other emerging markets in the transparency of project execution and project management, although it still scores well below advanced economies in these areas. The region compares least favorably in terms of financing opportunities and multiyear budgeting.

[7]For example, the Trans-oceanic highway connecting the coasts of Peru and Brazil, which was exempted by law from Peru's National Public Investment System, ended up with a large cost overrun.

Institutional and Regulatory Frameworks for Public-Private Partnerships

As slowing growth throughout the region reduces the available fiscal space for public investment, many governments may turn to public-private partnerships to boost capital expenditure on infrastructure. In public-private partnership arrangements, the private partner is usually responsible for investment and service provision for the construction and operational phases of an infrastructure project, and receives compensation either from the government or from user charges. Although private sector involvement can often generate efficiency gains, the right incentives and conditions are required to minimize risks to the budget. Thus, as the role of public-private partnerships in the provision of infrastructure continues to grow in the LAC region, building skills for managing complex long-term contractual relationships will have to go hand in hand with creating a sound legal and institutional framework and attractive business environment. The key elements include strong public-private partnership legislation, clear and consistent regulations, fair and consistent bidding procedures, the integration of projects into the budget cycle, clarity on roles and responsibilities across institutions responsible for public-private partnerships, a strong oversight framework, value for money, and fiscal affordability, transparent disclosure, and sound accounting systems.

According to the Economist Intelligence Unit (2014), the LA5 (Brazil, Chile, Colombia, Mexico, and Peru) are the countries in the region with the most attractive overall environment for public-private partnerships (Figure 5.14). They are well placed in the global context and have consistently ranked high in terms of the overall environment for enabling public-private partnerships since 2009. They also rank highest across most subcategories: institutional framework, regulatory framework, operational maturity, financial facilities available for public-private partnerships, and use of public-private partnerships at the

Figure 5.14. LAC: Overall Public-Private Partnership (PPP) Environment

Ranking of PPP Favorability, by Country
(Rank)
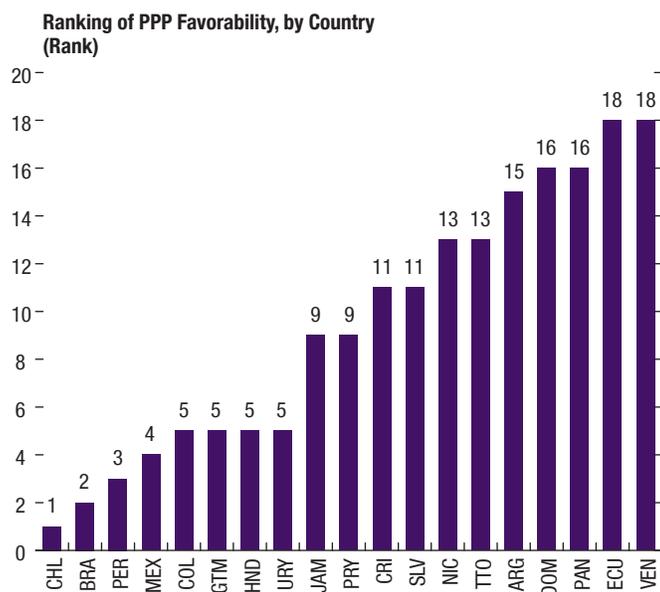
Source: Economist Intelligence Unit (2014).
Note: Data labels use International Organization for Standardization (ISO) country codes, see page 108.

Figure 5.15. LAC: Public-Private Partnerships (PPPs)

1. PPP Projects, by Country (2001–14)
(Total number of projects)

2. PPP Projects, by Sector (2008–2014)
(Percent of total number of projects)
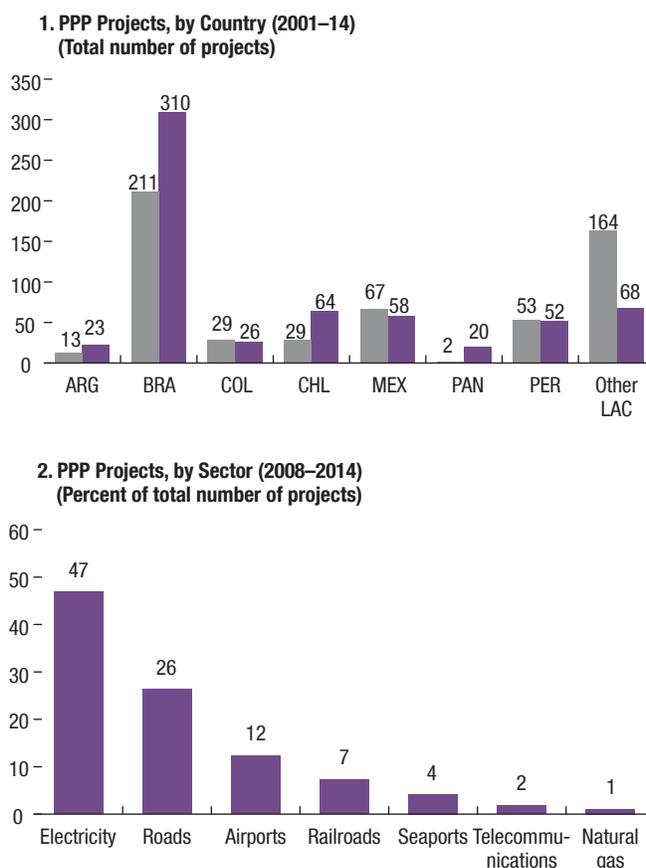
Source: IMF staff estimates with World Bank data.
Note: LAC = Latin America and the Caribbean. Data labels use International Organization for Standardization (ISO) country codes, see page 108.

subnational level. These rankings tend to reflect their experience in the use of public-private partnerships. Indeed, the vast majority of projects have been undertaken in the LA5, led by Brazil, with energy projects being the most numerous (Figure 5.15). Most other countries in LAC have, nonetheless, made notable progress over time in creating conditions suitable for scaling up public-private partnerships, building on the experience of LA5 countries.

Although public-private partnerships can ease the fiscal burden and increase the efficiency of service provision, they entail fiscal risks. Contingent liabilities can arise from poor contract design and unexpected changes in the regulatory framework or macroeconomic environment. In addition, the private partners can engage in substantial efforts to renegotiate contracts, calling for modifications of terms or additional contributions from the public sector to respond to changes in demand, quality standards, or other evolving circumstances. Renegotiations may undermine the budget process and result in higher government outlays

and lower value for money when done outside a competitive tender process. To minimize these risks, governments must set limits on contract renegotiations. Chile introduced limits on renegotiation when it reformed its public-private partnership framework in 2010. Incentives for renegotiation could be reduced by including all government obligations associated with public-private partnerships in the balance sheet of the government and applying the same oversight as for other budgetary expenses (Engel, Fischer, and Galetovic 2014). Putting in place platforms and strict rules for renegotiation of contracts (Chile and Peru) and the use of expert panels has proven successful. Based on these lessons, Colombia

enacted a law in 2012 to systematically regulate public-private partnerships, minimize incentives for renegotiation, and facilitate financing (Box 5.6).

LAC countries are well placed to continue to reap the benefits from improvements in institutional frameworks and lessons from past experience but some important challenges lie ahead. The operational maturity and technical capacity needed to scale up investment will come only over time, with more on-the-job skills development and training. Planning and execution will continue to pose challenges until technical capabilities and know-how are fully developed across lower government levels, including in countries where subnational public-private partnerships enjoy an already strong legal framework and presence (for example, Brazil and Mexico). Preserving political support and building popular trust will also be important. Transparent communication and public consultations have been crucial for building communities' support for the infrastructure agenda in Colombia and Peru, although with still limited success in the latter. Finally, bringing clean energy products and environmentally friendly options into the design of public-private partnership projects, currently at an incipient stage in many LAC countries but prominent in Brazil, will become paramount for building sustainable infrastructure in the near future.

Conclusions

On the state and growth of infrastructure in LAC, the key findings include the following:

- Infrastructure indicators in the region compare, on average, reasonably well with those in the group of emerging markets at large, and emerging Asia in particular.

- However, a comparison of each country against the group of its rivals in export markets suggests that competitiveness is compromised in many LAC countries by the state of their infrastructure.

- As other IMF research has found, infrastructure affects growth potential (IMF 2014). Unless progress continues, there is a risk that the observed infrastructure shortfalls, relative to rivals and what might be expected given LAC countries' development levels, may increasingly hamper the region's growth over the medium term.

Fiscal policy and fiscal institutions play a critical role in improving the infrastructure network.

- The extent of fiscal space, and the level and composition of public financing instruments matter significantly for infrastructure stock accumulation.

- Closing infrastructure "gaps" is not just a matter of public money. Strengthening public investment management processes and practices is important for ensuring that the money mobilized is put to effective use.

- Infrastructure investment and maintenance of existing infrastructure capital need to be protected over the economic cycle to preserve the quality of the stock.

Public policy should also set appropriate conditions to crowd-in private investment in infrastructure. These are especially important in the current environment, characterized by reduced prospects for growth compared with those envisioned a few years ago.

- Private sector participation should be fostered in sectors that have the most potential interest, especially by improving the regulatory framework, enabling economically sound fee structures, and protecting contracts.

- Public-private partnerships should be welcomed where they offer efficiency gains compared with more traditional investment models, and any implications for fiscal risk should be proactively managed (including by reducing incentives for contract renegotiation) and transparently recorded. Countries in the region can benefit from the experience of

LA5 countries in improving their public-private partnership frameworks.

- Developing deep local bond markets for infrastructure bonds and other innovative forms of finance, including through private pension and sovereign wealth funds, can help mobilize resources for projects while containing currency risk.

- Several countries have made important strides in these areas, and offer useful examples for the region at large. Addressing remaining impediments on a country-specific level or through regional cooperation and leading by example can help the region to raise its potential growth over the coming decades.

Box 5.1. Endogenous Dynamics of Infrastructure and Growth

Causality in the relationship between infrastructure and growth runs in both directions. On the one hand, better infrastructure is likely to increase productivity and GDP. On the other hand, as national income increases, governments are able to raise more taxes in absolute terms and financial markets tend to deepen, facilitating both public and private infrastructure investment.

To assess the mutually reinforcing nature of this relationship, we estimate a panel structural vector autoregressive (panel VAR) model. The endogenous variables consist of the natural log of (1) GDP per capita, corrected by purchasing power parity; (2) electricity generation capacity; (3) number of fixed telephones per capita; and (4) road density. The model uses difference generalized method of moments equations, which control for time-invariant characteristics of the 104 countries in the sample. The methodology follows the panel VAR strategy described in Góes (2016).

To avoid overestimating the short-term income effect of infrastructure, we identify the model with GDP per capita as the most exogenous variable. The results shown in Figure 5.1.1 are average responses across countries of endogenous variables to an exogenous shock in any variable, assuming homogeneous and linear dynamics. They take into consideration all the simultaneous dynamics in the system of equations.

Responses of GDP per capita to a 1 percent temporary shock in both electricity generation capacity and the number of telephone lines are positive and statistically significant. They peak at 0.85 percent and 0.15 percent, respectively. The income response to an innovation in road density is positive but statistically insignificant. All infrastructure variables respond positively to income shocks. A 1 percent exogenous shock to GDP per capita leads to peak 1.3 percent, 0.25 percent, and 1.4 percent increases in electricity generation capacity, telephone lines, and road density, respectively.

These results support the idea that the relationship between infrastructure and growth is bidirectional. This is relevant because by ignoring the positive feedback loops between infrastructure and GDP per capita one might underestimate the beneficial effects of increased infrastructure.

Note: This box was prepared by Carlos Góes.

Box 5.1 *(continued)*

Figure 5.1.1. Panel Vector Autoregressions: Impulse Response Functions
(Noncumulative responses to a 1 percent innovation in the impulse variable, percent)

1. GDP per Capita to Electricity Production Capacity

2. GDP per Capita to Telephone Lines

3. GDP per Capita to Road Density

4. Electricity Production Capacity to GDP per Capita

5. Telephone Lines to GDP per Capita

6. Road Density to GDP per Capita
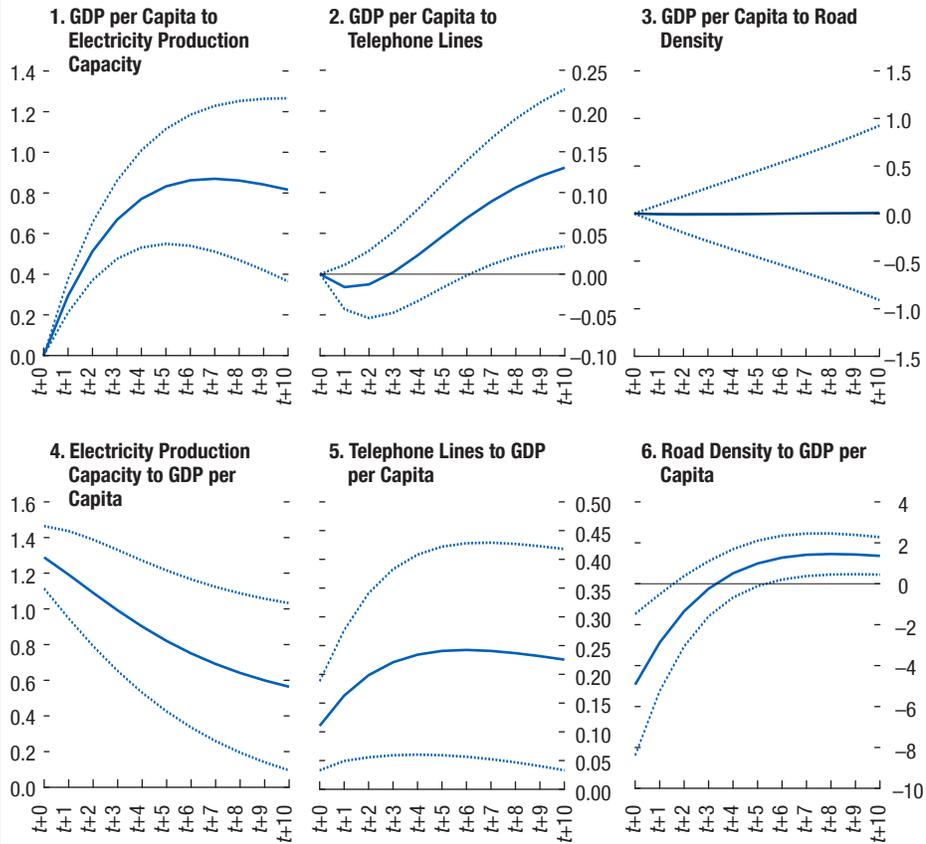
Source: IMF staff estimates.
Note: Dashed lines denote 90 percent confidence intervals.

Box 5.2. Post-Panamax Port Investments in the Western Hemisphere

The Panama Canal is a 50-mile waterway connecting the Atlantic and Pacific Oceans, which guides more than 13,000 ships a year through a system of locks that lifts them 26 meters (85 feet) above sea level. A new $5.3 billion expansion will install a third, larger lane of locks and provide additional depth throughout the long passage. The project, expected to be completed in mid-2016, will double the canal's capacity, allowing it to accommodate larger post-Panamax vessels that now carry a significant percentage of shipping containers worldwide.[1] This project is having large multiplier effects spread across the region's logistics network. About $25 billion of port investments have been executed or are ongoing or planned throughout the Western Hemisphere to accommodate the post-Panamax ships that will go through the new set of locks—nearly five times the value of the expansion project (Figure 5.2.1).

The expansion will also generate large spillovers by reducing transportation costs. International cargo shipping involves economies of scale; the annual operating cost per unit of transportation capacity is estimated to be 37.4 percent lower for post-Panamax than for Panamax vessels. Assuming a conservative scenario in which the canal maintains its current share of 5 percent of global trade and post-Panamax vessels continue to transport 45 percent of cargo, we estimate that the total reduction in transportation costs would amount to at least $8 billion each year.

Figure 5.2.1. Planned Port Investments to Accomodate Post-Panamax Ships

Baltimore (U.S.) $1,800MN [2013]
Charleston (U.S.) $1,809MN [2020]
Savannah (U.S.) $763MN [2019]
New Orleans (U.S.) $100MN [2012]
Everglades (U.S.) $374MN [2022]
Miami (U.S.) $2,000MN [2014]
Manzanillo (Mexico) $1,000MN
Veracruz (Mexico) $1,800MN [through 2030]
Quetzal (Guatemala) $192MN
Kingston (Jamaica) $70MN [2019]
Limon (Costa Rica) $1,000MN [2016-]
Cartagena (Colombia) $200MN [2016]
Buenaventura (Colombia) $150MN [2030]
Callao (Peru) $750MN [2022]
Iquique (Chile) $80MN [2019]
Antofagasta (Chile) $91MN [2018]
San Antonio/Valparaiso (Chile) $1,420-2,750MN

Sidney (Canada) $450MN
Melford (Canada) $350MN
Massachusetts (U.S.) $300MN [2019]
NY/NJ (U.S.) $4,000MN [2014-]
Philadelphia (U.S.) $398MN [2016]
Virginia (U.S.) $5,170MN [through 2039]
Jacksonville (U.S.) $766MN [2018]
North Abaco (the Bahamas) $39MN [2017]
Cuba $957MN
Martinique $95MN
Trinidad and Tobago $500MN

Santos (Brazil) $324MN [2020]
Itajai (Brazil) $111MN
Quequen (Argentina) $45MN

Source: IMF staff estimates based on various news and government sources.

Note: This box was prepared by Ana Ahijado, Diego Cerdeiro, Metodij Hadzi-Vaskov, and Fang Yang.

[1]Post-Panamax vessels accounted for 16 percent of container ships and 45 percent of the fleet's capacity in 2012, and are expected to comprise 27 percent and 62 percent, respectively, by 2030. ("U.S. Port and Inland Waterways Modernization: Preparing for Post-Panamax Vessels," Institute for Water Resources, U.S. Army Corps of Engineers, June 20, 2012.)

Box 5.3. Brazil: Infrastructure Bonds

Infrastructure bonds are a relatively recent and promising instrument. One of the barriers for private investors to finance infrastructure in Brazil is the difficult access to long-term financing. The state-owned development bank BNDES is the dominant provider of long-term funding at below-market rates. But it cannot be expected to provide all financing for infrastructure. To address this situation, in 2011 the government decided to grant tax benefits for fixed-income products created specifically to finance infrastructure investments,[1] one of them being infrastructure bonds, whose buyers benefit from income tax exemption.[2] Government certification that the infrastructure project is in fact a priority in one of several targeted sectors is required for the issuance of the bonds with tax benefits for the holder.

Infrastructure bonds also aim to bring broader benefits for the development of capital markets, supporting the objectives of lengthening the private sector yield curve. To obtain the tax benefits, it must be a fixed rate bond or linked to an inflation index or a referential rate. Floating rate bonds (for example, linked to the central bank's Selic rate) are not allowed. Its average maturity must be of at least four years and the issuer cannot buy it back in the first two years, and it cannot be prepaid.

The importance of infrastructure bonds is still relatively modest (Figure 5.3.1). Since 2012, 74 infrastructure bonds associated with projects authorized by the ministries were issued, totaling 5.8 billion reais. This represents about 5.2 percent of total private bonds issued over the period. On average, spread of infrastructure bonds over the benchmark public bond is 124 basis points, although some of them have been issued at a lower cost than the government funding.

The share of infrastructure bonds in total private bonds is expected to grow, but their growth faces obstacles. The usefulness of the bonds has been boosted because projects included in the second phase of the government's program of investment in logistics (PIL II), with the exception of railway projects, will have access to a greater share of BNDES loans at low interest rates provided that at least 10 percent of the project capital is financed using infrastructure bonds. An obstacle to the growth in infrastructure bonds, however, is their relatively low liquidity and low premium compared with standard government bonds. Foreign investors, who still typically owe taxes on income from these bonds in their own jurisdictions, are therefore not sufficiently attracted to them.

Note: This box was prepared by Flávia Barbosa.
[1] Federal Law 12,431, of June 24, 2011.
[2] Foreign and resident investors benefit from zero income tax, while domestic corporate investors pay 15 percent (instead of the regular 25 percent). Special provisions apply also for investment funds with at least 85 percent of capital invested in corporate bonds related to an investment project.

Box 5.3 *(continued)*

Figure 5.3.1. Brazilian Infrastructure Bonds
(Volume, spread, and share)

1. Volume and Spread over Benchmark Public Bond
(Basis points, bubble size denotes volume)

2. Volume and Share in Total Private Bonds Outstanding
(Billions of Brazilian reais and percent)

■ Volume (Billions of Brazilian reais)
— Percent share of private bonds (right scale)
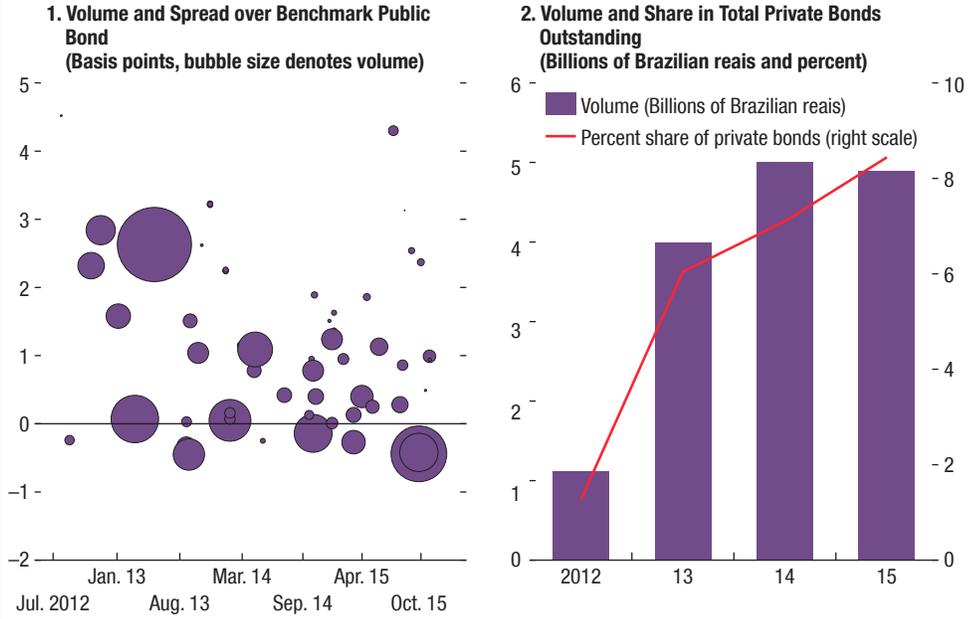
Sources: IMF staff estimates with national authorities' data.

Box 5.4. Estimating Public Investment Efficiency

The Public Investment Efficiency Indicator (PIE-X) estimates the relationship between the public capital stock and income per capita, on the one hand, and indicators of access to (and the quality of) infrastructure assets in more than 100 countries on the other.[1] Countries with the highest levels of infrastructure coverage and quality (output) for given levels of public capital stock and income per capita (inputs) form the basis of an efficiency frontier (a surface in three-dimensional space that envelops the data points). Countries are assigned a PIE-X score of between 0 and 1 based on their vertical distance to the frontier (countries right on the frontier get a score of 1). The indicator of infrastructure quality and access combines physical and survey-based indicators into a synthetic index (see Figure 5.11 in the main text):

- The physical indicator combines data on the volume of economic infrastructure (length of road network, electricity production, and access to water) and social infrastructure (number of secondary school teachers and hospital beds).

- The survey-based indicator relies on the World Economic Forum's survey of business leaders' impressions of the quality of key infrastructure services.

- A hybrid indicator combines the physical and survey-based indicators into a synthetic index of the coverage and quality of infrastructure networks.

The *efficiency gap* is measured as the distance between the average country and the frontier for a given level of public capital stock and income per capita (Figure 5.4.1).

Figure 5.4.1. Public Investment Efficiency Index

Source: IMF staff estimates.
Note: EME = emerging market economies; LAC = Latin America and the Caribbean.
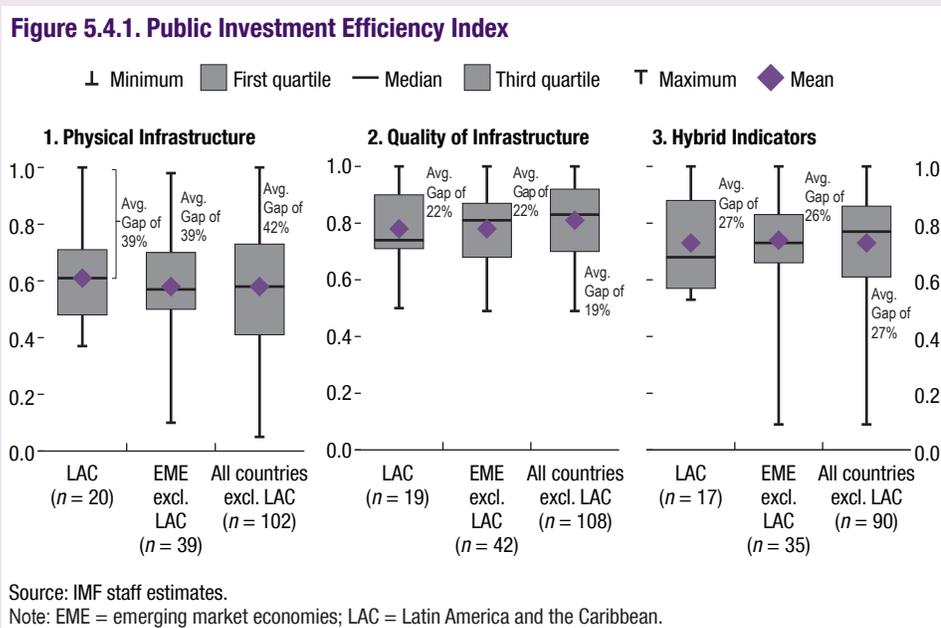
Note: This box was prepared by Svetlana Vtyurina and adapted from IMF (2015b).
[1] A more detailed discussion of the measurement of infrastructure performance as well as the construction of PIE-X can be found in Annex II of IMF (2015b). The number of countries with available PIE-X scores ranges from 114 to 134 depending on the model used.

Box 5.5. Peru: Public Investment Management

Peru's system of national public investment (SNIP), created in 2000, is the main instrument to manage the country's investment projects. The SNIP is comprehensive and is mandatory for all projects implemented by the central and subnational governments (the nonfinancial public sector). The system centralizes the control of all phases of the project (feasibility, implementation, and ex-post assessment). During the feasibility phase, alternatives are studied, and project selection is based on the highest expected socioeconomic return. During the implementation phase, the project is further detailed through final studies and the preparation of executive projects. Then, as the project enters the operational and maintenance phases, an ex-post assessment is performed.

The SNIP is supported by the Investment Project Bank, which registers each phase of investment projects from the feasibility study to the ex-post evaluation.[1] The system is publicly available and provides information on the status of ongoing projects. The Directorate General of Investment Policy at the Ministry of the Economy and Finance is responsible for SNIP management, and a unit in each ministry and subnational government is responsible for operating the SNIP. The system controls five stages of each project: (1) feasibility study, (2) feasibility statement, (3) implementation, (4) monitoring, and (5) ex-post assessment.

Several units are involved in the project approval process: (1) the implementation units propose the projects, (2) sectoral programming and investment offices or regional and local governments evaluate and prepare the feasibility statement, (3) authorities at the different levels of government have the responsibility for project identification, and (4) implementation units at the different levels of government are responsible for implementation, monitoring, and ex-post assessment.

The Multiannual Public Investment Program details the implementation of investments for the year and projected expenditure for the following three years. Information is available on the total cost of each project and the amount invested to date, although the system could be updated in a more timely fashion, especially with information on the stage of project execution at the municipal level. Information is available on the SNIP website (http://www.snip.gob.pe).

Note: This box is based on Pessoa, Fainboim, and Fernandez (2015).

[1]In certain cases, the evaluation of projects depends on the Ministry of the Economy and Finance, as in the case of projects proposed by subnational governments that need a central government guarantee.

Box 5.6. Colombia: Regulatory and Institutional Changes to the Public-Private Partnership Framework

The legal and regulatory framework governing Colombia's public-private partnerships has evolved over time since its first adoption in the mid-1990s. Under an earlier framework, the license holders and institutional investors contributed a low share of equity capital to projects (for example, first-, second-, and third-generation road projects). This created a system of poor incentives for private sector participants and led to delays in completion of the works, with legal and financial implications.

During 2010−14, the authorities undertook regulatory and institutional changes to enhance the efficiency of infrastructure investment and facilitate financing by institutional investors. They created the Vice-Ministry of Infrastructure, the National Infrastructure Agency (ANI), and the National Development Bank (FDN). The Infrastructure Law was expedited to address bottlenecks in the relocation of utilities networks and purchase of land. In 2014, amendments were made to the regulatory framework related to investment regimes and larger individual credit limits for institutional investors to provide incentives for domestic private sector participation in projects, including from pension funds and insurance companies.

In 2012, a new public-private partnership law was passed that significantly addressed the previously identified problems and aimed at regulating public-private partnerships in a systematic manner. The law eliminated the possibility for the private sector to request cash advances and limited amendments to contracts to a maximum of 20 percent of the value of the original contract. Government payments to the concessioner were linked to the quality of infrastructure services provided. A decision to pursue a public-private partnership would need to be based on sound socioeconomic and technical studies, and the responsibilities of the parties involved in the process needed to be clearly defined. The law also included an improved gateway process for the Ministry of Finance and Public Credit, and regulated unsolicited proposals for public-private partnerships. In addition, to improve the capacity of the government to manage fiscal costs and risks arising from public-private partnerships, the law introduced as a general principle that risks should be borne by the partner (that is, public or private sector) most suited to handle them.

Note: This box was prepared by Valerie Cerra and Kristine Vitola.

Annex 5.1

Determinants of Infrastructure: The Role of Fiscal Policy and Private Participation

This annex presents estimates of the determinants of infrastructure, based on Agénor and Neannidis (2015) and Calderón and Servén (2010). The model specification is as follows:

$$Infra_{it}^n = \beta_0^n GDP_{it-1} + \sum_{j=1}^{3} \beta_{1j}^n Infra_{it}^j +$$

$$\sum_{k=1}^{k-1} \beta_{2k}^n Fisc_{it}^k + \sum_{l=1}^{m} \beta_{3l}^n X_{it}^l + B_4^n DEBT_{it} + \mu_{it}$$

where i and t are the country and time indices, respectively; GDP_{it} is the log of GDP per capita (purchasing power parity, constant terms); $Infra_{it}^j$ denotes the log of infrastructure of type j (telecommunication, power, and transport, measured by fixed telephone lines per 100 people, electricity generation capacity (in gigawatts), and road density in kilometers of roads per square kilometer, respectively). This specification takes into account (1) the heterogeneity of infrastructure assets, (2) their interconnectedness in stock accumulation and the growth process, and (3) their different dynamics depending on policy priorities. As in Agénor and Neannidis (2015), the model imposes the government budget identity $\sum_{k=1}^{k-1} Fisc_{it}^k = 0$ (tax revenue, nontax revenue, noninterest current expenditure, capital expenditure, primary balance as a percent of GDP) excluding one fiscal variable (nontax revenue, in this analysis) to avoid linear dependence (multicollinearity is likely still present, though, potentially affecting the significance of individual coefficients). X_{it}^l is a set of standard control variables for growth and infrastructure (credit to the private sector, inflation, trade openness, fertility rate, urbanization rate, population density, rule of law, private sector participation in investment). ε_{it} and μ_{it} are the error terms, including both country- and time-specific effects.

The model is estimated using a dynamic panel of 110 countries (advanced Europe, Canada and the United States, emerging Asia, LAC, and sub-Saharan Africa) during 1990–2013. Data sources include Dealogic, the Energy Information Agency,

IMF's *World Economic Outlook* and Government Finance Statistics, the IMF's Fiscal Affairs Department, the International Telecommunication Union, the World Bank, the World Economic Forum, and Worldwide Governance Indicators. To verify the robustness of results, four alternative model specifications are estimated: a least squares dummy variable (LSDV) and a bias corrected version (LSDVC), which follows Bruno (2005), as well as difference and system IV-generalized method of moments estimators based on Arellano and Bond (1991) and Arellano and Bover (1995).[1]

The results are qualitatively similar for both the full and LAC samples, although some of the results appear stronger in the LAC sample. The net impact of public investment on electricity and transport infrastructure stocks may depend on how the investment is financed (new debt, tax increases, or current spending cuts). For example, a 1 percent increase in the public-capital-to-GDP ratio financed through debt will lead to an increase in road density of up to 0.041 percent for the full sample and 0.175 percent for LAC. A 1 percent increase in the public-capital-to-GDP ratio fully financed (in the same year) by an equivalent 1 percent rise in the tax-to-GDP ratio[2] would lead to an average increase in road density of up to 0.035 percent for the full sample and to 0.163 percent for LAC. A 1 percent increase in capital spending financed by a 1 percent cut in current spending[3] will raise road density up to 0.062 percent for the full sample and up to 0.225 percent for LAC. A similar exercise for electricity generation suggests that the reaction to debt-financed public investment is stronger in LAC than in the full sample, whereas the reaction to public investment that is financed with savings elsewhere in the budget is stronger in the full sample. (The significance of these net effects has not been tested; Annex Tables 5.1.1 and 5.1.2 show individual coefficients' significance levels as measured by *p*-values.)

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[1]The LSDVC estimator is also suitable for unbalanced dynamic panels. Typically, the LSDV bias is corrected by corrected LSDV estimator (Kiviet 1995, 1999; and Bun and Kiviet, 2003) compared with more traditional GMM estimators when N is only moderately large.

[2]This simulation neither distinguishes between types of taxes (trade, income, property, consumption taxes) nor whether the increase comes from a tax rate change or an increase in the tax base.

[3]The shock does not discriminate among the types of current spending (that is, wages, social benefits, or transfers, goods and services, and so on).

Annex Table 5.1.1. Determinants of Infrastructure: Latin America and the Caribbean

	Dependent Variable: Log Fixed Telephone Lines per 100 people				Dependent Variable: Log Electricity Generation Capacity				Dependent Variable: Log Road Density (km of roads per square km)			
	(1) LSDV	(2) LSDVC	(3) Diff. GMM	(4) Sys. GMM	(1) LSDV	(2) LSDVC	(3) Diff. GMM	(4) Sys. GMM	(1) LSDV	(2) LSDVC	(3) Diff. GMM	(4) Sys. GMM
Lagged Variables												
LN GDP per Capita, Constant PPP (t–1)	0.333**	0.304***	0.405***	0.007	0.356***	0.327***	0.359***	–0.039	–0.012	–0.032	–0.004	–0.029***
LN Fixed Telephone Lines per 100 people (t–1)	0.812***	0.918***	0.757***	0.985***	0.033	0.023	0.032	0.023	–0.046**	–0.03	–0.055**	0.025***
LN Electricity Generation Capacity (t–1)	0.154**	0.127*	0.18**	0	0.442***	0.526***	0.43***	0.998***	0.033	0.03	0.02	0.002
Road Density (km of roads per square km) (t–1)	–0.193	–0.06	–0.307**	–0.01***	–0.047	–0.05	–0.055	–0.001	0.72***	0.839***	0.696***	1.003***
Fiscal												
Tax Revenues, Share of GDP	0.517	0.303	0.187	0.105	–0.64	–0.651*	–0.649	–0.059	–0.238	–0.231	–0.28	–0.001
Current Expenditures, Share of GDP	0.438	0.43	0.505*	–0.105	0.541**	0.536*	0.541**	0.122	–0.159	–0.136	–0.199	–0.061
Capital Expenditures, Share of GDP	0.326	0.323	0.387	0.186	0.832**	0.788***	0.838**	0.339*	0.002	0.038	–0.035	0.164*
Primary Balance, Share of GDP	–0.036	–0.007	0.062	–0.156	0.815***	0.805**	0.802***	0.199	0.028	0.021	–0.014	–0.035
Debt-to-GDP ratio	0.015	0.014	–0.001	–0.041	–0.06	–0.056	–0.064	–0.074***	–0.001	0.005	–0.001	0.009
Macro												
Private Participation in Investment, constant U.S. dollars	–0.309***	–0.305***	–0.298***	–0.002	0.123*	0.094	0.13**	0.006	0.022	0.023	0.04	0.005**
Consumer Price Inflation, yearly average	–0.004	0.009	0.139	–0.028	0.013	0.018	0.01	0.116	–0.062	–0.061	–0.047	–0.079**
Trade Openness, Share of GDP	0.069	0.032	0.079	0.01	–0.031	–0.026	–0.027	0.005	0.033	0.034	0.052	0.004
Credit to Private Sector, Share of GDP	–0.203***	–0.185**	–0.207***	–0.019	0.031	0.022	0.033	0.022	0.047	0.044	0.063*	0.006
Observations	356	314	170	314	352	314	170	314	352	314	170	314
Number of countries	24	23	21	23	24	23	21	23	24	23	21	23
Chi-squared			137.3	174.5			152.3	200.6			137.3	174.5
Sargan-Hansen Statistic, p-value			0.78	0.81			0.79	0.89			0.79	0.81

Source: Authors' estimates.

Note: LSDV = least square dummy variable; LSDVC = least square bias-corrected dummy variable, following Bruno (2005); Diff. GMM = difference generalized method of moments (GMM), following Arellano and Bond (1991); Sys. GMM = system GMM, following Arellano and Bover (1995). All of the regressions also include a vector of control variables with the following variables that are not reported in the table: fertility rate; urbanization rate; population density; and rule of law governance indicator. PPP = purchasing power parity.
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

Annex Table 5.1.2. Determinants of Infrastructure: Full Sample

	Dependent Variable: Log Fixed Telephone Lines per 100 people				Dependent Variable: Log Electricity Generation Capacity				Dependent Variable: Log Road Density (km of roads per square km)			
	(1) LSDV	(2) LSDVC	(3) Diff. GMM	(4) Sys. GMM	(1) LSDV	(2) LSDVC	(3) Diff. GMM	(4) Sys. GMM	(1) LSDV	(2) LSDVC	(3) Diff. GMM	(4) Sys. GMM
Lagged Variables												
LN GDP per Capita, Constant PPP (t−1)	−0.054	−0.095	0.126***	−0.014	0.084**	0.082**	−0.11	0.035*	0.006	0.001	0.009	−0.005**
LN Fixed Telephone Lines per 100 people (t−1)	0.937***	1.043***	0.67***	1.016***	−0.006	−0.006	−0.022***	0.007	−0.001	−0.002	0.007***	0.001
LN Electricity Generation Capacity (t−1)	0.068	0.063	0.132***	0.004	0.588***	0.674***	0.61***	0.998***	−0.001	−0.001	−0.005	0.001
Road Density (km of roads per square km) (t−1)	0.168*	−0.113	−0.385***	−0.004	−0.016	−0.015	0.459**	0.008	0.907***	0.969***	0.886***	1***
Fiscal												
Tax Revenues, Share of GDP	0.008	−0.113	0.602*	−0.088	0.015	−0.058	0.801**	−0.202	−0.011	0	0	−0.008
Current Expenditures, Share of GDP	−0.134	−0.189	0.077	0.11	−0.165	−0.145	0.245	−0.036	−0.025	−0.025	−0.019**	−0.019
Capital Expenditures, Share of GDP	0.089	0.033	−0.09	−0.137	0.438**	0.423**	0.322	0.223	0.038	0.049	−0.023**	0.043*
Primary Balance, Share of GDP	0.08	0.095	0	−0.047	0.166*	0.189**	0.296***	0.064	−0.011	−0.009	−0.03***	−0.038*
Debt-to-GDP ratio	0.01	0.027	−0.002	−0.028**	−0.056**	−0.047***	−0.063***	−0.021*	0	−0.003	−0.003*	−0.002
Macro												
Private Participation in Investment, constant U.S. dollars	0.017	0.012	−0.103***	0.002	0.073***	0.051**	0.268***	−0.005	0.005	0.001	0.01***	0.001
Consumer Price Inflation, yearly average	−0.042	−0.043	−0.001	−0.021	−0.014	−0.013	−0.056***	0.004	0.012	0.011	0.013**	0.004
Trade Openness, Share of GDP	0.079	0.074	0.034*	0.007	−0.052*	−0.056*	−0.044**	0.009	0.004	0	0.009***	0.003
Credit to Private Sector, Share of GDP	−0.01	0.007	−0.159	−0.025	0.009	0.007	−0.196**	0.009	0.005	0	0.009	0.001
Observations	789	789	702	789	790	790	703	790	713	713	630	713
Number of countries	83	83	78	83	83	83	78	83	79	79	73	79
Chi-sqared			43.46	48.36			47.16	49.96			47.77	43.62
Sargan-Hansen Statistic, p-value			0.99	0.99			0.99	0.99			0.99	0.99

Source: Authors' estimates.

Note: LSDV = least square dummy variable; LSDVC = least square bias-corrected dummy variable, following Bruno (2005); Diff. GMM = difference generalized method of moments (GMM), following Arellano and Bond (1991); Sys. GMM = system GMM, following Arellano and Bover (1995). All of the regressions also include a vector of control variables with the following variables that are not reported in the table: fertility rate; urbanization rate; population density; and rule of law governance indicator. PPP = purchasing power parity. Robust standard errors in parentheses.

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

List of Country and Region Abbreviations

Country Groups

CAPDR	Caribbean Commodity Exporters	Caribbean Tourism-Dependent	Central America	Eastern Caribbean Currency Union (ECCU)	LA6	South America
Costa Rica	Belize	Antigua and Barbuda	Belize	Anguilla	Brazil	Argentina
Dominican Republic	Guyana	The Bahamas	Costa Rica	Antigua and Barbuda	Chile	Bolivia
El Salvador	Suriname	Barbados	El Salvador	Dominica	Colombia	Brazil
Guatemala	Trinidad and Tobago	Dominica	Guatemala	Grenada	Mexico	Chile
Honduras		Grenada	Honduras	Montserrat	Peru	Colombia
Nicaragua		Haiti	Nicaragua	St. Kitts and Nevis	Uruguay	Ecuador
Panama		Jamaica	Panama	St. Lucia		Guyana
		St. Kitts and Nevis		St. Vincent and the Grenadines		Paraguay
		St. Lucia				Peru
		St. Vincent and the Grenadines				Suriname
						Uruguay
						Venezuela

Region Abbreviations

East Asia Pacific	EAP	Middle East and North Africa	MENA
Europe and Central Asia	ECA	South Asia	SAR
Latin America and the Caribbean	LAC	Sub-Saharan Africa	SSA

List of Country Abbreviations

Antigua and Barbuda	ATG	Guyana	GUY
Argentina	ARG	Haiti	HTI
The Bahamas	BHS	Honduras	HND
Barbados	BRB	Jamaica	JAM
Belize	BLZ	Mexico	MEX
Bolivia	BOL	Nicaragua	NIC
Brazil	BRA	Panama	PAN
Canada	CAN	Paraguay	PRY
Chile	CHL	Peru	PER
Colombia	COL	St. Kitts and Nevis	KNA
Costa Rica	CRI	St. Lucia	LCA
Dominica	DMA	St. Vincent and the Grenadines	VCT
Dominican Republic	DOM	Suriname	SUR
Ecuador	ECU	Trinidad and Tobago	TTO
El Salvador	SLV	United States	USA
Grenada	GRD	Uruguay	URY
Guatemala	GTM	Venezuela	VEN

References

Acevedo, S. 2014. "Debt, Growth and Natural Disasters: A Caribbean Trilogy." IMF Working Paper 14/125, International Monetary Fund, Washington.

Agénor, P., and K. Neanidis. 2015. "Innovation, Public Capital, and Growth," *Journal of Macroeconomics* 44: 252–75.

Albagli, E., A. Naudón, and R. Vergara. 2015. "Inflation Dynamics in Latin America: A Comparison with Global Trends and Implications for Monetary Policy." Documentos de Política Económica 58, Central Bank of Chile, Santiago.

Arellano, M., and S. Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* 58: 277–97.

Arellano, M., and O. Bover. 1995. "Another Look at the Instrumental Variable Estimation of Error Components Models." *Journal of Econometrics* 68: 29–51.

Arslanalp, S., and T. Tsuda. 2014. "Tracking Global Demand for Emerging Market Sovereign Debt." IMF Working Paper 14/39, International Monetary Fund, Washington.

Basel Committee on Banking Supervision (BCBS). 2011. *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems.* Basel: BCBS.

Benes, J., K. Clinton, R. Garcia-Saltos, M. Johnson, D. Laxton, P. Manchev, and T. Matheson. 2010. "Estimating Potential Output with a Multivariate Filter." IMF Working Paper 10/285, International Monetary Fund, Washington.

Blagrave, P., R. Garcia-Saltos, D. Laxton, and F. Zhang. 2015. "A Simple Multivariate Filter for Estimating Potential Output." IMF Working Paper 15/79, International Monetary Fund, Washington.

Bloomberg, L.P. 2015. *Bloomberg Credit Risk: Framework, Methodology and Usage.* New York: Bloomberg.

Bruno, G. S. F. 2005. "Approximating the Bias of the LSDV Estimator for Dynamic Unbalanced Panel Data Models." *Economics Letters* 87: 361–66.

Bruns, B., and J. Luque. 2015. "*Great Teachers: How to Raise Student Learning in Latin America and the Caribbean.*" World Bank, Washington.

Bun, M., and J. Kiviet. 2003. "On the Diminishing Returns of Higher-Order Terms in Asymptotic Expansions of Bias." *Economics Letters* 79(2): 145–52.

Burstein, A., M. Eichenbaum, and S. Rebelo. 2005. "Large Devaluations and the Real Exchange Rate." *Journal of Political Economy* 113(4): 742–84.

Caceres, C., and F. Rodrigues Bastos. 2016. "Understanding Corporate Vulnerabilities in Latin America." IMF Working Paper 16/80, International Monetary Fund, Washington.

Calderón, C., and L. Servén. 2010. "Infrastructure in Latin America." Policy Research Working Paper 5317, World Bank, Washington.

Campa, J. M., and L. S. Goldberg. 2005. "Exchange Rate Pass-Through into Import Prices." *Review of Economics and Statistics* 87(4): 679–90.

Caselli, F. G., and A. Roitman. 2016. "Non-Linear Exchange Rate Pass-Through in Emerging Markets." IMF Working Paper 16/1, International Monetary Fund, Washington.

Carrière-Swallow, Y., B. Gruss, N. Magud, and F. Valencia. Forthcoming. "Nominal Anchoring and Exchange Rate Pass-Through in Emerging Markets." IMF Working Paper, International Monetary Fund, Washington.

Cavallo, E., and P. Valenzuela. 2007. "The Determinants of Corporate Risk in Emerging Markets: An Option-Adjusted Spread Analysis." IMF Working Paper 07/228, International Monetary Fund, Washington.

Ca'Zorzi, M., E. Hahn, and M. Sánchez. 2007. "Exchange Rate Pass-Through in Emerging Markets." Working Paper 739, European Central Bank, Frankfurt.

Celasun, O., F. Grigoli, K. Honjo, J. Kapsoli, A. Klemm, B. Lissovalik, J. Luksic, M. Moreno-Badia, J. Pereira, M. Poplawski-Ribeiro, B. Shang, and Y. Ustyugova. 2015. "Fiscal Policy in Latin America: Lessons and Legacies of the Global Financial Crisis." IMF Staff Discussion Note 15/06, International Monetary Fund, Washington.

Chamon, M., P. Mauro, and Y. Okawa. 2008. "Mass Car Ownership in the Emerging Market Giants." *Economic Policy* 23(54): 243–96.

Choudhri, E. U., H. Faruqee, and D. S. Hakura. 2005. "Explaining the Exchange Rate Pass-through in Different Prices." *Journal of International Economics* 65(2): 349–74.

Choudhri, E. U., and D. S. Hakura. 2006. "Exchange Rate Pass-Through to Domestic Prices: Does the Inflationary Environment Matter?" *Journal of International Money and Finance* 25: 614–39.

Das, S. R., P. Hanouna, and A. Sarin. 2009. "Accounting-Based Versus Market-Based Cross-Sectional Models of CDS Spreads." *Journal of Banking and Finance* 33: 719–30.

Doshi, H., K. Jacobs, J. Ericsson, and S. M. Turnbull. 2013. "Pricing Credit Default Swaps with Observable Covariates." *Review of Financial Studies* 26(8): 2049–94.

Dovern, J., U. Fritsche, and J. Slacalek. 2012. "Disagreement among Forecasters in G7 Countries." *Review of Economics and Statistics* 94(4): 1081–96.

Duan, J., W. Miao, and J. A. Chan-Lau. 2015. "BuDA: A Bottom-Up Default Analysis Tool." Unpublished. Risk Management Institute, National University of Singapore and International Monetary Fund.

Economist Intelligence Unit. 2014. "Evaluating the Environment for Public-Private Partnerships in Latin America and the Caribbean." *The 2014 Infrascope*. New York: Economist Intelligence Unit.

Engel, E., R. Fischer, and A. Galetovic. 2014. "Renegotiation in Public-Private Partnerships: Theory and Evidence." International Transport Forum Discussion Paper 2014-17, Organization for Economic Co-operation and Development, Paris.

Frankel, J., D. Parsley, and S. Wei. 2012. "Slow Pass-through around the World: A New Import for Developing Countries?" *Open Economies Review* 23(2): 213–51.

Frischtak, C., and K. Davies. 2014. "O Investimento Privado em Infrastrutura e seu Financiamento." In *Gargalos e Soluçoes na Infrastrutura de Transportes*, edited by A. Castelar and C. Frischtak. Rio de Janeiro: Editora FGV.

Froot, K. A., and P. Klemperer. 1989. "Exchange Rate Pass-Through When Market Share Matters." *American Economic Review* 79(4): 637–54.

Garcia-Escribano, M., C. Góes, and I. Karpowicz. 2015. "Filling the Gap: Infrastructure Investment in Brazil." IMF Working Paper 15/180, International Monetary Fund, Washington.

Góes, C. 2016. "Institutions and Growth: A GMM/IV Panel VAR Approach." *Economics Letters* 138: 85–9.

Gopinath, G. 2015. "The International Price System." Working Paper 21646, National Bureau of Economic Research, Cambridge, Massachusetts.

Gruss, B. 2014. "After the Boom: Commodity Prices and Economic Growth in Latin America and the Caribbean." IMF Working Paper 14/154, International Monetary Fund, Washington.

International Monetary Fund (IMF). 2013. "Canada's Loss of External Competitiveness: The Role of Commodity Prices and the Emergence of China." In Canada: 2012 Article IV Consultation – Selected Issues, IMF Country Report 13/41, International Monetary Fund, Washington, 42–51.

_____. 2014. "Is It Time for an Infrastructure Push? The Macroeconomic Effects of Public Investment." In *World Economic Outlook*. Washington: IMF, October, 75–114.

_____. 2015a. "Exchange Rates and Trade Flows: Disconnected?" In *World Economic Outlook*. Washington: IMF, October, 104–42.

_____. 2015b. "Making Public Investment More Efficient." IMF Staff Report, International Monetary Fund, Washington.

_____. 2016. "Commodities Special Feature." In *World Economic Outlook*. Washington: IMF, April.

Jordà, Ò. 2005. "Estimation and Inference of Impulse Responses by Local Projections." *American Economic Review* 95(1): 161–82.

Kiviet, J. F. 1995. "On Bias, Inconsistency, and Efficiency of Various Estimators in Dynamic Panel Data Models." *Journal of Econometrics* 68: 53–78.

_____. 1999. "Expectations of Expansions for Estimators in a Dynamic Panel Data Model: Some Results for Weakly Exogenous Regressors." In *Analysis of Panels and Limited Dependent Variables*, Edited by C. Hsiao, K. Lahiri, L. F. Lee, and M. H. Pesaran. Cambridge, UK: Cambridge University Press.

Krugman, P. 1989. "The Delinking of Exchange Rates from Reality." In *Exchange Rate Instability*. Cambridge, Massachusetts: MIT Press.

Kuttner, K. N. 1994. "Estimating Potential Output as a Latent Variable." *Journal of Business and Economic Statistics* 12: 361–68.

Laframboise, N., N. Mwase, J. Park, and Y. Zhou. 2014. "Revisiting Tourism Flows to the Caribbean: What Is Driving Arrivals?" IMF Working Paper 14/229, International Monetary Fund, Washington.

Laxton, D., and R. Tetlow. 1992. "A Simple Multivariate Filter for the Measurement of Potential Output." Technical Report No. 59, Bank of Canada, Ottawa.

Lenzen, M., K. Kanemoto, D. Moran, and A. Geschke. 2012. "Mapping the Structure of the World Economy." *Environmental Science and Technology* 46(15): 8374–81.

_____. 2013. "Building Eora: A Global Multi-Region Input-Output Database at High Country and Sector Resolution." *Economic Systems Research* 25(1): 20–49.

Magud, N., and Sosa, S. 2015. "Investment in Emerging Markets: We Are Not in Kansas Anymore… Or Are We?" IMF Working Paper 15/77, International Monetary Fund, Washington.

McIntyre, A., A. El-Ashram, M. Ronci, J. Reynaud, N. Xingyuan Che, K. Wang, S. Acevedo Mejia, and M. Scott Lutz. 2016. "Caribbean Energy: Macro-Related Challenges." IMF Working Paper 16/53, International Monetary Fund, Washington.

Merton, R. 1974. "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates." *Journal of Finance* 29: 449–70.

Noy, I. 2009. "The Macroeconomic Consequences of Disasters." *Journal of Development Economics* 88(2): 221–31.

Perrotti, D., and R. Sánchez. 2011. *La brecha de infraestructura en América Latina y el Caribe*. Santiago, Chile: Comisión Económica para América Latina y El Caribe.

Pessoa, M., I. Fainboim, and A. Fernandez. 2015. "Modernization of Peru's Public Investment Management Systems." In *Peru: Staying the Course of Economic Success*, edited by Alejandro Santos and Alejandro Werner. Washington: International Monetary Fund, 135–50.

Rodrigues Bastos, F., H. Kamil, and B. Sutton. 2015. "Corporate Financing Trends and Balance Sheet Risks in Latin America: Taking Stock of the "Bon(d)anza." IMF Working Paper 15/10, International Monetary Fund, Washington.

Strobl, E. 2012. "The Economic Growth Impact of Natural Disasters in Developing Countries: Evidence from Hurricane Strikes in the Central American and Caribbean Regions." *Journal of Development Economics* 97(1): 130–41.

Taylor, J. B. 2000. "Low Inflation, Pass-Through, and the Pricing Power of Firms." *European Economic Review* 44(7): 1389–1408.

Tang, D. Y., and H. Yan. 2013. "What Moves CDS Spreads?" Unpublished. Authors.

Vacisek, O. 1991. "The Loan Loss Distribution." Technical Report, KMV Corporation.

Vtyurina, S. 2015. "The Role of Fiscal Policies in Peru's Transformation." In *Peru: Staying the Course of Economic Success*, edited by Alejandro Santos and Alejandro Werner. Washington: International Monetary Fund.

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