

# IV Monetary and Exchange Rate Regimes

## Overview

Inflation control was an essential element of reform programs in Latin America and also the one in which achievements were most notable and enduring. Yet the means used to achieve rapid, up-front reductions in inflation—generally exchange rate-based anchors for monetary policy—led to imbalances over the longer term that increased countries' vulnerability to financial crises. Such regimes would have been sustainable only if a highly prudent approach had been taken to fiscal policy, combined with aggressive measures to increase the flexibility of prices and wages and raise the share of external trade in overall activity. In the event, reform programs in these areas were inadequate, and the “hard” exchange rate regimes eventually failed in the midst of financial turmoil. At the same time, these stabilization plans may have been necessary to arrest very high initial rates of inflation. They also left a legacy of broad popular support for low inflation that likely contributed to the successful implementation of subsequent approaches to monetary management, notably the inflation-targeting frameworks adopted in Mexico and Brazil.

This section reviews the experience with monetary stabilization in the region that began in the late 1980s and early 1990s, with a focus on the implications of exchange rate-based regimes for the results of reform programs. It first discusses the background to the introduction of monetary reforms and the influence this subsequently had on the exchange rate strategies that were taken in various countries, ranging from hard exchange rate anchors to pursuit of informal inflation objectives with a variety of intermediate targets. The macroeconomic effects of exchange rate-based stabilization plans are then described; in particular, we examine why cyclical expansions were observed in the initial stages of the plans, while the costs were borne later. The section then turns to the impact of inflexible exchange rate regimes on the implementation of other aspects of policy, including fiscal consolidation and trade opening. The eventual exit from inflexible exchange rates and the transition to alternative arrangements are then described. The section con-

cludes with a brief assessment of the increasing experience in the region with an inflation-targeting approach that responds to the lessons of the 1990s and reviews the challenges that lie ahead in ensuring that such an approach becomes entrenched.

## Alternative Approaches to Monetary Stabilization

### Background

Most Latin American economies experienced chronic monetary instability during the 1980s, resulting in high and volatile inflation and plunging currencies.<sup>77</sup> Of the larger countries, none had an average annual inflation rate of less than 20 percent during the decade. Several experienced bouts of very high inflation, defined as annual rates of over 100 percent (Fischer, Sahay, and Végh (2002)), including Argentina, Bolivia, Brazil, Mexico, and Peru; Argentina, Brazil, and Bolivia experienced brief periods of hyperinflation.<sup>78</sup> Argentina had the most extreme experience in the region, with an average inflation rate of 350 percent during the decade, leading to consumer prices increasing by a factor of more than 100 million. At the other end of the spectrum, Chile, Paraguay, and Colombia witnessed relatively moderate and stable inflation rates, which averaged 20–25 percent. In addition to the negative effect on overall economic performance of high and volatile inflation, wealth disparities were exacerbated, as the costs of inflation fell disproportionately on the poor.<sup>79</sup>

Generally speaking, high inflation reflected rapid monetary expansion, which, in turn, was caused by central bank financing of large fiscal deficits. As discussed in Fischer, Sahay, and Végh (2002), although

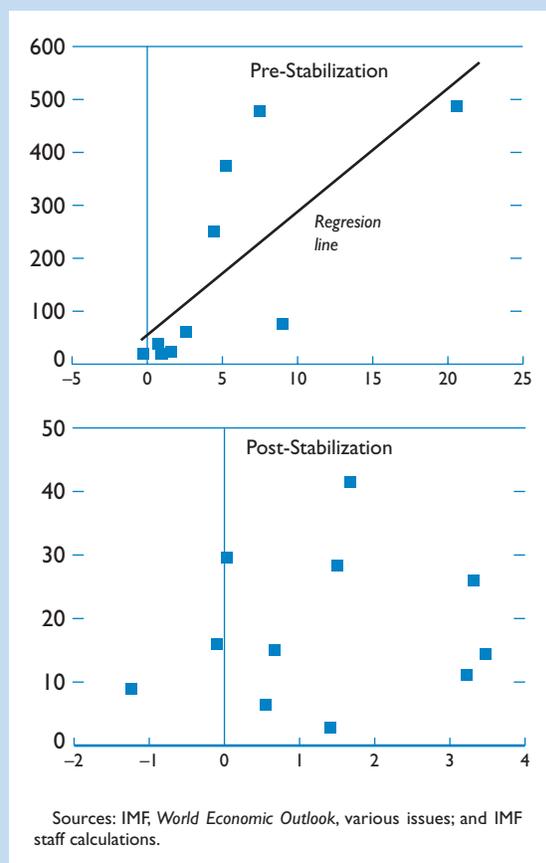
<sup>77</sup>See Pazos (1972) for a review of the longer history of monetary instability in the region.

<sup>78</sup>Based on Cagan's (1956) definition of hyperinflation “as beginning in the month in which the rise in prices exceeds 50 percent and ending in the month before the monthly rise in prices drops below that amount.”

<sup>79</sup>See Mishkin and Savastano (2000).

**Figure 4.1. Latin America: Fiscal Deficits and Inflation, 1980–2001**

(Inflation in percent, vertical scale; fiscal deficit in percent of GDP, horizontal scale)



international evidence on the link between deficits and inflation is weak during periods of low inflation, it becomes much more robust under high inflation.<sup>80</sup> Figure 4.1 illustrates the relationship between cross-country averages for fiscal deficits and inflation for the major Latin American countries since 1980, divided into periods before and after monetary stabilization plans were introduced. (The timing of these plans is indicated below.) There is a positive and statistically significant relationship in the pre-stabilization period, when inflation rates were high, consistent with “fiscal dominance” of monetary policy.<sup>81</sup> In contrast, the pattern is less clear in the post-stabilization period, when

<sup>80</sup>See also Catão and Terrones (2003) and Corbo (2000).

<sup>81</sup>The classic reference to long-run fiscal dominance is Sargent and Wallace (1981).

inflation was much lower.<sup>82</sup> The change in the relationship reflects both reductions in fiscal deficits themselves and increased scope for financing deficits through debt, as opposed to money creation—at least in the near term.

### Monetary Regimes and Institutions

There was a need, as a part of overall economic reform programs launched in the late 1980s and early 1990s, to establish monetary frameworks that would prevent fiscal dominance and underpin financial stability. Different approaches were taken to achieving this goal, ranging from hard pegs to the U.S. dollar to informal inflation targeting. Table 4.1 provides a categorization of monetary frameworks used for stabilization that reflects an assessment of the relative importance of exchange rates, inflation, and other criteria in policymaking.<sup>83</sup> Examples of stabilization programs that were centered on an objective for the exchange rate include Mexico’s *pacto* (1988), Argentina’s currency board (1991), Uruguay’s *tablita* (1990), and Brazil’s *real* plan (1994).<sup>84</sup> The top panels in Figure 4.2 indicate that, except for Uruguay, the introduction of exchange rate-based plans was associated with an abrupt halt in currency depreciation, while Uruguay’s *tablita* involved a more gradual stabilization. In all cases, short-term volatility in currency movements dropped sharply following the introduction of exchange rate-based stabilization plans (Table 4.2).

<sup>82</sup>The regression in the pre-stabilization period yields a slope coefficient of 23.5 with a  $t$ -statistic of 3.01, while the post-stabilization coefficient is 0.014 with a  $t$ -statistic of 0.004. Excluding the extreme case of Bolivia in the pre-stabilization period, which had a particularly large fiscal deficit of about 20 percent of GDP, the slope coefficient is 35.2 with a  $t$ -statistic of 2.40.

<sup>83</sup>For countries with hard exchange rate targets, the classifications and timing in Table 4.1 generally correspond to the official implementation of explicit regime changes. The classification of countries with informal inflation objectives is based on Corbo (2000). Countries were defined as having “soft” exchange rate objectives when the volatility of nominal exchange rate movements was significantly greater than under hard exchange rate targeting (Table 4.2).

Looking more narrowly at exchange rate regimes, as opposed to the overall monetary policy framework, the literature on de facto classifications includes Ghosh and others (1997), Calvo and Reinhart (2000), Reinhart and Rogoff (2002), Levy Yeyati and Sturzenegger (2002a), and Bubula and Ötker-Robe (2002). For the purposes of this study, one drawback to these classifications is that they look only at exchange rate regimes as opposed to the overall monetary framework. Frenkel (2003) also notes that the conclusions of these studies are often contradictory and depend on the criteria chosen.

<sup>84</sup>Bolivia is excluded from this classification because stabilization was initially achieved in 1985–86 without an explicit exchange rate anchor. The crawling-peg system was introduced in late 1986 after inflation had fallen sharply.

Countries that opted for exchange rate-based stabilization plans were generally those with the highest inflation rates and most volatile exchange rates in the pre-stabilization period, although Peru is an exception (Table 4.2).<sup>85</sup> The experience in Central America was also quite different, as discussed in Box 4.1. The high-inflation countries stood to benefit even more than the others in the region from the credibility afforded by a visible and easily monitored link to an external anchor in the form of U.S. monetary policy. At the same time, hard exchange rate targets were often not accompanied, at least in the first instance, by explicit measures to limit fiscal deficits or increase central bank independence (Table 4.3), thereby jeopardizing the longer-term insulation of monetary policy from fiscal dominance.<sup>86</sup>

The exception was Argentina, which introduced constitutional reforms to increase the independence of the central bank in early 1992, shortly after the currency board was introduced.<sup>87</sup> In the other countries that adopted exchange rate-based stabilization plans, central bank reforms were introduced much later (e.g., in Mexico) and/or they left central banks with relatively low degrees of effective independence.

Other countries adopted approaches that assigned a less important role to the exchange rate and instead focused on an inflation objective. Examples are the monetary regimes introduced in Chile (1989), Colombia (1991), and Peru (1993).<sup>88</sup> These arrangements could not be characterized as full inflation targeting as it is currently understood, partly because they involved monitoring other variables—notably monetary aggregates and/or the exchange rate—at least in the short run. Yet an analysis of the way policy was implemented suggests that inflation developments were the primary determinant of policy actions.<sup>89</sup> Interestingly, these countries, unlike most of

<sup>85</sup>The choice of exchange rate regime in stabilization plans is discussed in Edwards (1998) and Gould (1996). Interestingly, these studies generally argue that a history of high inflation is associated with the choice of money-based stabilization as opposed to exchange rate-based stabilization, which seems to be at odds with the experience in Latin America in the late 1980s and early 1990s.

<sup>86</sup>In terms of fiscal measures, Brazil is an exception, since its primary surplus in 1994 reached 5.1 percent of GDP. Both Jácome (2001) and Gutiérrez (2003) find evidence that greater central bank independence is associated with better inflation performance in Latin America.

<sup>87</sup>Of course, subsequent developments underscore the fact that institutional arrangements of this nature do not offer complete protection against the failure of monetary regimes.

<sup>88</sup>For Peru, the beginning of the stabilization effort could also be dated from mid-1990, with the election of Alberto Fujimori's government; specific inflation objectives were not introduced until the beginning of 1993.

<sup>89</sup>See Mishkin and Savastano (2000) for a discussion of this issue. Corbo (2000) analyzes econometrically the response of these countries' policies to various factors, supporting the view that they behaved as inflation targeters.

**Table 4.1. Monetary Stabilization Plans: Objectives and Timing**

"Hard" Exchange Rate Objective	
Argentina	Apr. 1991–Dec. 2001
Brazil	Jul. 1994–Dec. 1998
Mexico	Apr. 1988–Dec. 1994
Uruguay	Nov. 1990–Dec. 2001
"Soft" Exchange Rate Objective	
Ecuador	Oct. 1992–Sep. 1998
Paraguay	Apr. 1989–Dec. 2001
Venezuela	Apr. 1989–Feb. 2002
Inflation Objective	
Chile	Oct. 1989–present
Colombia	Jan. 1991–present
Peru	Jan. 1993–present

Sources: For countries with hard exchange rate targets, the classifications and timing generally correspond to the official implementation of explicit regime changes. The classification of countries with informal inflation objectives is based on Corbo (2000). Countries were defined as having "soft" exchange rate objectives when the volatility of nominal exchange rate movements was significantly greater than under hard exchange rate targeting (Table 4.2).

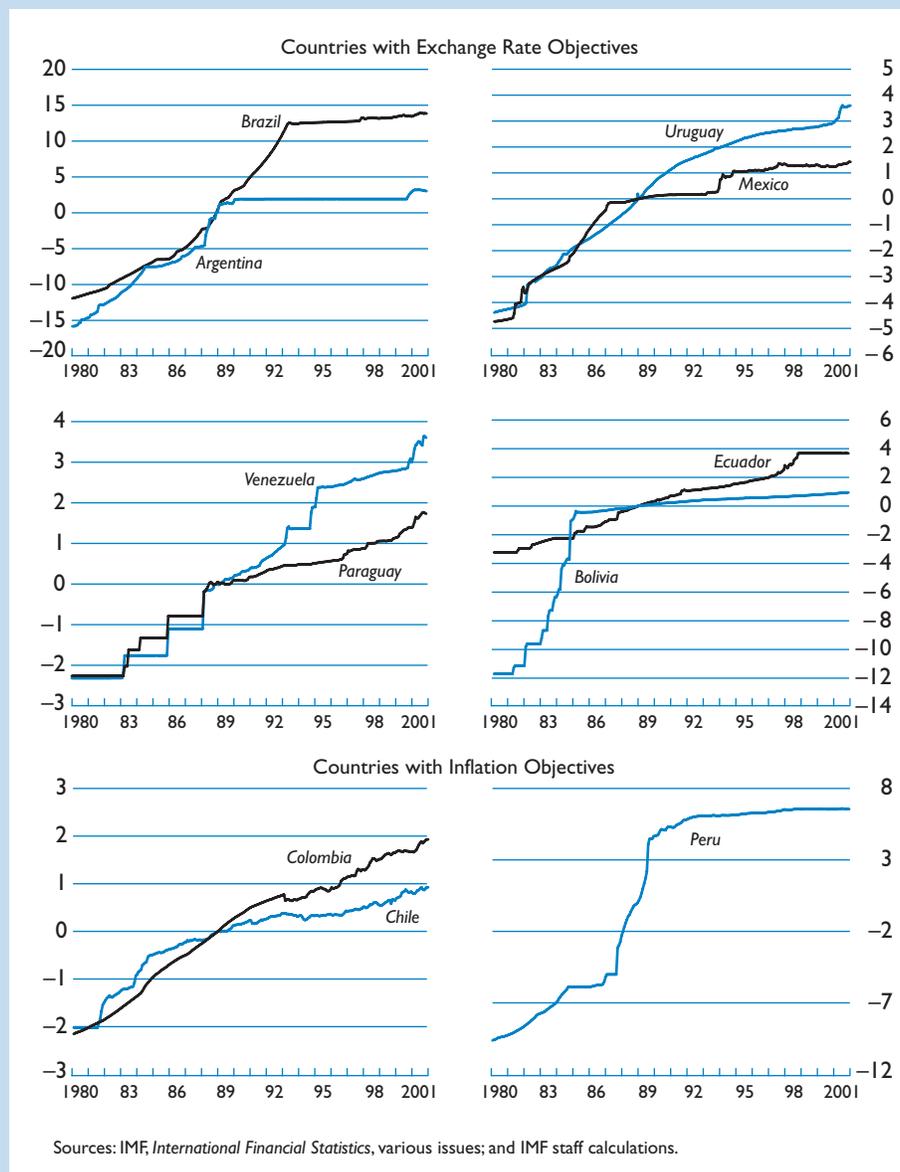
the countries that adopted explicit exchange rate objectives, also introduced measures to increase central bank independence in conjunction with stabilization plans.

For the other countries shown in Table 4.1—specifically Ecuador, Paraguay, and Venezuela—the timing of the introduction of stabilization plans and the characterization of the exchange rate regime are more ambiguous. Nevertheless, the evidence suggests that these countries focused on the exchange rate in setting policy, although control was less tight than in countries that explicitly adopted exchange rate-based stabilization, as reflected in greater short-term volatility in exchange rates (see Table 4.2 and Figure 4.2). Venezuela, in particular, experienced episodes of discrete, sharp depreciations in the exchange rate that were not subsequently reversed.

Broadly speaking, then, countries with the highest pre-stabilization inflation rates tended to opt for exchange rate-based stabilization plans, while those with more moderate rates adopted inflation objectives. Bolivia and Peru, however, stand out as countries that successfully reduced inflation from high levels without using an exchange rate anchor, at least initially. In any case, the frequent recourse to exchange rate-based stabilization may have reflected the difficulty in credibly implementing inflation targeting starting from triple-digit inflation rates, especially given that inflation targeting was not, at the

**Figure 4.2. Latin America: Exchange Rate Developments**

(In logarithms; January 1990 = 0)



time, well established internationally as a monetary policy regime. Exchange rate anchors yielded rapid, up-front reductions in inflation. They also tended to produce initial cyclical upswings in activity, reinforcing the immediate attractiveness of the approach. Absent viable exit strategies over the longer term, however, and without clear frameworks to prevent eventual fiscal dominance, the durability of these exchange rate-based stabilization plans was jeopardized.

## Macroeconomic Impact of Exchange Rate-Based Stabilization Plans

### Inflation

Inflation tended to come down much more quickly under explicit exchange rate-based stabilization plans than under inflation targeting (Figure 4.3). In Argentina, inflation was reduced from more than 700 percent at the beginning of 1991 to

Table 4.2. Pre- and Post-Stabilization Inflation and Exchange Rate Developments

	Pre-Stabilization <sup>1</sup>			Stabilization Period <sup>2</sup>		
	Inflation	Growth in REER	Exchange Rate Volatility <sup>3</sup>	Inflation	Growth in REER	Exchange Rate Volatility <sup>3</sup>
"Hard" Exchange Rate Objective						
Argentina	374.0	-1.7	20.8	2.9	2.7	0.1
Brazil	478.3	0.8	10.4	11.1	4.2	1.9
Mexico	76.7	-4.4	7.5	15.9	3.3	0.9
Uruguay	61.8	-4.1	7.1	28.4	5.1	1.4
Unweighted average	241.0	-2.4	11.5	14.6	3.8	1.1
"Soft" Exchange Rate Objective						
Ecuador	38.3	-6.8	5.6	29.6	4.3	2.9
Paraguay	19.5	-7.9	7.7	15.1	0.0	5.1
Venezuela	19.6	-6.4	7.9	41.5	2.5	8.6
Unweighted average	25.8	7.0	7.1	28.7	2.3	5.5
Inflation Objective						
Chile	20.5	-5.8	3.1	9.0	-0.1	2.0
Colombia	24.2	-3.3	0.7	14.4	-2.1	2.5
Peru	251.4	7.8	22.5	6.4	0.2	1.1
Unweighted average	98.7	-0.4	8.8	8.9	-0.7	1.9
Not Classified <sup>4</sup>						
Bolivia	487.0	-2.2	43.2	26.0	-7.6	0.6

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

Note: REER denotes the real effective exchange rate.

<sup>1</sup>Defined as 1980M1 until the last month before stabilization plans began (see Table 4.1).

<sup>2</sup>Defined as the period extending from when the stabilization plans were introduced until they ended (see Table 4.1).

<sup>3</sup>Standard deviation of monthly log changes in the exchange rate vis-à-vis the U.S. dollar.

<sup>4</sup>See discussion in the text.

less than 10 percent by mid-1993, less than two years after the currency board was introduced. In Mexico, inflation fell from 180 percent at the beginning of 1988 to less than 20 percent by April 1989, one year after the *pacto* came into effect. And Brazil's inflation rate plunged from more than 3,000 percent in 1994 to single digits by the end of 1996, less than two years after the *real* plan was introduced. These rapid declines in inflation are consistent with international evidence that the inflationary process lacks inertia when inflation reaches very high levels (Fischer, Sahay, and Végh, 2002).<sup>90</sup>

In Chile and Colombia, in contrast, inflation started from much lower levels. In Chile, inflation

stood at about 25 percent in 1990 but did not decline to single digits until late 1994, five years after stabilization began. In Colombia, as noted previously, progress in inflation reduction was modest through much of the 1990s; and it was not until mid-1999, or nine years after the plan was introduced, that inflation fell below 10 percent.<sup>91</sup> In Peru, the initial stabilization process without an inflation target was quite rapid, as inflation fell from more than 10,000 percent in mid-1990 to 56 percent by the end of 2002. It did not, however, reach single digits until early 1997.

The evidence, then, suggests that the exchange rate-based stabilization plans likely had a significant and rapid effect on near-term inflation expectations, in spite of past failures in the region. In countries

<sup>90</sup>At the same time, it may be surprising that the plans enjoyed sufficient credibility to bring down inflation quickly, given the extensive and unsuccessful track record of exchange rate-based stabilization plans in the region. See Edwards (2000) for a discussion of the experience in the 1970s and Pazos (1972) for a longer historical perspective. The difference may have been that these plans were introduced in the context of more comprehensive efforts to correct deficiencies in fiscal and monetary policies.

<sup>91</sup>As discussed below, Mexico had a similar experience of slow disinflation after adopting an informal inflation objective following the 1994–95 crisis; Brazil, in contrast, made the transition to formal inflation targeting in 1999 without a sustained period of double-digit inflation.

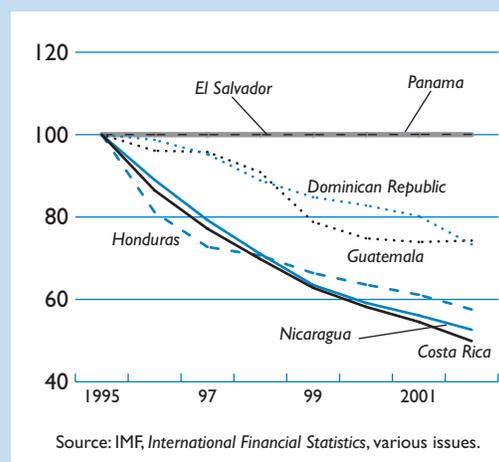
### Box 4.1. Exchange Rate Experience in Central America

During the 1990s, most of Central America pursued some form of fixed exchange rate regime. Costa Rica, Honduras, and Nicaragua adopted crawling pegs, while El Salvador relied on a fixed peg, which, in 2001, culminated in formal dollarization, making it the second country in Central America—along with Panama—in which the U.S. dollar is legal tender. Guatemala relied on a managed float, but one with relatively limited exchange rate volatility. Despite the adoption of exchange rate-based anchors, Central America's monetary regimes managed to withstand a number of adverse external shocks—including devastating hurricanes, earthquakes, and a sustained fall in the price of one of the region's most important commodities (coffee)—without major disruptions. (See figure.) This raises the question of whether the initial conditions in Central America differed from those in other Latin American countries and whether the reliance on fixed exchange rate systems was complemented by positive institutional developments and increased flexibility in factor markets, especially labor markets.

In contrast with much of Latin America, initial annual inflation rates in Central America were more modest, ranging from about 8 percent in Honduras to 27 percent in Costa Rica during the 1980s.<sup>1</sup> Consequently, the use of U.S. dollar-based exchange rate anchors in Central America was primarily a reflection of the relatively small size of the countries and their strong dependence on the U.S. economy, rather than an instrument to bring inflation down quickly. In addition to being their most important trading partner, the United States was a major source of income owing to remittances received from workers. For example, during the 1990s, remittances reached, on average, 12 percent of GDP in El Salvador and 3 percent of GDP in Honduras. These close links to the United States also contributed, at least partly, to the high degree of dollarization of their banking systems.

<sup>1</sup>The only exception was Nicaragua, which experienced substantially higher inflation rates during both the 1980s and the first half of the 1990s.

**Central America: Nominal Exchange Rates**  
(Index 1995 = 100)



During the 1990s, the reliance on exchange rate pegs in Central America was supported by a strengthening of institutions, including increased central bank independence and the curtailment of central bank financing of government activities. Also, Central America made progress in reducing fiscal deficits and public sector debt, although reconstruction efforts in the aftermath of natural disasters resulted in setbacks.<sup>2</sup> Although labor markets in El Salvador were quite flexible, overall improvements in labor market flexibility lagged; the region profited substantially, however, from its proximity to the United States, and, in many respects, the U.S. labor market acted as a shock absorber.

<sup>2</sup>At the end of 2002, Central America's average debt-to-GDP ratio amounted to about 55 percent, compared with an average of about 60 percent of GDP in South America.

that adopted inflation objectives, in contrast, there was little indication of significant, front-loaded credibility gains. This is consistent with the wider experience with inflation targeting, which indicates that monetary policy credibility has to be earned by good observed performance after inflation-targeting regimes are introduced.<sup>92</sup>

<sup>92</sup>See, for example, Almeida and Goodhart (1998) and Bernanke and others (1999). Brazil's experience in 1999 is somewhat unique, in that the initial level of inflation was very low (1.7 percent through 1998). The challenge for the inflation-

### Exchange Rates and Interest Rates

Although inflation came down quickly in countries that adopted exchange rate-based stabilization, it did not decelerate rapidly enough to avoid appreciation of the real exchange rate. As shown in Figure 4.4, countries that adopted exchange rate-based stabilization generally experienced significant real

targeting framework, then, was to contain inflation in the face of a large exchange rate depreciation as opposed to engineering a disinflation process.

**Table 4.3. Latin America: Increases in Central Bank Independence**

	Monetary Stabilization Introduced	Central Bank Law or Constitution Changed	Index of Central Bank Independence <sup>1</sup>
“Hard” Exchange Rate Objective			
Argentina	April 1991	September 1992	18.5
Brazil	July 1994	June 1999	12.0
Mexico	April 1988	April 1994	16.0
Uruguay	November 1990	March 1995	12.5
“Soft” Exchange Rate Objective			
Paraguay	April 1989	June 1995	10.5
Venezuela	April 1989	December 1992	9.5
Inflation Objective			
Chile	October 1989	October 1989	16.5
Colombia <sup>2</sup>	January 1991	August 1991	15.0
Peru	January 1993	January 1993	17.0

Source: Jácome (2001).

<sup>1</sup>Following changes in the law; the higher the index, the more independent is the central bank.

<sup>2</sup>Corresponds to the date when the new, independent central bank board was appointed.

exchange rate appreciation in the starting years of the plans, in contrast to what occurred in countries that adopted inflation objectives.<sup>93</sup> In some countries, such as Mexico and Uruguay, the initial level of the real exchange rate was relatively depreciated from a historical perspective; thus, a component of this appreciation reflected a return to more typical levels. Brazil’s stabilization began with a real exchange rate that was similar to the historical average, while Argentina introduced the currency board at a real exchange rate level that was significantly appreciated compared with those prevailing in the 1980s.<sup>94</sup> By the time of the collapse of its currency board, Argentina’s real effective exchange rate had appreciated by some 60 percent relative to the 1980s, seriously undermining the country’s competitiveness. Countries that had informal inflation objectives tended to avoid substantial real appreciations through the use of crawling exchange rate bands that were adjusted in response to inflation developments. For Chile, the imposition of controls on capital inflows may also have played a role.

<sup>93</sup>If the starting point of monetary stabilization for Peru is instead dated at August 1990, when the “Fujishock” program was introduced, the real effective exchange rate would have depreciated about 20 percent during the period shown in Figure 4.4.

<sup>94</sup>The consumer price index (CPI)-based real effective exchange rates of Mexico and Uruguay were, respectively, about 20 percent and 25 percent below the average of the 10 years preceding stabilization, while Argentina’s exchange rate was about 30 percent above the comparable level.

Nominal interest rates also came down quickly in countries that adopted exchange rate-based stabilization. A dramatic example was Argentina, where money market rates fell from about 250 percent at the beginning of 1991 to 20 percent by the end of the year; in Brazil, rates fell from 7,000 percent in early 1994 to 56 percent by the end of the year.<sup>95</sup> Access to foreign capital also expanded rapidly with the stabilization of the exchange rate and improved investor confidence in the overall direction of the government’s reform programs.

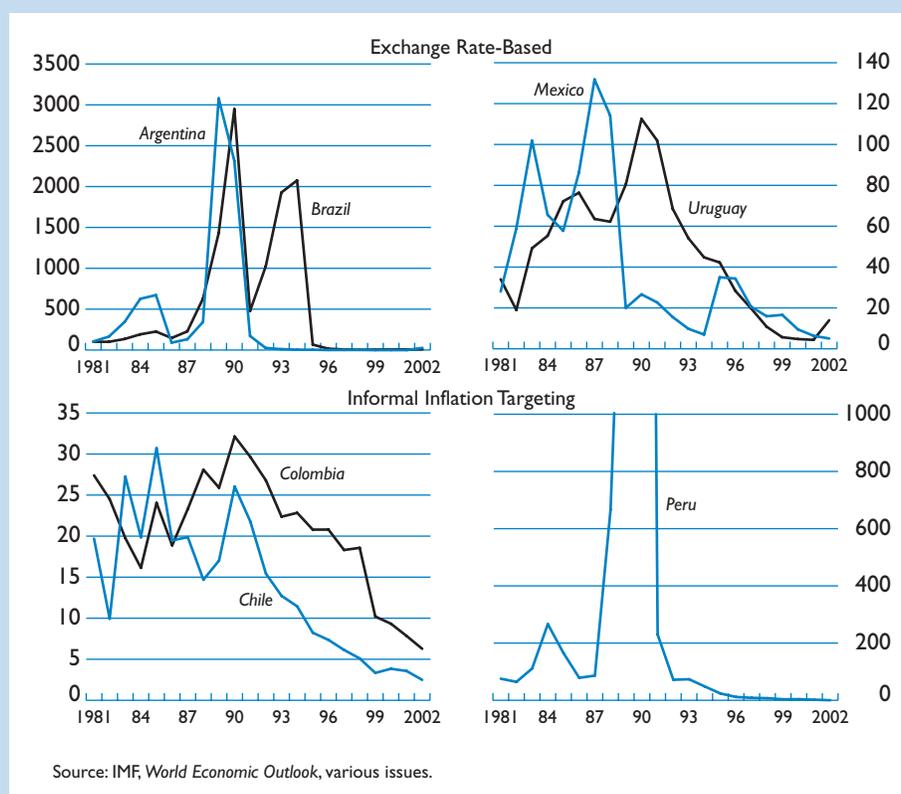
### Business-Cycle Dynamics

Low domestic interest rates, the availability of foreign capital, and the apparent lack of risk of borrowing in foreign currency created a favorable environment for debt-financed spending. Cycles resulted that were typical of those observed in other countries, inside and outside the region, under exchange rate-based stabilization.<sup>96</sup> Box 4.2 summarizes the experience with such programs in Latin America and discusses alternative explanations for the stylized

<sup>95</sup>Although it would also be desirable to look at the evolution of real interest rates, it is difficult, in practice, to construct reliable estimates of inflation expectations given the high degree of financial volatility during the transition to stabilization.

<sup>96</sup>References to the typical cycle associated with exchange rate-based stabilization include Végh (1992), Calvo and Végh (1999), and Kiguel and Liviatan (1992).

**Figure 4.3. Inflation Under Alternative Stabilization Plans**  
(In percent)



facts. In particular, growth in output initially increased, fueled by higher private consumption spending.<sup>97</sup> The trade balance tended to deteriorate as the real exchange rate appreciated, and capital inflows surged.

These developments were unsustainable, as reflected in a rising ratio of external debt-servicing payments to exports.<sup>98</sup> But reversing these trends without changing the nominal exchange rate would have required a sharp contraction in domestic spending and an associated decline in the domestic price level to restore competitiveness. Few countries have managed this transition successfully, especially in an environment of high international capital mobility. Instead,

<sup>97</sup>It is notable that business investment was typically not a driving force, perhaps reflecting underlying weaknesses in reform plans that failed to instill longer-term confidence.

<sup>98</sup>This assessment, of course, is easier to make in hindsight. As discussed in Section II, there was a view at the time that higher potential owing to the reforms would allow countries to service debt more easily over the longer term. There was also an expectation that trade liberalization would lead to more rapid export growth than actually occurred, as is discussed in Section VII.

Latin American countries displayed the more typical pattern of persistent external deficits combined with domestic recession, notably in Argentina from 1999 through 2001. In the absence of either a viable strategy for a controlled exit from these regimes or any scope for fiscal policy to actively support demand, the outcome was a self-reinforcing loss of confidence in financial markets and eventual crisis.<sup>99</sup> It is striking that all of the countries that adopted exchange rate-based stabilization ended up abandoning the policy framework during financial turmoil, while none of the countries that adopted informal inflation targeting experienced similar outcomes.

When crises hit, they were particularly damaging, given high levels of informal dollarization, particularly in Argentina and Uruguay. Although the emer-

<sup>99</sup>Designing a viable exit strategy would have presented its own challenges. The relevant issues are discussed in Eichengreen and Masson (1998), who observe that exit from a fixed exchange rate is easier when financial conditions are stable. Yet this is also the environment in which the motivation for abandoning the exchange rate anchor is least compelling.

gence of informal dollarization had initially been associated with financial volatility prior to stabilization, it continued even after stabilization had been achieved. Indeed, further informal dollarization of liabilities was often encouraged by an environment of exchange rate stability, which obscured the risk that exchange rate movements posed for balance sheets (see Section VI).<sup>100</sup> When exchange rate targets were eventually abandoned, borrowers in foreign currency (including governments) experienced sharp increases in the domestic currency value of debt and debt-servicing payments. As creditworthiness worsened and financing dried up, pressures on the exchange rate were exacerbated, leading to a self-reinforcing plunge in currencies.

### Role of Capital Controls

Given the absence of flexibility to conduct countercyclical monetary policy, avoiding this typical cycle under exchange rate-based stabilization would have required a combination of firm fiscal discipline from the outset, significant increases in wage and price flexibility, and concerted trade opening—none of which were observed in practice. Another supporting measure could have been controls on capital inflows to limit the buildup in external debt and the appreciation of the real exchange rate. Chile and Colombia both adopted “price-based” capital controls in the form of unremunerated reserve requirements on short-term inflows.<sup>101</sup>

There is an extensive but inconclusive literature on the success of Chile’s strategy in insulating the economy from swings in foreign financing, as critically surveyed in Nadal-De Simone and Sorsa (1999). In any event, it is clear that attempts to evade controls created problems that had to be addressed by tightening their application over time. Although there is disagreement on whether controls sheltered Chilean monetary policy from external influences, most observers agree that they lengthened the maturity of foreign inflows (De Gregorio, Edwards, and Valdes, 2000).<sup>102</sup> Given that the level of short-term

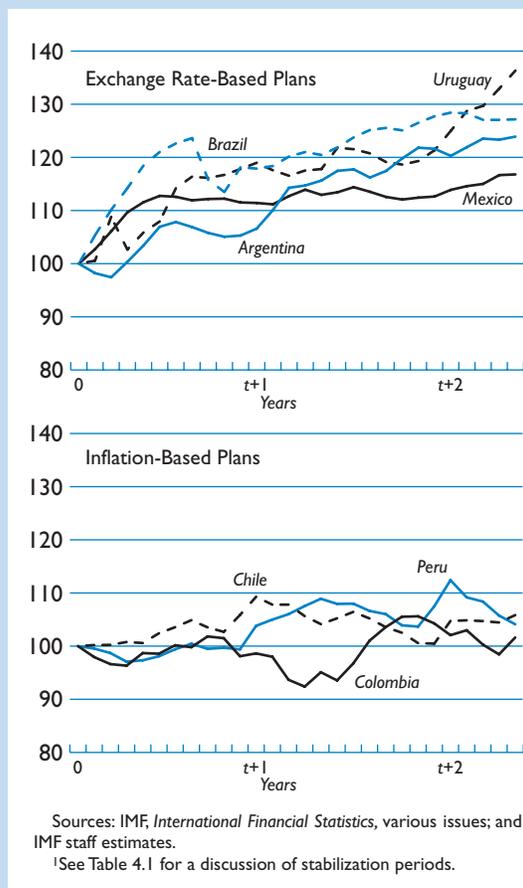
<sup>100</sup>Martinez and Werner (2002) provide firm-level evidence for Mexico that the foreign exchange exposure of corporations increased during the period of exchange rate-based stabilization.

<sup>101</sup>Agosin and Ffrench-Davis (2001) discuss Chile’s experience. Controls were instituted in 1991 with a reserve requirement of 20 percent. The rate was raised to 30 percent a year later, reduced to 10 percent during the Asian crisis, and eventually eliminated in 1998. Ocampo and Tovar (2003) analyze the Colombian case. Controls in the form of compulsory deposits were in place from 1993 to 2000, with deposit rates that varied over time from 10 percent to almost 100 percent and also depended on the maturity of the inflow.

<sup>102</sup>Le Fort and Budnevich (1996) and Le Fort and Lehmann (2003) argue that more scope was provided for policy independence, while De Gregorio, Edwards, and Valdes (2000) find little

**Figure 4.4. Latin America: Real Effective Exchange Rates<sup>1</sup>**

(Index = 100 at start of stabilization)



external debt is one of the most robust predictors of financial crises, the controls likely helped to “crisis proof” the Chilean economy, even if they did not facilitate an independent monetary policy.<sup>103</sup> There has been less formal analysis of the Colombian experience, but, again, the results are conflicting. Ocampo and Tovar (2003) conclude that controls both reduced the volume of inflows and increased their maturity, while Cárdenas and Barrera (1997) and Cárdenas and Steiner (2000) arrive at the opposite conclusion.

Whether controls on capital inflows would have similarly helped to crisis proof other countries in the

evidence of such an effect. Espinosa, Smith, and Yip (2000) provide a theoretical framework for how capital controls can reduce economic volatility and raise growth.

<sup>103</sup>On the role of short-term external debt in predicting financial crises, see Radelet and Sachs (1998); Berg and Patillo (1999); and Berg, Borensztein, and Patillo (1999).

**Box 4.2. Cyclical Impact of Exchange Rate-Based Stabilization Plans**

The boom-bust cycle associated with several exchange rate-based stabilization programs in Latin America is illustrated in the panels in the accompanying figure. Strong initial output growth is led by a consumption boom, particularly in durable goods. Inflation falls quickly, but not by enough to avoid appreciation of the real exchange rate. The trade balance deteriorates and capital inflows increase, leading to a rising ratio of external debt-servicing payments to exports. As the initial boom in consumption wanes, GDP growth falls sharply in the third and fourth years after stabilization. Reversing this cycle without making adjustments in the nominal exchange rate would require substantial flexibility of domestic wages and prices to bring the real exchange rate back to its original level—or possibly even lower to compensate for higher debt-servicing payments.

This pattern of effects under exchange-rate based stabilization is not unique to Latin America. Cross-country analysis—including Israel (1986) and Turkey

(1995)—indicates similar behavior.<sup>1</sup> What accounts for the boom-bust cycle under exchange rate-based stabilization? Alternative hypotheses have been proposed:<sup>2</sup>

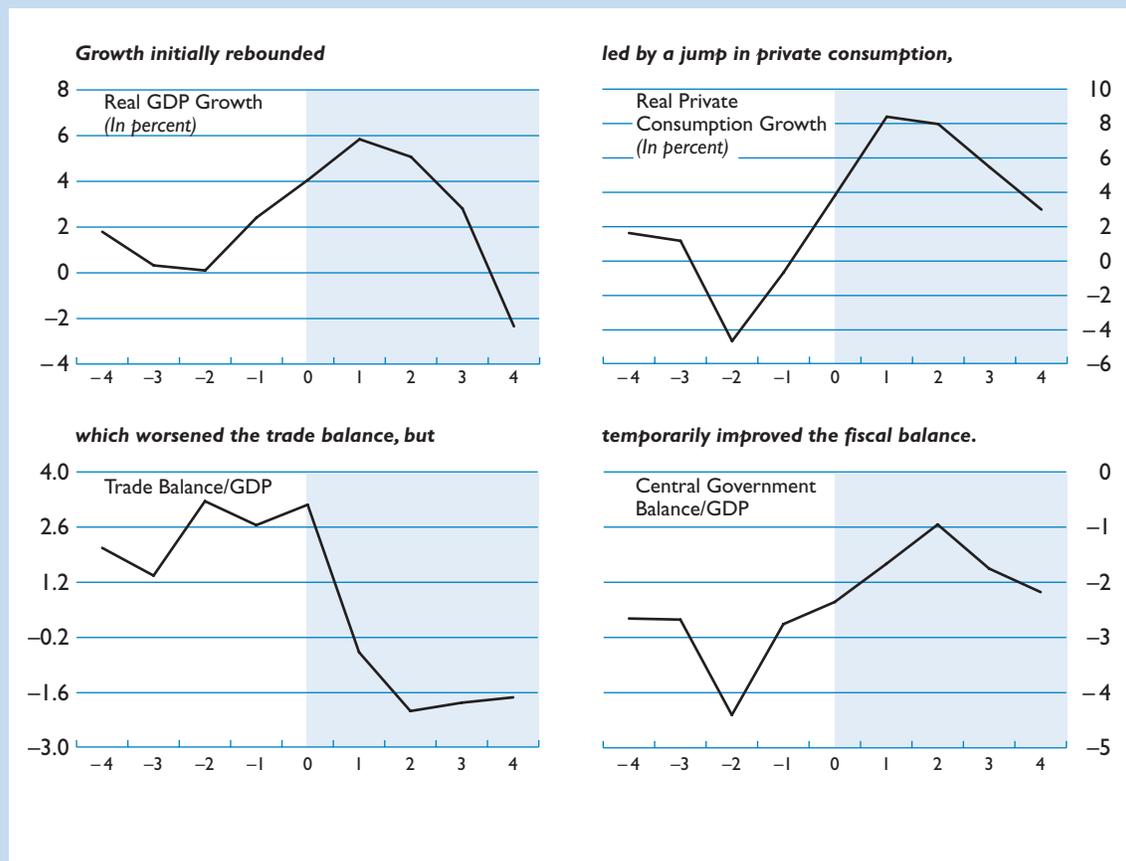
- *Wealth effects:* The decline in inflation reduces the inflation tax on households and firms, increasing wealth and thus boosting spending (Kimbrough, 1986). The problem with this explanation is that it

<sup>1</sup>In contrast, Gould (1996) argues that money-based and exchange rate-based stabilizations have similar output effects after controlling for past inflation and reserve levels. His results are sensitive to the choice of timing of stabilization, however. More generally, his model is based on the view that countries with high past inflation choose money-based stabilization, contrary to the stylized facts in Latin America since the mid-1980s.

<sup>2</sup>For reviews of this literature, see Rebelo and Végh (1995) and Fischer, Sahay, and Végh (2002).

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(Centered on year of program introduction)



is difficult to obtain effects as large as those observed in the data, especially if it is assumed that the government “rebates” the inflation tax to the public in the pre-stabilization period.

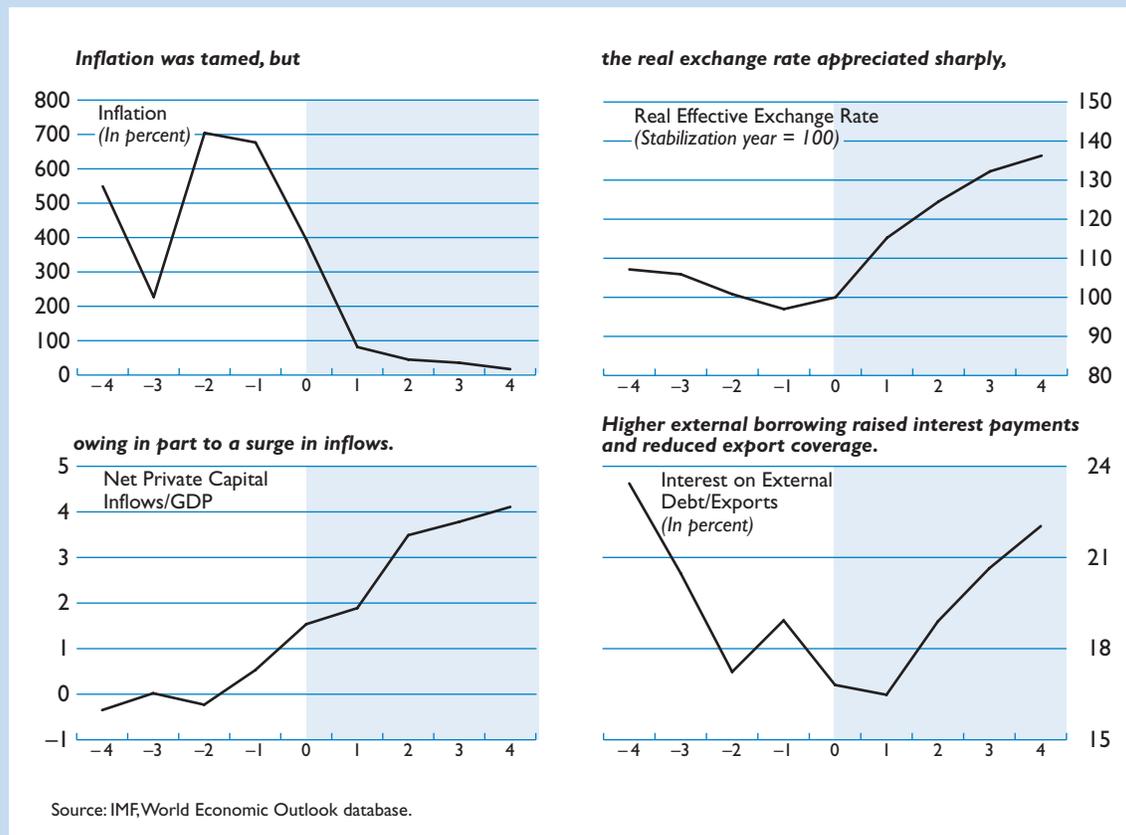
- *Imperfect credibility and intertemporal substitution:* If stabilization plans are not fully credible, households may shift consumption from the future to the period when the plan is in place, thus reducing transaction costs associated with the inflation tax (Calvo, 1986; Calvo and Végh, 1993; and Mendoza and Uribe, 1999). As for wealth effects, however, it is difficult to generate a significant impact unless the intertemporal elasticity of substitution is well above typical estimates (Reinhart and Végh, 1995).
- *Inflation stickiness:* Introducing inflation stickiness helps to explain why real interest rates may be quite low at the beginning of these plans, as well as why the real exchange rate tends to appreciate (Rod-

riguez, 1982; Celasun, 2003)). The difficulty here is how to motivate inflation stickiness when inflation is actually often observed to drop very sharply when stabilization plans are introduced.

In short, there are drawbacks to each of these explanations considered individually. More recently, however, Burstein and others (2003) have shown that the presence of distribution costs in the traded-goods sector can substantially increase the predicted impact of exchange rate-based stabilization arising from these factors, especially for the real exchange rate. This feature allows them to closely mimic the effects of the 1991 stabilization plan in Argentina, even in a model in which stabilization is perfectly credible. In practice, a combination of the above factors has probably played a role in most experiences with exchange rate-based stabilization, and collectively they appear capable of explaining the main stylized facts.

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(Centered on year of program introduction)



region during the 1990s is difficult to assess. Chile's controls, for instance, were implemented in the context of a robust, preexisting institutional structure for monitoring financial flows that was not available in some other countries. Continuing efforts were also needed to ensure broad coverage of the controls to maintain their macroeconomic effectiveness and minimize microeconomic distortions. Finally, Chile's controls were viewed as a supporting measure for sound monetary, exchange rate, and fiscal policies; and even their proponents agree they would not have been effective absent sound policies in these areas. Beyond implementation issues, there is the more general question of whether short-term capital inflows were perceived as a problem by other countries in the region. Indeed, many governments were themselves actively issuing short-term external debt, since they viewed strong foreign demand for these instruments as an indication of confidence in their policy regimes. In the event, it seems that both weak implementation capacity and absence of will presented obstacles to the introduction of controls on capital inflows elsewhere in the region.

### Effects on Other Elements of Reform Programs

As discussed above, exchange rate-based stabilization plans had immediate benefits in terms of reducing inflation and stimulating demand. Medium-term sustainability, however, was more difficult to achieve in an environment of decreasing competitiveness and rising external debt. These plans also tended to affect policy implementation in other areas, including fiscal consolidation and trade opening.

Regarding fiscal consolidation, it was generally understood from the outset of stabilization plans that budgetary restraint would be necessary to sustain inflexible exchange rate regimes. Yet immediate, tangible incentives to consolidate fiscal positions were absent, or even perverse, under exchange rate-based stabilization. As discussed in Section III, expanded access to external finance lowered borrowing costs, especially in foreign currencies, which, in turn, encouraged greater debt issuance along with a shift to riskier short-term external financing. Given uncertainties about the willingness of governments to take further consolidation measures, it was difficult to assess whether "fiscal dominance" had, indeed, been avoided. In any case, the immediate financing environment under exchange rate-based stabilization did not encourage prudence.<sup>104</sup>

<sup>104</sup>On the general issue of why fiscal prudence may not be promoted by exchange rate-based stabilization, see Tornell and Velasco (1995, 1998).

The second feature that undermined fiscal discipline was the lack of scope for countercyclical monetary policy implied by inflexible exchange rate regimes to offset the contractionary effects of fiscal consolidation on activity. This was not a major problem in the initial stages of stabilization, when output growth tended to be robust owing to strong growth in private domestic demand. It became more problematic later, however, when the initial boost to private demand faded and markets began to question the sustainability of fiscal policy, causing sovereign yield spreads to rise. Opportunities to take credible fiscal policy initiatives to address these doubts became very limited, since fiscal contraction would have undermined activity further.

As is discussed in Section VII, trade opening may also have been hindered by inflexible exchange rates. Without scope for adjustments in nominal exchange rates, the relative price changes needed to adapt to trade liberalization had to come about through movements in domestic prices and wages.<sup>105</sup> Since these markets remained inflexible, the adjustment process was slow and export growth was suppressed. With exports stagnating relative to overall activity and falling relative to interest payments on external debt, the ability of these economies to adapt to shocks was undermined.

Another area in which inflexible exchange rates may have had indirect spillovers was the financial sector. Specifically, there was a tendency during the 1990s for informal dollarization to rise in Latin American economies that had inflexible exchange rate regimes. As is discussed in Section VI, low observed exchange rate volatility may have suppressed the risks arising from the associated currency mismatches, encouraging the informal dollarization of liabilities.<sup>106</sup> The result was to increase vulnerabilities in the financial sector, which exacerbated crises when these exchange rate regimes were eventually abandoned.

### Exit and Regime Change

Almost all of the exchange rate-based stabilization plans culminated in financial crises and forced exits to more flexible regimes. Mexico was first, with its tequila crisis of 1994–95, followed by Brazil (1999), Argentina (2001), and Uruguay (2002).<sup>107</sup> Ecuador,

<sup>105</sup>In particular, a decline in domestic prices was needed to offset the decline in the domestic prices of imported goods associated with a reduction in trade barriers.

<sup>106</sup>See Cuevas and Werner (2003) for evidence on liability dollarization in the Mexican corporate sector.

<sup>107</sup>In this context, Hamann and Prati (2002) find that exchange rate anchors enhance the probability of a successful disinflation

although classified here as having a “soft” exchange rate objective, also experienced a financial crisis in 1999, but it exited instead to a more rigid relationship by adopting formal dollarization. In contrast to these crisis-driven exits, the countries that pursued informal inflation targeting during the 1990s—Chile, Colombia, and Peru—managed to achieve gradual transitions to more formal inflation-targeting regimes without experiencing sharp volatility in exchange rates or inflation.

These financial crises were generally associated with sharp declines in activity, with the impact often being exacerbated by belated attempts to counteract market pressures made in the period immediately before the crisis. Examples are Mexico’s issuance of *Tesobonos* in 1994 and Argentina’s forced debt restructuring in 2000–2001. What is perhaps more surprising is that the financial volatility accompanying these crises did not presage a quick return to the triple-digit inflation rates of the 1980s. In Mexico, for instance, inflation averaged 50 percent in the 12 months following the collapse of the exchange rate at the end of 1994 and then decelerated steadily back to single-digit levels in the context of a floating exchange rate regime and an announced objective for inflation.<sup>108</sup> Formal inflation targeting was introduced in 2000, with the target gradually being lowered to 3 percent in 2003.

Brazil’s experience with abandoning an inflexible exchange rate anchor in 1999 is another striking break from the region’s past experience of a return to hyperinflation. Despite depreciation in the *real* of almost 60 percent through 1999, inflation averaged under 10 percent that year and remained in single digits until late 2002.<sup>109</sup> In Argentina, in spite of a plunge in the exchange rate to about one-third of its pre-crisis value in 2002, inflation peaked at only about 40 percent.

## Lessons, Policy Responses, and Challenges

It seems, then, that the underlying dynamics of inflation in the region were altered by the experience of

strategy. Their evaluation period, however, extends only three years after the beginning of the disinflation. Thus, the stabilizations in Argentina (1991), Mexico (1989), Uruguay (1992), and Ecuador (1994) are judged to have been successful, even though they eventually ended in crisis.

<sup>108</sup>See Berg and others (2003) for a review of monetary regimes following financial crises, including Mexico (1994), Brazil (1999), and Ecuador (1999). The Mexican experience is described in more detail in Carstens and Werner (1999).

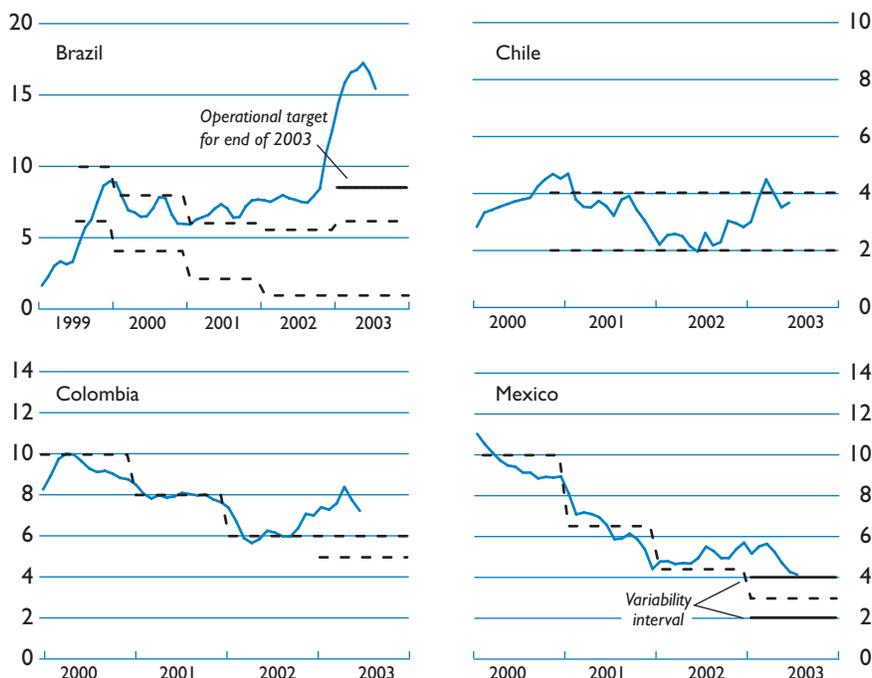
<sup>109</sup>See Belaisch (2003) for a discussion of why inflation pass-through may have been low in Brazil during this episode.

the 1990s. Inflation expectations appear to have become better anchored; and, in a related development, the pass-through of exchange rate changes to inflation has declined. These developments provide support for the view that exchange rate-based stabilization plans, while not in themselves sustainable in the context of the structures of these economies and other policies, set the stage for establishing the credibility of sustained low inflation in the region. Much credit goes to the progressive introduction of more flexible policy responses in the region that have sustained low inflation despite the market pressures and financial crises of recent years. In many countries, the inflation-targeting approach has provided the basic framework underlying these responses and, in most cases, the greater constitutional or de facto autonomy of central banks has been fundamental in providing credibility for the commitment to low inflation.

The recent experience with inflation targeting in Latin American countries—including Brazil, Chile, Colombia, Mexico, and Peru—has been promising.<sup>110</sup> As shown in Figure 4.5, inflation has generally been kept in line with targets in these countries:

- Mexico’s experience with a flexible exchange rate and inflation targeting is discussed in detail in Cuevas and Werner (2003). They conclude that growth in trade and foreign investment has not been undermined by exchange rate flexibility, although it has had the desirable effect of reducing informal dollarization of corporate liabilities. At the same time, movements in the nominal exchange rate have been important in allowing adjustments to changing competitiveness without abrupt internal adjustments. Monetary policy has been used flexibly to provide countercyclical support for activity in times of internal and external weakness.
- In Brazil, the relatively new inflation-targeting regime (adopted in 1999) was severely tested in the context of the political transition in 2002–2003, and associated market pressures and shocks. The regime has worked well to guide expectations, minimize slippages from original targets, and bring inflation rapidly down by the end of 2003, thereby enabling policy-determined interest rates in Brazil to return relatively quickly to levels below those prevailing before the crisis in market pressures occurred in 2002.
- These generally favorable experiences under inflation targeting point to the viability of monetary policy strategies that focus on the ultimate objec-

<sup>110</sup>About twenty countries worldwide have adopted inflation-targeting regimes, demonstrating a trend that is likely to continue. Argentina is also preparing to implement inflation targeting.

**Figure 4.5. Inflation Targeting in Latin America***(12-month percentage change in CPI)*

Source: National authorities.

Notes: CPI denotes the consumer price index. The solid lines indicate inflation outcomes, and the dotted lines indicate inflation targets.

tive of keeping inflation low while allowing exchange rates to be determined by market forces—an outcome that was not evident when the initial stabilization plans were introduced in the late 1980s and early 1990s.<sup>111</sup> These approaches, supported by growing policy credibility, have also allowed monetary policy to play a more active countercyclical role in recent years.<sup>112</sup>

It is important to recognize that the inflation-targeting approach is still evolving in Latin America, even in countries where it has operated for some time, and that lessons are still being learned from its implementation. Thus, there are still challenges to

ensuring that the approach becomes entrenched. Meeting these will require efforts extending well beyond countries' central banks. As is well known, full-fledged inflation targeting is based on several important pillars, many of which are more challenging for emerging market countries—including those in Latin America—to construct than for the industrial countries in which the approach originated. Among the enabling conditions for the approach are the absence of fiscal dominance and the presence of a well-established macroeconomic framework, policy instrument independence, and a sound and developed financial system. In addition, countries in Latin America are generally more vulnerable to shocks than their industrial country counterparts and may face more difficult trade-offs between output and inflation—especially in deciding upon the time frame within which to adjust to shocks—both of which add to the challenges they face in implementing inflation targeting. Although inflation targeting has generally been conceived in the context of a flexible exchange rate regime, recent thinking suggests that it can still

<sup>111</sup>Ho and McCauley (2003) analyze how exchange rate movements have been incorporated in inflation-targeting frameworks in emerging market economies. Other recent analyses of inflation targeting and exchange rate policy in emerging markets include Schaefer, Stone, and Zelmer (2000); Williamson (2000); Rojas-Suarez (2003); and Goldstein (2002).

<sup>112</sup>Ortiz (2002) discusses the recent experiences with countercyclical monetary policy in Mexico and Chile.

play a role in countries that are unwilling to let the exchange rate float freely.<sup>113</sup>

Despite these concerns, it is important to note that most countries that have adopted inflation targeting have been able to phase in—sometimes over an extended period—the conditions needed for effective, full-fledged inflation targeting.<sup>114</sup> For example, among industrial countries, the Bank of England adopted inflation targeting well before gaining instrument independence. Most central banks have gradually improved their policy transparency and the sophistication and dissemination of their inflation forecasts. Indeed, a country is more likely to put in place the enabling conditions—which are needed in any case for sound monetary policy—once it has adopted inflation targeting, so there seems to be an important, mutually reinforcing process involved.

Thus, countries in Latin America are making steady progress in creating the conditions necessary for full-fledged inflation targeting. Given their countries' history of higher and more variable rates of inflation, and concern about their greater vulnerability to monetization of government debt, policymakers in Latin America have been working toward formal institutional frameworks that extend central bank autonomy and restrict or prohibit central bank financing of government deficits. Many central banks are also enhancing their analytical capacities and making their operations and decision-making processes more transparent. For example, some central bank inflation reports now feature greater emphasis on forward-looking analyses of inflation (in Colombia and Argentina, among others). Carrying these efforts to completion is an important challenge for the region, especially in ensuring that central bank laws clearly assign monetary responsibility to senior bank officials, and provide central banks with appropriate objectives, incentives for good performance, and operational independence.

Nevertheless, conditions in emerging market countries—including those in Latin America—continue to pose special challenges for ensuring that full-fledged inflation targeting becomes entrenched. First, there may be considerable pressure to suspend inflation targets and resist bringing inflation down, particularly when growth is weak. Second, continued fiscal dominance still creates a risk, although, as explained in Section III, countries in the region have renewed

their commitment to establishing stronger fiscal institutions that would keep fiscal policy in check. Third, a high degree of informal dollarization is also potentially a problem, notably because it might induce central banks to try to prevent sharp exchange rate fluctuations that could undermine adherence to the inflation objective. Fourth, even in countries without high dollarization, central banks may be sensitive to movements in the exchange rate, making it more difficult to establish and maintain the credibility of the approach. To some extent, these dilemmas can be addressed by recognizing that inflation targeting still allows policymakers some room to consider short-term trade-offs with other objectives and deciding upon the extent of flexibility to accommodate within the approach (i.e., to avoid being “inflation nutters” as described by Mervyn King).

In concluding this section, there is much reason for optimism about the recent transition in Latin America to more robust approaches to sustaining low inflation. The experience already gained has shown that inflation targeting, combined with exchange rate flexibility, presents a viable and robust monetary regime for countries in the region. The durability of the “constrained discretion” implied by these inflation-targeting regimes remains to be fully tested, however, given their relatively short histories. Successful implementation also requires strong institutional autonomy and capacities of the sort that the region's many central banks are striving to put in place. The IMF is closely engaged in helping its member countries with the development of these new institutional structures.

## References

- Agosin, Manuel R., and Ricardo Ffrench-Davis, 2001, “Managing Capital Flows in Chile,” in *Short-Term Capital Flows and Economic Crises*, ed. by Stephany Griffith-Jones, Manuel F. Montes, and Anwar Nasution (New York: Oxford University Press).
- Almeida, Alvaro, and Charles Goodhart, 1998, “Does the Adoption of Inflation Targets Affect Central Bank Behaviour?” *Banca Nazionale del Lavoro Quarterly Review*, Vol. 51 (March), pp. 9–107.
- Belaisch, Agnès, 2003, “Exchange Rate Pass-Through in Brazil,” IMF Working Paper 03/141 (Washington: International Monetary Fund).
- Berg, Andrew, Eduardo Borensztein, and Catherine Pattillo, 1999, *Anticipating Balance of Payments Crises: The Role of Early Warning Systems*, IMF Occasional Paper No. 186 (Washington: International Monetary Fund).
- Berg, Andrew, Christopher J. Jarvis, Mark R. Stone, and Alessandro Zanello, 2003, “Reestablishing Credible Nominal Anchors After a Financial Crisis: A Review of Recent Experience,” IMF Working Paper 03/76 (Washington: International Monetary Fund).

<sup>113</sup>Truman (2003).

<sup>114</sup>See Mishkin (2000); Mishkin and Schmidt-Hebbel (2001); and Fraga, Goldfajn, and Minella (2003) for comprehensive assessments of the conditions and unresolved issues regarding the implementation of inflation targeting, especially of the implications for emerging market countries. Corbo and Schmidt-Hebbel (2001) and Corbo (2002) present additional material on the Latin American experience.

- Berg, Andrew, and Catherine Pattillo, 1999, "Predicting Currency Crises: The Indicators Approach and an Alternative," *Journal of International Money and Finance*, Vol. 18 (August), pp. 561–86.
- Bernanke, Ben S., Thomas Laubach, Frederic S. Mishkin, and Adam Posen, 1999, *Inflation Targeting: Lessons From the International Experience* (Princeton, New Jersey: Princeton University Press).
- Bubula, Andrea, and Inci Ötker-Robe, 2002, "The Evolution of Exchange Rate Regimes Since 1990: Evidence from De Facto Policies," IMF Working Paper 02/155 (Washington: International Monetary Fund).
- Burstein, Ariel T., João C. Neves, and Sergio Rebelo, 2003, "Distribution Costs and Real Exchange Rate Dynamics During Exchange Rate-Based Stabilizations," *Journal of Monetary Economics*, Vol. 50, No. 6, pp. 1189–214.
- Cagan, Philip, 1956, "The Monetary Dynamics of Hyperinflation," in *Studies in the Quantity Theory of Money*, ed. by Milton Friedman (Chicago: University of Chicago Press), pp. 25–117.
- Calderón, César, and Klaus Schmidt-Hebbel, 2003, "Learning the Hard Way: Ten Lessons for Latin America's Turmoil" (unpublished; Santiago, Chile: Central Bank of Chile).
- Calvo, Guillermo A., 1986, "Temporary Stabilization: Predetermined Exchange Rates," *Journal of Political Economy*, Vol. 94 (December), pp. 1319–29.
- , and Carmen Reinhart, 2000, "Fear of Floating," NBER Working Paper No. 7993 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Calvo, Guillermo A., and Carlos Végh, 1993, "Exchange Rate-Based Stabilization Under Imperfect Credibility," in *Open Economy Macroeconomics*, ed. by Helmut Frisch and Andreas Wörgötter (London: Macmillan), pp. 3–28.
- , 1999, "Inflation Stabilization and Balance of Payments Crises in Developing Countries," in *Handbook of Macroeconomics*, ed. by John Taylor and Michael Woodford (Amsterdam: North-Holland), pp. 1531–614.
- Cárdenas, Mauricio, and Felipe Barrera, 1997, "On the Effectiveness of Capital Controls: The Experience of Colombia During the 1990s," *Journal of Development Economics*, Vol. 54 (October), pp. 27–57.
- Cárdenas, Mauricio, and Roberto Steiner, 2000, "Private Capital Flows in Colombia," in *Capital Flows, Capital Controls and Currency Crises: Latin America in the 1990s*, ed. by Felipe Larraín (Ann Arbor, Michigan: University of Michigan Press).
- Carstens, Agustín, and Alejandro Werner, 1999, "Mexico's Monetary Policy Framework under a Floating Exchange Rate Regime," Serie Documento de Investigación No. 9905 (Mexico City: Banco de México).
- Catão, Luis, and Marco E. Terrones, 2003, "Fiscal Deficits and Inflation," IMF Working Paper 03/65 (Washington: International Monetary Fund).
- Celasun, Oya, 2003, "Sticky Inflation and the Real Effects of Exchange Rate-Based Stabilization," IMF Working Paper 03/151 (Washington: International Monetary Fund).
- Corbo, Vittorio, 2000, "Monetary Policy in Latin America in the 90s," Central Bank of Chile Working Paper No. 78 (Santiago, Chile: Central Bank of Chile).
- , 2002, "Monetary Policy in Latin America in the 90s," in *Monetary Policy and Transmissions Mechanisms*, ed. by Norman Loayza and Klaus Schmidt-Hebbel (Santiago, Chile: Central Bank of Chile).
- , and Klaus Schmidt-Hebbel, 2001, "Inflation Targeting in Latin America," Central Bank of Chile Working Paper No. 105 (Santiago, Chile: Central Bank of Chile).
- Cuevas, Alfredo, and Alejandro Werner, 2003, "Mexico's Experience with a Flexible Exchange Rate Regime," *Management International*, Vol. 8 (Autumn), pp. 29–49.
- De Gregorio, José, Sebastian Edwards, and Rodrigo O. Valdés, 2000, "Controls on Capital Inflows: Do They Work?" *Journal of Development Economics*, Vol. 63 (October), pp. 59–83.
- Edwards, Sebastian, 1998, "Exchange Rate Anchors and Inflation: A Political Economy Approach," in *Positive Political Economy: Theory and Evidence*, ed. by Sylvester Eijffinger and Harry Huizinga (New York: Cambridge University Press).
- , 2000, "Twenty-Five Years of Stabilization Programs in Latin America: The Exchange Rate Connection" paper presented at the conference celebrating the Banco de México's seventy-fifth anniversary, Mexico City, November 14–15.
- , and Miguel Savastano, 1999, "Exchange Rates in Emerging Economies: What Do We Know and What Do We Need to Know?" NBER Working Paper No. 7228 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Eichengreen, Barry, and Paul R. Masson, 1998, *Exit Strategies: Policy Options for Countries Seeking Greater Exchange Rate Flexibility*, IMF Occasional Paper No. 168 (Washington: International Monetary Fund).
- Espinosa-Vega, Marco A., Bruce Smith, and Chong K. Yip, 2000, "Barriers to International Capital Flows: When, Why, How Big, and for Whom?" Federal Reserve Bank of Atlanta Working Paper No. 2000-16 (Atlanta).
- Fischer, Stanley, Ratna Sahay, and Carlos Végh, 2002, "Modern Hyper- and High Inflation," IMF Working Paper No. 02/197 (Washington: International Monetary Fund).
- Fraga, Arminio, Ilan Goldfajn, and Andre Minella, 2003, "Inflation Targeting in Emerging Market Economies," NBER Working Paper No. 10019 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Frenkel, J.A., 2003, "Experience of and Lessons from Exchange Rate Regimes in Emerging Economies," background paper for *Study on Monetary and Financial Cooperation in East Asia* (McMillan Press).
- Ghosh, Atish, Anne-Marie Gulde, Jonathan Ostry, and Holger Wolf, 1997, "Does the Nominal Exchange Rate Regime Matter?" NBER Working Paper No. 5874 (Cambridge, Massachusetts: National Bureau of Economic Research).

- Goldstein, Morris, 2002, "Managed Floating Plus," Policy Analyses in International Economics No. 66 (Washington: Institute for International Economics).
- Gould, D., 1996, "Exchange Rate- vs. Monetary-Based Stabilization: Recession Now vs. Recession Later?" (unpublished; Dallas: Federal Reserve Bank of Dallas).
- Gutiérrez, Eva, 2003, "Inflation Performance and Constitutional Central Bank Independence: Evidence From Latin America and the Caribbean," IMF Working Paper 03/53 (Washington: International Monetary Fund, March).
- Hamann, A. Javier, 2001, "Exchange Rate-Based Stabilization: A Critical Look at the Stylized Facts," *Staff Papers*, International Monetary Fund, Vol. 48, No. 1, pp. 111–37.
- , and Alessandro Prati, 2002, "Why Do Many Disinflation Fail? The Importance of Luck, Timing, and Political Institutions," IMF Working Paper 02/228 (Washington: International Monetary Fund).
- Ho, Corinne, and Robert McCauley, 2003, "Living with Flexible Exchange Rates: Issues and Recent Experience in Inflation Targeting Emerging Market Economies," BIS Working Paper No. 130 (Basel: Bank for International Settlements).
- Jácome, Luis I., 2001, "Legal Central Bank Independence and Inflation in Latin America During the 1990s," IMF Working Paper 01/212 (Washington: International Monetary Fund).
- Kiguel, Miguel, and Nissan Liviatan, 1992, "The Business Cycle Associated with Exchange Rate-Based Stabilization," *World Bank Economic Review*, Vol. 6 (May), pp. 279–305.
- Kimbrough, K.P., 1986, "The Optimum Quantity of Money Rule in the Theory of Public Finance," *Journal of Monetary Economics*, Vol. 18 (November), pp. 277–84.
- Le Fort, Guillermo R., and Carlos Budnevich, 1996, "Capital Account Regulation and Macroeconomic Policy: Two Latin Experiences," Jerome Levy Economics Institute Working Paper No. 162 (Annandale-on-Hudson, New York: Bard College).
- Le Fort, Guillermo R., and Sergio Lehmann, 2003, "The Unremunerated Reserve Requirement and Net Capital Flows: Chile in the 1990s," *ECLAC Review*, Economic Commission for Latin America and the Caribbean, Vol. 81 (December).
- Levy Yeyati, Eduardo, and Federico Sturzenegger, 2002a, "Classifying Exchange Rate Regimes: Deeds vs. Words" (unpublished; Buenos Aires: Universidad Torcuato Di Tella).
- , 2002b, "To Float or to Trail: Evidence on the Impact of Exchange Rate Regimes" (unpublished; Buenos Aires: Universidad Torcuato di Tella). Also available on the Web at <http://www.utdt.edu/~ely/Marzo2002.pdf>.
- Martinez, Lorenzo, and Alejandro Werner, 2002, "The Exchange Rate Regime and the Currency Composition of Corporate Debt: The Mexican Experience," *Journal of Development Economics*, Vol. 69, No. 2, pp. 315–34.
- Mendoza, Enrique G., and Martín Uribe, 1999, "Devaluation Risk and the Syndrome of Exchange Rate-Based Stabilizations," NBER Working Paper No. 7014 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Mishkin, Frederic, 2000, "Inflation Targeting in Emerging Market Countries," NBER Working Paper No. 7618 (Cambridge, Massachusetts: National Bureau of Economic Research).
- , and Miguel Savastano, 2000, "Monetary Policy Strategies for Latin America," NBER Working Paper No. 7617 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Mishkin, Frederic, and Klaus Schmidt-Hebbel, 2001, "One Decade of Inflation Targeting in the World: What Do We Know and What Do We Need to Know?" NBER Working Paper No. 8397 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Nadal-De Simone, Francisco, and Piritta Sorsa, 1999, "A Review of Capital Account Restrictions in Chile in the 1990s," IMF Working Paper 99/52 (Washington: International Monetary Fund).
- Ocampo, José A., and Camilo Tovar, 2003, "Managing the Capital Account: Colombia's Experience with Price-Based Controls on Capital Inflows," *ECLAC Review (Revista de la CEPAL)*, No. 81 (December), pp. 47–75.
- Ortíz, Guillermo, 2002, "Monetary Policy in a Changing Economic Environment: The Latin American Experience," paper presented at the Federal Reserve Bank of Kansas City's symposium on Rethinking Stabilization Policy, Jackson Hole, Wyoming, August 29–31.
- Pazos, Felipe, 1972, *Chronic Inflation in Latin America* (New York: Praeger).
- Radelet, Steven, and Jeffrey Sachs, 1998, "The Onset of the East Asian Financial Crisis," NBER Working Paper No. 6680 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Rebelo, Sergio, and Carlos A. Végh, 1995, "Real Effects of Exchange Rate-Based Stabilization: An Analysis of Competing Theories," in *Macroeconomic Annual*, ed. by Ben S. Bernanke and Julio Rotemberg (Cambridge, Massachusetts: National Bureau of Economic Research), pp. 125–74.
- Reinhart, Carmen, and Kenneth Rogoff, 2002, "The Modern History of Exchange Rate Arrangements: A Reinterpretation," NBER Working Paper No. 8963 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Reinhart, Carmen, and Carlos A. Végh, 1995, "Nominal Interest Rates, Consumption Booms, and Lack of Credibility: A Quantitative Investigation," *Journal of Development Economics*, Vol. 46 (April), pp. 357–78.
- Rodriguez, Carlos A., 1982, "The Argentine Stabilization Plan of December 20th," *World Development*, Vol. 10 (September), pp. 801–11.
- Rojas-Suarez, Liliana, 2003, "Monetary Policy and Exchange Rates: Guiding Principles for a Sustainable Regime," in *After the Washington Consensus*, ed. by Pedro-Pablo Kuczynski and John Williamson (Washington: Institute for International Economics), pp. 123–56.
- Sargent, Thomas J., and Neil Wallace, 1981, "Some Unpleasant Monetarist Arithmetic," *Federal Reserve Bank of Minneapolis Quarterly Review*, Vol. 5 (Fall), pp. 1–17.

- Schaecter, Andrea, Mark R. Stone, and Mark Zelmer, 2000, *Adopting Inflation Targeting: Practical Issues for Emerging Market Countries*, IMF Occasional Paper No. 202 (Washington: International Monetary Fund).
- Tornell, Aaron, and Andrés Velasco, 1995, "Fiscal Discipline and the Choice of Exchange Rate Regime," *European Economic Review*, Vol. 39 (April), pp. 759–70.
- , 1998, "Fiscal Discipline and the Choice of a Nominal Anchor in Stabilization," *Journal of International Economics*, Vol. 46 (October), pp. 1–30.
- Truman, Edwin, 2003, *Inflation Targeting in the World Economy* (Washington: Institute for International Economics).
- Végh, Carlos A., 1992, "Stopping High Inflation: An Analytical Overview," *Staff Papers*, International Monetary Fund, Vol. 39 (September), pp. 626–95.
- Williamson, John, 2000, "Exchange Rate Regimes for Emerging Markets: Reviving the Intermediate Option," *Policy Analyses in International Economics* No. 60 (Washington: Institute for International Economics).