Mismanagement of the short-run volatility associated with commodity dependence may slow long-term growth through many channels (see chapter 3). Three channels are particularly important to LAC countries: volatility of export income (accentuated by export concentration), instability of fiscal spending (particularly public investments in health, education, and infrastructure), and systematic undersaving (or over-consumption) of natural resource revenues. These channels of transmission can result in volatility in short-run aggregate demand and output and in wealth depletion, slowing growth in the long run. Thus, these adverse effects on growth materialize largely to the extent that governments fail to save enough from commodity income or to dampen the transmission to the domestic economy of the volatility inherent in commodities.

This section focuses on the challenges that commodity price volatility poses for macroeconomic policy, particularly fiscal stabilization policy but also exchange rate policy. Undersaving of natural resource income is briefly examined in the analysis of the fiscal implications. We begin the discussion by considering the relationship between export shocks and shocks to real economic output.

Commodity Price Volatility, Export Concentration, and Output Volatility Are Linked
Commodity-exporting countries, whether rich, middle-income, or poor, are exposed to commodity price...
volatility. But its impact on aggregate demand, saving and investment, and output rises with the degree of export concentration. This is a key dimension that differentiates high-income, natural resource–rich countries from the commodity-exporting countries in LAC: high-income countries have much less export concentration (see figure 2.3). While the “risk” (the probability of commodity price changes) is the same for both classes of countries, the “value at risk” (the degree of dependence of total export income on commodity exports) is substantially lower for the high-income commodity exporters.

Through pronounced Dutch disease–type effects of natural resource discoveries and export booms, commodity abundance may lead to concentrated (or undiversified) export baskets. Without price volatility, export concentration might not be inconsistent with maximizing social welfare, since it may reflect strong comparative advantage. But volatility can reduce welfare by undercutting long-term growth. Although the direct connections between commodity price volatility and long-run growth are difficult to establish empirically, econometric work has found a strong positive association between export concentration and volatility in terms of trade and output growth (Lederman and Xu 2009). Moreover, the positive link between commodity price volatility and output variability appears to be nonlinear: larger price shocks result in disproportionately larger short-run fluctuations in output relative to smaller shocks (Camacho and Pérez 2010).

Furthermore, the effects of commodity price fluctuations on growth rate stability seem to be asymmetric and to vary with the cyclical state of the economy (Camacho and Pérez 2010). Positive price shocks have larger effects during recessions than during booms, while negative shocks have a greater effect in good than in bad times. In line with the value at risk reasoning, countries with high shares of commodity exports in total exports are more strongly affected by commodity price changes. Of course, the effect on output volatility of a one-time commodity price shock dies out over time, as illustrated for Colombia in figure 5.1.

These findings underscore the importance of export diversification for immunizing natural resource–abundant countries against the adverse effects of commodity price volatility. But commodity-rich countries tend to experience Dutch disease effects that discourage diversification into noncommodity exports. These effects can be reduced by insulating the domestic economy from shocks to exports. Much of the burden of creating such a shock absorber falls on macroeconomic policy, to which we now turn.

**Hydrocarbon and Mining Provide a Substantial—and Growing—Share of Fiscal Revenues in the Region**

A heavy reliance on commodities for fiscal revenues contributes to the volatility of revenues and procyclicality in budget execution in LAC. As noted in the literature on the procyclicality of fiscal policy in the region (Gavin and Perotti 1997), this has involved burgeoning debt levels and inefficient public spending during booms, with deleterious economic effects. Countries expand spending during commodity price booms, unleashing strong real exchange rate appreciation, and are then forced to cut spending and allow sharp devaluations of the real exchange rate during busts. In what follows, we discuss the revenue response to the recent commodity price bonanza and examine the impact on fiscal expenditures in commodity-dependent LAC economies.

The large share of fiscal revenues derived from commodities in LAC commodity-rich countries exacerbates the volatility of fiscal revenues. Worse, the share of revenues derived from commodities appears to be rising in mineral- and hydrocarbon-rich LAC countries. Natural resource revenues are much more volatile than other revenues (figure 5.2). LAC countries rely more on this volatile source of revenues for their tax base than do high-income commodity producers. Although LAC fiscal revenues from commodities as a share of GDP were similar to those in Canada and Norway in 2004, a quarter of the revenue was sourced from commodity production and export in LAC compared with 2.5 percent in Canada and 14.6 percent in Norway, because high-income commodity producers collect more tax revenues from other sources. The over-reliance on commodity revenues creates a large challenge for LAC governments in moderating the impact of commodity revenue cycles on the economy.
High hydrocarbon rents may reduce other forms of taxation

Making matters worse, the reliance on natural resources may dampen other revenue generation efforts, exacerbating the concentration and volatility of fiscal revenue. Taxing mineral resources makes life easier for politicians—they can dole out resources without having to tax most residents and firms. Because the ready availability of commodity-based fiscal income can raise the political cost of collecting traditional taxes, politicians may opt to reduce traditional tax rates as a way of distributing rents (Dunning 2009). Thus, a high dependence on commodities can constitute a self-reinforcing equilibrium.

There is empirical evidence for this effect and for its leading to greater volatility in overall revenues. Bornhorst, Gupta, and Thornton (2009), in a study of 30 hydrocarbon-producing countries—including Ecuador, Mexico, Trinidad and Tobago, and República Bolivariana de Venezuela—during 1992–2005, find that countries that receive large revenues from hydrocarbons raise less revenue from other domestic taxes. A cross-country analysis by Knack (2008) provides evidence that tax effort—as measured by the efficiency of revenue mobilization rating from the World Bank’s Country Policy and Institutional Assessments—is lower for large hydrocarbon exporters. And case study evidence strongly suggests that resource booms have eroded the

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**FIGURE 5.1**

The Impulse Response Function to a Commodity Price Shock in Colombia

Source: Camacho and Pérez (2010).

Note: The charts plot the impulse response function of GDP growth to different commodity price shocks for Colombia. The country-specific export commodity price index of Cunha, Prada, and Sinnott (2009a) is used. The shocks hitting the systems are set to \( d \) times the standard deviation of commodity price residuals, with \( d \) being \( \pm 1, \pm 3, \) and \( \pm 6 \). The graphs show nonlinear responses evaluated in period \( t \), where \( t \) is the highest (left) and lowest (right) probability of recession. The first row represents positive shocks, and the second row represents negative shocks.
non-resource-derived tax base in Latin America and elsewhere (Soifer 2006; Dunning 2008).

The fiscal response to the recent boom has been uneven

Fiscal positions have responded more strongly to positive commodity shocks in LAC than in high-income exporters (Medina 2010). This remained the case during the recent commodity price boom for many LAC commodity producers, with the exception of Chile, which behaved similarly to high-income countries. Real primary expenditures rose in all the fiscally dependent commodity countries during the boom.¹ Use of the increased fiscal revenues to fund primary spending rose gradually, with a slower response in the early years of the boom (figure 5.3). However, there was considerable variability. Saving out of the commodity windfall was greater in Bolivia and Chile, where primary expenditures grew substantially more slowly than total revenues and with primary expenditure growth about equal to the contribution of noncommodity revenues to total revenue growth. By contrast, in Colombia, Ecuador, Peru, Trinidad and Tobago, and República Bolivariana de Venezuela, primary expenditures grew somewhat faster than total revenue, particularly in the second half of the boom.² For these oil producers, spending grew much faster than did the contribution of non-commodity revenues to overall revenue growth.

The IMF (2009a) finds a similar pattern across countries when comparing the growth of primary spending to that of trend GDP. Primary expenditures increased much more than trend GDP growth during the height of the boom years in the group of LAC countries categorized as “other commodity exporting countries” (Argentina, Bolivia, Ecuador, Paraguay, Suriname, Trinidad and Tobago, and República Bolivariana de Venezuela). For these countries, this implies a strong fiscal response in the boom years.

Much of the spending favored public investment. Thus, the pattern Gelb (1990) observed during the 1974–78 oil price shock—faster growth in public investment than in other expenditures for six oil exporters—obtained again in the recent boom, as growth in capital spending outpaced that for current spending. LAC capital budgets grew fast but from a low base. And growth in current expenditures was tilted in favor of large increases in subsidies and transfers. Some countries, including Chile and República Bolivariana de Venezuela, used part of the proceeds to fund
increases in health, education, social housing, and social protection programs, albeit with very different styles of fiscal management and intertemporal fiscal prudence.

Many LAC commodity producers entered the global crisis—in particular the economic downturn that triggered the collapse of Lehman Brothers in September 2008—with much stronger fiscal positions and lower public sector debt burdens than during previous crises. Public sector balances had been improving in LAC over the past decade or so. Calderón and Fajnzylber (2009) provide econometric evidence that LAC fiscal processes have become more viable even if they remain procyclical. The pre-crisis commodity price boom was not associated with the large increases in indebtedness experienced in the past. Rather, many countries used the windfall to reduce public-sector debt and increase foreign reserves.

However, the vulnerability to a decline in commodity prices has increased among LAC mineral and oil producers, with the exceptions of Chile and Peru, as evidenced by their fiscal position excluding commodity-related revenues. On average, the non-commodity primary balance of large (relative to total exports) oil exporters declined significantly each year over 2005–08, whereas that of other commodity-dependent countries improved. Oil-reliant economies such as Ecuador, Mexico, Trinidad and Tobago, and República Bolivariana de Venezuela have developed large non-oil fiscal deficits, whereas the mineral producers—Chile and Peru—managed to run noncommodity primary surpluses by the end of the period (figure 5.4).

As commodity exporters emerged from the commodity boom, they evidenced a large divergence in the fiscal space for countercyclical fiscal policy. Chile had built up large fiscal resources in its stabilization fund, Fondo de Estabilizacion Economica y Social (Chilean Economic and Social Stabilization Fund), during the pre-crisis copper boom that allowed the country to follow an ambitious countercyclical agenda once the downturn began. Chile had accumulated US$20 billion, equivalent to about 12 percent of GDP, in its stabilization fund by the end of 2008. About half the reserves were used to fund the initial countercyclical fiscal package, permitting Chile to finance a substantial part of a 14.5 percent increase in public spending in real terms (IMF 2009b).
Bolivia, Peru, and to a lesser extent Mexico were also able to accumulate fiscal savings out of the pre-crisis windfalls and use them—in different degrees—to fund countercyclical spending. By contrast, Ecuador and República Bolivariana de Venezuela did not manage to accumulate large savings from the pre-crisis windfall and so had to reduce primary expenditures in 2009 because of the decline in commodity revenues in the second half of 2008 and the first quarter of 2009 (IMF 2009a).

**Countries have had mixed experience using different fiscal instruments to manage volatility**

Many natural resource (fiscally)–dependent countries in LAC and around the world have established fiscal rules, natural resource stabilization funds, and fiscal responsibility legislation to deal with volatile fiscal rents from natural resources. These mainly apply to hydrocarbons and minerals, given that export taxes on agricultural commodities have tended to wane, and their relative importance in fiscal revenues has tended to fall. Some governments in LAC’s resource-rich countries (e.g., Bolivia, Peru) have self-insured by simply accumulating regular deposits in their central banks. To make this sort of prudence a reality, some countries have moreover used a conservative—that is, lower-than-expected—commodity price as a reference to formulate the budget. Of course, the less formal stabilization-oriented fiscal-saving mechanisms face greater risks of being breached. There are frequent examples where commodity fiscal revenues in excess of those forecast by the budget have been consumed via off-budget spending driven by clientelist considerations.

Other countries have used more formal arrangements. Formal stabilization funds, for example, have been used in Chile and Mexico to reduce the impact of volatile prices on fiscal spending. In practice, these fiscal rules and funds conflate multiple objectives, beyond that of smoothing fiscal spending in the face of volatile and unpredictable natural resource revenues across the
cycle (a basic purpose, for instance, of the Chilean Economic and Social Stabilization Fund, FEES). Other objectives, some of which will be discussed below, include the equitable distribution across generations of the natural resource income (a central objective, for instance, of Norway’s Government Pension Fund); the protection of the poor and other vulnerable groups in times of cyclical downturns (see Engel, Nielsen, and Valdés 2010, who find that the welfare gains of such a social policy fiscal rule are particularly high where there is greater income inequality); the mitigation of real exchange rate appreciation (one rationale behind the fact that Chile’s two sovereign wealth funds are invested abroad); and asset diversification (an explicit motive of Trinidad and Tobago’s Heritage and Stabilization Fund, HSF). Additionally, fiscal rules and dedicated funds typically aim at increasing transparency and accountability in the spending of natural resource revenues, in line, for instance, with the Extractive Industries Transparency Initiative (EITI).

The decision on the optimal use of natural resource rents is then quite complex, and the institutional mechanisms to save resources reflect this intricacy, often combining a number of diverse aims. Most natural resource funds are based on twin policy objectives of stabilization and saving. For example, the interest and dividends from Norway’s sovereign wealth fund are used to balance the structural, non-oil deficit in bad times, whereas the principal can only be used to cover future pension liabilities. The key point is that a long-term saving function in fiscal policy is essential to adequately address the challenges posed by nonrenewable natural resources. The typical policy instrument in this regard is the so-called sovereign wealth fund. The accumulation of long-term savings out of windfall rents in this sort of fund is typically subject to special rules and governance arrangements, as well as to different investment criteria compared to stabilization-oriented funds. The latter tend to be invested in foreign securities that are safe and highly liquid, whereas the former tend to be invested within a long-term horizon in a diversified portfolio, where less liquid and riskier assets have a nontrivial weight.

Of the five countries that began the recent boom in 2002 with a stabilization fund or other fiscal arrangements to manage windfall hydrocarbon or mineral revenues, only two delivered results in terms of significant windfall savings at the end of the boom. These were Chile’s FEES and Trinidad and Tobago’s HSF. Both Chile’s and Trinidad and Tobago’s funds endured, with each country accumulating savings equivalent to 12 percent of GDP by the end of 2008. Ecuador and República Bolivariana de Venezuela dispensed with their arrangements. Ecuador breached its fiscal deficit and spending rules, which were unable to survive political and social pressures, ultimately leading to a revision of the fiscal responsibility law in 2005 in favor of higher spending, and to the law’s elimination in 2008. República Bolivariana de Venezuela stopped contributions to its Macroeconomic Stabilization Fund (Fondo de Estabilización Macroeconómica, FEM) soon after the fund’s inception in 2003. In fact, República Bolivariana de Venezuela chose to spend much of its increased oil revenues off budget. Although for Mexico, the fiscal responsibility framework lasted and generated consistent primary surpluses during the boom period, it did not result in sufficient savings to finance a strong countercyclical package. Accumulation in oil-savings funds was capped at 1.5 percent of GDP (IMF 2010a).

**Price Volatility Also Is a Problem at the Household Level, Especially for Food and Fuels**

Although the focus of this section is on more aggregate effects on the economy, government, and society as a whole, commodity price volatility is also a problem for households in which a significant share of income either is spent on commodities or comes from commodity production, whether through direct reliance on production and sales or through the labor market. Commodity price shocks can also impact the poor and vulnerable through reduced fiscal space that limits social spending in times of need. To cope with price risks within the constraints they face, households may follow ex ante strategies (e.g., crop diversification, diversification of income-generating activities, precautionary savings to smooth consumption) and ex post strategies (e.g., short-term consumption credit and informal help or compensation arrangements between members of a group or village) (see Deaton 1991;
Alderman and Paxson 1992; Dercon 2004). Of course, the choice of low-risk activities to cope with price shocks may involve a trade-off in the form of lower average return. The evidence suggests that despite all the smoothing strategies adopted voluntarily by households, substantial residual consumption risk remains (Jalan and Ravallion 1999).

While social spending should be countercyclical, historically it has tended to be either acyclical or pro-cyclical (although possibly with some reversal of this tendency in the current global downturn). This has typically reflected the inability of countries to borrow at reasonable costs in bad times, so that when the fiscal space shrinks, social spending has as well. In the latest global crisis, however, LAC countries were better able to respond to the external shock (which also included a temporary but major fall in commodity prices), and social spending was maintained and even increased in several countries. The ability of the fiscal process to help cushion the shock in the latest crisis is a clear sign that the region has made significant strides toward improving its macroeconomic fundamentals, as emphasized in recent (biannual) reports of the World Bank for the Latin American region. The need to smooth social spending across time and possibly make it countercyclical calls for delaying some of the spending until “bad times.” This likely requires some special provisions in the commodity-related macro-stabilization funds, complemented by a structure of effective social safety nets that enables the expansion of social assistance when a crisis hits.

Commodity price shocks, especially those affecting socially sensitive goods such as internationally tradable foods and fuels, tend to have complex distributional implications not just in countries that are importers of such commodities, but even in those that are net exporters. In the latter case, although an increase in international commodity prices benefits the country as a whole, the pass-through of the international price rise to the domestic prices can raise social tensions because some groups in society lose while others gain. This was illustrated clearly in Argentina during the recent spike (2007–08) in the international prices of foods and fuels, where, faced with protests from the urban poor and middle classes, the authorities introduced domestic price controls and limits on exports of commodities that are also significantly consumed at home. One lesson is that in the absence of a permanent structure of well-functioning social safety nets, the optimal policy (allow domestic prices to reflect international prices and use fiscal transfer to compensate the losers) is politically difficult to implement.

Exchange Rate Policy

The volatile nature of revenue flows from commodities also has implications for exchange rate policy. Of course, the burden of such volatility on the exchange rate will be higher in the absence of the kind of well-designed, stabilization-oriented, and long-term-saving-oriented funds discussed earlier. The exchange rate regime that can best deal with such residual volatility is not independent of the specific conditions of the country.

With any exchange rate regime, however, a shock to the terms of trade will require, in equilibrium, a change in the real exchange rate (defined as the relative price of tradables to nontradables)—a real devaluation in the case of a negative shock, or a real appreciation in the case of a positive one. With a floating exchange rate, this will be accomplished through a change in the nominal rate, which can happen quite quickly. With a fixed rate, the adjustment must be accomplished through a change in domestic prices: that is, inflation for a real depreciation and deflation for a real appreciation. This process may take substantially longer than an adjustment in a flexible rate. Of course, between floating and pure fixed, there exist a wide range of intermediate regimes, either de jure or de facto. Few countries maintain pure floats; among the countries with even the most flexible regimes, intervention in LAC has been common during the recent commodity price cycle (Kiguel and Okseniuk 2010).

Although it is a matter of heated debate, a strong case can be made that a flexible exchange rate regime is more suited to dealing with commodity price volatility in countries that have a relatively large nontradable sector, experience real shocks that are asymmetric to those in their main trading partners, and are significantly integrated within international financial markets. A key reason behind this argument is that, in such countries, the equilibrium real exchange rate will itself tend to be volatile, responding to volatile terms of trade. By
contrast, a fixed exchange rate regime might be a better option for commodity-exporting countries that are very open, have a relatively small nontradable sector, and experience shocks that are symmetric to those in their main trading partners (i.e., countries that meet “optimal currency area” conditions). This, again, is in part because, in the latter type of countries, the equilibrium real exchange rate would not need to adjust significantly in response to terms-of-trade shocks. An important consequence of this distinction is that countries in the first group that nonetheless adhere to hard pegs or less flexible exchange rate regimes need to compensate by greater flexibility in nominal wages and fiscal policy in order to achieve adjustments in the real exchange rate without excessive adjustments in quantities (output, employment), particularly during periods of terms-of-trade deterioration.

To be sure, countries do not generally choose their exchange rate regimes only in light of whether they are commodity exporters or not, and many other factors, including the degree of trade and financial openness as well as institutional considerations, play a role. In fact, there has been a general trend toward increased exchange rate flexibility over the last 30 years in LAC. This process has intensified since the foreign exchange crises that hit many emerging-market countries in the late 1990s, and since the collapse of the currency board in Argentina in 2002.

The advantages and disadvantages of different exchange rate regimes in the context of the most recent commodity price cycle (with a focus on the 2004–09 period) were empirically assessed by Kiguel and Okseniuk (2010) in a paper prepared for this report. The authors compare the adjustment paths of the real exchange rates for three groups of LAC countries, confirming that those with flexible rate regimes adjusted most quickly, those with fixed rates the most slowly, and the intermediate regimes in the middle (figure 5.5).

On one hand, greater exchange rate flexibility implied less inflation during the commodity price boom years and better capacity to run countercyclical monetary policy in the downturn. Countries with floating exchange rate systems were thus somewhat more successful in limiting the impact of the “agflation” phenomenon during 2007 and 2008. The main reason is that they partially compensated for the increase in

![FIGURE 5.5](image)

**Real Appreciation and Inflation during the Recent Boom**

Source: Kiguel and Okseniuk (2010).

Note: The real exchange rate is bilateral with the United States, deflated by consumer prices. A decrease indicates an appreciation relative to the U.S. dollar. Hard pegs are those economies in LAC that have dollarized: Ecuador, El Salvador, and Panama. The following countries are classified as having intermediate regimes: Argentina, Bolivia, Costa Rica, Honduras, Jamaica, Nicaragua, Paraguay, Peru, Uruguay, and República Bolivariana de Venezuela. The floaters consist of Brazil, Chile, Colombia, the Dominican Republic, Guatemala, and Mexico.
international prices of food and energy through the nominal appreciation of their currencies. During the downturn in prices that started in mid-2008, the floaters had a faster adjustment in the real exchange rate (although there was also some overshooting), and they were able to sharply reduce nominal interest rates as part of the stimulus packages to compensate the adverse external shocks. In addition, the countries that had less flexible regimes in general (including countries that are formally dollarized or have hard pegs) had to increase interest rates to defend parity and to limit capital outflows. When a real depreciation was required in the bust phase of the cycle, this had to be accomplished through a politically difficult reduction in domestic prices and wages.

On the other hand, a disadvantage of flexible regimes is their greater real exchange rate volatility (as is clear from figure 5.5). This brings with it difficulties when deciding to intervene to mitigate the impact of temporary exchange rate volatility on the noncommodity export sectors. For larger countries with more substantial nontradable sectors, this may present a particularly thorny problem. Inappropriate intervention may lead to a sharp short-run overshooting of the exchange rate relative to fundamental values. Intervention is also associated with the problem of domestic liquidity management of growing foreign exchange reserves due to sterilization when commodity prices are booming.

For countries with floating regimes, the recent performance of inflation-targeting countries has shown advantages in comparison with fixed exchange rate regimes for commodity producers. The adoption of an inflation anchor in many of the countries in the region has brought credibility and transparency to monetary policy frameworks. The most popular regime has been to target the consumer price index (CPI). However, Frankel (2009), in a paper prepared for this report, argues that events of the past few years, particularly the global financial crisis of 2007–09, may have somewhat strained inflation-targeting regimes. In particular, during this period, the price shock was a supply one, and inflation targeting is admittedly best suited to control inflation pressures arising from excess aggregate demand (relative to potential output). Hence, the authorities in inflation-targeting countries in LAC had to focus not solely on the CPI, but also on the exchange rate and the prices of agricultural and mineral products, as well as on their second-round effects on inflation expectations.6 This is problematic partly because of regime credibility issues but also because of the fact that commodity prices are not given a weight in the CPI that their volatility warrants. The solution to this problem, however, is not simple, particularly for commodity-dependent countries. Frankel (2009) argues that, with this type of inflation targeting, countries would achieve lower domestic price volatility by targeting the producer price index instead of the CPI, as the former takes into account much better the most volatile prices of a country’s exports or a more comprehensive group of a country’s exports (box 5.1).

**BOX 5.1.**

**Potential Anchors for Monetary Policy for Commodity Producers and Consumers**

Fixed and floating exchange rates each have their advantages. However, econometric attempts to discern what sort of regime delivers the best economic performance across countries—fixed, floating, or intermediate—have not been successful. The answer depends on the circumstances of the country in question. The CPI is the most common choice of the possible price indexes that a central bank could target. The CPI is indeed the natural candidate to be the measure of the inflation objective for the long term. But it may not be the best choice for an intermediate target on an annual basis. There is a case to be made for instead targeting either the producer price index (PPI) or an export price index. The latter idea is a moderate version of a more exotic monetary regime, proposed by Frankel and Saiki (2002) and Frankel (2003), called Peg the Export Price (PEP). Frankel (2009) examines possible nominal variables as candidates to be anchor for monetary policy. Three candidates are exchange rate pegs, to the dollar, euro, and SDR; one candidate is orthodox inflation targeting; and two candidates represent proposals where

* (Box continues on next page)
prices of exports are given substantial weight and prices of imports are not: PEP and PPI. The selling point of these production-based indexes is that each could accommodate shocks in terms of trade.

The proposed PEP regime targets the leading commodity of a country in question. The proposal is to fix the price of that commodity in terms of domestic currency. For example, Bolivia would peg its currency to natural gas; Chile would peg to copper; Ecuador, Trinidad and Tobago, and the República Bolivariana de Venezuela would peg to oil; Jamaica would peg to aluminum; the Dominican Republic would peg to sugar; Central American coffee producers would peg to coffee; and Argentina would peg to soybeans. An advantage of the PEP anchor is that it results in automatic adjustments in the face of fluctuations in the prices of the countries’ exports on world markets. When the dollar price of exports rises (or falls), then the currency appreciates (or depreciates) in terms of dollars. Such accommodation of terms-of-trade shocks is precisely what is wanted. The side effect of using PEP is that it would destabilize the local-currency price of other tradable goods. If agricultural or mineral commodities constitute virtually all of exports, then this may not be an issue; however, for most countries in LAC, no single commodity constitutes more than half of exports. Exports are dominated by agricultural and mineral commodities, but it is a diversified basket of commodities. A more flexible and broad-ranging variant of the commodity price peg would take export diversification into account, aiming to stabilize a more comprehensive index of export prices in terms of the local currency. Finally, a more moderate version is to target the producer price index (PPI), which includes a substantial commodity component.

Frankel (2009) shows a counterfactual analysis of alternative monetary regimes using the different nominal targets to simulate their ability to minimize both variability in the real price of commodity exports and variability in the real price of other traded goods. Frankel follows the logic that stabilizing the relative price of commodity exports is not much of an accomplishment if it comes at the expense of a corresponding destabilization of the relative price of other traded goods. The study focuses on a set of countries in LAC and compares the historical paths of

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<td><strong>Historical regime</strong></td>
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<td>ARG 0.661</td>
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<td>BOL 0.538</td>
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<td>BRA 0.522</td>
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<td>CHL 0.510</td>
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<td>COL 0.456</td>
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<td>CRI 0.420</td>
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<td>GUY 0.922</td>
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<td>HND 0.533</td>
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<td>URY 0.504</td>
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<td>VEN 0.429</td>
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Source: Frankel (2009).

Note: The figures show the average of the export price standard deviation and import price standard deviation.

(Continued on next page)
This proposal is likely to be unpalatable to central banks, however, not least because the headline inflation, as measured by the CPI, remains as the most important issue to be address by currency policy.

Based on Frankel’s simulations, all nominal anchors ( pegs) deliver greater overall nominal price stability than the inflationary historical monetary regimes actually followed by LAC countries, and the PEP proposal (“Comm peg” column) is found to be the best anchor for reducing relative price variability. Also, the PEP and PPI alternative inflation targeting anchors dominate a policy targeting the CPI with respect to terms-of-trade shocks. The PEP and PPI have the desirable property that the currency appreciates (or depreciates) when prices for exports go up (or down) on world markets; the CPI does not have this undesirable property.

An interesting finding is the comparison of a CPI target and a PPI target as alternative interpretations of inflation targets. The results show that the PPI target generally delivers more stability in the prices of traded goods, especially the export commodity. This is a natural consequence of the larger weight on commodity exports in the PPI than in the CPI. Perhaps surprisingly, both the CPI target and the PPI target deliver more relative price variability than any of the three exchange rate pegs (dollar, euro, and SDR). Frankel suggests that more research is needed to clarify this. Estimates are made for the weights that the countries’ CPI and PPI place on each of three sectors: nontradable goods, the leading commodity export, and other tradables. Thus, it may be necessary to see if the estimation of these weights and the price series can be improved and the comparison made more realistic by allowing the CPI and PPI to fall within a range rather than requiring the central bank to hit a target precisely.

Endnotes
1. The period 2005–07 is used to examine the response to the boom, given that reliable cross-country fiscal data are available only on an annual basis and that commodity prices took a nosedive in the second half of 2008.

2. The expenditure data for República Bolivariana de Venezuela shown in figure 5.3 do not reflect the true magnitude of spending during the recent boom. Much of the spending was carried out using off-budget mechanisms. For illustration, Manzano et al. (2010) estimate the cost of the off-budget social and infrastructure expenditure programs of PDVSA at US$66.2 billion over 2003–08.

3. The papers by Davis, Ossowski, and Fedelino (2003) and Ossowski et al. (2008) provide a useful overview of the literature and country experiences on special fiscal institutions to manage commodity (oil) revenues and are used extensively as background for this section. An examination of general fiscal rules by the IMF (2009c) also provides a comprehensive discussion on their evolution, design, implementation, and impact on fiscal performance.

4. For an overview and insights on the difficult choices official institutions face in managing their sovereign wealth, see Johnson-Calari and Rietveld (2007).

5. There is conflicting evidence on whether such strategies are effective at smoothing consumption (see, e.g., Rosenzweig and Binswanger 1993; Rosenzweig and Wolpin 1993; Fafchamps, Udry, and Czukas 1998; Dercon 2004).

6. Each of the inflation targeters (IT) in the region had positive correlations between dollar import prices and the dollar values of their currencies over the period 2000–08. In fact, these were greater than the correlations during the pre-IT period. The implication seems to be that the CPI they target does not, in practice, entirely exclude oil price shocks.