BETWEEN A ROCK AND A HARD PLACE

THE MONETARY POLICY DILEMMA IN LATIN AMERICA AND THE CARIBBEAN

Semiannual Report
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October 2017
Between a Rock and a Hard Place:

The Monetary Policy Dilemma in Latin America and the Caribbean
Acknowledgements

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Executive Summary

After a growth slowdown that lasted six years (including a contraction of 1.3 percent last year), the Latin American and Caribbean (LAC) region is finally expected to resume positive growth in 2017, with market analysts forecasting real GDP growth of 1.2 percent for 2017 and 2.3 percent for 2018. The resumption of positive growth will be mainly due to the recovery in South America (SA), which is expected to grow by 0.6 percent in 2017 and 2.2 in 2018 after two consecutive years of negative growth (with real GDP falling by 1.2 percent in 2015 and 2.9 percent in 2016). Within SA, the recovery will be led by a robust rebound in Argentina, which is expected to grow by 2.8 percent in 2017 and 3.0 percent in 2018 (after a contraction of 2.2 percent in 2016) and Brazil, which is expected to resume positive growth as well, by growing 0.7 percent in 2017 and 2.3 in 2018, after contracting for two consecutive years. In the rest of the region, Mexico will continue to grow just above 2 percent (with real GDP expected to increase by 2.2 percent both in 2017 and 2018), while growth in Central America and the Caribbean should stay at just below 4 percent in both 2017 and 2018.

In general, external factors that are typically important drivers of growth for the region (such as commodities prices and growth in China for SA) and growth in the U.S. for Mexico, Central America, and the Caribbean (MCC) are expected to remain roughly stable, or even show slight improvements. On the other hand, the gradual increase in world interest rates, led by rises in the Federal Funds Rate and the slow unwinding of the large increase in the Federal Reserve’s balance sheet since the Global Financial Crisis may eventually negatively affect global liquidity. But, overall, we would expect the global environment to remain roughly neutral for the region in the near future – particularly if potential protectionist policies in the U.S. do not materialize, at least to the degree expected earlier this year. This implies that, in the near future, the region will need to rely on its own sources of growth; in particular, further structural reforms in labor markets and education, and increases in infrastructure spending.

Unfortunately, the region’s need to increase spending on human and physical capital may be hampered by limited fiscal resources. Indeed, as emphasized in Chapter 1 of the report, a major macroeconomic worry in the region comes from the weak fiscal situation in most countries, particularly in SA. In fact, 28 out of 32 countries in the region will show a negative overall fiscal balance in 2017. The median fiscal deficit in the region is 3.1 percent of GDP, with the one in SA being 6.0 percent of GDP compared to just 1.5 percent of GDP in Mexico, Central American, and the Caribbean. During the period 2011-2017, the increase in the median fiscal deficit was 5.1 percentage points in SA compared to essentially zero in MCC (unfortunately, the recent string of natural disasters in Mexico and the Caribbean will only add to existing fiscal pressures in light of the staggering losses.) Not surprisingly, the weak fiscal situation has resulted in an average level of public debt for the region of 58.7 percent of GDP, with six countries having debt ratios above 80 percent of GDP. This could eventually negatively affect international credit ratings and hence the region’s cost of borrowing both domestically and abroad at a time when international financial conditions may become tighter.

Given the weak fiscal situation, a source of concern for the near future is that there will be little room for countercyclical fiscal policy if it were needed to boost growth and/or support fiscal rebuilding efforts. This naturally tends to put more
of the burden on monetary policy for macro-stabilization purposes. In this context, Chapter 2 – the core of this report – analyzes in detail how monetary policy has been conducted in the region and what may be its potential to support growth, without risking some hard-won gains in the battle against inflation. Specifically, the chapter is built around a critical monetary policy dilemma faced by many countries in the region. Consider a commodity-exporter country that suffers a negative terms of trade shock (as happened with the fall in oil prices in mid-2014). This shock will lead, among other things, to a fall in real GDP, a fall in net capital inflows, higher inflation, and a depreciation of the domestic currency. How should the monetary authority react? On the one hand, if it raises the policy interest rate to defend the currency and prevent inflation from taking off, it will aggravate the underlying slowdown/recession (which we would define as procyclical monetary policy). On the other hand, if it reduces the policy rate to stimulate the economy (countercyclical monetary policy), it risks further depreciation which could trigger capital outflows and even more depreciation, as economic agents worry about macroeconomic instability.

It is worth noting that this monetary policy dilemma does not typically arise in industrial countries because they tend to be larger economies where the exchange rate plays a much minor role and, more importantly, inflation and GDP tend to be positively correlated. The fact that GDP and inflation tend to, say, fall together during a recession (as happened in the United States during the Global Financial Crisis) implies that a reduction of policy rates can serve the dual purpose of stimulating output and preventing deflation. In contrast, as just noted, GDP and inflation/depreciation tend to move inversely in emerging markets. Further, the exchange rate is a key variable for any small open economy, with even moderate depreciations having potential damaging effects through its impact on dollar denominated debt (the so-called liability dollarization problem), pass-through to higher inflation, and loss of credibility in the stability and sustainability of the existing monetary policy framework. For these reasons – and as shown in Chapter 2 – industrial countries, almost without exception, have pursued countercyclical monetary policy (i.e., reducing policy rates in bad times) whereas many emerging markets (EMs) in general, and many LAC countries in particular, have followed procyclical monetary policy (i.e., raising policy rates in bad times), thus making the recession/slowdown even worse.

How can EMs solve this fundamental monetary policy dilemma? The best way would be to have an independent central bank, low levels of dollarization, and a credible monetary policy framework (typically built over many years) which inspires market confidence and prevents some depreciation of the currency in bad times from becoming a major source of instability. This would be the case of Chile, which has typically conducted monetary policy in a countercyclical manner as industrial countries do. In fact, following this recipe, many countries in the regions have been able to switch from monetary policy procyclicality to countercyclicity. In particular, the percentage of procyclical LAC countries fell from 60 to 42 percent before and after 2007. In great part, however, this was due to some strong countercyclical policies – both on the fiscal and monetary side – in response to the Global Financial Crisis of 2008-2009. In other words, the monetary policy dilemma still lurks in many central banks in the region.

In fact, this monetary policy dilemma has recently been taking a more nuanced and dynamic form in terms of how central banks respond to a negative shock. Consider again the effects of the fall in oil prices in mid-2014 in some of the major SA economies. As mentioned above, this led to a fall in GDP, sharp depreciations, and inflation taking off. In response, countries like Brazil severely tightened monetary policy by raising policy rates in an (eventually) successful attempt to stabilize the domestic currency and controlling inflation. It was only after the exchange rate had stabilized (after increasing by 82 percent between July 2014 and January 2016) and inflation had begun to fall that the central bank began a loosening cycle, drastically reducing the policy rate in the last 12 months. This “policy cycle within the
business cycle” was also observed in Colombia, Peru, and Uruguay. In contrast, Chile immediately reduced policy rates when the negative terms of trade shock took place.

This dynamic policy response is yet another reminder that many LAC countries still greatly value monetary and currency stability and become quite concerned when a negative shock may cause instability. This is a valid concern and may make procyclical monetary policy inevitable, at least in the early phases of the response to a negative shock. Still, the first best would be to build strong monetary institutions that make this unnecessary. Alternatively, many countries have resorted to a second policy instrument – legal reserve requirements – as a way of solving the monetary policy dilemma. The idea is that if the policy rate is raised to defend the currency in bad times, the central bank can lower reserve requirements to stimulate the economy. In fact, many LAC countries have routinely resorted to using reserve requirements (both in domestic and foreign currency) as another monetary policy instrument. Finally, we should note that some occasional use of foreign exchange market intervention should surely be part of the policy menu. Early intervention in foreign exchange markets to prevent currency depreciation may free the policy rate to help the economy regain its footing.
Chapter 1:
Growth and Fiscal Challenges in the Region

Introduction

After six years of growth deceleration (including the last one with negative growth), the Latin America and Caribbean (LAC) region is expected to grow by about 1.2 percent in 2017 and 2.3 percent in 2018 (Table 1.1 and Figure 1.1, Panel A). Although modest, this rebound in 2017 would constitute the first year with an increase in growth since 2010, after a surprisingly long and deep slowdown. The improvement in growth relative to last year was mainly driven by a strong recovery in Argentina and a more tepid one in Brazil (but still quite robust relative to the previous two years of strong negative growth (Table 1.1).

Two features of LAC’s growth performance are worth emphasizing. First, average growth in the region masks an important heterogeneity across sub-regions. While Central America and the Caribbean continue to grow at a healthy rate of close to 4 percent per annum (Table 1.1), Mexico’s growth remains barely above 2 percent, while South America (SA) is finally entering positive territory and expected to grow by 0.6 percent in 2017. The recovery in SA is led by a robust rebound in Argentina, which is expected to grow by 2.8 in 2017 (Table 1.1), and a tepid recovery in Brazil, which

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<th>TABLE 1.1. Recent and Forecasted Real GDP Growth in LAC</th>
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Notes: Sub-regional values are weighted averages. SA includes Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, and Venezuela, RB. MCC includes Antigua and Barbuda, The Bahamas, Barbados, Belize, Costa Rica, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines. Sources: Consensus Forecasts (September 2017) when available, otherwise World Bank staff estimates (September 2017), and WEO (April 2017).
constitutes nonetheless a big improvement relative to the two previous years of contraction (growth fell 3.8 percent in 2015 and 3.6 percent in 2016).

**FIGURE 1.1. LAC: Real GDP Growth**

**PANEL A. LAC**

**PANEL B. Subregions**

**PANEL C. Selected SA Countries**

*Notes: Sub-regional values are weighted averages. SA includes Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, and Venezuela, RB. MCC includes Antigua and Barbuda, The Bahamas, Barbados, Belize, Costa Rica, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines. Sources: Consensus Forecasts (September 2017) when available, otherwise World Bank staff estimates (September 2017), and WEO (April 2017).*
This heterogeneity can also be seen in terms of individual countries. Figure 1.2 shows the growth rate in 2016 and the forecasts for 2017 and 2018 for each country in LAC. Four out of the top five faster growing economies in 2016 were from MCC (Dominican Republic, Panama, Nicaragua, and Costa Rica) and only one from SA (Bolivia).\(^1\) Furthermore, only three South American economies had a better performance than the average of MCC, namely Peru, Paraguay, and the already mentioned Bolivia. The median rate of real GDP growth for all countries in 2017 is 2.4 percent, with the median for MCC being 2.4 and 1.8 for SA. Hence, once again, we see the pattern of MCC doing better in terms of growth than SA.

**FIGURE 1.2. Real GDP Growth in LAC per Country, 2016-2018**

Second, the region has consistently underperformed its peers during the last decade and a half (Figure 1.3). Although most of the economies in the world grew slower after 2011 compared with the period 2003-2011 (excluding 2009), the deceleration in LAC was particularly strong. Figure 1.3 shows the GDP growth rate of SA and MCC vis-à-vis the major economies in the world (G-7), China, and other middle-income countries from Europe and Central Asia (ECA) and South East Asia (SEA). It also shows the relative performance of SA and MCC against a group of peers. Peer countries were constructed taking into account similarities in different characteristics of the economies of each respective region. SA has underperformed compared to its peers, in particular during 2016 when it

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\(^1\) MCC stands for Mexico, Central America, and the Caribbean.
experienced a contraction of GDP while its peers grew by about 2 percent on average. This was also the case for MCC, which has underperformed its peers consistently since 2002. Further, both SA and MCC are expected to underperform their peers in both 2017 and 2018.

**FIGURE 1.3. Real GDP Growth: International Comparisons**

![Graph showing real GDP growth comparisons](image)

*Notes: Sub-regional values are weighted averages. SA includes Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, and Venezuela, RB. MCC includes Antigua and Barbuda, The Bahamas, Barbados, Belize, Costa Rica, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines. SA Peers include Ghana, Indonesia, Nigeria, Russian Federation, South Africa, and Uzbekistan. MCC Peers include Bangladesh, Malaysia, Pakistan, Philippines, Thailand, and Turkey. ECA includes Croatia, Czech Republic, Hungary, Lithuania, Poland, and Turkey. SEA MICs include Indonesia, Malaysia, Philippines, and Thailand. Sources: Consensus Forecasts (September 2017) when available, otherwise World Bank staff estimates (September 2017), and WEO (April 2017).*

Given the significant difference between growth in different subregions of LAC, it is natural to ask what factors may explain this phenomenon. External or domestic? The next section tackles these questions.

**The Growth Slowdown and the Role of External Factors**

From the perspective of a small open economy, as those in LAC, external factors play a fundamental role in determining growth. In fact, this has been a critical determinant of the marked deceleration in growth experimented by SA since 2011.

Typically, the price of commodities, growth in China and the U.S., and international liquidity – as captured for instance by the real yield on the 10-year U.S. Treasury note – are among the most important external factors. Figure 1.4 illustrates the recent path of these four factors. The most salient
recent features are the end of the commodity super cycle and the deceleration of China.\(^2\) The end of the commodities super cycle was a negative shock to the net exporters of commodities (SA and Mexico) and a positive one to the net importers (the Caribbean and Central America). Meanwhile, the growth deceleration in China and the U.S. was a negative shock for the whole region. At the moment, however, commodity prices seem to have stabilized as has growth in China and the U.S.

To shed light on the quantitative importance of external factors in growth in SA, we use the WIM model as in previous issues of this report. The model estimates the effects of four external variables on the growth rate of each country in SA (see De La Torre, Levy Yeyati, and Pienknagura, 2013). The

\(^2\) For a historical explanation of the super cycle, see Erten and Ocampo (2013).
explanatory variables are the above-mentioned growth rate of the G-7, the growth of China, an index of commodity prices, and the U.S. 10-year Treasury note as a proxy for the global cost of capital.

Figure 1.5 illustrates the results from the model. The blue line shows the actual growth rate of SA while the red line shows the growth rate predicted by the model. This predicted value summarizes the effect of the external factors on the growth rate. Therefore, the difference between both lines can be interpreted as the influence of internal factors. The figure makes clear two important points. First, the sharp growth deceleration suffered by SA since 2011 was mainly due to external factors. This can be clearly inferred from the fact that the red line falls rather steadily from 2010 onwards. Second, the net effect of external factors on SA's growth at the end of the sample (2017.Q2) is just 0.9 percent. In other words, SA will need to generate its own growth, so to speak, rather than relying on external tailwinds, which are very mild at best.

**FIGURE 1.5. Quantifying the Role of External Factors in SA’s Growth**

![Figure 1.5. Quantifying the Role of External Factors in SA’s Growth](image)

*Source: Authors’ estimations based on data from Bloomberg and Haver Analytics.*

**Fiscal Adjustment in LAC**

Unfortunately, the region’s need to invest more in human and physical capital to generate its own growth comes at a time when the fiscal situation of most countries in the region is weak, as reflected in the fact that 28 out of 32 countries have an overall fiscal deficit (Figure 1.6). The median fiscal deficit for the region is 3.0 percent of GDP, with that of SA (6.0 percent) around four times as much
as that of MCC (1.5 percent). If there is a silver lining, it is the fact that many MCC countries actually show a primary surplus, a rare fact among SA countries. In sharp contrast, with the exception of Paraguay and Colombia, all SA countries are expected to have a primary deficit in 2017.

FIGURE 1.6. Fiscal Balances in LAC, 2017f

Sources: World Bank staff estimates (September 2017) when available, otherwise WEO (April 2017).

Figure 1.7 shows the fiscal deterioration of individual countries in the region during the period 2011-2017. Again, one sees a marked difference between SA and MCC. While in SA the median increase in the deficit was 5.1 percent of GDP, the median increase was essentially zero in MCC. The increase in SA is explained by a 3.0 percentage points increase in spending and 1.9 percentage points fall in revenues. In MCC, median spending actually fell by 0.9 percentage points while revenues increased by 1.8 percentage points.

Several factors have contributed to the fiscal deterioration in SA. First, most SA governments failed to save enough during the Golden Decade of 2003-2013, when commodities prices were extremely high, and instead spent most of the windfall. While some of the spending was undoubtedly important to improve social conditions and other public needs, a cardinal principle of public finance is that permanent expenditures should only be financed out of permanent increases in revenues. Increasing permanent spending out of mostly temporary increases in revenues will surely seed the sows of future fiscal problems. Second, slowdowns typically reduce revenues automatically due to the fall in the tax

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3 Unfortunately, the recent string of natural disasters in Mexico and the Caribbean will naturally impose a large fiscal burden, as detailed in Box 1.1.

4 This procyclicality of fiscal policy was analyzed in detail in our previous semiannual report (Végh, Lederman, and Bennett, 2017).
base, which is normally highly elastic to GDP in the region (with the elasticity in general higher than one, as shown in Sancak, Velloso, and Xing, 2010). In this respect, the very different growth performance of SA and MCC explains part of the different behavior of the fiscal accounts.

FIGURE 1.7. Fiscal Deterioration in LAC, 2011-2017f

Sources: World Bank staff estimates (September 2017) when available, otherwise WEO (April 2017).

FIGURE 1.8. LAC: Gross and Net Debt 2017

Sources: World Bank staff estimates (September 2017) when available, otherwise WEO (April 2017).
The average level of gross debt for the region is 58.7 percent of GDP, with many countries surpassing 80 percent. Higher levels of deficits/public debt eventually have a negative impact on international credit ratings.

Indeed, Figure 1.9 shows a significant negative relationship between higher fiscal deficits and credit ratings, implying that markets view higher deficits as affecting the countries’ repayment capacity. In fact, even Chile saw its Fitch Credit Rating downgraded from A+ to A in August 2017, due to the weaker fiscal situation. Worse credit ratings have, of course, a direct negative financial impact as they increase the cost of rolling over existing debt or issuing new debt.

Given the weak fiscal situation in SA, there is little doubt that countries will need to engage in fiscal adjustments in the near future. Figure 1.10, however, shows that, with the exception of Mexico, fiscal adjustment is generally proceeding rather slowly in several major LAC countries. Even though a somewhat gradual adjustment path is not necessarily a bad strategy given the still weak recovery, it seems inevitable that many countries will have to raise the pace of fiscal adjustment in the near future.
Figure 1.11 presents a measure of the adjustment in the primary balance that would be needed to stabilize the current gross debt as a percentage of GDP (see Appendix A for details of the calculation). It is worth noting that the countries that need major adjustments are concentrated in SA. For example, all of the five countries that need the greatest adjustment are from SA (Trinidad and Tobago, Ecuador, Brazil, Suriname, and Bolivia).

A natural question to be asked is how to bring about this fiscal adjustment. In many countries (particularly in SA), the possibility of increasing revenues (as a percentage of GDP) appears to be rather limited since tax burdens are already quite high. Further, expected growth is unlikely to make a big dent in countries with relatively high fiscal deficits.

Figure 1.12 tries to shed some light on the fiscal spending side. Each bar represents expenditure on wages, social benefits, and debt interest payments as a percentage of total expenditures. The conventional view is that these expenditures categories are difficult to cut (i.e., they are “rigid”), either for political economy or credit market access problems. Hence, the higher they are, the more difficult it becomes to cut the deficit via expenditure reduction. In SA, countries that require greater fiscal adjustment are generally those countries with the more rigid expenditures. In fact, among the top six countries in SA with the greatest expenditure rigidty, four of them are also the ones that need the largest fiscal adjustment.
FIGURE 1.11. Size of Fiscal Adjustments Needed to Stabilize Public Debt

Notes: Each bar denotes the primary surplus adjustment needed to reach constant public debt as % of GDP. See Appendix A for details. World Bank staff estimations (September 2017). Sources: World Bank staff estimates (September 2017) when available, otherwise WEO (April 2017).

FIGURE 1.12. LAC: Rigid Fiscal Expenditures as a Percentage of Total Expenditure

Note: By definition, rigid expenditures include wages, social benefits, and interest payments. Source: WEO (April 2017).
### BOX 1.1. MCC: The Fiscal Effects of Natural Disasters

During August and September 2017, many LAC countries were affected by several natural disasters. On August 18, Hurricane Harvey made landfall in Guyana and continued its path of destruction all the way into the continental United States. In early September, Hurricane Irma hit the Caribbean, causing catastrophic damages as a Category 5 hurricane. Twelve days later, Hurricane Maria also struck the Caribbean as a Category 5 hurricane, devastating islands such as Dominica and Antigua and Barbuda. Although assessments of the damages caused by this devastating hurricane season are still to be completed, the fact is that since 1980 (and prior to Irma and Maria), eight countries in the Caribbean have had losses from natural disasters that have exceeded 50 percent of GDP. In some cases, major hurricane losses can even exceed the overall annual GDP of a small island nation. On September 19, a 7.1 magnitude earthquake struck Central Mexico causing damages in the Mexican states of Puebla and Morelos and in the Greater Mexico City area, including the collapse of more than 40 buildings. Twelve days earlier, an even stronger earthquake had struck off the coast of the state of Chiapas, causing significant damages in some of the poorest areas of the country. Both earthquakes killed more than 450 people. These recent tragedies pose an extra challenge to the affected countries, given that they will have to face reconstructions programs in a context of limited fiscal space. As can be seen in Figure 1.8, MCC countries, in contrast to SA countries, have relatively large stocks of gross debt. In fact, the MCC average is roughly eight points above the LAC average. In particular, Caribbean countries face the toughest challenge since they hold the highest stocks of debt as a percentage of GDP. For example, Antigua and Barbuda (one of the most affected economies by Irma), has a stock of gross debt of 90.1 percent of GDP. The affected countries’ fiscal position is not strong either. Dominica, for example, has the second largest fiscal deficit in MCC (3.7 percent of GDP) and Guyana also has a relatively large fiscal deficit at 5.7 percent of GDP. On a brighter note, these countries should face a relatively low tax multiplier, close to zero in fact, according to Gunter, Riera-Crichton, Végh and Vuletin (2017), since they start off from a relatively low initial level of tax rates (VAT). This should allow them, in the medium term, to achieve resource mobilization for reconstruction programs at a lower cost than otherwise.
The Role of Monetary Policy

As mentioned above, since 2011 the average growth rate of LAC has been steadily decreasing (though a rebound will take place this year). This slowdown is essentially due to the poor growth performance of SA, since MCC countries have experienced more stable growth rates. Due, however, to the widespread presence of fiscal deficits and relatively high levels of public debt, the fiscal space for possible countercyclical fiscal policies is extremely limited. In fact, if anything, countries will need to proceed with fiscal consolidation, albeit gradually, due to already high tax burdens and a great deal of “rigid” expenditures. In this context, the role of monetary policy along the cycle becomes particularly important insofar as it could help in providing more impetus to economic growth.

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Notes: The Eastern Caribbean Dollar (common currency issued by the ECCB) is fixed to the U.S. dollar at a rate of 2.75 XCD per 1 USD. “non/ avail.” and “non/app.” stand for non available and non applicable, respectively. Sources: National Central Banks and WEO (April 2017).

The potential role for monetary policy not only depends on the fiscal space available, the cyclical nature of monetary policy instruments, and the nature of the shock faced by the economy, but also on the institutional framework. Table 1.2 presents descriptive statistics for all central banks in LAC. Column 1 indicates which countries currently have an inflation targeting (IT) regime; column 2 the date in which the IT regime started (if applicable); column 3 the inflation target for 2017; column 4 the 2016 inflation rate; column 5 the inflation forecast for 2017; column 6 the prevailing exchange rate regime; column 7 indicates whether countries have legal reserve requirements or not; and, if they do, column 8 specifies whether countries use reserve requirements as a macro-stabilization tool or
not. Roughly one third of the countries in LAC have flexible exchange rates, one third hard peg, and the rest managed floating. Among countries with flexible exchange rate regimes, the major difference is whether they have an IT regime or not. Almost all inflation targeters started in the new millennium and have been able to keep inflation low. Figure 1.13 shows the path of the inflation and nominal exchange rate for four selected IT countries. As can be seen in the cases of Colombia and Brazil, the positive relationship between inflation and the nominal exchange rate is quite clear: when the exchange rate rose around mid-2014 (i.e., when the currency started depreciating), inflation accelerated. A similar, though less marked, pattern is observed in Peru and Uruguay. Having this background in mind, Chapter 2 analyses the role of monetary policy in a context in which the economy is slowed down by external shocks, as for example, the deterioration of the terms of trade. In this scenario, the monetary authorities face a dilemma between applying countercyclical policy measures and defending its currency. This dilemma puts the monetary authorities between a rock and a hard place.

FIGURE 1.13. Nominal Exchange Rates (January 2014 = 100) and Annual Inflation

PANEL A. Brazil

PANEL B. Colombia

PANEL C. Peru

PANEL D. Uruguay

Sources: Central Banks data and Haver Analytics.

Ilzetzki, Reinhart, and Rogoff’s (2017) classification was used.
Chapter 2: The Emerging Markets Monetary Policy Dilemma

Introduction

Consider the following scenario, typical of commodity-exporting emerging markets but applicable more generally to all emerging markets (EMs) in response to other shocks, such as an increase in world interest rates. A sudden fall in commodity prices generally leads to (see Figure 2.1):

- A slowdown/recession in economic activity
- A fall in net capital inflows
- A depreciation of the domestic currency
- An increase in inflation

In response, should the central bank:

- Increase policy rates to defend the currency/fight inflation even at the cost of aggravating the slowdown?
- Or lower policy rates to stimulate economic activity but risking further depreciation and inflation?

This is a fundamental monetary policy dilemma that EMs have faced many times ever since capital accounts have been relatively open. This dilemma, for instance, already took center stage during the Asian crises of 1997-1998. In response to rapidly depreciating currencies, the IMF recommended that central banks increase policy rates to stabilize the currency, even at the cost of worsening already weak economic activity. This policy recommendation led to sharp disagreements from well-known

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6 Figure 2.1 illustrates this pattern for the case of Brazil during the period 1995Q1-2017Q1, using a structural vector autoregression (SVAR) model. Each panel shows the response, as deviation from the initial equilibrium, of the indicated variable to a negative shock to the terms of trade.

7 To quote Stanley Fischer (at the time, the IMF’s First Deputy Managing Director), “[i]n weighing [the question of whether programs were too tough], it is important to recall that when they approached the IMF, the reserves of Thailand and Korea were perilously low, and the Indonesian rupiah was excessively depreciated. Thus, the first order of business was, and still is, to restore confidence in the currency. To achieve this, countries have to make it more attractive to hold domestic currency, which, in turn, requires increasing interest rates temporarily, even if higher interest costs complicate the situation of weak banks and corporations. This is a key lesson of the tequila crisis in Latin America 1994-95, as well as from the more recent experience of Brazil, the Czech Republic, Hong Kong and Russia, all of which have fended off attacks on their currencies in recent months with a timely and forceful tightening of interest rates along with other supporting policy measures. Once confidence is restored, interest rates can return to more normal levels.”
economists such as Joseph Stiglitz and Jeffrey Sachs, who stressed not only the output costs of raising policy rates but also the fiscal costs.  

8 9

FIGURE 2.1. Typical Response of a Commodity-Exporter LAC Country to a Negative Shock to Terms of Trade

Note: The data correspond to Brazil 1995Q1-2017Q1. Dotted lines are 90 percent confidence intervals around SVAR impulse responses. See Appendix B for details. Sources: Authors' estimations, based on Banco Central do Brasil, Bloomberg, Haver Analytics, and Ipeadata.

8 On Brazil, for example, Sachs argued (Financial Times, January 22, 1999) that “at that point [when the Asian crises hit], an urgent re-assessment of monetary and exchange rate policy was due. And yet the IMF defended the Brazilian decision in October 1997 to put up interest rates to 50 percent per year precisely in order to hold the currency. This decision was fateful. It cemented the end of Brazilian economic growth, and built in a fiscal time bomb.” Furman and Stiglitz (1998) argued that increasing interest rates could even lead to a depreciation of the domestic currency, rather than appreciation.

9 Theoretically, Hnatkovska, Lahiri, and Végh (2016) show that it is indeed possible that an increase in policy rates leads to currency depreciation if the fall in output and increase in the fiscal deficit due to a rise in the cost of servicing the public debt (both of which tend to depreciate the currency) dominate the higher demand for domestic-currency denominated assets (which tends to appreciate it).
This chapter will take a detailed look at this monetary policy dilemma faced by EMs. In terms of monetary policy, it is arguably the most important policy decision that central banks must make over the business cycle. In fact, central bankers often agonize over which decision to take, as they are torn between depreciation/inflation and falling economic activity. As background, the next section clearly distinguishes this unique dilemma from others in the literature. The chapter then proceeds to cast this dilemma in terms of the cyclicality of monetary policy. Choosing to defend the currency/fight inflation in recessionary times amounts to pursuing procyclical monetary policy (i.e., monetary policy aggravates the underlying recession), whereas reducing interest rates and not worrying about depreciation implies engaging in countercyclical monetary policy. We will show that, unlike developed countries, EMs have traditionally pursued procyclical monetary policy, though recently many EMs have managed to switch from pro- to countercyclical monetary policy. Since the monetary policy dilemma essentially amounts to having only one policy instrument (interest rate) to target two variables (output and inflation/depreciation), the chapter will then analyze the use of legal reserve requirements as a convenient additional instrument that has been frequently used by EMs. We will as well show that foreign exchange market intervention has also been part of the EMs’ policy mix to relieve the policy rate from having to defend the currency. Finally, we will look at a more nuanced monetary policy cycle within the business cycle – which several LAC countries have followed recently – in which the central bank first chooses to defend the currency/fight inflation and, only once it has succeeded in stabilizing these variables, reduces the policy rate to stimulate economic activity.

**On Dilemmas and Trilemmas: Why Is this EMs Dilemma Different?**

This EMs monetary policy dilemma is, of course, related, but quite distinct from the famous trilemma (or impossible trinity) well-known in open economy macroeconomics. The impossible trinity states that an open economy cannot simultaneously have (i) fixed exchange rates, (ii) free capital mobility, and (iii) independent monetary policy. While theoretically still valid, of course, this trilemma has lost relevance in light of the fact that EMs (and particularly LAC countries) have, by and large, chosen an open capital account and relatively flexible exchange rates in the context of inflation-targeting regimes. In other words, EMs have chosen (ii) and (iii) above and have actually quite happily given up on fixed/predetermined exchange rates, given some traumatic experiences in this regard (the catastrophic end of the Convertibility plan in Argentina in 2001 being the latest and perhaps most famous fixed-exchange rate fiasco of the last 40 years). Hence, this traditional trilemma is no longer relevant simply because, in practice, it has been resolved in favor of an open capital account and flexible exchange rates. In contrast, this new EMs monetary policy dilemma arises precisely in a regime with an open capital account and independent monetary policy.

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10 In our previous semi-annual report Végh, Lederman, and Bennett (2017), we looked at the same phenomenon for fiscal policy and showed how, traditionally, EMs (and LAC countries) have pursued procyclical fiscal policy. For an earlier look at the cyclicality of monetary policy, see Végh and Vuletin (2013) and Cordella, Federico, Végh, and Vuletin (2014).

11 We are referring to the large economies in the region, mainly in South America. As indicated in Table 1.2 in Chapter 1, smaller economies (mainly in the Caribbean) continue to operate under fixed exchange rates which, of course, makes sense given their size and ties to the U.S. via tourism and other services (see, for example, Lederman and Lesniak, 2017).
This EMs monetary policy dilemma is also related to Helene Rey’s (2013) argument that the traditional trilemma has actually become a dilemma (a choice between an open capital account or independent monetary policy). In other words, she argues that the global financial cycle severely limits monetary policy autonomy regardless of the exchange rate regime. Two points are worth noting here. First, Rey’s dilemma is very different from the one presented in this report (which, assumes an open capital account, and refers to the choice between tightening or loosening monetary policy in response to an external shock). Second, as convincingly argued by Obstfeld, Ostry, and Qureshi (2017), the evidence is consistent with the idea that the exchange rate regime still matters a great deal for EMs and that flexible exchange rates do exert a significant effect on the transmission of global financial shocks to domestic economies. Further, revealed preferences are clearly consistent with this idea. If Rey’s idea were true for EMs, we should observe that EMs do not basically care about which exchange rate regime they choose, whereas casual evidence is overwhelming in showing that, by and large, most EMs have chosen flexible exchange rates in the context of inflation targeting regimes precisely because they believe that this brings credibility and low inflation to their monetary policy framework (see Table 1.2 in Chapter 1).

Fundamentally, this EMs monetary policy dilemma could be viewed as an application of the so-called Tinbergen rule that states that there should be at least the same number of instruments as there are targets. Otherwise, some of the targets may not be achieved. In this context, the monetary authority can be viewed as having two targets (output and depreciation/inflation) and a single instrument: the policy rate. The monetary authority is thus forced to choose between these two targets.

While, in principle, this EMs monetary policy dilemma would be equally applicable to developed countries, in practice it is not, simply because, in developed countries, output and inflation are generally positively correlated. In other words, periods of economic booms tend to bring high inflation while recessions are accompanied by falling inflation. In sharp contrast, inflation and output tend to be negatively correlated in emerging markets.

Figure 2.2 illustrates this pattern by showing the country correlations between the cyclical components of inflation and real GDP for 36 countries (25 industrial and 11 South American). The average correlation is positive for industrial countries (0.15) and negative for South American countries (-0.23) and highly significant in both cases.

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12 In related research, Cadavid Sánchez and Ortiz Bolaños (2017) find a significant fall in inflation in Brazil, Chile, Colombia, Mexico, and Peru after they implemented an IT regime.
13 Named after Jan Tinbergen (1903-1994), a Dutch economist who was awarded the first Nobel Prize in Economics in 1969.
14 Depreciation and inflation are highly positively correlated so they can be viewed as a single target.
15 This is the typical “Keynesian” inflation captured in sticky-prices models, caused by aggregate demand exceeding (or falling short) of aggregate supply, thus leading to higher (lower) prices.
16 See Cordella and Gupta (2015) for a detailed analysis of this issue.
This positive co-movement of output and inflation in developed countries implies that the single policy instrument, the policy interest rate, can take care of both targets at the same time. For example, in expansions with rising inflation, higher policy rates should in principle help both cooling down the economy and reducing inflation.

In sum, this EMs monetary policy dilemma is quite distinct from the traditional trilemma and from Rey’s new dilemma. It is peculiar to EMs markets – and that is why we have chosen to refer to it as the “EMs monetary policy dilemma” – and applies to EMs with an open capital account that need to choose between defending the exchange rate/fighting inflation and stimulating economic activity.¹⁷ In other words, central banks in EMs find themselves caught between a rock (higher depreciation/inflation) and a hard place (slowdown/recession in economic activity).

Having identified this critical monetary policy dilemma faced by EMs, the next section analyzes how countries have responded historically.

¹⁷ The analysis emphasizes this dilemma in bad times just to fix ideas. The same dilemma applies in good times (with GDP increasing and the currency appreciating), in which case the choice is between increasing policy rates to cool down the economy but inviting more capital inflows and appreciation, or reducing policy rates to fight currency appreciation and discouraging capital inflows but, in the process, fueling the economic boom.
How Has Monetary Policy Been Conducted in LAC over the Business Cycle?

Figure 2.3 shows the average correlation between the cyclical components of a policy rate and real GDP for the period 1960-2016 for 70 countries (22 industrials, 33 emerging non-LAC, and 15 LAC).\(^\text{18}\) Black bars denote industrial countries, yellow bars non-LAC EMs, and red bars LAC countries. As indicated in the figure, a positive correlation implies countercyclical monetary policy (policy rates are raised in good times to cool down the economy and reduced in bad times to help the economy regain its footing) while a negative correlation indicates procyclical monetary policy (policy rates increase in bad times and fall in good times). Of course, procyclical monetary policy reinforces the underlying business cycle, exacerbating the booms and deepening the recessions.\(^\text{19}\)

Excerpt from Figure 2.3: Country Correlations between Cyclical Components of the Policy Rate and Real GDP, 1960-2016

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Notes: The y-axis is the correlation between the cyclical components of the policy rate and real GDP. Cyclical components are calculated using the Hodrick-Prescott filter. Black, yellow, and red bars denote industrial, non-LAC emerging, and LAC countries, respectively. *, **, and *** indicate significance at the 10, 5, and 1 percent level of a standard two-tailed means test, respectively. Sources: Author's calculations, based on data from Haver Analytics and IFS.
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Except for Portugal, all industrial countries have been historically countercyclical. This is not surprising given that, as argued above, GDP and inflation are generally positively correlated in developed countries and therefore there is no reason to use the policy rate procyclically. The average

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\(^\text{18}\) The sample period and the interest rates used vary across countries depending on data availability (see Appendix C).

\(^\text{19}\) This is the phenomenon referred to by Kaminsky, Reinhart, and Végh (2004) as “when it rains it pours,” which can apply equally to monetary or fiscal policy.
correlation in industrial countries is 0.17 and statistically significant at the one percent level. In sharp contrast, the average correlation for emerging countries is -0.07 and -0.10 for LAC countries, in both cases significant at the one percent level. This implies that, on average, LAC countries have tended to raise policy rates in bad times to defend the currency/fight inflation – even at the cost of aggravating the underlying slowdown/recession – rather than lowering policy rates to stimulate the economy.

Notice that, in principle, it is theoretically correct to talk about interest rate policy even during periods of fixed/predetermined exchange rates because, as long as there is imperfect substitution between domestic and foreign bonds (which would be the normal case in practice), the monetary authority has the ability to affect domestic rates. 20 Hence, there is nothing intrinsically wrong with talking about the cyclicality of interest rate policy during both flexible and fixed/predetermined exchange rate periods. It is the case, however, that interest rate policy is, strictly speaking, the main policy instrument primarily in regimes of flexible exchange rates typically combined with an inflation targeting framework.

In this light, Figure 2.4 shows a version of Figure 2.3 where the sample is limited to LAC countries that have operated under flexible exchange rates. 21 In this case, the correlation is also positive but not significantly different from zero. Countries are basically evenly distributed: of the 13 countries, 6 have been procyclical and 7 countercyclical.

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20 See Lahiri and Végh (2003) and Flood and Jeanne (2005) for theoretical models of interest rate defense under fixed/predetermined exchange rates.

Figures 2.5-2.8 provide a dynamic illustration of the idea captured in Figure 2.4 for the cases of Chile, Colombia, Peru, and Brazil. Each plot shows the response of real GDP, nominal exchange rate, inflation, and policy rate to a negative shock to the terms of trade.\(^{22}\)

In the case of Chile (Figure 2.5), we can see how, on impact, GDP falls and the currency depreciates. The monetary authority reacts by reducing the policy rate to stimulate the economy (i.e., countercyclical monetary policy). The same is true of Colombia (Figure 2.6) and Peru (Figure 2.7).

On the procyclical side, Figure 2.8 shows the case of Brazil, where the monetary authority reacts to the depreciation of the currency by raising the policy rate in spite of the fall in real GDP.

\(^{22}\) These figures are based on SVARs (see Appendix B for technical details).
FIGURE 2.5. Chile: Countercyclical Monetary Policy Response

PANEL A. Inflation

PANEL B. Policy Rate

PANEL C. Real GDP

PANEL D. Nominal Exchange Rate

Note: Dotted lines are 90 percent confidence intervals around SVAR impulse responses. See Appendix B for details. Sources: Authors’ estimations, based on Bloomberg, Banco Central de Chile, Haver Analytics, and INE.
FIGURE 2.6. Colombia: Countercyclical Monetary Policy Response

PANEL A. Inflation

PANEL B. Policy Rate

PANEL C. Real GDP

PANEL D. Nominal Exchange Rate

Note: Dotted lines are 90 percent confidence intervals around SVAR impulse responses. See Appendix B for details. Sources: Authors’ estimations, based on Banco de la República, Bloomberg, and Haver Analytics.
FIGURE 2.7. Peru: Countercyclical Monetary Policy Response

PANEL A. Inflation

PANEL B. Policy Rate

PANEL C. Real GDP

PANEL D. Nominal Exchange Rate

Note: Dotted lines are 90 percent confidence intervals around SVAR impulse responses. See Appendix B for details. Sources: Authors’ estimations, based on Banco Central de Reserva del Perú, Bloomberg, and Haver Analytics.
FIGURE 2.8. Brazil: Procyclical Monetary Policy Response

PANEL A. Inflation

PANEL B. Policy Rate

PANEL C. Real GDP

PANEL D. Nominal Exchange Rate

Note: Dotted lines are 90 percent confidence intervals around SVAR impulse responses. See Appendix B for details. Sources: Authors’ estimations, based on Banco Central do Brasil, Bloomberg, Haver Analytics, and Ipeadata.
Why Do Some Countries Follow Procyclical Monetary Policy?

Since procyclical monetary policy will tend to exacerbate the already volatile business cycle of EMs, why would the monetary authority pursue such a policy? It certainly looks like a puzzle in search of an explanation.

The key to understanding procyclical monetary policy in LAC (and, more generally, in many EMs) is the monetary policy dilemma introduced above. When a negative shock triggers a domestic currency depreciation, the monetary authority needs to decide whether or not to increase the policy rate to make domestic-currency denominated assets more attractive and hence defend the value of the domestic currency, even at the cost of aggravating the slowdown/recession. But what, in turn, determines the need to defend the domestic currency? In other words, why do many central banks perceive a sharp/sudden depreciation as harmful? Several factors seem to come into play:

- Liability dollarization. As has been well-documented, it is very common in EMs for both enterprises and households to take debt in foreign currency (typically dollars). A devaluation of the currency thus increases the relative value of dollar debts. More specifically, since dollar debts are, by definition, denominated in units of tradable goods, a real depreciation of the currency (which typically accompanies the nominal depreciation of the currency) and implies an increase in the price of tradable relative to non-tradable goods, will raise the relative value of the dollar debt. An extreme case would be firms that sell only non-tradable goods (like services) but finance themselves exclusively with dollar debt/credit. Figure 2.9 illustrates this phenomenon by showing a scatter plot of monetary policy cyclicality versus a measure of dollarized liabilities as a share of total liabilities. The higher the share of dollarized liabilities, the less countercyclical/the more procyclical is monetary policy, with the relationship being significant at the 10 percent level.

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23 See, for example, Choi and Cook (2004) and Magud (2010).
Lack of credibility. EMs that, for some reason or another, have not achieved a credible macroeconomic framework (both on the fiscal and monetary sides) are particularly susceptible to large depreciations creating expectations of further depreciations which, in turn, triggers further capital outflows as perceptions of country risk increase and investment opportunities dry up. More generally, macroeconomic stability is rightly seen as a pre-condition for resuming growth.

Poor institutional quality. Countries with poor quality of institutions will be much more susceptible to large depreciations creating vicious cycles of depreciation and further capital outflows. The scatter plot illustrated in Figure 2.10 captures this fact by showing a significant positive relationship between our measure of monetary policy cyclicality (i.e., the correlation between the cyclical components of the policy rate and GDP) and an index of institutional quality.

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24 We construct an index of institutional quality (IQ) by calculating the average of four normalized variables from the International Country Risk Guide dataset: investment profile (i.e., factors affecting investment risk), corruption, law and order, and bureaucratic quality. The IQ index ranges from 0 (lowest institutional quality) to 1 (highest institutional quality).
Non-independent central banks will be viewed as more likely to give in to the treasury’s needs of more resources to finance the increase in public debt (due to foreign currency sovereign debt) and thus generating more inflation. Hence, central banks will need to pursue a very tight monetary policy to avoid losing control of the situation. Figure 2.11 illustrates this fact by showing a scatter plot of monetary policy cyclical versus an index of central bank independence. The higher is central bank independence, the less procyclical/the more countercyclical is monetary policy.

Vuletin and Zhu (2011) show that when central banks are not independent, inflation becomes a tax tool for the treasury.
Switching from Procyclicality to Countercyclicality

Far from being a static phenomenon, the cyclicity of monetary policy evolves over time and some countries that used to be procyclical some time ago eventually managed to become countercyclical.\footnote{Frankel, Végh, and Vuletin (2013) have analyzed the same phenomenon (which they refer to as “graduation”) for fiscal policy.} Figure 2.12 illustrates this phenomenon by plotting separately the country correlations between the cyclical components of the policy rate and real GDP for all of our sample before and after 2007. Just visually comparing Panel A (before 2007) and Panel B (after 2007), we can already see that a lot of yellow and red mass has switched sides, so to speak. In fact, before the year 2007 (Panel A), the average correlation for LAC countries was -0.11, indicating procyclicality, and significant at the 1 percent level. In contrast, after 2007 (Panel B), the average correlation for LAC countries has become positive (0.11), and significant at the 5 percent level, indicating countercyclical monetary policy. In terms of number of countries, we can see that, before 2007, 60 percent of LAC countries are procyclical. This number falls to 42 percent after 2007.
FIGURE 2.12. Country Correlations between Cyclical Components of the Policy Rate and Real GDP

PANEL A. 1960-2006

Notes: The y-axis is the correlation between the cyclical components of the policy rate and real GDP. Cyclical components are calculated using the Hodrick-Prescott filter. Black, yellow, and red bars denote industrial, non-LAC emerging, and LAC countries, respectively. *, **, and *** indicate significance at the 10, 5, and 1 percent level of a standard two-tailed means test, respectively. Sources: Authors’ calculations, based on data from Haver Analytics, and IFS.
While the graduation observed in LAC is certainly very good news, it needs to be put into perspective to the extent that, in several cases, it was mainly due to the strong countercyclical monetary policy response of many LAC countries to the Global Financial Crisis (see Végh and Vuletin, 2014). Still, several factors have helped many countries in becoming countercyclical in monetary policy. In particular, many features that made countries fear depreciation of their currencies in bad times have subsided, such as a lowering of dollarization in many economies and, more generally, a greater credibility of the monetary policy framework resulting from the implementation of inflation targeting schemes with ambitious inflation targets which, in many instances, have indeed succeeded. In other words, economic agents have come to see some depreciation as a normal occurrence in bad times of the business cycle in EMs and do not react with dire consequence as they would have done in the past.

**Reserve Requirements as an Additional Instrument**

Since the fact that there is only one policy instrument (the policy rate) for two targets (depreciation/inflation and output) is at the root of the EMs monetary policy dilemma, a natural “solution” would be to try to find a second instrument. This is, in fact, what many EMs, and in particular LAC countries, have done. In other words, many EMs countries have resorted to legal reserve requirements as an additional instrument.

To characterize the use of legal reserve requirements as an additional policy instrument, Figure 2.13 plots the quarterly frequency of changes in reserve requirement for 64 countries over the period 1970-2016. We can see that Argentina, with 0.43, is the country that has used reserve requirements the most. This means that, on average, Argentina has changed reserve requirements almost twice every year. Of course, reserve requirements could also be changed for microeconomic and/or technical reasons, rather than for macro-stabilization purposes. To operationalize this idea, we assume that if reserve requirements changed more frequently than once every two years, they were used for macro-stabilization purposes. Otherwise, we assume that reserve requirements were not used for macro-stabilization purposes. A case in point would be Chile, which has changed legal reserve requirements only 3 times in 41 years. Clearly, one would conclude that reserve requirements are not used for macro-stabilization purposes.

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27 Note that “countries” also includes central banks that issue a common currency, such as the ECB and ECCB.

28 Notice that many countries either do not have legal reserve requirements (like Australia and Canada) or never change them (like Guatemala and Panama). In either case, the registered frequency of changes would be zero in Figure 2.13.

29 Cordella, Federico, Végh, and Vuletin (2014), use a more refined operational methodology in which they actually compare the average duration of the business cycle in each country with the duration between changes in legal reserve requirements.
By proceeding in this way, we find that, after 2007, 25 out of 48 emerging countries (52 percent) have used reserve requirements actively, while no industrial country has. As Figure 2.14 illustrates, all but three of these EMs have used reserve requirements countercyclically, including the seven LAC countries in the sample. The average correlation for EMs has been 0.30 and for LAC 0.23, both significant at the one percent level. This tells us that many EMs that still act procyclically in monetary policy (that is, “lose” the policy rate as an instrument to stimulate economic activity because of the need to defend the currency or fight inflation) use reserve requirements to prop up the economy. Lower reserve requirements increase the amount of liquidity that the banking system has available to lend to firms and other economic agents, thus helping revive the economy.

30 Notice that a positive correlation indicates countercyclical policy because it implies that reserve requirements are being lowered in bad times.
As an illustration, Figure 2.15 shows three cases (Brazil, Argentina, and Uruguay) where interest rate policy and reserve requirements have been used as substitutes (that is, in bad times, policy rates have been raised while reserve requirements have been lowered). This means that the correlation of the policy rate with the GDP cycle will be positive while that of legal reserve requirements with real GDP will be negative. Of course, policy rates and reserve requirements could be used in such a way that they reinforce each other, as illustrated in Figure 2.15 for the cases of Colombia and Peru. This would mean, for instance, that in bad times, both policy rates and reserve requirements are lowered to prop up output. The reason could be a weak monetary transmission mechanism through interest rates that might benefit from having even more liquidity to be lent to entrepreneurs and other economic agents.
Foreign Exchange Market Intervention

Finally, notice that many EMs resort to foreign exchange market intervention as a third policy instrument. To illustrate this idea, Figure 2.16 shows the country correlations of the cyclical components of international reserves and real GDP for 75 countries (28 industrials, 32 emerging non-LAC, and 15 LAC). The average correlation for industrial countries is -0.05 (significant at the 5 percent level), compared with 0.15 for EMs and 0.31 for LAC countries (and significant at the one percent level in both cases). A positive correlation indicates that the monetary authority is selling dollars in bad times in an attempt to defend the value of the currency. This is quite a common policy, used mostly intermittently, that frees to some extent the policy rate to stimulate the economy. As shown in Cordella, Federico, Végh, and Vuletin (2014), it is not uncommon in LAC to see countries that, when faced with recessionary forces (and depreciating currencies) raised policy rates and sell foreign exchange to prop up the currency while lowering reserve requirements to stimulate economic activity.
A Theoretical Illustration of the Monetary Policy Dilemma

To illustrate the ideas just discussed, we constructed a standard small open economy model with sticky prices and a Taylor rule of the form:

\[ i^g_t - i^g_{t-1} = \beta (y_t - y^F_t) + \delta (\pi_t - \bar{\pi}) + \gamma (E_t - \bar{E}) \]

where \( y_t \) is the log of total output, \( y^F_t \) is the log of full-employment output, \( \pi_t \) is the inflation rate, \( \bar{\pi} \) is the inflation rate target, \( E_t \) is the log of the nominal exchange rate, \( \bar{E} \) is the log of the nominal exchange rate target, and \( \beta, \delta, \) and \( \gamma \) are non-negative parameters. In other words, the change in the nominal interest rate (the policy instrument) is a function of the output, inflation, and exchange rate gaps.

In the model, the policy rate, \( i^g \), can be thought of as interest paid on money. The opportunity cost of holding money is thus \( i - i^g \), where \( i \) is the nominal interest rate on bonds. An increase in \( i^g \) thus

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31 The model is a fairly standard micro-founded new-Keynesian model with optimizing agents and interest rate policy introduced as in Calvo and Végh (1996) and Hnatkovska, Lahiri, and Végh (2016). The reader is referred to Rojas, Végh, and Vuletin (2017) for details on the set-up and solutions.

32 Technically, we also allowed for a lagged dependent variable with a coefficient different from one.
reduces the opportunity cost of holding money and increases its demand. For a given money supply, this will lower the nominal exchange rate so that real money balances in terms of tradable goods increase. The cost of raising \( t^d \) is given by the fact that it leads to a nominal and, given sticky prices, real appreciation which, by increasing the price of non-tradable goods, reduces aggregate demand and hence output.

A country like Chile would have, if at all, a very low value of \( \gamma \), reflecting the idea that it does not seem too concerned about currency depreciation in bad times given that Chile chooses to, as shown in Figure 2.5, to pursue countercyclical monetary policy. This is indeed formally corroborated in Figure 2.17, Panel A, which shows the estimates of \( \gamma \) for Mexico, Brazil, Peru, Colombia, and Chile with the vertical lines indicating 90 percent confidence intervals. The plot shows that the estimated values of \( \gamma \) for Chile, Colombia, and Peru are not statistically different from zero, whereas those for Mexico and

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**FIGURE 2.17. Taylor Rules**

**PANEL A.**

*Nominal Exchange Rate Gap Coefficients*

**PANEL B.**

*Output Gap Coefficients*

**PANEL C.**

*Inflation Rate Gap Coefficients*

*Notes: The estimated coefficients are for the period 2000Q1-2017Q1. Sources: Authors’ estimations, based on model detailed in the text using data from Bloomberg, Central Banks data, Haver Analytics, and National Accounts.*
Brazil are significantly positive, indicating a genuine concern for the exchange rate gap in the Taylor rule.

Figure 2.17, Panel B repeats the same exercise for $\beta$, the coefficient corresponding to the output gap. Remarkably, in this case all coefficients are significantly positive, indicating that all countries are indeed concerned about stabilizing output. Finally, Figure 2.17, Panel C shows the estimates of $\delta$, the coefficient corresponding to the inflation gap. With the exception of Mexico, this coefficient is significantly positive for all countries.

Having estimated the coefficients of the Taylor rule, the model is then used to compare the dynamic response of the economy to a negative shock to the world real interest rate with and without policy response. The case of Chile is illustrated in Figure 2.18.

The dashed dark lines indicate the impulse responses with no policy response (i.e., the Taylor rule above is not operative), while the red lines illustrate the case in which the monetary authority follows the above Taylor rule, with the Taylor rule coefficients estimated for Chile. We can see that, in
response to the higher international real interest rate and in the absence of any policy response, inflation first falls but then increases, the currency depreciates sharply, and GDP plummets.

Once the Taylor rule is introduced, the monetary authority’s reaction is to reduce the policy rate immediately to stimulate the economy. We can see that GDP responds and begins to recover after the initial fall faster than it would otherwise. The currency, however, depreciates more than it would otherwise. In sum, the model predicts that Chile would engage in countercyclical monetary policy in response to a negative shock which is, of course, consistent with the data.

The case of Mexico is illustrated in Figure 2.19. Here we see the opposite reaction from the monetary authority. Again, the rise in world real interest rates increases inflation, depreciates the currency, and leads to a sharp fall in output. In response to the currency depreciation, the monetary authority raises the policy rate. By so doing, the currency depreciates less than it would otherwise at the cost of a considerably deeper recession.

**FIGURE 2.19. Mexico: Procyclical Monetary Policy Response**

- **PANEL A. Inflation**
- **PANEL B. Policy Rate**
- **PANEL C. Non-Tradable Output**
- **PANEL D. Nominal Exchange Rate**

Notes: The y-axis represent deviations from the initial stationary equilibrium. Sources: Authors’ calculations based on model detailed in the text using data from Banco de México, Bloomberg, Haver Analytics and INEGI.
A nice feature of having a theoretical model to analyze the monetary policy response of different countries is that we can also estimate the sacrifice ratio of defending the exchange rate. Of the five countries that we focused on (Brazil, Chile, Colombia, Mexico, and Peru), two (Brazil and Mexico) turned out to be procyclical. In other words, these are countries that are willing to pay an output cost to defend the currency. For these two countries, we computed a “sacrifice ratio,” which measures the (average) output cost of defending the domestic currency. Brazil’s sacrifice ratio, for example, is 0.047. Specifically, to prevent the rate of devaluation from increasing an additional percentage point (say, from 10 to 11 percent), output would need to fall an additional 0.047 percentage points (say, from falling 1 percent to 1.047 percent). Mexico has a sacrifice ratio of 0.07. These are certainly non-negligible costs that indicate that defending the currency/fighting inflation is, without a doubt, costly.

**The Policy Cycle within the Business Cycle**

While, as argued above, many LAC countries became countercyclical after 2007, this was mainly due to their countercyclical reaction to the Global Financial Crisis of 2008-2009. In recent times, we have observed in many LAC countries a more nuanced response to negative shocks that amounts to a policy cycle within the business cycle. More specifically, consider the response of the policy rate to the sharp fall in commodity prices in mid-2014 in three South American countries (Brazil, Colombia, and Chile) and Mexico.\(^{33}\)

The case of Brazil is illustrated in Figure 2.20, Panel A. By the end of 2015, GDP (yellow line) is falling sharply, the currency (green line) is depreciating fast, and inflation (red line) is taking off. In response, the central bank initiates a period of tight monetary policy (procyclical monetary policy) that will take the Selic (the policy rate, blue line) from 11 to 14.25 percent in 10 months. The Selic is kept at 14.25 until October 2016. By then, the currency has stabilized and inflation has started to fall. As a result, the central bank feels free to start loosening monetary policy (countercyclical monetary policy) and begins to drastically reduce the Selic, which reaches 8.25 in early September 2017. In other words, if one views roughly this business cycle as extending from early 2014 to the present, we see a policy rate cycle of first procyclical monetary policy followed by countercyclical monetary policy. The trigger for the period of procyclical monetary policy is the depreciation of the domestic currency and inflation taking off.\(^{34}\)

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\(^{33}\) We chose these countries because they provide the best illustration of the process we wish to describe. But other countries such as Argentina, Peru, and Uruguay went through similar dynamics. In Central America, Costa Rica and Guatemala have also chosen exchange rates and inflation targeting regimes but, of course, the fall in oil prices constituted a positive, rather than negative, shock since they are net energy importers. In contrast, countries like the Dominican Republic and Honduras appear to use the nominal exchange rate as the main nominal anchor, with the latter following a more or less explicit real exchange rate rule. Finally, we have economies with fixed exchange rates (such as Trinidad and Tobago) or fully dollarized (such as Ecuador, El Salvador, and Panama) which do not have monetary policy independence and hence are not subject to the monetary policy dilemma as such. The adjustment of such economies to a negative shock will need to entail a deflationary process that eventually reduces real wages and the price of non-tradable goods (i.e., real depreciation).

\(^{34}\) The inflation band for the period 2014-2016 was 2.5 percent to 6.5 percent. In 2017, it was changed to 3.0 percent to 6.0 percent.
FIGURE 2.20. Policy Rate, Exchange Rate, Inflation, and Real GDP in Selected LAC Countries

PANEL A. Brazil

Notes for both panels: The dashed line in yellow represents the latest forecast for the year 2017. Sources for both panels: Banco Central do Brasil, Banco de la República, Bloomberg, Haver Analytics, and Ipeadata.
A similar story can be told for Colombia (Figure 2.20, Panel B). By mid-2015, GDP has fallen quite drastically from its peak of early 2014, inflation has taken off, and the currency is rapidly depreciating. In response, the monetary authority starts a tightening cycle, taking the policy rate from 4.5 percent in August 2015 to a peak of 7.75 percent in July 2016. By the beginning of 2017 inflation is falling and the currency has stabilized. At that point, the central bank decides to begin to loosen monetary policy and reduces gradually the policy rate from 7.75 percent in November 2016 to 5.75 percent in July 2017.\(^\text{35}\)

In the case of Mexico, Figure 2.20, Panel C shows that, by late 2015, the currency is starting to depreciate sharply and inflation is about to take off as well. In response, and even though real GDP is flat and will eventually start to fall, the central bank initiates an aggressive tightening cycle that takes the policy rate from 3 percent in December 2015 to 7 percent in June 2017. On that occasion, the central bank announced its intention of not increasing further the policy rate, which would be consistent with the fact that the currency has clearly stabilized (and has actually appreciated quite a bit since early this year) and that the monetary authority expects inflation to have peaked and begin to converge towards the target of 3 percent (+/- 1 percent) by the end of 2018. Up to this point, therefore, Mexico has thus pursued a procyclical monetary policy, but seems ready to turn the tide as Brazil and Colombia have already done.

In contrast to Brazil, Colombia, and Mexico, Chile (Figure 2.20, Panel D) started to loosen monetary policy early in October 2013 as GDP began to fall even though inflation was taking off and the currency had already started to depreciate. The policy rate was reduced from 5 percent to a low of 3 percent until GDP stabilized. As GDP weakened again in mid-2016, the central bank started to reduced policy rates once again reaching a low of 2.5 percent in May 2017. This evidence thus makes clear that the monetary authority in Chile is mostly guided by the behavior of economic activity.

\(^{35}\) The inflation target in Colombia is 3 percent (+/- 1 percent).
FIGURE 2.20. (cont.) Policy Rate, Exchange Rate, Inflation, and Real GDP in Selected LAC Countries

PANEL C. *Mexico*

PANEL D. *Chile*

Note for both panels: The dashed line in yellow represents the latest forecast for the year 2017. Sources for both panels: Banco Central de Chile, Banco de México, Bloomberg, Haver Analytics, INE, and INEGI.
Policy Conclusions

This chapter has focused on the monetary policy dilemma faced by central banks in many LAC countries. When a commodity-exporter country is hit by a negative terms of trade shock, output falls, inflation increases, and the currency depreciates. Should the central bank increase the policy rate (procyclical monetary policy) to defend the currency/fight inflation at the cost of further output losses or should it reduce the policy rate (countercyclical monetary policy) to stimulate output even it implies further inflation and depreciation?

It is a very difficult dilemma. Traditionally, most LAC countries (and EMs in general) have reacted by raising policy rates because they fear the monetary instability brought about by runaway inflation and depreciation. But, as credibility in the monetary policy framework (typically flexible exchange rates with inflation targeting) has increased, together with central bank independence, many central banks have chosen the route of industrial countries which use monetary policy countercyclically. Clearly, a credible, transparent, and sustainable monetary policy framework is critical for escaping this dilemma.

In addition, using an additional instrument such as legal reserve requirements can be very helpful for those central bankers who still may feel that they need to keep the currency depreciation under control. In that case, they can always lower reserve requirements in bad times to stimulate economic activity. Foreign exchange market intervention should also be part of the policy mix. Used judiciously, it can help free the policy rate, at least temporarily, of the task of defending the domestic currency.
Chapter 3: Challenges Ahead

This report has discussed the recent growth and fiscal outcomes in LAC and the monetary policy response by major inflation targeting central banks in the region after the commodity prices slowdown of 2014. As we have argued throughout the report, the region’s growth prospects are constrained by a number of domestic and foreign factors that could be summarized in five major challenges.

The first challenge faced by LAC is how to grow in the current environment of relatively low commodity prices and lackluster growth in the major economies that are relevant for the region. On the external front, it is clear that the windfalls have ceased. The “Golden Decade” for commodity exporters has come to an end: only between 2014 and 2015, energy commodity prices fell by 82 percent, which has been a major negative shock for the majority of the economies in the region. Non-energy commodity prices have also decreased since 2013: for example, soybean prices are down by 42 percent since the end of 2012 (when they had reached their historical high). Growth in the U.S. and especially China (whose economic performances are very relevant for MCC and SA, respectively) will make, at best, a rather modest contribution to the region’s growth.

The second challenge faced by the region is addressing the current fiscal deficits and making further progress on the structural reforms needed to remove the distortions present in the economy that limit growth. Limited resources thus link reforms and current fiscal deficits. The Golden Decade of high commodities prices led the region to a high level of public expenditure relative to revenues, which will have to be adjusted sooner or later. Unfortunately, the adjustment process will not be easy: 28 out of 32 countries in the region will show an overall fiscal deficit in 2017. In addition, debt levels remain rather high: the region’s average is 58.7 percent of GDP, with MCC having the highest debt to GDP ratio. This constrains the possibilities of the region to issue debt at relatively low interest rates, given that fragile fiscal positions are correlated with lower international credit ratings.

Thirdly, recent political changes have turned the attention of the region to potential protectionist policies in the U.S. These should affect MCC the most, but have also forced the whole region to revise and enhance current commercial treaties and seek new commercial partners. Potential trade and investment restrictions could weaken economic growth in countries such as Mexico, which exports around 83 percent of its manufactures to the U.S. and receives, on average, 41 percent of its foreign direct investment from the U.S. Also, remittances, an important source of resources for Central America and the Caribbean, could face limitations.

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36 Argentina, Brazil, and Paraguay are the biggest producers and exporters of soybeans in the region.

37 As an example, remittances represent 17 and 16 percent of Honduras and El Salvador’s GDP, respectively. See Brown, Lederman, Pienknagura, and Robertson (2017) for an analysis of further regional economic integration.
On the bright side, just as is the case for fiscal policy, many LAC countries have managed to switch to a countercyclical monetary policy. However, some LAC countries (in particular, all four MERCOSUR countries) continue to be procyclical, which poses a fourth challenge. But even though their monetary policy remains procyclical, they have cleverly used legal reserve requirements countercyclically. This highlights the advantages of having a second monetary policy instrument to achieve countercyclicality. As has been shown in Chapter 2, Argentina, Brazil, and Uruguay have used policy rates and legal reserve requirements as substitutes, while Colombia and Peru have utilized them as complements.

Finally, the upcoming normalization in the United States’ monetary policy – as the economy picks up steam and inflation rises - poses the fifth challenge to LAC countries. This will probably reduce global liquidity, constraining possible sources of funding for the region. In addition, the expected appreciation of the dollar and corresponding depreciation of some of the major LAC currencies could bring again to the forefront the monetary policy dilemma discussed in Chapter 2 of the report.

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38 Cyclicality of fiscal policy was analyzed in detail in our previous semiannual report (Végh, Lederman, and Bennett, 2017).
References


Appendices

Appendix A: Fiscal Adjustment Index

The fiscal adjustment index is an adaptation of the primary balance sustainable gap presented in Ley (2009). It captures the gap between the primary balance needed to maintain constant the current level of gross public debt as percentage of GDP and the observed primary fiscal deficit. The index is given by

$$z = \left(\frac{r-g}{1+g}\right) \times d + p,$$

where $z$ is the needed primary surplus adjustment, $g$ is the real growth rate of GDP, $r$ is the real interest rate, $p$ is the observed primary deficit (as percentage of GDP), and $d$ is the gross debt (as percentage of GDP). We use actual data for real interest rates, primary deficit, and gross debt, and forecasts for real GDP growth. The data sources are WEO (April 2017) and World Bank Staff estimates (September 2017).

The interpretation is that if the government generates a primary surplus of $z$, then it reaches a constant level of debt as percentage of GDP equal to $d$.

Appendix B: SVARs

Chapter 2 introduces a Structural Vector Autoregression (SVAR) model with the following analytical form:

$$i_t = c^1 + \beta_1 e_t + \beta_2 \pi_t + \beta_3 Y_t + \sum_{h=1}^2 \beta_4 h \epsilon_{t-h} + \sum_{h=1}^2 \beta_5 h \epsilon_{t-h} + \sum_{h=1}^2 \beta_7 h \epsilon_{t-h} + \sum_{h=1}^2 \beta_9 h Y_{t-h} + \beta_{12} X_t + \eta_t^i,$$

$$e_t = c^6 + \gamma_1 \pi_t + \gamma_2 Y_t + \sum_{h=1}^2 \gamma_3 h \epsilon_{t-h} + \sum_{h=1}^2 \gamma_6 h \epsilon_{t-h} + \sum_{h=1}^2 \gamma_9 h Y_{t-h} + \gamma_{11} X_t + \epsilon_t^i,$$

$$\pi_t = c^\pi + \delta_1 Y_t + \sum_{h=1}^2 \delta_3 h \pi_{t-h} + \sum_{h=1}^2 \delta_6 h \pi_{t-h} + \sum_{h=1}^2 \delta_9 h Y_{t-h} + \delta_{15} X_t + \pi_t^\pi,$$

$$Y_t = c^Y + \sum_{h=1}^2 \alpha_{0+h} \epsilon_{t-h} + \sum_{h=1}^2 \alpha_{2+h} \epsilon_{t-h} + \sum_{h=1}^2 \alpha_{4+h} \epsilon_{t-h} + \sum_{h=1}^2 \alpha_{6+h} Y_{t-h} + \alpha_9 X_t + \eta_t^Y,$$

where $i_t$ is the cyclical component of the nominal interest rate, $e_t$ is the nominal exchange rate minus the previous years’ average, $\pi_t$ is the log difference of quarterly CPI, $Y_t$ is the cyclical component of real GDP, the $\eta_t$’s are the error terms corresponding to each equation, the $c$’s are the constants corresponding to each equation, and $X_t$ is the cyclical component of the terms of trade. As usual, given that this is a small open economy, the terms of trade are viewed as exogenous.

We use the exogenous variable as a temporary shock, and then show the path of the endogenous variables in the system. The literature has not arrived to a consensus about how to introduce an

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39 The only exception is the SVAR presented in Figure 2.1, where the cyclical component of the terms of trade is not included and net capital inflows take the place of the interest rate. In that case, the shock is a fall in total factor productivity.
exogenous shock in an SVAR. So far, Canova (2005) and Broda (2004) present two different alternatives to solving this issue from a theoretical perspective; our approach follows Broda (2004) with the additional assumption that the cyclical component of the terms of trade is a white noise.

**Appendix C: Definition of Variables and Data Sources**

**Gross Domestic Product**

World Economic Outlook (WEO), and International Financial Statistics (IFS), were the main data sources. Series NGDP (gross domestic product, current prices) from WEO. Data period covers 1960-2016 (data availability varies across countries).

**Consumer price index**

IFS was the main data source. Data period covers 1960-2016.

**Interest rates**

Bloomberg and Haver Analytics were the main data sources. See Table C for details.

**Institutional quality**

International Country Risk Guide (ICRG) was the source of data. Institutional quality is a normalized index that ranges between 0 (lowest institutional quality) and 1 (highest institutional quality). The index was calculated by the authors as the average of four components: investment profile, corruption, law and order, and bureaucratic quality. Data period covers 1984-2016.
<table>
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<tr>
<th>Country</th>
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Sources: Bloomberg and Haver Analytics.
### TABLE C. (cont.) Interest Rates

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Sources: Bloomberg and Haver Analytics.
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BETWEEN A ROCK AND A HARD PLACE