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Currency Crises and Collapses

It is not speed that kills, it is the sudden stop.
Bankers' adage

THE COLLAPSE of the Mexican peso in late 1994 remains a topic of controversy. To some observers it appeared that the bungling of a new administration had brought about a disaster where there was no problem and every reason to expect stability and prosperity. In fact, some even argue that the damage could be undone by raising the peso to its initial level. The notion that the devaluation was a blunder or worse was shared by the *Wall Street Journal*'s editorial board, some members of the U.S. Congress, and other advocates of hard money, including exposed investors. In the *Financial Times* Jude Wanniski referred to "currency devaluationists," and "currency debauchery" at the hands of Lawrence Summers and Stanley Fischer.[1]

To others, the ultimate collapse seemed inevitable and the only issue was one of timing. In this view currency alignment—devaluation or floating—was long overdue and had it been accomplished earlier, much

We are indebted to our discussants on the Brookings Panel, and to Stanley Fischer and Robert Barro, for helpful comments and suggestions.

1. On raising the peso, see David Malpass, "The Mexican Peso: 3.5 or Bust," *Wall Street Journal,* January 11, 1995, p. A14. On the view that the devaluation was misguided, see Robert L. Bartley, "Mexico: Suffering the Conventional Wisdom," *Wall Street Journal,* February 8, 1995, p. A14; Paul A. Gigot, "Potomac Watch: Piñata Politics, or Who Lost Mexico?" *Wall Street Journal,* February 24, 1995, p. A10; and Jude Wanninski, "At Odds with the Economic 'Scientists'," *Financial Times,* April 11, 1995.

of the damage could have been avoided. The protracted lack of growth, other than for election year spending, was the prime evidence of unsustainable overvaluation.[2]

To virtually any observer, the sheer vehemence of the collapse and the extent of disruption in capital markets remain a surprise.[3] This paper revisits the peso question by looking at several instances of currency collapse and identifying their common features, in particular, the way in which vulnerabilities interacted and cumulated. The paper suggests that a situation of overvaluation is deeply unstable because, in a deregulated financial environment, it creates mechanisms that amplify the excesses and exacerbate the subsequent financial distress and decline in real activity. This is illustrated by the examples of Mexico in 1982 and 1994, Chile in the early 1980s, and Finland in 1992. The Chilean situation was so much a dry run of what happened in Mexico in 1994 that it is difficult to understand why policymakers and financial markets refused to accept the relevance of the precedent and its implications. If anything, the sustainability of such policies was more plausible in Chile, where there was initially a boom, than in Mexico, which did not experience growth. The paper also looks at collapses within the European Monetary System (EMS) by way of comparison.

The paper emphasizes four points. First, that the real exchange rate is a key relative price. When it becomes too high it hurts growth, endangers financial stability, and ultimately comes crashing down. Second, that the real exchange rate is in many, though not all, instances a policy variable; this represents a departure from a large body of thought. Third, that an overly accommodating capital market aggravates the potential for mismanaging the exchange rate and amplifies the ultimate costs of a collapse. Disagreement about the exchange rate at is a key aspect of why policymakers and capital markets produce an overvalued rate. Fourth, that inflation has been overemphasized as a policy target. Given the great difficulty in bringing down inflation fully without protracted recession, a regime of moderate but relatively stable inflation is an acceptable, if imperfect, interim solution.

The paper emphasizes the inertia of the level and rate of change of

2. See Dornbusch and Werner (1994).

3. For alternative views on the Mexican collapse, see Calvo and Mendoza (1995), Atkeson and Ríos-Rull (1995); Leiderman and Thorne (1995); Sachs, Tornell, and Velasco (1995); and Lustig (1995).

prices as a key aspect of real exchange rate behavior. Because the real exchange rate is sticky downward, policymakers are ill-advised to let it rise in the first place. At the outset of any stabilization, the nominal exchange rate should play a key role, more so if an economy is coming out of extreme inflation.[4] But soon that strategy must give way to a more flexible rate regime that does not risk cumulative overvaluation.

Going beyond autopsy, the paper looks at the situations in Brazil and Argentina to consider whether a somewhat overvalued currency can be brought down without crisis and, in particular, whether and how nominal devaluation can be effective. The paper also compares the growth performance of Chile and Mexico. It concludes that Mexico's neglect of a competitive real exchange rate is an important factor in its relatively poorer performance.

Four Similar Crises

This section reviews four currency collapses that share common features: an overvaluation; large external deficits; lending up to the last minute; and a deep recession in the aftermath, amplified by serious problems in the financial system. The aim of the comparison is to draw out common factors that sustain a protracted overvaluation and that lead to the ultimate collapse.

The central contention of this section is that in trying to fight inflation, the authorities rely on a nominal exchange rate anchor. This does, in fact, help to contain inflation, but it does so at the cost of a cumulative real appreciation. The real appreciation hurts growth and leads to a buildup of a large external deficit. The financial sector is drawn into the process because interest rates in local currency rise to reflect the diminishing public confidence in the viability of the policy. Borrowing abroad to lend at home, or just to fund firms, becomes common.

Over time the situation becomes unsustainable, but that does not translate into an immediate crisis or a need to take action instantly. On the contrary, it is diffuse enough for policymakers to entertain the belief that the strategy can work, and for skeptics to believe that it will

4. See the discussion in Dornbusch and Fischer (1993). For discussions of exchange rate-based stabilizations, see Calvo and Végh (1994), Bruno and others (1988), Kiguel and Liviatan (1992), Rebelo and Végh (1995), and Edwards (1993).

ultimately fail, although possibly not for several years. The belief that it may take years for a problem to become acute removes the urgency for both financial markets and policymakers.

The overvaluation situation is sufficiently diffuse for different participants to entertain very different views as to the timing and modalities of its solution. One scenario is that the currency peg holds, and good news comes to offer relief and draw attention away from (and prospectively resolve) trade and growth problems—the North American Free Trade Agreement, in the case of Mexico. But sometimes other developments make it increasingly difficult to wait for good news. Instead, the arrival of bad news (in the form of the international environment or politics, for example) forces a collapse, and is then routinely faulted for the failure of the strategy: "If it had not been for . . . ." This scenario is absurd since, in the words of Herbert Stein, anything that is unsustainable will ultimately end. Only an unending string of good news would avoid the eventual abandonment or collapse of the strategy. An exchange rate strategy that is only viable with good news is a bad strategy.

Another possibility is a game of reputation in which the firmness of the authorities increasingly gains credibility and translates into rapid disinflation, even deflation, to the point where competitiveness over time is restored.

The exact details of the story of overvaluation and crisis differ from episode to episode, but the broad pattern is very much the same. A few cases follow, to draw attention to the parallels.[5]

Chile, 1978–82

Following the coup of 1973, Chile's military government introduced many of the reforms now called the Washington consensus: opening trade, balancing the budget, privatization, and of course, stabilizing the high inflation.[6] By 1978 much of the work had been done, and

5. Such parallels rarely convince policymakers who are locked into their own credibility strategies. Mexican policymakers were perfectly well aware of the case of Chile, but that did not stop them from replicating the situation.

6. See Edwards and Edwards (1987) for a comprehensive study of the Chilean experience, and also the essays in Bosworth, Dornbusch, and Labán (1994) and Dornbusch (1986a).

Euromoney referred to the economic change as "spectacular."[7] But it was not complete without full success on the issue of disinflation.

In June 1979, after a year and a half of the *tablita* exchange rate policy, the government addressed the inflation issue with an even more determined program of exchange rate pegging. Appealing to the law of one price, it contended that inflation was kept alive by a cycle of depreciation and inflation that, in turn, was validated by another round of depreciation. Cutting through that cycle required an end of depreciation. Following this logic, the exchange rate was fixed at 39 pesos to the U.S. dollar and kept at that level for three years, even though the rate of inflation was initially above 30 percent.

Over time inflation declined. Yet the fixed exchange rate and relatively moderate world inflation meant a steady real appreciation. The opening of trade, combined with the real appreciation, caused a large deterioration in the trade balance. By 1981 the trade deficit had reached 8.2 percent of GDP, and the current account deficit stood at 14.5 percent. These deficits were easily financed. This was the period when oil exporters' surpluses were being recycled; thus Chile not only made a comeback in the world capital market following the Allende years, but also found ready access to steady financing for large and growing external deficits. Table 1 provides information on some of Chile's principal macroeconomic indicators.

We focus on the exchange rate policy from June 1978 to June 1982. The real exchange rate in August 1981 was 59.5 percent above its average over the period 1970–80, as shown in figure 1 (higher index value is appreciation).[8] Relative to those of the United States, wholesale prices increased by 21 percent between the first quarter of 1978 and the crash of the exchange rate regime in 1982, even though the wholesale price index (WPI) had already fallen during 1981.

The Chilean economic picture was very diffuse. In the late 1970s, most people's view was colored by the very positive developments that had taken place.[9] The impression of an economic miracle was not so farfetched because, against the background of chaos and hyperinflation

7. "Chile: The Move to Market Economy," *Euromoney*, July 1978.

8. Using the J. P. Morgan effective exchange rate based on nonfood wholesale prices, in which an increase in the index represents exchange rate appreciation.

9. See, for example, "The Fight Goes On: Survey of Chile," *Economist*, February 2, 1980, pp. 5–26.

Table 1. Chile: Macroeconomic Indicators, 1978–82

Units as indicated

Indicator	*1978*	*1979*	*1980*	*1981*	*1982*
GDP growth[a]	8.2	8.3	7.8	5.5	−14.1
Inflation (CPI)[b]	30.3	38.9	31.2	9.5	20.7
Inflation (WPI)[c]	43.2	56.3	31.9	−4.8	37.5
Depreciation[d]	47.0	17.6	4.7	0.0	30.5
Current account[e]	−1.1	−1.2	−2.0	−4.7	−2.3
Real exchange rate[f]	112.9	126.0	154.0	176.2	158.6
Real interest rate[g]	35.7	6.7	15.8	59.2	24.8
Terms of trade	122	141	128	111	102
Debt[e]	7.4	9.4	12.1	15.7	17.3

Source: Data for growth, CPI inflation, depreciation, and the real interest rate are from *International Financial Statistics;* for WPI inflation, the current account balance, and debt, from Banco Central de Chile (1989); and for terms of trade, from the World Bank's *World Tables*. Data for the real exchange rate are obtained directly from the J. P. Morgan currency index database.

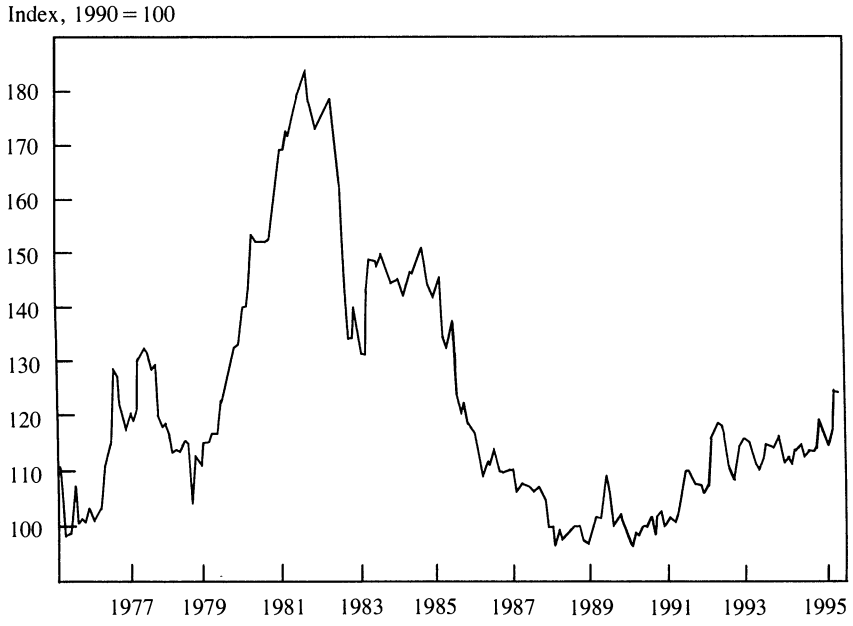
a. Percent per year.
b. December-to-December percentage change in CPI.
c. December-to-December percentage change in wholesale prices of national goods.
d. December-to-December percentage change in national currency divided by U.S. dollars.
e. Billions of U.S. dollars.
f. Effective exchange rate index based on nonfood wholesale prices, 1990 = 100.
g. Lending rate less WPI inflation.

in the early 1970s, Chile had accomplished the transition to a serious public finance, trade reform, deregulation, and privatization, as well as significant progress in disinflation. More important, Chile had entered a protracted boom. Emerging from the deep recession of 1975, the growth rate averaged 7.4 percent from 1977 to 1981. Because economists and financial observers piously believe that reform and stabilization must translate into successful growth, and because they feel that what grows is good, the story of Chile's reforms was a positive one.

As table 2 demonstrates, the economic boom and the opening of trade precipitated a large trade deficit that peaked at more than 10 percent of GDP. This trade deficit, in part, reflected a substantial decline in the national saving rate—private saving fell sharply, more than offsetting an increase in public sector saving. In part, it reflected a sharp increase in investment.

Discussion about the exchange rate was focused on the one hand on the sustainability of the external balance, and on the other hand on the operation of wage-price adjustment. The sustainability discussion could not go very far since financing was readily available—this was still period of buildup for the first debt crisis—and Chile's image of successful reform was nothing but positive. The availability of unlimited

Figure 1. Chile: Real Exchange Rate, 1975–95[a]



Source: Data obtained directly from the J. P. Morgan currency index database.
a. Effective exchange rate index based on nonfood wholesale prices.

capital without a significant premium was key to creating an atmosphere of prosperity and removing traditional external constraints to prosperity. Moreover, with investment picking up and the budget in surplus, it was at first quite easy to argue that the external deficit was a private sector deficit and therefore not a problem.

The authorities remained steadfast in their insistence that the way to break inflation was by adhering to a nominal anchor. And indeed, the scheme did work. In December 1980 wholesale price inflation was negative for the first time and, after a brief return to inflation, prices fell every month between October 1981 and February 1982. But the decline was not sufficiently large to restore competitiveness. The sudden emergence of recession at the end of 1981 spelled trouble, and exorbitant real interest rates spread the emerging crisis.

The large real appreciation and the deteriorating external balance raised the question of just how long the exchange rate peg could last. By then, it had begun to affect not only the timing of trade transactions,

Table 2. Chile: Saving, Investment, and Trade, 1978–82

Units as indicated

Indicator	*1978*	*1979*	*1980*	*1981*	*1982*
Saving[a]	12.6	12.4	13.9	8.2	2.1
Investment[a]	14.7	14.9	16.6	18.6	14.6
Budget surplus[a]	1.5	3.3	4.5	0.8	−3.5
Net exports[a]	−3.3	−2.8	−4.2	−10.3	−1.9
Imports[b]					
Consumer goods	0.6	0.9	1.2	1.9	0.9
Capital goods	0.7	0.9	1.0	1.2	0.6
Intermediates	1.8	2.5	2.9	3.2	2.0

Source: Data for saving, investment, exports, and the budget surplus are from Corbo and Fischer (1994); and for imports, from Banco Central de Chile (1989).

a. Percent of GDP.

b. Billions of U.S. dollars.

but also the financial sector. Those who felt that the rate was overvalued and would inevitably be realigned bought durables while they were "on sale" and borrowed in pesos. Those who felt that the rate was sure to stay in place borrowed in dollars and lent in pesos. Thus domestic interest rates started to reflect both the scarcity of capital and the expectation of depreciation. Peso-to-dollar loan rate spreads rose from 25 percent in 1979 to 44.9 percent in January 1982. Finance Minister De Castro claimed in mid-1981: "Having a fixed exchange rate since mid-1979, and having the conditions to keep it that way indefinitely, have given the Chilean economy a great stability. . . . Chile has today one of the most healthy, solid, and dynamic economies that can be found in the world."[10]

Table 3 shows changes in Chile's foreign reserves and external debt. The restoration of access to the international capital market and the high yield on loans, especially in pesos, led banks and firms to borrow offshore in U.S. dollars. Foreign reserves initially increased sharply, along with private sector external debt; then, inevitably, they started to fall off, while debt continued to rise. The period from mid-1981 until June 1982 represents the last phase of the failing program. Output started to fall rapidly (as shown in figure 2), unemployment rose sharply, the trade deficit grew wider, reserves fell, interest rates turned upward, the rhetoric became fiercer, and the skepticism became more pronounced. The peso was devalued by 18 percent in June 1982, and

10. Authors' translation from De Castro (1981).

Table 3. Chile: Foreign Reserves and External Debt

Billions of U.S. dollars

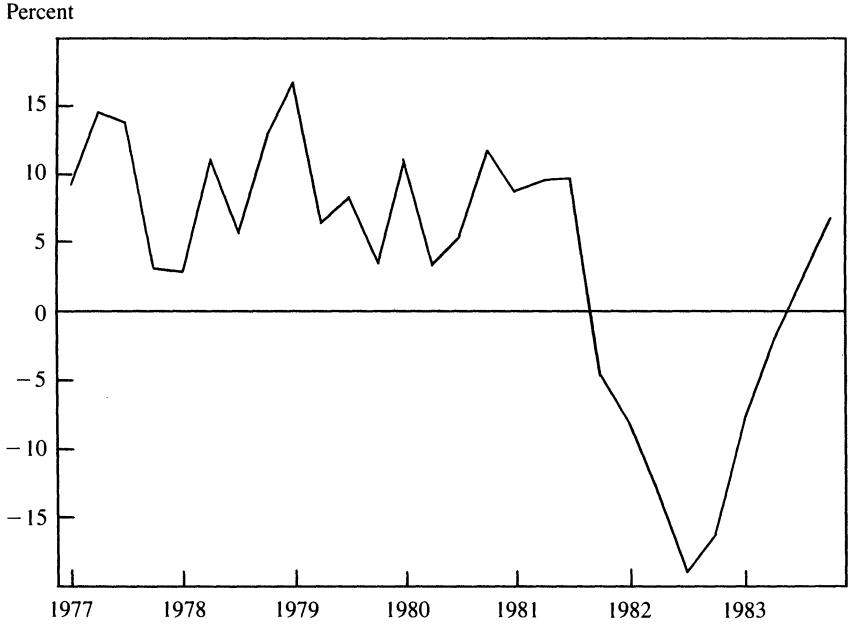
Indicator	*1977*	*1980*	*1982*
Foreign reserves	0.3	4.1	2.6
Public debt	3.5	4.7	5.2
Private debt	1.0	4.6	8.7

Source: Banco Central de Chile (1989).

by much more in the years to come. Part of the reason for this collapse was the deterioration of the external environment. Terms of trade dropped by 20.3 percent between 1980 and 1982, and world interest rates increased sharply. These developments called into question the sustainability of the deficit and led to higher interest rates, and hence a more dramatic fall in output.

The Chilean government argued that the collapse was solely due to

Figure 2. Chile: GDP Growth, 1977–83[a]



Source: Haindl (1986).
a. Calculated as percentage change from four quarters earlier.

the failure of confidence and the adverse external environment. Sebastian Edwards and Alejandra Cox Edwards report the government's insistence that "correctly measured" international inflation was no different from inflation in Chile, and hence no overvaluation process was underway.[11] This was hardly the first time that differences among various price indexes and an insistence on using the "right" one (typically, not the most readily available), and movements in the U.S. dollar relative to other currencies had been invoked to camouflage an overvaluation.

An alternative view justifying the developments in Chile conceded the fact of real appreciation but countered with the fact of a major reform and modernization. By this argument, real appreciation results from capital inflows. Reform and renewed access to capital markets provided both the incentive and the financing for spending in Chile. A real appreciation was the obvious mechanism to effect the transfer. If the market knows best, then real appreciation is a market price development requiring no further comment. That clearly is not always the case: opening trade, for example, necessitates an offsetting real depreciation if full employment is to be maintained.[12]

The government view is patently absurd; all broadly accepted measurements show real appreciation in the case of Chile. The true debate, then, is between the equilibrium model and an indexation-inertia interpretation. From this latter perspective, disinflation was unsuccessful because of explicit indexation. Disinflation is possible only if sufficient recession is marshaled to overcome the tendency for wage and price inflation to persist as a result of overlapping contracts or relative wage effects. This view was out of favor for a while—having ceded to a fully flexible model of pricing—but it has made a comeback. Thus, as backward-looking indexation implied major wage increases, the fixed currency led almost automatically to overvaluation. This indexation arrangement was kept in place for the same length of time as the fixed rate.

The alternative view, emphasizing reform-driven opportunities and, especially, the removal of capital constraints, is not at all absurd, but

11. Edwards and Edwards (1987).

12. See, for example, Dornbusch (1974), which obtains this result in a model with traded and nontraded goods.

it only applies when the economy is strong.[13] It helps to explain spending—why the expansion could last, and why overvaluation did not prompt a decline in demand for domestic goods. It cannot help in understanding what happens when the economy slows down, because with the sudden drop in demand, wages and prices should have collapsed to accommodate the "crowding-in" required to maintain full employment.[14]

The devaluation put an end to the nominal anchor. The sharp deterioration in the external climate, both in the goods and capital markets, and the collapse of the banking system made the adjustment dramatically worse. In 1982 per capita output declined by over 15 percent, and unemployment (including workers in public jobs programs) rose to almost 30 percent. Inflation was back.

Chile returned to miracle performance only very gradually. In hindsight it must have started in 1985–86, after the country had recovered from the initial recession and resolved its banking problems. One cornerstone of the recovery strategy was a highly competitive real exchange rate—in 1985–94 it was fully 40 percent below the level of 1981. The destruction of the financial system (and the associated effects on investment and consumption spending) and the decline in government spending needed an offsetting crowding-in that was delivered by real depreciation. The competitive real exchange rate, combined with reform and restructuring of the economy, set the basis for an average growth rate of 7.0 percent in the period 1986–94.

A particularly interesting feature of Chile's performance in the past decade is the *relative* disregard for inflation. Over the past decade, inflation has averaged 18.7 percent. That has not been an obstacle to growth. Moreover, at no time have policymakers seriously entertained the notion of making inflation the main priority of economic strategy. Today inflation is still at 8 percent, and falling; but fortunately there is no proposal to make that perilous attempt to use exchange rate policy for disinflation to U.S. levels.

13. See Harberger (1985), Edwards (1985), and Morandé (1988).

14. The argument is reinforced by the positive impact of overvaluation on real wages and spending, in the tradition of Carlos Díaz-Alejandro.

Table 4. Mexico: Macroeconomic Indicators, 1978–82

Units as indicated

Indicator	*1978*	*1979*	*1980*	*1981*	*1982*
GDP growth[a]	8.3	9.2	8.3	7.9	−0.6
Inflation[b]	17.5	18.2	26.4	27.9	58.9
Budget surplus[c]	−2.7	−3.3	−3.0	−6.4	−14.9
Current account[d]	−3.2	−5.5	−10.8	−16.1	−6.3
Trade balance[d]	−1.7	−2.8	−3.4	−3.8	6.8

Source: Data for growth and inflation are from *International Financial Statistics;* and for the current account and trade balance, from Banco de México (1995).

a. Percent per year.

b. Annual percentage change in CPI.

c. Percent of GDP.

d. Billions of U.S. dollars.

Mexico, 1978–82

The Mexican crisis of 1982 is notorious because it marked the onset of the 1980s debt crisis.[15] Its significance here is in the emergence of an overvaluation, the persistence and expansion of its consequences, and the ultimate collapse. The year 1982 is notable because, just as the crisis year of 1994, it was an election year.

In the period 1954–75 Mexico maintained a fixed exchange rate as well as full and unrestricted convertibility of its currency. Inflation was moderate and the real exchange rate was stable. But in the runup to the 1976 election, overexpansion led to inflation which, in turn, necessitated a realignment. This policy decisively broke with a tradition of conservative monetary management. It opened the door to an extended period of discretionary management, when recurrent crises were the rule. Financial adaptation in the form of dollarization and capital flight were among the results.

Table 4 shows the economic picture of Mexico during the period 1978–82. The oil price increases of the 1970s put Mexico in a favorable external balance position as an oil exporter and with very strong credentials for international capital market access. Government spending skyrocketed and, high oil revenues notwithstanding, deficits blossomed. Inflation, already in double digits, increased even further. The current account turned sharply downward and became negative.

Where do the sources of the Mexican crisis of 1982 lie? In terms of the external situation, very high interest rates and the world recession

15. See Dornbusch (1986a), Solís and Zedillo (1985), and Zedillo (1985).

Table 5. Mexico: Real Interest Rates and Real Exchange Rates, 1978–83

Units as indicated

Rate	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*
Real interest rate[a]	−1.8	−3.8	−2.1	0.6	−27.6	−10.4
Bilateral real exchange rate[b]	100.3	105.3	114.0	121.7	84.6	77.6
Multilateral real exchange rate[a]	126.8	134.1	146.1	162.5	118.2	110.1

Source: The real interest rate and the bilateral real exchange rate are from *International Financial Statistics;* the multilateral real exchange rate is obtained directly from the J. P. Morgan currency index database.

a. Average cost of funds less WPI inflation.

b. Exchange rate index with respect to the United States based on the WPI, 1990 = 100.

c. Effective exchange rate index based on nonfood wholesale prices, 1990 = 100.

were clearly major negative factors. However, their effects were partly offset by high oil prices. The terms of trade were actually 3.7 percent higher in 1982 than in 1980, although they were below their 1981 peak.

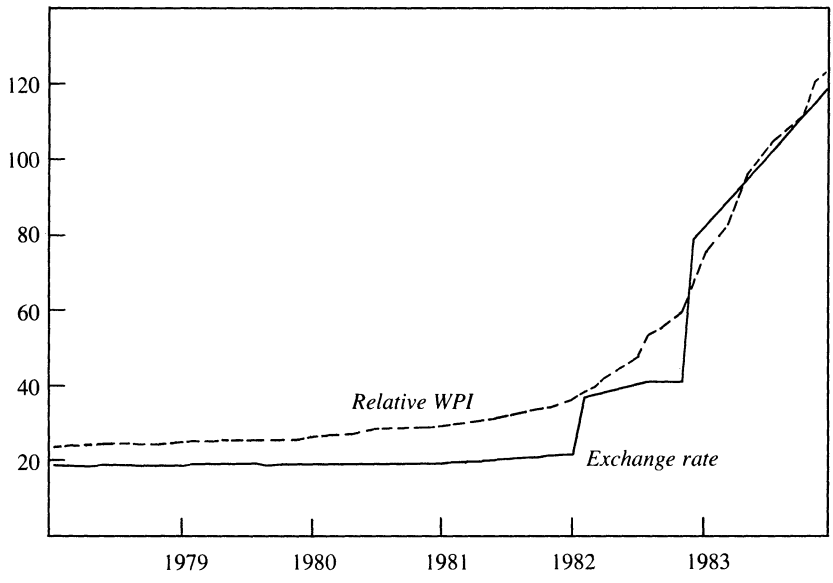
In the domestic context, three facts can be singled out. First, a massive fiscal expansion and an accompanying rise in private spending. The budget deficit increased by 3 percentage points of GDP for the 1982 election alone. Second, as table 5 shows, with repressed capital markets and administered interest rates, real interest rates were negative and thus helped to propel the spending boom. Third, the real exchange rate was allowed to appreciate.

Figure 3 shows the nominal peso-to-dollar exchange rate and the relative wholesale price index. Even though inflation was 20 percent or higher, the nominal exchange rate was held constant from mid-1978 to mid-1980. From mid-1980 until the first alignment in early 1982 the peso gradually depreciated by 16 percent, while the annual inflation rate was nearly 30 percent. As a result the real exchange rate (using wholesale prices relative to those in the United States) appreciated steadily. By the end of 1981 the real exchange rate had appreciated by 37 percent relative to the trough in 1977. The obvious overvaluation, the current account deficit, and the emerging problems of financing all spelled major financial trouble.

Mexico had a convertible currency. In the presence of overvaluation with negative real interest rates, it was natural that asset holders would seek to shift them abroad. And those who did not move their assets offshore shifted to dollar deposits in the Mexican banking system. Estimates of capital flight in the period 1980–82 range from 17.3 billion to 23.4 billion U.S. dollars.[16] At the same time, the dollarization of

16. See Lessard and Williamson (1987).

Figure 3. Mexico: Nominal Exchange Rate and Relative Wholesale Price Index, 1978–83[a]



Source: *International Financial Statistics*.
a. Mexican WPI divided by U.S. WPI.

deposits moved from an average of about 20 percent to more than 40 percent.[17] Clearly a crisis was in the making. The devaluations of early 1982, including an immediate real depreciation of 35 percent, did not go far enough. They worked more to increase financial instability than to resolve what by then was becoming a major financial crisis. As is common in Mexico, particularly in an election year, the government chose to do too little too late.

In the end, everything came together: an election year, uncertainties with respect to economic policies, populist economics in the form of bank nationalizations and capital controls, the impossibility of borrowing on a scale that could finance interest, a debt moratorium resulting from amortization and the trade deficit, and increasing inflation. In a short period Mexico's international status had changed from that of a big and favored borrower to that of a pariah in capital markets. At

17. See Dornbusch (1993).

home, inflation and currency instability became the norm. Default on Mexdollars (dollar-denominated Mexican liabilities) and the prospect of further devaluations promoted capital flight. The first devaluation of 68 percent in February 1982 was ultimately followed, after the election, by the new government's devaluation of almost 100 percent in December, and much more in the following years.

Like Chile's experience in the early 1980s, the Mexican crisis of 1981–82 was also a dry run for the crisis of 1994–95. In both instances, ready access to international capital and the sudden halt of lending formed a precedent. In Chile, the emphasis on nominal anchors and credibility at any price was an important precursor of Mexico's experiences in the 1990s. In the case of Mexico in 1981–82, the mix of election year priorities, fiscal expansion, rapid domestic credit expansion, and overvaluation was a direct preview of what came later.

Finland, 1988–92

The Finnish experience of the late 1980s and early 1990s highlights once more the interaction of easy finance and a credibility-oriented inflation strategy. However, as other episodes have shown, overvaluation by itself is not enough to precipitate the collapse of an exchange rate regime. A financial environment that accommodates large borrowing is one contributory factor. In addition, there need to be certain disturbances that will force an unsustainable situation into an actual collapse.

Even though Finland was not part of the EMS, in the 1980s the country increasingly simulated membership by attempting to peg its currency to the system. The attempt to hold onto this exchange rate at, literally, any price proved tremendously expensive. Table 6 details Finland's economic picture from 1984 to 1992. Overall, the 1980s was a period of economic liberalization and deregulation in Finland. In particular, financial markets that had been severely repressed were opened, both in the domestic sphere and in respect to international borrowing and lending. The financial boom led to increased wealth, higher asset prices, and hence to a spending boom. Strong terms of trade reinforced the feeling of prosperity. At the outset the government did not participate; in fact, through 1990 it ran a budget surplus.

By 1987–89 the boom was underway fully. In the period 1983–88

Table 6. Finland: Macroeconomic Indicators, 1984–92

Units as indicated

Indicator	*1984–87*	*1988*	*1989*	*1990*	*1991*	*1992*
GDP growth[a]	3.2	4.9	5.7	0.0	−7.1	−3.8
Inflation[b]	5.0	5.1	6.6	6.1	4.3	2.9
Budget surplus[c]	2.6	4.1	6.3	5.4	−1.5	−5.8
Interest rate[d]	13.2	10.0	12.6	14.1	13.1	13.3
Real exchange rate[e]	86.5	90.9	96.2	100.0	95.5	83.7

Source: Data for growth and inflation are from *International Financial Statistics;* for the budget surplus and the interest rate, from *OECD Economic Outlook;* and for the real exchange rate, directly from the J. P. Morgan currency index database.

a. Percent per year.
b. Annual percentage change in CPI.
c. Percent of GDP.
d. Three-month Hellibor rate (annual rate).
e. Effective exchange rate index based on nonfood wholesale prices, 1990 = 100.

real household wealth had increased by almost 80 percent. Residential and nonresidential investment grew at rates of 10 and 15 percent, respectively. Real domestic demand was growing at an average of 6.5 percent. By 1989, according to the OECD, the excess of output over potential reached 6.4 percent. The major problem in this boom phase was inflation. Throughout the 1980s Finland, like other European economies, had been trying to achieve disinflation and convergence. From double-digit levels in the early 1980s, inflation in fact came down to only 2.9 percent in 1987. But then, under the impact of the boom, inflation accelerated, and with wage settlements near 10 percent it shot up toward 6 percent in 1988–89.

Against this background, the central bank had been using a currency peg and high interest rates to contain and roll back inflationary pressure. With interest rates of 12 to 14 percent, debt burdens were piling up. Until the end of 1988 that was not a problem because assets were appreciating. But when high interest rates, reinforced by external shocks, squashed demand and spending, a full-blown recession descended.

As table 7 shows, the end of prosperity came very abruptly. The financial boom went into reverse with pervasive debt service problems and interest rate risk from mismatches in the balance sheets of banks. The collapse of Russian trade, a severe decline in the terms of trade, and high real interest rates combined to bring down demand. Moreover, as is common in the aftermath of deregulation, the banking system had overlent, and the resulting credit squeeze further cut into demand. Then

Table 7. Finland: Demand and Unemployment, 1983–92

Units as indicated

Indicator	*1983–88*	*1989*	*1990*	*1991*	*1992*
Real domestic demand[a]	6.5	7.6	−1.3	−9.2	−6.4
Unemployment rate[b]	5.1	3.5	3.5	7.6	13.1

Source: *OECD Economic Outlook.*
a. Annual percentage change.
b. Percent of total labor force.

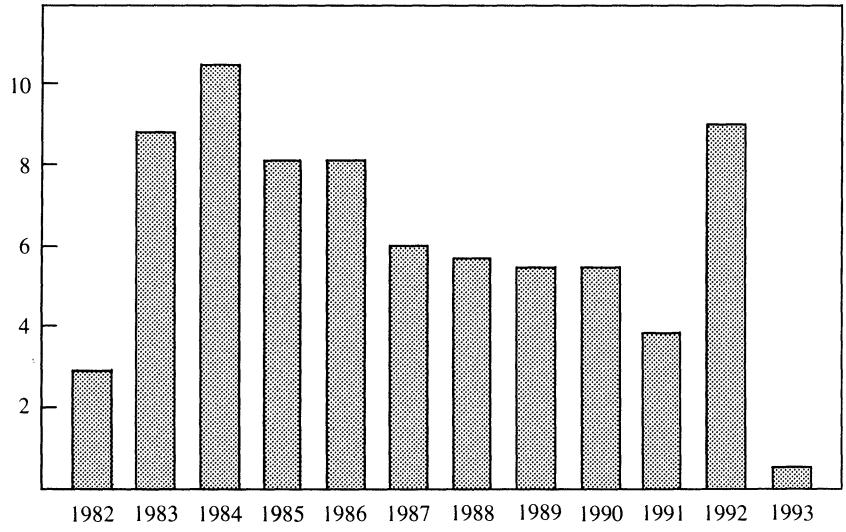
in March 1989 the central bank made matters worse by appreciating the currency as an anti-inflationary shock treatment.[18] In 1990–91 output plunged, and in 1992 the unemployment rate reached double digits. Finland had entered a depression. Real household wealth declined, consumption plummeted, and investment took a nose dive.

In this difficult setting the government made the surprising decision to peg the Finnish markka to the European Currency Unit (ECU) in June 1991, without a prior devaluation. At the outset the interest rate spread relative to Germany declined, as shown in figure 4. But Finnish interest rates did not stay low for long, and the depression-like atmosphere and growing debt problems soon made high interest rates implausible. In November 1991 the markka was devalued. The exchange rate was pegged at this new level but, once again, interest rates rose until, in April 1992, foreign exchange support agreements with the central banks of Denmark, Norway, Sweden, and Germany began to take effect. Finally, in October 1992, the markka was allowed to float.

Throughout the crisis the discussion about the exchange rate focused on credibility: its influence on interest rates and hence, on demand. It was thought that the effective way to bring down interest rates was to emulate Germany's anti-inflationary stance, rather than to maintain an undervalued currency. Note that by this time inflation had ceased to be an issue—in 1992 producer price inflation was down to 2.6 percent, and consumer price inflation stood at 2.9 percent, against 4 percent in Germany. The high interest rate strategy and the overvalued currency meant that there could be no crowding-in. Moreover, the policy was extremely expensive, especially because Finland operated as an overly generous welfare state. Between 1989 and 1992 net external liabilities

18. See Bordes, Currie, and Soderstrom (1993) and Dornbusch and Park (1995).

Figure 4. Nominal Finnish-German Interest Rate Spread[a]



Source: *OECD Economic Outlook*, various issues.
a. The Finnish three-month Hellibor rate less the German three-month Interbank lending rate (annual rates).

increased sharply, from $27 billion to $47 billion, and the public debt exploded, increasing from $17.4 billion to $44 billion.

There is very little question that the central bank and the government were quite wrong to overvalue the currency—trade deterioration, in terms of both prices and markets, and the domestic credit collapse required a serious dose of crowding-in. The effective way to accomplish that was not by a continued squeeze in financial markets and record unemployment-driven deficits. A shift to a more competitive currency, possibly accompanied by restrictive fiscal policy, would have helped to solve both the unemployment and the debt problems.

Finland was certainly not alone in its attempt to buy credibility with a hard currency posture. The United Kingdom, Spain, and Italy did just the same. Finland is the most interesting case, however, because the disturbances and the collapse of the financial system were so obvious in their implication for real depreciation, as has been borne out by developments since the realignment. The export sector has been the driving force of economic recovery (aided by the world economy), interest rates are down, growth is spreading to domestic demand. Even

though the slowdown in 1991–93 was severe, the growth rate for 1995–96 is expected to be 5 percent.

Mexico, 1990–94

Just over a decade after the debt moratorium and collapse of the early 1980s, Mexico found itself in the same situation. Once again it was in an election year, once again finance was accommodating and the exchange rate was overvalued. The principal actors were different, but the script was much the same. All the stabilization, restructuring, and reform that the country had undergone was cast aside in a single-minded attempt to cover up the problems and get strong election results. Because the team was so good, substantively and in its public relations, the scheme almost worked. As is almost always the case, though, some impediments remained, notably political uncertainty in the transition to a new government.

Without question, Mexico moved forward dramatically during the 1980s. In response to the shock of a debt moratorium and inflation in excess of 200 percent, economic policy became very conservative. That shift was facilitated by the bankruptcy of populism throughout Latin America, and the emergence of a consensus on market-oriented reforms such as trade liberalization, privatization, deregulation, and stabilization.[19] It was also facilitated by the return of international lending, even before debt had been restructured using Brady bonds. The vigor, perseverance, and effectiveness of the Mexican reforms attracted international attention. They were carried far enough for Mexico to succeed in the negotiation of a North American free trade agreement. To the financial world, Mexico was a new country.

This confidence in Mexico was not fully warranted in macroeconomic terms, for three specific reasons. First, growth was very low, both absolutely and, even more so, relative to the 3 percent growth in the labor force. In fact in 1993 per capita income was barely higher than it had been fifteen years earlier and was 9 percent lower than its peak in 1981. The full effect of reform would take time, but the signs of reform-driven growth were quite absent. The second issue was continuing inflation. Even though the inflation rate had been brought down dramatically, it remained in the 20 to 30 percent range, far out of line

19. See Aspe (1993) for an account of the reforms.

Table 8. Mexico: Macroeconomic Indicators, 1990–94

Units as indicated

Indicator	*1990*	*1991*	*1992*	*1993*	*1994*
GDP growth[a]	4.5	3.6	2.8	0.6	3.5
Inflation[b]	29.9	18.8	11.9	8.3	7.1
Current account[c]	−3.1	−5.2	−7.5	−6.5	−7.8
Trade balance[c]	−1.8	−4.0	−6.3	−5.2	−6.5
Real exchange rate[d]	77.4	85.9	93.3	99.3	90.6

Source: Data for growth, inflation, and the real exchange rate are from the International Monetary Fund's *World Economic Outlook*; and for the trade balance, from *International Financial Statistics* and Banco de México (1995).

a. Percent per year.

b. December-to-December percentage change in CPI.

c. Percent of GDP.

d. Effective exchange rate index, 1980 = 100.

with what Mexican policymakers considered politically convenient or economically acceptable. The third issue, and the main problem as it turned out, was once again the real appreciation of the peso. Table 8 provides some of the principal macroeconomic indicators.

Through a series of *pacto* programs, the government succeeded in bringing inflation down to single-digit levels.[20] These *pacto* agreements invariably held back the rate of currency depreciation relative to wage and price movements in Mexico. As a result the real exchange rate steadily appreciated. Over the period 1988–93, Mexico's wholesale prices in dollars increased by 55.5 percent. By comparison, the U.S. wholesale price index increased by 11.1 percent. An index of the real exchange rate on a multilateral basis prepared by the International Monetary Fund (IMF) shows a real appreciation of 36 percent over this period.[21]

In Mexico the end of a *sexenio* (six-year presidential term) is almost sure to bring a collapse of the exchange rate. Growth is necessary for good elections, and inflation needs to be moderate. The temptation is invariably to use the nominal exchange rate for inflation control, supplemented more or less successfully with an incomes policy. The runup to the 1994 election was no different.

Formally, the Mexican peso was flexible within a band that had a fixed floor and a moderately depreciating ceiling. In fact, the peso was basically held constant from 1991. The ongoing inflation differential

20. For details, see Dornbusch and Werner (1994).

21. International Monetary Fund's *World Economic Outlook*, May 1995, p. 92. From the 1987 level, the real appreciation measures as much as 76 percent.

thus meant increasing real appreciation over and above what already had accumulated in the previous years. Real appreciation was not tantamount to overvaluation. The reforms, the trade opportunities arising from the NAFTA, and the return to the capital market implied an improvement in Mexico's economic situation that could reasonably translate into a sustainable rise of wages and prices in dollars. The issue was to draw a line between warranted real appreciation and overvaluation.

The Mexican authorities were adamant that the peso was not overvalued, and they reaffirmed this belief at every opportunity. In doing so, they tended to use productivity growth as an additional argument for competitiveness, over and above measures based on traded goods prices.[22] With productivity growth estimated at 6 to 8 percent, Mexico could not possibly be uncompetitive. The trade results showed otherwise. While the country did have significant export growth, import growth was much higher, and as a result the trade deficit was widening, even though the economy was not booming.

Most striking, the Bank of Mexico seems not to have drawn the right inferences. Its 1995 annual report states:

> In spite of the progress made during 1994 . . . a reversal of capital inflows occurred during certain periods. This was the result of the criminal offenses and unfortunate political events that took place during the year, which had a negative impact on the expectations of economic agents. Thus, towards the end of the year, conditions of profound instability in financial markets arose, in spite of the tight monetary policy implemented to contain them. . . .
>
> Economic analysts frequently mention the current account deficit and the appreciation of the real exchange rate as the main causes behind the devaluation of the peso in late December. However, this claim overlooks a series of other very important factors. When a country receives huge capital inflows, it is inevitable that the real exchange rate tends to appreciate. As long as the appreciation of the real exchange rate is accompanied by increases in the productivity of labor, the country will not experience a loss of competitiveness. The extraordinary expansion of Mexican exports within the last few years is testimony that the compet-

22. For a vigorous statement of this position (anonymous, but authored by the Banco de México), see Banamex-Accival (1994). This flawed argument concerning productivity growth is addressed more fully in the final section of this paper

Table 9. Mexico: Budget Surplus and Credit Creation, 1990–94

Units as indicated

Indicator	*1990*	*1991*	*1992*	*1993*	*1994*
Budget surplus[a]	7.7	8.7	8.7	3.7	2.3
Credit creation[b]	22.6	31.6	20.8	15.5	32.0
Development banks	−10.1	18.8	23.4	47.4	42.2

Source: Data for the budget surplus are from Banco de México (1995); and for credit creation, from *International Financial Statistics*.

a. Primary budget as a percentage of GDP.

b. Nominal annual percentage change.

itiveness of domestic industry was not eroded by the real appreciation of the peso.[23]

In hindsight it is clear that the Mexican exchange rate was highly vulnerable, and the same judgment could have been made ex ante. First, it was clear that disinflation was stalling, implying that real appreciation would continue for two years or more. Second, Mexican growth was very moderate indeed. In the election year fiscal spending was increased, concentrated on the third quarter, but otherwise growth was low. Third, Mexico had undergone a comprehensive unilateral trade liberalization. Theory leaves no doubt that a trade liberalization requires an offsetting real depreciation, if full employment is to be achieved. Domestic fiscal expansion, a drop in the saving rate, or an investment boom can temporarily provide the crowding-in required by such a liberalization. But there will be a trade deficit that will grow as domestic spending increases. If no financing is found, the result will be either a deep recession, or a deep real depreciation, or both. Hence the vulnerability of the exchange rate.

Mexico's fall from star performer came during the course of 1994. First, domestic political events disturbed the markets—the Chiapas uprising drew international attention to a country deeply divided between its business-oriented north and its Central American, guerrilla-style south. Next, the assassination of the presidential candidate called in question the political regime. But the government managed to keep the economy on track for the election. The central bank fully sterilized the politically motivated capital flight, and as table 9 shows, the development banks created credit without pause, and the treasury spent money wherever the election outcome was predicted to be tight, thus

23. Banco de México (1995, p. 3).

Table 10. Mexico: Debt Composition, 1990–94

Billions of 1990 Mexican pesos

Type of debt	*1990*	*1991*	*1992*	*1993*	*1994*
Cetes[a]	31.9	26.7	27.6	52.2	13.5
Tesobonos[b]	0.1	0.9	0.8	3.3	75.1

Source: Banco de México (1995).
a. Treasury bills.
b. Indexed to free market exchange rate.

further reducing the primary surplus. This increase in spending was reflected in the very large deficit in the external balance.

By late 1994, with the new government in place and no good news to hold out for, the situation worsened. Devaluation was discussed and major capital flight set in almost immediately. The IMF report on the Mexican collapse leaves room to infer the indiscretions that allowed Mexican asset holders to take their money out in time.[24] As soon as the first, insufficient devaluation of 15.6 percent took place, investors withdrew en masse. The reserves were not there to meet the withdrawals, liabilities were suddenly seen to be large and liquid, and panic and chaos ensued.

The fallout of the Mexican overvaluation was severely complicated in two ways. First, in order to continue to attract foreign capital despite political difficulties and fears of overvaluation, the government allowed its debt to become both very liquid and dollar-denominated. In 1994 the relative ratios of peso and dollar short-term debt—*cetes* and *tesobonos*—moved sharply, as shown in table 10. The second factor was the keen sense of fraud felt by investors who had been ardently assured throughout the year that devaluation would never happen. Having run off its reserves and dissipated its credibility, the Mexican government did not have the wherewithal to pay. Markets disappeared, and had it not been for the U.S.–IMF intervention, Mexico would once again have defaulted.

In part as a result of the U.S. congressional and IMF involvement, the autopsy of Mexico's collapse has not yet concluded. To some, it was simply due to a wrongheaded devaluation when tight money could have saved the situation. To others, it was the result of bungling management, pending the NAFTA. Yet to still others, it occurred because

24. See the International Monetary Fund's *World Economic Outlook*, May 1995.

Table 11. Common Factors of Currency Collapses

Factor	*Chile 1982*	*Mexico 1982*	*Mexico 1994*	*Finland 1992*
Appreciation	Yes	Yes	Yes	Yes
Disinflation	Yes	Yes	Yes	Yes
External deficit	Yes	Yes	Yes	Yes
Fiscal expansion	No	Yes	Yes	No
High real interest rates	Yes	Yes	Yes	Yes
Trade liberalization	Yes	Yes	Yes	Yes
Financial opening	Yes	Yes	Yes	Yes
Domestic credit creation	Yes	Yes	Yes	No
Opening to external capital	Yes	Yes	Yes	Yes

the currency was overvalued and was awaiting the appearance of some adverse condition, any adverse condition.

Summary

It is useful to try to identify the common elements of the experiences discussed above. As table 11 illustrates, candidates include real appreciation, deterioration in the current account, heavy external borrowing, distress of the financial system, poor growth, inflation stabilization programs, and high real interest rates. The fact that so many of these features occurred together helps to explain why the crashes were so massive and look quite similar.

The EMS Experience

Almost a year after the Mexican currency collapse, the discussion continues as to what exactly happened. The magnitude of the collapse adds to the confusion because it suggests (and for some, proves) that the supposedly corrective currency realignment was a great mistake. It is striking to compare this and the other collapses discussed above with the currency realignments that took place in Europe in 1992. In the making these seemed traumatic, but once completed they seemed like a liberation. By contrast, the Chilean, Finnish, and Mexican collapses were each part of a deep and lasting setback in the economic and social performance of the respective country.

The four collapse episodes stand out for being extreme events. To

Table 12. The EMS Realignments

Units as indicated

Indicator	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*
GDP growth[a]						
Italy	2.9	2.1	1.3	0.7	−0.7	1.7
Spain	4.7	3.7	2.2	0.7	−1.1	2.0
United Kingdom	2.2	0.4	−2.0	−0.5	2.2	3.8
Real interest rate[b]						
Italy	. . .	6.2	8.3	14.9	−4.9	−3.9
Spain	9.0	11.8	10.7	11.5	7.8	3.7
United Kingdom	9.7	7.3	4.8	4.4	1.5	3.5
Real exchange rate[c]						
Italy	93.1	100.0	101.0	98.3	85.0	83.2
Spain	96.9	100.0	98.2	95.3	83.1	79.3
United Kingdom	98.0	100.0	103.0	100.5	92.1	93.3

Source: Data for growth and the real interest rate are from *International Financial Statistics;* and for the real exchange rate, directly from the J. P. Morgan currency index database.

a. Percent per year.

b. Nominal less WPI inflation.

c. Effective exchange rate index based on nonfood wholesale prices, 1990 = 100.

complete the discussion, three more moderate examples have been drawn from the context of the EMS in 1992: Italy, Spain, and the United Kingdom. Annual data on each country's performance are shown in table 12. The common denominators are the attempt to converge on German inflation, the overvaluation that emerged in the process, the inability to hold on to high enough interest rates to defend the rates and roll back inflation, and the ultimate collapse. The interesting question to ask of these cases is whether, unlike in the extreme episodes, overvaluation was quite obvious and devaluation was inevitable; or whether, in a standoff between skeptical investors and less-than-fully committed policymakers, devaluation may have happened "by accident."

The cases had three features in common before the devaluations: high real interest rates, real appreciation, and a slowdown in growth. In each case disinflation was the official objective, and in each case its success raised the unemployment rate to uncomfortable levels, leaving open the question of whether policymakers had the stomach for more. Moreover, each situation was complicated by a single external event: Germany's unification had raised that country's inflation to unacceptable levels and brought about a shift to tight money.

This paper does not attempt to review the EMS collapse of 1992 in

any detail.[25] Suffice it to say that convergence was incomplete, in terms of both actual results and persuading markets that a deep and lasting change of institutions and attitudes had in fact taken place. Growth in the beleaguered economies was poor, and unemployment was rising. There was no prospect of a rapid change in the economic environment that would allow a major reduction in interest rates. Germany was fighting rampant inflation, and speculators were on the lookout for opportunities. Once it was clear that EMS guarantees were limited, and reserves were small relative to the scope for attacks, one currency fell after another.[26]

The real depreciation of the currencies that fell to attacks was surprisingly large. The initiating real appreciations were quite moderate compared to the actual depreciations, and even interest differentials hardly suggested the size of depreciations that eventually materialized. In each case, the collapse of the currency spelled immediate and substantial relief. Real interest rates fell, and economic growth resumed. It soon seemed as if the real losers might be the countries that had held out. Discussion focused on interest rates; in particular, whether real rates were lower under the hard-money policies of France or the soft-money policies of the United Kingdom. Another issue was whether the countries whose currencies had collapsed would be overtaken by a bad spell of inflation before having had time to reap the benefits of a currency realignment. Advocates of hard money were sure that the loss of confidence would have to be paid for dearly.

So far, hardly any of these pessimistic predictions have been realized and to the extent that they have, the setting is quite different. With the exchange rate constraint removed, the United Kingdom has enjoyed low interest rates and strong growth. Italy has entered a boom, and even in Spain, growth has been good. Inflation is an issue—more so in Italy and Spain than in the United Kingdom—but given the size of the depreciations, there is surprisingly little of it.

In sum, the EMS collapses of 1992 were quite positive events. This is not at all true of the four collapses reported above. The difference lies, in large measure, in the financial fallout of the initial misalign-

25. Reviews of the EMS experience can be found in Bacchetta (1994), Eichengreen and Wyplosz (1994), Micossi and Padoan (1994), Portes (1993), and Vaciago (1993).

26. Agénor, Bhandari, and Flood (1992) and Eichengreen, Rose, and Wyplosz (1994) provide studies on speculative attacks.

ments. In Chile, Finland, and Mexico protracted overvaluation, high interest rates, and the large balance sheet impacts of the currency alignments destroyed the banking system, and thus threw a big shadow over prospects for growth. Whereas in the EMS collapse there seem only to be winners (apart from the central banks), in these other cases it is hard to find one.

What Went Wrong?

The interesting feature of the four extreme episodes reported above is their sudden, harsh end. In each case policy was thought to be successful, prosperity prevailed, credibility was intact or being built up, and policymakers rode high. Then the entire strategy unraveled in almost no time and gave way to a large realignment. Invariably it is asked what went wrong.

Major misalignments can arise because, absent a clear and accepted test for the right price for a currency, there is room for serious disagreement. The same is true for the stock market or in real estate. The factors influencing the exchange rate are diffuse and prospective, just as they are for asset prices. Once a misalignment is in place, it is difficult to undo quickly, for both political and economic reasons. That is why it will ultimately precipitate a collapse.

In the extreme cases discussed above, market participants differed in their opinions of the sustainability of the policy regimes. Policymakers and much of the market had little doubt that they were sustainable, and that reserve depletion would be short-lived. They believed (and perhaps still do) that had it not been for this or that surprising factor, all would have been well. It was not the policy that was wrong, but the accidental disturbance that interfered with short-term financing. This interpretation is captured by the "sudden stop" in the bankers' adage quoted at the beginning of the paper. But it is overly benign. If an exchange rate and current account position is vulnerable to disruption, then the currency is more than likely to be overvalued.

What actually goes wrong involves *both* the policies that created the vulnerability and the lenders who jump ship. In such situations, policymakers are invariably surprised by how the market can suddenly turn on them, and by the extent to which they have underestimated their

Table 13. Latin America and Mexico: Total Return on Stock Market in U.S. Dollars

Percent

				1994		*1995*
	1991	*1992*	*1993*	*Jan.–Sept.*	*Oct.–Dec.*	*Jan.–July*
Latin America	123.5	5.7	56.6	−0.1	−21.0	−10.0
Mexico	106.8	21.2	49.9	−40.6	−38.9	−19.2

Source: International Finance Corporation (1995). For 1995, obtained directly from the International Finance Corporation.

vulnerability. Markets, in turn, are surprised by how little liquidity there is when all the lenders scramble to get out at the same time. The combination makes for a chaotic collapse and the disruption of finance.[27] Moreover, because the policy regime is typically sustained by strong appeal to credibility, any action that undermines this will profoundly disorient the lenders, thus aggravating the lack of credit.

Why do markets keep financing a situation that to all appearances is vulnerable, if not outright unsustainable? Ex post this is always the question, whether in relation to the stock market, to tulip bubbles, to real estate, or to emerging market lending.[28] The answer is that there are different opinions of what is happening. Moreover, there is always a temptation to ride an unsustainable course for a little while. In fact, the capital market was exuberantly willing to lend in the Chilean and Mexican crises. After net negative portfolio investment in 1983–89, Latin America received an average of $26.6 billion in portfolio capital flows over the period 1990–94. For a while, stock returns bore out the wildest optimism, as table 13 shows. A dominant share of market participants thought that the risks were small and well worth taking; they thought that the policies were right and sustainable, and would increasingly be vindicated by events.

In its postmortem of the recent events in Mexico, the IMF proposed three hypotheses of the cause of the collapse—adverse shocks, an unsustainable external position, and policy slippage—and concluded that all three were probably responsible.[29] For the purposes of this paper it is interesting to consider the economic model that markets use to frame

27. For a model where financial fragility magnifies shocks and generates crises, see Goldfajn and Valdés (1995).

28. See Krugman (1995).

29. International Monetary Fund's *World Economic Outlook*, May 1995.

events, in order to understand how a large real appreciation can persist for an extended period of time. The answer has to be that a near-term collapse is implausible, and that accordingly, market participants either disregard the possibility or else feel sufficiently liquid to discount the event. As a result, the actual collapse comes as a surprise.

There are three basic perspectives on real exchange rates: the monetarist view, the classical view, and the disequilibrium view. These summary names contrast their essential features, but as is always the case, they do not take account of variations and special themes within each approach. The views clearly overlap to some extent, but the point here is to highlight how the fall in the real exchange rate can be perceived as a disequilibrium by some, and by others, as a price that is fully justified and appropriate.

The Monetarist View

This perspective is both naive and influential. It is held by much of Wall Street, some members of Congress, and the *Wall Street Journal*'s editorial page. Simply put, this view favors hard monetary commitments, low taxes, and free markets. Holding fast to such policies will, in time, yield rewards; if the government wavers, it will falter; if it caves in, it will fall. Applied to Mexico in 1994 this means that the key mistake was the failure to control credit and, under attack, to raise interest rates high enough to convince markets that the government was sincerely and fully committed to currency stability.

In the monetarist view, anything is acceptable except raising taxes or devaluing the currency. Because it is influential in finance, this view has also become a very decisive influence in the policy discussions of countries with vulnerable exchange rates. In the case of Mexico, it is interesting to note that proponents of the monetarist view do not pay too much attention to fiscal policy, particularly since tax increases are not at issue. Moreover, they did not monitor monetary policy very closely, although they did discuss it after the fact. Mexico's misguided monetary policy was raised as an issue after the collapse by Congress, the U.S. Treasury, and Jeffrey Sachs and his colleagues, and then many others jumped on the bandwagon.[30] Some observers recommended

30. See Sachs, Tornell, and Velasco (1995).

bringing the peso back to its initial level.[31] To this end, a currency board was deemed the best way to instill confidence.

The monetarist view is naive in that it cannot account for the fact that Mexico had ceased to grow, its banking system was becoming increasingly fragile, and the government would certainly have confused investors if, in the runup to an election, it had staged a major recession. Moreover, it offers no insight on how a high interest rate strategy would have brought back growth. The assumption that posturing is sufficient is definitely not vindicated by the European experience; Sweden's brief attempt with 80 percent interest rates in September 1992 bears remembering!

The Classical View

This perspective is thoroughly founded in the informed markets, flexible wages and prices, and maximizing agents posited by equilibrium theory, and offers an important benchmark against which any disequilibrium view must be held. An equilibrium perspective would naturally be an economist's first and preferred framework of analysis. In this view real exchange rates are market prices, similar to stock prices, and when conditions are favorable in a country, the real price of its currency goes up. Moreover, economic agents faced with improving productivity act appropriately when they consume today a portion of the increased incomes of the future.

Real appreciation is an assessment of a country's performance made by an approving market. It is the reward for reform, stabilization, and doing good and right. Capital inflows are the outright commitment to such policies, and real appreciation is the adjustment process that translates increased lending into equilibrium transfers. This view has much to commend it, particularly in the early phases of reform and stabilization. Indeed, it is hard to find fault with it until much later, when growth vanishes and loans go sour, and even then its validity is ambiguous.

Because external deficits represent an increase in absorption relative to income, in this view, the increased absorption is precisely what *should* be happening. If capital formation is increasing, the story is simple. If it is the consumption of durable goods that is increasing, who can blame the consumer for reaching out to all the things that are finally

31. See David Malpass, "The Mexican Peso: 3.5 or Bust," *Wall Street Journal,* January 11, 1995, p. A14.

available and affordable? If a budget deficit lies behind the spending boom, and if future revenues seem assured, who can blame a government for smoothing consumption and investment in anticipation of later earnings?

Yet if the long-run policies were valid, they should have led to rising standards of living or a boom in investment. The equilibrium view does not pay attention to actual growth performance, but concentrates instead on policy talk. This is an important issue here, since Mexico had very poor growth performance in comparison to that of Chile or the Asian economies. The moderate growth observed in 1994, after no growth at all in 1993, was due to a budget shift that was planned to coincide exactly with the election quarter. Fiscal policy went into an expansionary mode in 1994, and the market showed no concern.

The classical approach can rationalize real appreciation by pleading improved economic prospects and hence, a rise in the valuation of resources. Because the factors influencing asset prices, including the real exchange rate, are diffuse and their translation to valuation is imprecise, there is inevitably a broad zone of uncertainty between real appreciation and overvaluation. But this view, while recognizing the uncertainty in valuation, would reject the hypothesis of systematic, significant overvaluation.[32]

Both the classical and the monetarist approaches accept that confidence can be an issue, but they argue that it is a straightforward one. The most dangerous path is to compromise a conservative monetary (and fiscal) stance. It is even worse to allow the currency to be devalued (the term "debauched" is sometimes used in this context).[33]

Two of the IMF explanations for the most recent Mexican collapse—adverse shocks and policy slippage—fit the equilibrium approach. Much would be made of the changed political outlook in Mexico. It would be argued that whereas under President Salinas and with the NAFTA on the horizon there was no limit to the positive prospects, the institutional and political instability that became apparent in 1994 opened the doors to almost unlimited bad news. As to policy slippage, it would be argued that now that it is known how extensive credit

32. In addition, there is a strand of theory that interprets real appreciation as the response to temporary or incredible reform; see Calvo and Végh (1993).

33. A different approach makes much of the backing of the stock of money—base, M2, and others; see Calvo and Mendoza (1995) and Calvo (1995).

expansion actually was—including the contribution of the development banks—the bad outcome is hardly surprising.

The classical view presents a plausible story of what happens *before* a collapse. It lends support to those who believe that the rate is not misaligned and should be defended. When growth stops and bad loans accumulate, however, the story wears thin. In the case of Mexico, surprisingly little attention was paid to growth performance; in fact, wishful thinking and the fiscal expansion of last quarter of 1994 seemed to be more important.

In conclusion, it is worth noting that all too often reform is equated with productivity enhancement, and from there it is a short step to value creation and equilibrium real appreciation. But it is necessary to distinguish between different kinds of reform: those that shed labor, such as reducing the size of the government or unilateral trade liberalization, require a lower dollar wage (although they may raise the stock market). A far more differentiated view is therefore required when judging which way the exchange rate might move.

The Disequilibrium View

This paper contends that the real exchange rate is a variable that is significantly influenced by policy, not in all cases (Argentina, discussed below, is an exception), but in many. Policymakers might be misled to yield to real appreciation and financing deficits, but ultimately the country will pay with a collapse.

While reform and stabilization are important, it is also a basic premise that some reforms require crowding-in, not crowding-out. These reforms involve restructuring and opening the economy, both of which free labor and thus require the creation of employment. Unless there is a lasting investment boom with significant domestic content, real demand for domestic goods and services and for labor must be raised. If trade is liberalized, this liberalization must be accompanied by real depreciation. If exports collapse, real depreciation must correct the shortage of labor demand. If budget cutting or reform reduces employment, they must be accompanied by real depreciation to create jobs. Whereas the equilibrium approach values a country primarily in the asset market—market-oriented reforms make a country worth

more—the disequilibrium view focuses on the goods and labor market. The reforms make it possible to finance deficits, but they do not solve the issues of employment and growth; in contrast, real depreciation does.

To interpret the real exchange rate as a policy-influenced or even policy-dominated variable, the disequilibrium view starts from the proposition that there is some degree of inertia in the level or rate of change of wages and prices. This may be the result of an explicit indexation scheme, as in Chile, of a formal incomes policy agreement, as in Mexico, or of implicit indexation, such as might arise from insider-outsider models. But stickiness is the basic ingredient. Once stickiness is accepted, and also the influence of policymakers on the real exchange rate through the setting of nominal rates, the real exchange rate is seen to be a limited policy variable. The statement is no more controversial than the assertion that the real quantity of money is a policy variable, in the sense that changes in the nominal quantity of money exert a substantial and relatively lasting influence on the real quantity of money. If the change is appropriate as an offset to a disequilibrium, then it is, in fact, a lasting change in the equilibrium real quantity of money. In exactly the same sense, changes in the real exchange rate resulting from nominal exchange rate movements can bring about the change in equilibrium relative prices that is called for by a disequilibrium in the real economy. Whether to accomplish the relative change by nominal exchange rate movements, rather than through inflation or deflation, is the relevant policy decision.

As a policy variable, the real exchange rate is limited in two respects. First, in a boom it is hard to avoid real appreciation without engaging in an escalating inflation-depreciation cycle. Second, once the attack occurs, the financing to sustain an overvaluation runs out. But in between, when the boom is over and the financing continues, policy can sustain a situation of overvaluation, and can even make it worse. Specifically, a policy of bringing down inflation by slowing the rate of depreciation below the rate of inflation—or stopping depreciation altogether—is a common way of creating overvaluation. Because the real exchange rate is sticky downward, overvaluation is not easily undone by wage-price deflation and thus, ultimately, leads to collapse and devaluation.

Policy Implications

These differences in interpretation have a stark implication for policymaking. Proponents of the equilibrium view, and even more so of the narrow monetarist view, will advocate inflation stabilization without much question. They might disagree on whether this could be done better with a currency board or a flexible exchange rate, but they have little doubt that inflation can be stopped without major costs. The task at hand is simply to bring about a credible regime change.

In the discussion of Mexico it has been suggested that central bank policy was the reason for the collapse; specifically, sterilizing reserve losses supplemented by credit creation on the part of development banks. Accordingly, a different monetary policy could have avoided the collapse. This is not apparent. Credit creation did indeed help to promote reserve losses and precipitate a crisis that otherwise might have come later. But if sterilization had not taken place, and the development banks had contained their lending, Mexican interest rates would have been far higher, growth would have stalled, or there might have been a recession. Bankruptcies would have been pervasive, loan losses would have been larger, and politics would have been even more uncertain. There is no evidence that deflation is achieved quickly and painlessly, as Argentina is starting to demonstrate. It is difficult to believe that the level of wages and prices would have declined rapidly to yield competitiveness. The exchange rate might well have lasted longer, maybe even a whole year. But there is absolutely no indication that policies that did not work in Europe could have worked in Mexico. In sum, the Bank of Mexico merely helped to bring about the collapse earlier than might otherwise have happened. The problem, then, is not monetary policy but incomes policy or, more broadly, the context in which disinflation takes place.

In this there lies a genuine predicament, for bringing down inflation requires taking a stand and imposing a change in expectations by accepting slow growth and unemployment, making clear the resolve to hold to this regime. The temptation to use the exchange rate to obtain early results on disinflation without much unemployment is all too obvious as a shortcut, but the results are often illusory. After the collapse, inflation will be higher than it was at the outset.

Therefore it must be accepted, albeit reluctantly, that moderate but

reasonably stable inflation is probably the best that most countries can achieve in the short run. Some countries that have experienced extreme inflation may have the political support to achieve much more; Argentina is a case in point. But most, and definitely those countries with weak political systems, ought to settle for less than German inflation performance; they should reinforce reform, restructuring, and growth, and seek a very gradual disinflation. Chile has been admirably successful at this over the past decade.[34]

Can Devaluation Work?

It is commonly held that devaluation is not a remedy for overvaluation; that the *real* exchange rate is simply not a policy instrument. Devaluation, it is argued, cannot succeed because it would merely translate into a rapid and substantially matching increase in the level of prices. This is the view of monetarists, and also of adherents to the classical approach. There is no doubt that there are instances where it is mostly true; for example, Argentina. But few countries reach that level of exchange rate disillusion. In most cases a large nominal devaluation implies a lasting real depreciation, the more so as other macroeconomic policy instruments avoid creating a boom.[35] A separate issue is whether a real depreciation can help net exports. Here, too, the evidence is positive.[36]

In almost all of the European cases discussed above, nominal devaluation has meant real depreciation. As table 14 shows, in each instance the external sector has responded rapidly and strongly to the real depreciation and has become a source of growth. Granted a real depreciation can only be successful in a situation where there is room for crowding-in. At full employment, without an offsetting fall in domestic demand, it cannot do any good. But in a recession it can help, certainly as the counterpart of a fiscal contraction. Those European countries that

34. See Dornbusch and Edwards (1994) and Dornbusch and Fischer (1993) on this point.

35. Mussa (1986) and Obstfeld (1995) review the effect of nominal on real exchange rates.

36. See appendix B, below, for a more detailed discussion of the trade responses to real depreciation.

Table 14. Italy, Spain, and the United Kingdom: Exchange Rate Depreciation and the Trade Balance

Units as indicated

	Nominal exchange rate depreciation[a]		*Real exchange rate depreciation*[b]		*Trade balance*[c]	
	1990–92	*1993–94*	*1990–92*	*1993–94*	*1990–92*	*1993–94*
Italy	0.1	19.1	−5.6	15.4	1.4	34.2
Spain	−4.5	17.1	1.7	16.8	−30.4	−15.5
United Kingdom	2.5	7.8	−2.5	7.1	−24.8	−18.1

Source: Data for exchange rate depreciations are from *International Financial Statistics;* and for the trade balance, from *OECD Economic Outlook.*

a. Percentage change in nominal multilateral exchange rate over period indicated.

b. Percentage change in real effective exchange rate over period indicated. Depreciation shown as positive change.

c. Billions of U.S. dollars for period indicated.

devalued in 1992 still experience a positive growth contribution from the external sector in 1995, unlike France, for example, which did not.

Surprisingly, the European experience failed to reveal almost any inflationary response to devaluation. In every country, inflation barely responded even though double-digit devaluation had taken place. Clearly, as economies recover and come to realize their full productive capacity, inflation returns. But that is not the same as arguing that devaluation, per se, is inflationary.

The more extreme cases reviewed above also involved a large real depreciation and a resulting strong gain in net exports. The fact that in each case there was a deep recession and that, therefore, the trade changes reflected both the real exchange rate and the cyclical position should not cast doubt on this. Specifically, the boost in net exports served as the shock absorber early in the crisis and was the means by which the economy started turning upward. Subsequently, as domestic demand recovered, the sharp initial improvement in net exports was dampened.

In the Mexican case that process is currently under way. Net exports have improved dramatically, again partly as a result of the deep depression of demand. In fact, net exports are the only growing component of demand at this time. Ultimately the growth will spill over to domestic demand, but even so, at full employment the economy will have higher net exports and less vulnerability.

Are Capital Markets Guilty?

In many interpretations of currency collapses, capital flows were the principal drivers: opening to international capital brought the flows that appreciated the currency, the current account adjusted, the money left, and the system crashed. Certainly it takes both a misaligned exchange rate and ready financing to produce the resulting imbalances. A currency collapse cannot happen without the capital flows. Yet it is not likely that policymakers will suddenly, one day, decide to give in, unless the situation has deteriorated. A more plausible scenario is that a certain set of events change the economic outlook, and markets react by assessing that changed outlook, force an increase in the interest rate, and hence change the situation with which policymakers must work. That is a far cry from saying that markets will cause a collapse when there is no problem.

In assessing whether capital markets can be restrained so that they can no longer bring down currencies, there are two separate issues to consider. First, without significant capital flows it would be impossible to build up a large external deficit. Thus capital markets are certainly partners in a collapse. Second, if capital markets can, in fact, bring about a collapse and its attendant costs for no external reason, then they are clearly counterproductive and deserve restraint. If, by contrast, they bring down currencies and policy packages that are unsustainable, then they deserve three cheers.

It is not surprising that the policymakers for countries whose currencies have collapsed favor the view that markets are frivolous, force high interest rates that complicate economic management, limit the scope for growth without inflation, and in the end, force traumatic devaluations for no apparent reason. Such an explanation has been offered for the EMS collapses: that although nothing was wrong, the markets decided to stage an attack, and once attacked, it was hard for policymakers not to succumb.[37] A policy of holding up interest rates at extreme levels can only be sustained for so long before it becomes a problem in its own right, by creating recession or severe fiscal difficulties. The alter-

37. Eichengreen and Wyplosz (1993) investigate an interpretation that views the EMS collapses as the result of unnecessary speculative attacks. Their favored policy implication is capital control.

native view, which is reinforced by the lasting large real depreciation that follows an attack, is that the attacker must have been right and that the victim had defended a lost cause for too long, at great social cost.

In the extreme cases of collapse reported above, for example, the most recent Mexican episode or that of Finland, it is apparent that the policymakers were wrong to overvalue the currency. Their strategies were not persuasive; it would have taken a very long period indeed for deflation to restore competitiveness and growth, in comparison to the relatively mild remedy of devaluation. It is hard to see why capital markets should take the blame for bringing down these policies.

No doubt the debate will continue on whether capital markets did stage successful raids on perfectly reasonable currency strategies. One way to judge the merits of a capital control plan is to ask if it would really have been beneficial for Finland, Mexico, or the United Kingdom to hold fast to its nominal exchange rate. It is difficult to make this case. There may well be instances where the nominal exchange rate is plausible, if interest rates are not too high; and interest rates will not be too high if capital markets cannot challenge the exchange rate freely.[38] None of the major collapses reported above is associated in any way with an unwarranted attack.

Open Issues

This paper has argued that real exchange rates are a key price in the economy, and that mismanagement, if carried on for too long, can turn into a very bad experience. It has interpreted real exchange rates as policy variables: the nominal rate can be manipulated and thus, in the presence of exchange rate illusion or an initial disequilibrium, real exchange rates are policy instruments. In conclusion, it looks at two issues in the making. One is the growth comparison of Mexico and Chile, with a view to asking whether Mexico is overvaluing yet again. The other is a comparison of Brazil and Argentina, both countries with overvalued currencies, but with very different prescriptions for remedying the situation.

38. See Obstfeld (1994) for a recent evaluation of the theory of speculative attacks.

Table 15. Chile and Mexico: Growth and Inflation

Units as indicated

	Chile		*Mexico*	
Indicator	*1982–86*	*1987–95*	*1982–86*	*1987–95*
GDP growth[a]	−1.8	5.4	−2.6	0.7
Inflation[b]	21	17	74	43

Source: *International Financial Statistics.*
a. Annual average percent per year.
b. Annual average percentage change in CPI.

Mexico and Chile

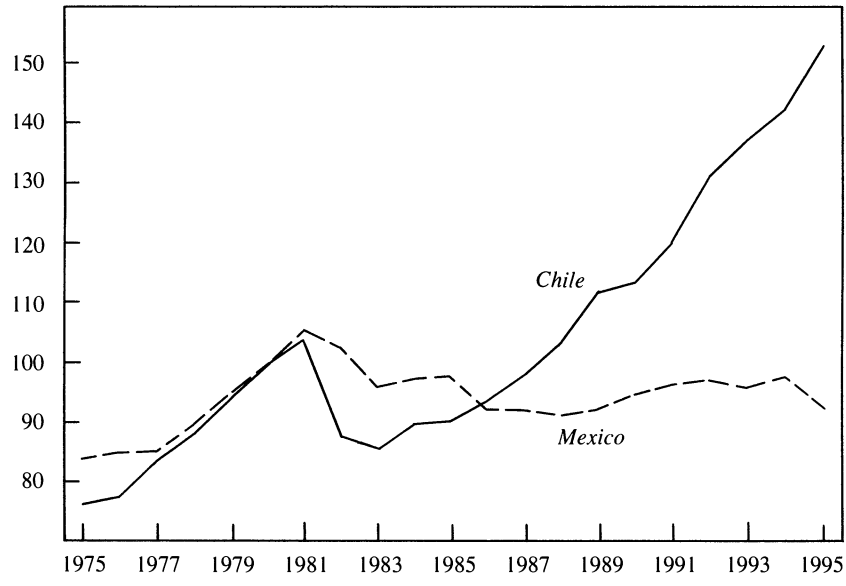
In the early 1980s the currencies of both Mexico and Chile crashed. Since then, these countries have evolved very differently. In Chile stabilization and reform translated into sustained high growth. In terms of inflation, although Chile's performance was not stellar, it raised little concern. In Mexico, as can be seen from table 15 and figure 5, growth was low and inflation was no better. Where lies the difference and what is the lesson for Mexico?

It might be tempting to see the explanation in political terms. Until 1988 Chile had a repressive regime; Mexico more closely resembled a democracy. But neither was fully democratic in the 1980s, and Mexico still is not today. More likely, the difference lies in the fact that Mexico has followed a statist-paternalistic economic strategy, with an incomes policy always close at hand. Chile, by contrast, has used an individualist Chicago school model, emphasizing business opportunities, competitiveness, and growth. Clearly, the Chilean model has won out, and without necessarily incurring significantly more hardship than Mexico in the process.

Another possibility is that Chile has a far better resource endowment than Mexico. That is hardly plausible, except in respect to human capital. But if it is the case, Mexico is to be blamed for not doing much, if anything, to develop its resource base.

The real difference in growth performance lies in the behavior of wages adjusted for productivity: in Mexico real wages rose sharply, in Chile they did not. Figure 6 helps to make an important point about the real exchange rate in relation to productivity. It is well known from trade theory that a country with higher productivity growth in tradables than the rest of the world will experience increases in the price of its

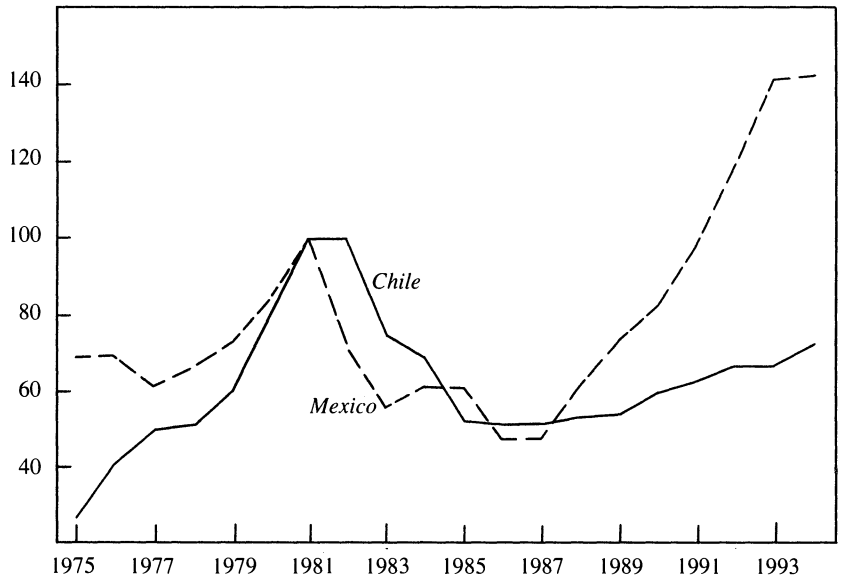
Figure 5. Chile and Mexico: Per Capita GDP, 1975–95



Source: *International Financial Statistics*.

nontradables and hence, real appreciations, if measured by relative CPI or GDP deflator. This is the familiar Samuelson-Balassa effect. It is the reason why relative CPIs are poor guides to competitiveness. But the real exchange rate measured by relative WPI (basically, tradables) would not rise. Specifically, to say that the relative level of wholesale prices has risen but so has productivity is simply an error of counting; any benefits resulting from productivity growth are already reflected in prices. Nor would wages adjusted for productivity increase. Reliable economywide estimates of productivity growth for Chile and for Mexico are not available. For that reason, in figure 6 we scale wages in dollars by an index of per capita GDP to arrive at a rough measure of adjusted wages in dollars. Mexico shows real appreciation and Chile does not. Not surprisingly, the wage strategies of the *pacto* are one of the reasons for the loss of growth in Mexico. Recourse to an incomes policy sustains wages and pushes them up, at least in time for the elections. Moreover, unemployment is pervasive because for the past fifteen years growth has been less than the growth rate of the labor

Figure 6. Chile and Mexico: Unit Labor Cost Index, 1975–94[a]



Source: Data for GDP, population, and exchange rates are from *International Financial Statistics;* for nominal wages in Chile from Banco Central de Chile (1989), and in Mexico, from unpublished data from the Banco de México.

a. The unit labor cost index is nominal wages divided by the exchange rate, all divided by per capita GDP.

force. In Chile, by contrast, the emphasis has been on a competitive exchange rate and high employment. The Chilean strategy has taken the economy gradually to full employment *as well as* significant increases in dollar wages, compared to 1980.

Reform, restructuring, the opening of trade, stabilization, privatization, and openness to capital are all features that Mexico and Chile have in common. The critical difference lies in the fact that in Chile the real exchange rate is the key price for long-term performance, while in Mexico it is the primary variable to be manipulated for short-term gain.

In the aftermath of the recent crash, Mexico has been in a rush to restore access to international capital markets. It was thought that the best way to achieve this was by means of a strong and stable exchange rate. After the initial collapse, the peso was allowed to fall to 6 pesos to the dollar, and it was the intention to keep it at that level until the

end of the year. Yet prices have increased significantly over the first six months of 1995, and thus, despite the weak dollar, the real depreciation amounts to only 35 percent. By the end of 1995, with inflation continuing at 2 percent per month, there will have been only a very minor real depreciation. Is Mexico doing it again? Granted there are purchasing power parity (PPP) calculations to show undervaluation, and it can be argued that wages have increased very little, at least, so far. But the right issues to focus on are growth and financial stability. The overriding impression is that the country is not focusing on export-led growth.

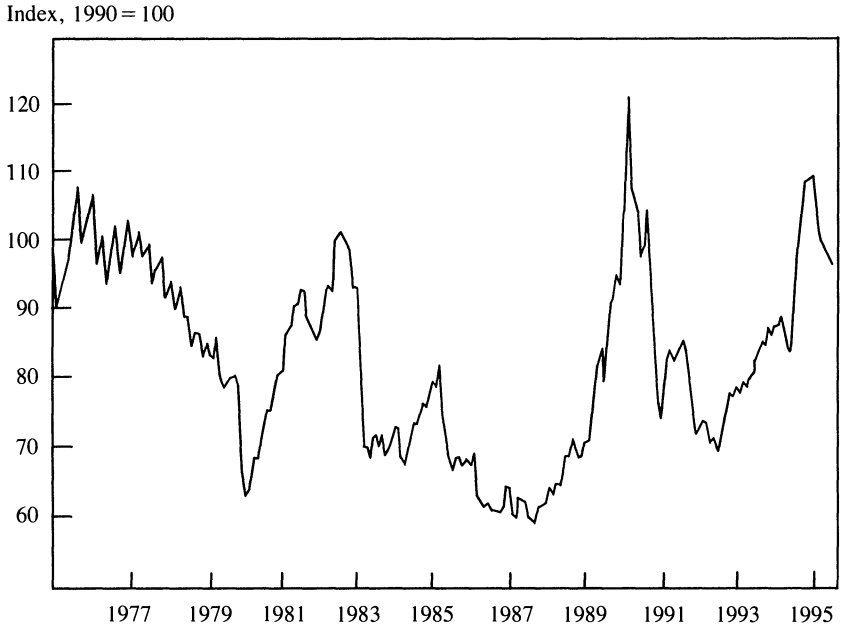
Brazil and Argentina

Argentina, with its currency board scheme, and Brazil, without any clearly defined currency scheme, present examples of situations in which events have not yet run their full course. Both countries have currencies that are strongly appreciated in real terms. In each case, the question is whether there is an overvaluation, and if so, what to do about it. We believe that Brazil should devalue as part of a comprehensive stabilization program, while Argentina should hold out and foster deflation. The reason for this eclectic recommendation is that Argentina, perhaps more than any other country, has abandoned any form of exchange rate illusion.

BRAZIL. Brazil has a long tradition of not allowing its exchange rate policy and external balance constraints to become an obstacle to growth. Lack of a serious macroeconomic policy has, over time, taken the country to hyperinflation. Since 1985, a few stabilizations have made temporary inroads, but have never come to grips with the problem because there has never been sufficient disillusion to support a radical change in regime.

The most recent stabilization, the Real Plan, was implemented in July 1994. This was an ingenious scheme of changing numeraires. In March 1994 nominal prices, wages and other contracts were allowed to be quoted in a unified reference value (URV) that would be replaced by a new currency, the real, on July 1, 1994. Since prices were already indexed to several different references, the innovation of the URV was to coordinate a unified unit of account that would substitute for all other indexation mechanisms. In the interim period after the introduction of

Figure 7. Brazil: Real Exchange Rate, 1975–95[a]



Source: Data obtained directly from the J. P. Morgan currency index database.
a. Effective exchange rate index based on nonfood wholesale prices.

the URV and before its replacement by the real, it was expected that relative prices would converge to their equilibrium value. This was important to the second phase of the conversion, when the URV would be transformed into real on a one-to-one basis and then pegged to the dollar. This pegging, in fact, caused monthly inflation rates to plunge from 46 percent in June 1994 to 1.5 percent in September 1994. Over the past months moderate inflation has continued, despite an immediate stabilization boom.

As part of the stabilization, the government initially allowed nominal appreciation, even though inflation continued at an annual rate of 25 to 30 percent. As a result, in July 1995 the cumulative real appreciation since June 1994, shown in figure 7, amounted to 15 percent. This real appreciation is potentially problematic because Brazil, like other cases discussed above, has already undergone a trade reform and plans to embark on fiscal restraint and restructuring of the public sector in the

Table 16. Brazil: Macroeconomic Indicators, 1992–95

Units as indicated

Indicator	*1992*	*1993*	*1994*	*1995*
GDP growth[a]	−0.8	4.1	5.7	5.0
Inflation[b]	1156.4	2828.7	1238.1	18.8
Budget surplus[c]	−2.8	−1.3	0.6	−2.2
Trade balance[d]	4.0	3.0	1.8	−1.7
Real exchange rate[e]	73.1	82.1	94.1	101.9

Source: Data for growth and the budget surplus are from Banco Central do Brasil (1995); for inflation, from *International Financial Statistics;* for the trade balance, from Banco Central do Brasil (1995) and *International Financial Statistics;* and for the real exchange rate, directly from the J. P. Morgan currency index database.

a. Percent per year. For 1995, estimate by Banco Central do Brasil.

b. December-to-December percentage change in CPI. For 1995, first quarter annualized.

c. Percent of GDP. Operational surplus (primary balance less real interest payments). For 1995, January annualized.

d. Percent of GDP. For 1995, first quarter annualized.

e. Effective exchange rate index based on nonfood wholesale prices, 1990 = 100. For 1995, first six months.

future. Since trade liberalization, restructuring, and budget cutting all involve restraint on demand, and since an aggressively priced currency does not go well with low interest rates, there is a crowding-in problem in the making. Sometime in the next year or so, real depreciation would be desirable. But real depreciation is a very poor idea if indexation linkages remain significant. The predicament, then, is that without the other elements of reform, devaluation makes no sense. But there is no such comprehensive reform program on the horizon. In the meantime, overvaluation and high interest rates continue. Although the Brazilian authorities, predictably, deny that there is a problem, it is useful to ask where this situation might lead.[39]

One scenario is that high interest rates will increasingly become a banking problem. This is beginning to be apparent in the state banks and is incipient in the private banks. The government's response of offering deposit insurance is not a solution. Once the banking problem has spread to the extent that it can only be resolved by lower interest rates, the basis will set for a speculative attack, as in some of the cases discussed above.

Table 16 shows some of Brazil's principal economic indicators. Historically, Brazil has been substantially inward-looking, and capital flight has not been part of the financial tradition. The indexation regime in capital markets, in addition to capital controls, was relatively effec-

39. Brazilian Finance Minister Malan was recently quoted as saying, "Those who criticize the exchange rate have a type of short-run myopia created by another trade deficit." (Authors' translation from *O Globo,* July 1, 1995.)

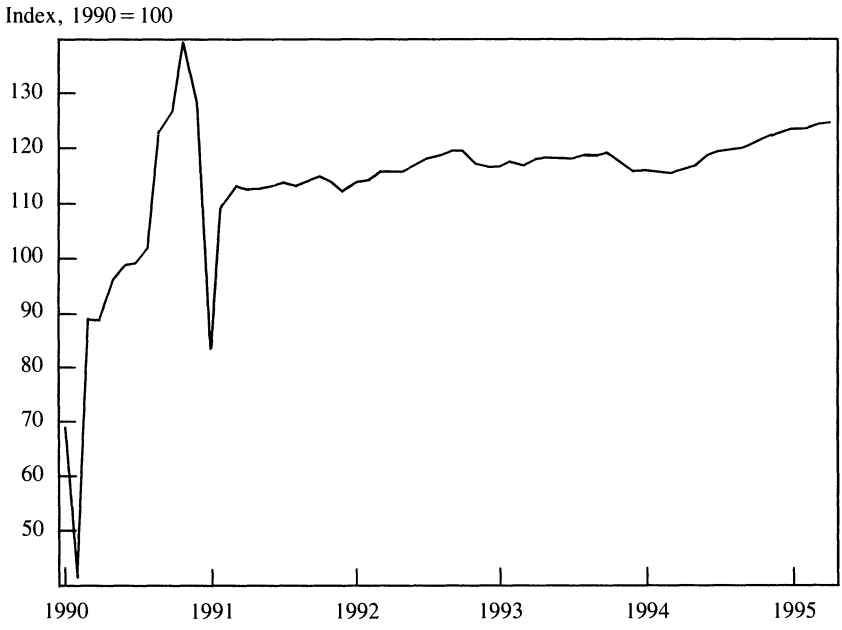
tive in maintaining a domestic capital market. But Brazil has now deregulated and as a result markets function far more internationally. Today capital flight and disinvestment by foreign investors is a real possibility in a way that policymakers, accustomed to a tradition of closed finance, do not seem to recognize.

Once a comprehensive program is set in place, preferably before inflation turns up once again, real depreciation could be achieved by three different methods: a devaluation, a fast crawl, or a float. It is not apparent that one strategy has any compelling advantage over another. The chief issue is to accomplish the task in hand.

ARGENTINA. Over the past twenty years, Argentina so thoroughly debased its currency that seigniorage became a source of hyperinflation; the only way to protect money was to move it offshore. Although Brazil also experienced hyperinflation, it did not seem to raise concern. Dollarization was an altogether remote concept; as has been seen, stabilization was eventually achieved around a unit of account. By contrast, when Argentina last stabilized, in April of 1991, it moved to an extreme monetary standard: the currency board. Just as at the end of the nineteenth century, when Argentina first experimented with a currency board, nothing short of a fully institutionalized mechanism of money issue could begin to yield credibility. The monetary regime is simple: the currency is fixed at one-to-one to the dollar; dollars and pesos circulate and are offered as deposits in parallel; and money creation must be fully backed by increases in foreign exchange reserves, and vice versa. Argentina is on a rigorous dollar standard and has, in fact, stuck to it against all temptations.

From an initial situation of hyperinflation, stabilization led to an immediate drop to almost zero inflation, in terms of consumer prices. In terms of wholesale prices the disinflation was quite rapid, but even so a real appreciation accumulated in the early months of the program and still remains, as seen in figure 8. This real appreciation is problematic because trade liberalization, restructuring, and budget cutting all involve a major reduction in labor demand. Even though growth averaged 7.7 percent over the past four years, the unemployment rate has risen to 18.6 percent and keeps rising. There is no question that the country would benefit from lower interest rates and a more competitive exchange rate, but devaluation is not the way to accomplish this in Argentina.

Figure 8. Argentina: Wholesale Price Index in U.S. Dollars



Source: *International Financial Statistics.*

Argentina is so fully dollarized that the dollar is the means of payment; if the peso goes, Argentina will stay with the dollar. Already 55 percent of deposits are in dollars, and likewise currency holdings are significantly dollarized. But beyond that, the dollar is also the unit of account and the reference point. As long as the peso stands at one-to-one with the dollar, any attempt to shake the relationship would surely demonstrate that, to all intents and purposes, Argentina is a dollar country. There is no exchange rate illusion.

Therefore Argentina will have to recover competitiveness through deflation. That is how the gold standard used to work. Table 17 presents the economic picture of Argentina. Not surprisingly, there has been very little evidence of deflation so far, since the economy was until recently in a boom. Yet even during this boom period, inflation in dollars came down below 5 percent. The next step is to bring down wages and prices. While Brazil was booming and overvaluing its currency, the problems of Argentina, which relies importantly on its export

Table 17. Argentina: Macroeconomic Indicators, 1990–95

Units as indicated

Indicator	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*[a]
GDP growth[b]	1.0	8.9	8.7	6.0	7.1	2.6
Inflation[c]	2314.0	171.7	24.9	10.6	4.2	4.9
Trade balance[d]	6.1	2.0	−1.2	−1.4	−2.1	−1.7
Real interest rate[e]	24.1	−0.5	13.2	9.0	4.7	7.9
Real exchange rate[f]	100.0	83.1	84.6	83.4	86.1	88.5

Source: Data for growth and the trade balance are from Republic of Argentina (various years); for inflation, GDP, and interest rates, from *International Financial Statistics;* and for exchange rates, directly from the J. P. Morgan currency index database.

a. First quarter, annualized.
b. Percent per year.
c. Annual percentage change in CPI.
d. Percent of GDP.
e. Deposit rate less WPI inflation.
f. Effective exchange rate index based on nonfood wholesale prices, 1990 = 100.

trade with Brazil, were smaller. Now, with a slowdown and the prospect of real depreciation in Brazil, Argentina's need for deflation is much larger. The government has begun moving in that direction. It has actually secured congressional approval for a 20 percent cut in public sector wages. In the private sector, though, downward stickiness remains the rule. Presumably it will take a severe slowdown to lower private sector wages; it is becoming quite apparent that this will happen.

Deflation, however, carries its own complications. While it may well restore competitiveness, a fall of prices redistributes debt burdens and will widen bankruptcy problems in a system that already has severe banking difficulties. Admittedly, devaluation would be just as complicated because of the mismatching of balance sheets. Thus there is no way to top off reform and stabilization with a quick and easy drop in prices.

Argentina bears watching for two reasons. First, the present situation makes it clear that a currency board is no panacea for failing credibility. Doubts persist for years, and real exchange rate issues do not go away easily. In fact, the Mexican crisis of 1994 in turn threw the international spotlight on Argentina; next, the March 1995 elections resulted in significant capital flight; and since then, in one way or another, the country has been on probation in international markets. Second, a currency board does not resolve the issue of an equilibrium real exchange rate. The emphasis is shifted to deflation, and there is very little evidence that this mechanism is any easier than a successful real depreciation.

Having mismanaged its money for decades, Argentina has no alternative to the most rigorous, most institutionalized monetary regime, with an accompanying experiment in deflation.

APPENDIX A

Selected Currency Appreciation Experiences

THIS APPENDIX reviews several appreciation experiences after 1975 in order to verify the propositions that all major currency appreciations have ended with a significant exchange devaluation (with or without a speculative attack), a fast crawling peg, or floating of the currency, and that no recent experience of appreciation with a fixed exchange rate has involved resorting to deflation or inflation to restore equilibrium. The information is compiled from the J. P. Morgan currency index database. Appreciations are defined as accumulated movements of the exchange of at least 15 percent that lasted more than one year and less than five. IMF classifications of exchange rate arrangements are taken from *International Financial Statistics*.[40]

Argentina, 1978–83. The real exchange rate (RER) appreciated by more than 60 percent during the period 1979–80. During 1981–83 it returned smoothly to its preappreciation level. As of June 1982 the IMF classified the Argentinian currency regime as "other types." The real depreciation was obtained through nominal changes in the exchange rate.

Australia, 1987–92. The RER appreciated by 21 percent between 1987 and 1989. Between 1990 and 1992 it returned smoothly to its preappreciation level. Throughout this period Australia had a floating exchange rate regime.

Brazil, 1987–90. The cumulative appreciation between 1987 and 1990 was almost 54 percent. This period was characterized by a slow crawling peg system. The floating of the currency in October and November 1990 ended the appreciation.

40. For experiences before 1975 that ended in collapses, see Edwards (1989). Note also that the J. P. Morgan database does not include Israel.

Colombia, 1979–85. The appreciation during 1979–83 totaled 27 percent. During 1983–85 the RER depreciated smoothly by 37 percent. This was achieved by means of a crawling peg system.

Indonesia, 1979–83. The RER appreciated by 31 percent during the period 1979–82. In March 1983 a nominal depreciation of 25 percent restored it to its preappreciation level. The currency regime during the appreciation was a managed floating system.

Malaysia, 1981–86. The RER appreciated by 20 percent during 1981–84. Between August 1985 and October 1986 it fell below its 1981 level. From March 1984 the currency was pegged to a composite of currencies.

New Zealand, 1985–91. Between 1985 and 1988 the RER appreciated by 32 percent. Between 1989 and 1991 it depreciated by 13 percent. Throughout this period the currency floated freely.

Nigeria, 1982–86. The RER appreciated by 66 percent during the period 1982–84. After a smooth depreciation during 1985–86, a nominal depreciation of 66 percent in October 1986 left it well below its preappreciation level.

The Philippines, 1983–86. The RER appreciated by 20 percent between 1983 and 1985. It returned to preappreciation levels through an initially smooth depreciation in 1985, followed by a 10 percent devaluation in January 1986. During this period the exchange rate regime evolved from a managed to a freely floating system.

South Africa, 1977–84. The RER appreciated by 57 percent between 1977 and 1980. Between October 1983 and October 1984 it almost returned to its preappreciation level. The currency floated freely during 1977–84.

Taiwan, 1978–83. The RER appreciated by 28 percent between 1978 and 1981. Between mid-1981 and 1983 it depreciated by 10 percent.

Turkey, 1976–80. Between 1976 and 1979 the RER appreciated by 57 percent. Nominal depreciations in January and February 1980 devalued it by 30 percent. The IMF did not classify Turkey as a pegging country.

Venezuela, 1979–84. The RER appreciated by 35 percent between 1979 and 1983. It recovered through devaluations in February and March of 1984 totaling 43 percent. Throughout this period the currency was linked to the U.S. dollar.

APPENDIX B

Trade Elasticities, Devaluation, and Trade

THIS APPENDIX addresses the issue of the impact of a devaluation on aggregate demand, focusing on the case of Mexico. First, different estimations of the trade elasticities are presented. From the average of these elasticities, the impact of a devaluation on trade and aggregate demand is then calculated, for both the short run and the long run. Table B1 presents the average of elasticities weighted against the relative value of imports in 1985 for each of the estimations.

Sweder van Wijnbergen presents estimations of demand for imports and exports as part of a macroeconomic model for the Mexican economy.[41] This study uses annual data covering the period 1970–87, and the estimation of imports is disaggregated into consumption, capital, and intermediary goods. The explanatory variables for imports are: relative price, measured as import price over the respective GNP deflator (current and lagged); an indicator for quantitative restrictions; and an indicator of activity (investment for capital goods, private consumption for consumption goods, and GDP for intermediate goods). The study presents estimations for both export demand and supply. The demand for exports is assumed to depend on the relative price (current and lagged) of Mexican exports with respect to an aggregate dollar-based price index of the imports of the trade partner. The supply is assumed to depend only on the relative price (current and lagged), proxied by the ratio of the price of exports to the GNP deflator. An important aspect of the results is the high price elasticity of the demand for exports (-0.95 in the short run and -1.07 in the long run). This drives the negative exports-revenue elasticity.[42]

Rudiger Dornbusch and Alejandro Werner use Mexican quarterly data from the first quarter of 1984 to the second quarter of 1993.[43] This study assumes a partial adjustment process for imports, using dummies

41. van Wijnbergen (1990).

42. Log changes in the price of exports (dP) and volume of exports (dX), given an initial change of exports dX_0 (as might be produced by a devaluation), are calculated as follows. By definition, given a supply change dX_0, we have $E_d dP = dX$ and $E_s dP = (dX - dX_0)$, where E_d and E_s are the demand and supply price elasticity, respectively. Solving both equations simultaneously yields the total change in volume and price.

43. Dornbusch and Werner (1994).

Table B1. Impact of Real Devaluations on Trade

	Import elasticity[a]		*Export elasticity*[a]		
Estimation	*Volume/ exchange rate*	*Volume/ income*	*Volume/ exhange rate*	*Price/ exchange rate*	*Revenue/ exchange rate*
van Wijnbergen					
Short-run	−0.81	2.38	0.11	−0.11	−0.02
Long-run	−1.01	2.38	0.40	−0.37	−0.12
Dornbusch and Werner					
Short-run	−0.30	1.25	0.31	−0.46	−0.16
Long-run	−0.63	2.60	0.91	−0.58	0.28
Haque, Lahiri, and Montiel					
Short-run	−0.16	0.08	0.05	. . .	0.05
Long-run	−0.94	1.12	0.67	. . .	0.67
Kumar, Samiei, and Bassett					
Western hemisphere	−0.50	0.77	0.17	−0.03	0.13
Benchmark					
Short-run	−0.44	1.12	0.16	−0.15	−0.01
Long-run	−0.77	1.72	0.54	−0.25	0.16

Source: Authors' calculations based on van Wijnbergen (1990), Dornbusch and Werner (1994), Haque, Lahiri, and Montiel (1990), and Kumar, Samiei, and Bassett (1993).
a. Calculated as log changes.

for changes in trade regimes, GDP as the activity index, and the real exchange rate (the U.S. WPI over the Mexican CPI) as the price variable. For exports, it estimates both supply and demand functions. The supply function is assumed to depend on the RER and the local activity level (following a partial adjustment model). The demand function is assumed to depend on the relative price of Mexican exports (in U.S. dollars) and total U.S. imports.

Nadeem Haque, Kajal Lahiri, and Peter Montiel estimate a complete macroeconomic model using a panel of countries (including Mexico) with annual data covering the period 1963–87.[44] The model has general-equilibrium features and it is estimated by nonlinear three-stage least squares. This study assumes that imports depend on the real exchange rate, the level of activity, and the reserves-to-imports ratio (that proxies for import restrictions). It also assumes partial adjustment. Exports are assumed to depend on the RER and the level of activity abroad, and to

44. Haque, Lahiri, and Montiel (1990).

follow partial adjustment. Contrary to the two previous studies, countries are assumed to be price takers.

Manmohan Kumar, Hossein Samiei, and Sheila Bassett, in an IMF Staff Study, estimate trade elasticities as part of a macroeconomic model including annual data covering the period 1973–91.[45] Estimation is carried on a set of countries, and the presented results are weighted averages (by GDP) for subsets of these countries. This appendix uses the estimations for the western hemisphere. Imports (nonoil) are a composite of desired imports and restricted imports, when the ratio of reserves to imports is low. Actual imports are a function of real export earnings, expenditure in home goods, relative prices, and the reserves-to-import ratio. The model considers both demand and supply for exports. The structural model includes the relative price (export price over world export price) and world income as the determinants of demand, and relative price (export price over domestic price of nontraded goods) and capital stock as the determinants of supply. The study estimates a reduced form of export volume and export price, from which it is straightforward to derive the effects of a devaluation.

The benchmark case is the average of the elasticities of the preceding four studies described above. With these elasticities it is straightforward to calculate the impact of a given devaluation in net exports and aggregate demand.

For Mexico the ratio of imports to GDP was 28.3 percent in 1994 and averaged 26.0 percent between 1988 and 1994. Exports, meanwhile, represented 20.7 percent of GDP in 1994 and averaged 21.7 in the period 1988–94. Using values of 27 percent for imports and 21 percent for exports in the benchmark case, a 20 percent devaluation implies the following direct effects: Exports decline in the short run (six months) by 0.04 percentage point of GDP; exports increase by the equivalent of 0.64 percentage point in the long run; imports decline by the equivalent of 2.37 percentage points in the short run; and imports drop by the equivalent of 4.16 percentage points of GDP in the long run. These effects total increments in aggregate demand of 2.33 percent of GDP in the short run and 4.80 percent of GDP in the long run.

45. Kumar, Samiei, and Bassett (1993).

Comments and Discussion

Sebastian Edwards: Rudiger Dornbusch and his associates would have us believe that, as are Anna Karenina's happy families, all currency collapses are alike. Not quite. In fact, Dornbusch, Ilan Goldfajn, and Rodrigo Valdés have chosen at least two episodes that clearly stand out as exceptions in the long history of devaluation crises of the world economy. Contrary to the prototypical devaluation, neither the Chilean nor the current Mexican crisis was preceded by large fiscal imbalances, runaway credit creation for the public sector, an exploding black market for foreign exchange, or hikes in import tariffs and exchange controls. These episodes are rather unusual instances of currency collapse with fiscal balance and openness. This, indeed, makes them somewhat puzzling, and makes their analysis particularly interesting. The two other crises examined by the authors, Mexico in 1982 and Finland in 1994, do conform to the broad characteristics of historical crises. They are, however, quite different from the cases of Chile in 1982 and Mexico in 1994.

This comment focuses on three issues raised by Dornbusch, Goldfajn, and Valdés. First, I argue that not all devaluation crises are alike. This means that better analytical stories than the existing speculative attack models are needed to account for differences across episodes. Second, I discuss the role of capital inflows in the Chilean and recent Mexican crises, and argue that the sudden surge in capital availability played a more important role than the authors allow. Third, I deal with their provocative assertion that the real exchange rate is a policy variable. I argue that this is not a new (revolutionary?) theory; the issue is

really one of semantics. Also, in discussing whether the real exchange rate is endogenous or exogenous, I address the question posed by the authors: Can devaluations work? I answer with a very strong positive. I end with some brief remarks on the selection of exchange rate regimes in developing and transitional economies.

The Anatomy of Devaluation Crises

What makes the Chilean and recent Mexican crises different is that, in terms of the policies pursued before the collapse, they do not conform to the historical regularities first studied by Richard Cooper in 1971. What they do share with the vast majority of crises is that the crash is preceded by a substantial real appreciation and a large loss, almost a complete depletion, of international reserves. But this is just another way of saying that the parity could not be sustained and that the fixed rate system crashed. The really interesting question is whether there are differences in the policy stance in the period leading to the attack on the currency. Could it have been known, exclusively on the basis of credit, monetary, fiscal, and commercial policies, that Chile and Mexico were inexorably slipping towards a free fall? I believe that the answer to this question is no.

In an extended study on the anatomy of devaluation crises in the developing world I analyzed, in quite some detail, eighty-seven episodes of currency collapses between 1954 and 1975.[1] These crises were overwhelmingly characterized by major fiscal imbalances—not merely fiscal loosening—that were validated by overly expansive credit policies. Not surprisingly, most of the credit creation went to the public sector. In spite of the rather rapid rate of growth of credit creation in Mexico documented by Dornbusch, Goldfajn, and Valdés, in all other respects both Chile and Mexico's macroeconomic policies were prudent. (Note that I am already disagreeing with the authors, in that I do not consider the real exchange rate to be strictly a policy variable!) In fact, in both cases the fiscal accounts exhibited comfortable—although, in the case of Mexico, admittedly declining—balances, and instead of

1. See Edwards (1989) and Edwards and Santaella (1993). For similar studies see Kamin (1988) and Harberger and Edwards (1982).

closing the external sector, both countries continued to pursue aggressive opening strategies.

The fact that the runs on the Chilean and Mexican currencies do not conform to the "inconsistent fiscal policy" norm means that the standard models of currency collapse and speculative attacks, such as Paul Krugman's classic formulation, cannot satisfactorily account for these episodes. Guillermo Calvo and Enrique Mendoza, and Leonardo Leiderman and Alfredo Thorne have suggested that models based on endogenous policy shifts or on the existence of a vulnerable banking systems can appropriately explain the Mexican case. Although these formulations represent an improvement over the standard approach, they still fall short of explaining the role of the massive capital inflows in the period leading up to these crises.[2]

Real Exchange Rates, Capital Inflows, and Crises

Stabilization programs based on an exchange rate anchor are in danger of generating a significant degree of real exchange rate overvaluation, a loss in the degree of international competitiveness, and very large trade deficits. If this situation is not corrected in time, the credibility of the stabilization program will be called into question, inviting speculative attacks on the currency. This was, indeed, the situation in Chile in 1981–82, when the combination of a fixed nominal exchange rate, backward indexed wages, and a major surge in capital inflows generated an acute overvaluation that ended in a precipitous crisis.[3]

In 1988–89 independent analysts, as well as the architects of the Mexican stabilization program, were clearly aware of the dangers of this overvaluation syndrome. In fact, in an early analysis of the Mexican program Dornbusch himself pointed out that the "risk is that when inflation has disappeared it has been replaced by a new problem such as exchange rate overvaluation or bankruptcies."[4] The Mexican authorities, however, argued that there were two reasons why Mexico would be exempted from this fate. First, the policy was initiated in a

2. See Krugman (1979), Calvo and Mendoza (1995), and Leiderman and Thorne (1995).

3. See Edwards and Edwards (1991).

4. Dornbusch (1988, p. 256).

situation of exchange rate undervaluation; that is, there was a built-in cushion allowing the real exchange rate to appreciate without hurting the country's external position. Second, Mexico had ample international reserves.[5] Addressing the Mexican congress on March 10, 1988, Minister Aspe said that "for the exchange rate to serve [as an anchor] it is required that the balance of payments starts from a favorable surplus position. . . . [T]he use of the exchange rate according to a downward tendency . . . is fully justified if we consider that there is an ample margin of undervaluation of our currency."[6]

The Mexican stabilization program succeeded in reducing inertia, but not in eliminating it. An empirical analysis of the degree of persistence of the Mexican rate of inflation strongly suggests that even after the renewals of the *pacto* in 1989–91, inertia continued to be very high. As a result, the decline in the rate of inflation was painfully slow.[7] As had been the case in Chile during the early 1980s, and as many had feared for Mexico, the process was accompanied by a substantial real appreciation and loss in international competitiveness. In 1989 a number of observers expressed concern about the mounting real appreciation and argued that the trend would become unsustainable because the country lacked the foreign exchange to finance an increasing external disequilibrium.[8] The surge in capital inflows that started in 1990, however, relaxed Mexico's external constraint, allowing the country to run extremely large current account deficits from 1992 to 1994. The fact that these inflows were largely private persuaded a number of analysts, including senior Mexican officials, that this was an equilibrium phenomenon that did not call for policy action.

To the questions of whether the current account deficit was sustainable and the real exchange rate was overvalued, the Mexican authorities responded that to the extent that flows were private and the fiscal accounts were in surplus, there was nothing to worry about. In January 1994, the Banco de México's governor, Miguel Mancera, told the *Economist* that the current account deficit was not a problem because it "was

5. Two additional explanations were later added to this list: that the NAFTA would provide enough capital to sustain a more appreciated real exchange rate, and that productivity gains would offset the real exchange rate appreciation (see Aspe, 1993).

6. Cited in Vela (1993, p. 1).

7. See Edwards (1993), and also Santaella and Vela (1995) and Vela (1993).

8. See, for example, Edwards (1990).

associated with the inflow of foreign funds, rather than expansionary fiscal or monetary policy.'' And in its 1993 annual report the Banco de México stated that the ''current account deficit has been determined exclusively by the private sector's decisions to save and invest. . . . [B]ecause of the above and the solid position of public finances, the current account deficit should clearly not be a cause for undue concern.''[9]

The increase in capital inflows, together with the rigid exchange rate regime, was the major cause of the persistent real exchange rate appreciation after 1989. In fact, the higher capital inflows *required* a real appreciation of the peso. This is because to the extent that the increase in expenditure financed by such flows is spent on domestic goods, a change in relative prices—that is, a real appreciation—will be required to maintain macroeconomic equilibrium. This was, indeed, the case in Mexico, where a large proportion of the increase in expenditure went to the real estate sector.

In that regard, then, it was possible for the Mexican authorities to argue that the real exchange rate appreciation was an equilibrium phenomenon that did not require policy intervention.[10] However, the problem with this argument is that in Mexico, as in Chile a decade earlier, the rate at which capital was flowing into the economy was clearly not sustainable in the long run, nor even in the medium run. Thus the major real appreciation of the peso induced by the greater availability of foreign financing was clearly a short-term phenomenon that, sooner or later, would have to be, at least partially, reversed; and in the meantime, was hampering growth and creating a serious long-run macroeconomic disequilibrium. In fact, what the Mexican authorities missed was that, just because the capital flowing in was private, it was susceptible to a sudden stop that would require a massive adjustment effort. In 1993 Daniel Oks and Sweder van Wijnbergen recognized the temporary nature of the expansion of capital inflows and argued that the key question was: ''Once capital stops flowing, should we expect the current account to improve or is Mexico heading for a major [balance of payments] crisis?''[11]

9. *The Economist,* January 22, 1994, p. 21; Banco de México (1993, pp. 179–80).
10. See, for example, Banco de México (1993, 1994) and Aspe (1993, pp. 43–46).
11. Oks and van Wijnbergen (1995, p. 174). It is worthwhile noting that Oks was

In long-run equilibrium it is not possible for the ratio of Mexican securities held by foreigners relative to Mexico's GDP to grow continuously. In fact, the long run will be characterized by a stable ratio of claims on Mexico to the country's GDP. Given the rate of growth of the Mexican economy in the early 1990s, the sustainable rate of capital inflows was closer to the 2 to 4 percent of GDP range than the 8 percent of GDP observed during 1992–93.[12]

Thus the relevant question was not, as many analysts thought during 1994, whether these inflows were sustainable, but how and when Mexico was going to adjust toward a lower availability of foreign resources. More precisely, even in early 1993 Mexico's challenge was to engineer a smooth landing, adjusting gradually to a situation of lower capital inflows. By mid-1994 this challenge had become an urgent imperative. The problem is that whereas the real exchange rate appreciates without any impediments during the surge in inflows, when capital inflows decline nominal wage and price rigidity tend to make the required real depreciation difficult.

The abandonment of the predetermined exchange rate regime in late 1992, and the adoption of a managed floating regime—or even a crawling peg—would have increased the credibility of Mexico's trade liberalization, allowing exports to grow faster and the recession to end. Also, and more important, it would have given the system the gear for a smooth landing once capital inflows started to decline to their lower, equilibrium level. An even better strategy would have been a more gradual opening of the capital account—that would have largely discouraged short-term speculative flows—combined with a flexible nominal rate. However, the government's determination to cling to the rigid nominal exchange rate system, its insistence—an obsession, really—on attaining single-digit inflation, and a succession of negative shocks made the possibility of a smooth landing increasingly unlikely as 1994 unfolded. More serious, however, was the fact that after rejecting exchange rate adjustment and deciding to maintain the band system, the

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the World Bank's country economist for Mexico at the time, and van Wijnbergen had been the bank's lead economist for Mexico until early 1993.

12. This condition for overall sustainability is an extension of the well-known public sector sustainability condition that calls for maintaining a constant ratio of public debt to GDP. See Edwards, Steiner, and Losada (1995) for an estimation of sustainable capital inflows over the period 1992–93.

Mexican authorities were unwilling to follow the policies required to defend the parity during 1994.

The Real Exchange Rate Is Not a Policy Tool

I must confess that I was quite shocked to read in the introduction that the real exchange rate was a policy tool. My concern was premature. A careful reading of the paper reveals that the authors do not mean quite that. In fact, what they mean is that policymakers can "influence" the real exchange rate "through the setting of nominal rates." And they qualify their initial statement by saying that "the real exchange rate is seen to be a limited policy variable."

My interpretation of these statements is that nominal devaluations can, and in many cases will, affect the real exchange rate. Moreover, the effect can even persist in the medium and long runs. I largely agree with this view, subject to some qualifications. As the existing evidence shows, the extent to which a nominal devaluation will be translated into a real devaluation will vary greatly from country to country and will depend on a number of variables. Chief among these, as the authors acknowledge, are the country's inflationary history and the degree of currency substitution. Interestingly, however, regression results for eleven countries during the 1970s and first half of the 1980s suggest that, other things given, even in inflationary countries as much as 45 percent of a nominal devaluation translates into a real one, on average.[13] Unfortunately, in many cases "other things," especially fiscal and monetary policies, are not given. In fact, Latin America's economic history is filled with instances when nominal devaluations have been accompanied by fiscal expansion and surges in credit creation. The result has been an unavoidable outburst of inflation followed, sooner rather than later, by a new crisis, a new devaluation, and a new round of recriminations. Some good examples are Argentina in 1970, Bolivia in 1972 and 1979, Colombia in 1962 and 1965, Jamaica in 1978, Nicaragua in 1979, Mexico in 1976 and 1982, Peru in 1972, and Ecuador in 1982.

The key, and highly valuable, message of this paper is that avoiding

13. See Edwards (1995, ch. 5).

real exchange rate overvaluation is critical for assuring sustainable growth. And this can clearly be achieved more easily with a flexible exchange rate regime, be it managed float or crawling peg. This is, in fact, an old lesson, and one that Carlos Díaz-Alejandro was never tired of repeating. The euphoria of the "emerging markets" era, however, has made a few people forget some of the basic lessons of Latin America's economic history. A poor memory can, indeed, be costly, as Mexico's recent experience shows.

Michael Bruno: Rudiger Dornbusch is on record as having predicted the collapse of the Mexican peso and has every right to say, "I told you so."[1] Other experts, both in Mexico and outside, agreed that the peso had become substantially overvalued by 1994 and that the Mexican government had hung on to it for too long, for political reasons. Mexico has had a tradition of pegged exchange rates and, as in the earlier episode that the authors discuss (1978–82), has found it hard to move away from this regime under changing circumstances. I concur with the authors' "disequilibrum" interpretation of what recently went wrong with the exchange rate peg and Mexico's macroeconomic policy.

But what lesson does this and the earlier episode teach about the exchange rate regime? For many observers it would prove, yet again, that a peg cannot last forever, not that it should never have been adopted in the first place. The authors go further than that. They use the two Mexican episodes, that of Chile in the early 1980s, and the more recent case of Finland, as well as three more moderate EMS collapses from the 1990s to suggest a policy conclusion that would appear to be a marked departure from the paradigm that has held for the last decade or two: that the nominal exchange rate can play a, sometimes central, role (together with fiscal discipline) in disinflation. In the authors' opinion *real* exchange rates tend to be sticky downward and therefore it is a mistake to let them appreciate. Countries are ill-advised to allow a real appreciation to continue for any length of time because the current account is likely to be of greater concern than inflation as a policy target. Moreover, the real exchange rate is a policy variable; that is, a nominal devaluation will, in general, lead to a real devaluation with no substantial inflationary trade-offs.

1. See Dornbusch and Werner (1994).

Of the four points that the paper emphasizes, I fully agree with two: that the real exchange rate is a key relative price, and that an overly accommodating capital market may aggravate the potential for mismanagement and amplify the ultimate costs of collapse. I am disturbed by the other two points, that the real exchange can be viewed as a policy variable and that inflation has been overemphasized as a policy target, mainly because of the unqualified interpretation that can be given to these statements. In addition, the authors' selective choice, and some of their interpretations, of the country examples are open to question.

The Real Exchange Rate as a Policy Variable

To start with the conditions under which the real exchange rate can be deemed a policy variable, I agree that the relevant analytical framework is that of the real goods and labor markets. To simplify matters, I first consider the real goods market. In short-run equilibrium and under capital mobility, a clear relationship must hold between the ratios of the following three nominal variables: the nominal exchange rate, E (measured in terms of domestic currency per unit of foreign currency), the nominal wage rate, W, and the price level, P.[2] Under these definitions, the real exchange rate (E/P) must, ceteris paribus, bear a negative relationship to the real wage, W/P; that is, real depreciation and a decrease in the real wage necessarily go together. But real exchange rate depreciation also depends on real fundamentals, including the government budget variables, S, that rise with increases in tax revenue and expenditure cuts, and other given shift factors, T, that are positively related to increases in the capital stock and total factor productivity, as well as to a beneficial shift in external terms of trade. This commodity market constraint can be written

$$E/P = F\underset{-}{(W/P;}\ \underset{+}{S},\ \underset{+}{T}). \tag{D1}$$

At given levels of S and T, a real depreciation (which increases net

2. The role of the money supply (M) is endogenous here on account of capital mobility. Under flexible exchange rates M and M/P would replace E and E/P.

demand for goods) requires a fall in the real wage (which increases net supply of goods), and the reverse for a real appreciation.

Returning to the paper with this constraint in mind, suppose that balancing the current account requires a real devaluation (an increase in E/P). Although the authors do not make this explicit, a central condition, based on equation D1, for a nominal devaluation to lead to a real devaluation is that there be a corresponding drop in the real wage. This can happen only if there is substantial unemployment or if wage earners are under some kind of money illusion. Only if there were no, or little, response by nominal wages to changes in the exchange rate and the price level could the real exchange rate be thought of as a policy variable. Even though this might sometimes seem to be the case in the short run, when there is unemployment, it would be very unlikely to hold for relatively small and very open economies. In any case, this scenario is hardly likely to persist over time, as wage earners begin to "learn" and new devaluations are implemented once the old ones have run their course at the cost of rising inflation. In other words, it eventually returns to the situation in which the existing paradigm for stabilization took hold, in the inflationary years of the late 1970s and early 1980s.

When to Exit from a Nominal Peg

It has hitherto been accepted that, in general, the real exchange rate can only be altered by a change in real fundamentals, such as fiscal policy or market structures, and that in an open economy, certainly a small open economy, the nominal exchange rate can often serve as a key nominal anchor.[3] Obviously pegging the exchange rate in order to stabilize from high or moderate inflation involves a calculated risk. As the price level usually is not stabilized completely, the ensuing real appreciation may eventually lead to the overvaluation of the currency and a gradual worsening of the current account balance. Unless sustainable financing is assured for the current account, sooner or later a

3. The following view propounded in the mid-1980s, albeit in regard to high inflation, presumably would still be advocated by its author: "Those who argue that budget correction is essential and exchange-rate fixing redundant or even counterproductive need to provide evidence for their contention." (Dornbusch, 1986b, p. 11.)

corrective devaluation may be called for. However, anticipation of a change in the peg may, under certain circumstances, lead to a currency collapse. None of this is news. But it is important to stress that the breathing space during which a stabilization may run its course can be quite substantial, depending first of all on the real exchange rate at the time of the fixing, and no less important, on the real productivity dividends that may accrue as a result of disinflation and competitive pressure on the exchange rate. In terms of equation D1, the factor T may rise endogenously as a result. Because T also affects the current account, this could make for an appreciation not only of the actual rate, but also of the equilibrium real exchange rate.

Thus the main question is not whether stabilization by means of the exchange rate is good or bad policy, per se, but what the optimal timing of exit is. Determining this is more of an art than an exact science. There are plenty of examples of success as well as of failure. The authors mention none of the successes, yet the failures that they cite do not necessarily prove their point.

Before considering this, recall that the current paradigm for stabilization took hold during an inflationary period, several years after the breakdown of Bretton Woods and the age of commodity shocks, and was manifested in two distinct groups of countries in two different ways. The formation of the EMS gave traditionally inflation-prone countries, such as France, Italy, and Spain, a way of tying their governments' hands by fixing the currency to the arch-conservative German Bundesbank. In this way, they eventually brought inflation down below the German rate. In high-inflation, middle-income countries, on the other hand, the important link from the exchange rate to the price level gradually persuaded policymakers to move back to pegged exchange rate regimes. Leaving aside phony exchange rate *tablitas* that ignored fundamentals and ended up in currency collapse (for example, Chile in 1979–81 and Israel in 1981–83), the main development has been to use the exchange rate peg as a nominal anchor, an essential supplement to fiscal retrenchment, for sharp stabilization from high inflation.

Among the countries that have recently experienced high inflation, Israel may have been the first to succeed with an exchange rate–based stabilization program, in 1985.[4] The Mexican *pacto* of 1988, modeled

4. In this assessment I do not include extreme episodes of hyperinflation, such as

on the Israeli example, came next and was a success, at least until 1990. Subsequently, there were a number of successful stabilizations in eastern Europe, for example, Poland in 1990 and Czechoslovakia in 1991. And there have been quite a few additional sucesses since.

It was never thought that if the exchange rate is initially pegged it should remain thus, come what may. The choice of the exchange rate as a nominal anchor *only* relates to the initial phase of stabilization. Israel adjusted its exchange rate in March 1987, twenty months after the initial stabilization. Poland and Czechoslovakia also adjusted, in due course. In all of these cases, inflation did come down quickly and substantially, but ongoing residual inflation led to substantial real appreciation. In none of these cases was there a currency collapse or a hard landing.

Israel's Experience after the 1985 Stabilization

The Israeli example is the one that I know best, from personal experience.[5] No objective observer (which I am not) would deny that the defense of the initial peg over a period of twenty months (given the achievement of fiscal balance) had a profound impact on the sustainable reduction of high inflation from 500 percent to below 20 percent, and more recently, to below 10 percent annually. The first poststabilization realignment (7 percent) took place in March 1987 and would have been followed by another limited realignment exactly a year later, under strong recommendation from the Bank of Israel, had it not been delayed for political reasons by the minister of finance, in view of the forthcoming October 1988 elections. In that respect it was an interesting forerunner of the Mexican experience before the 1994 election. The outcome, as expected, was a mini-run on the currency that, on one bright morning in December 1988, caused a loss of $300 million of reserves and necessitated an immediate devaluation of 5 percent. For lack of credibility, this had to be followed by an 8 percent devaluation very shortly afterward.

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those experienced in Europe immediately after both world wars. Among the recent exchange-rate pegging episodes, Argentina's stabilization in 1985, and Brazil's in 1986, failed mainly for fiscal reasons.

5. For more detail, see Bruno (1993, ch. 5).

Since 1989, Israel has adopted a more flexible exchange rate policy that amounts to a crawl: a band (with first 3 percent and then 5 percent on each side) with occasional adjustments in the mid-rate, culminating at the end of 1991 with a preannounced crawling band that was recently widened further. From the initiation of the stabilization program in July 1985 to the end of 1988, the shekel appreciated by about 40 percent in real terms, without a major collapse. The initial 2 to 3 percentage point increase in unemployment during the interim period (later followed by another 2 percentage points, to reach 11 percent at the height of the Russian immigration) was the necessary price of making the stabilization program credible to the trade unions and the public at large, and bringing about the convergence of nominal wage growth to the rate of inflation. Substantial overshooting in the real wage between 1985 and 1988 (unit labor costs increased by 12 percent) was followed by a major downward correction over 1989–92. Going to a more flexible exchange rate any sooner would not have achieved the same result.[6]

The Country Examples

In regard to the country examples presented in the paper, one would have thought that if currency collapse is, indeed, an inevitable consequence of exchange rate fixing, it would have been easy to come up with examples of collapses that occured in the absence of large external shocks. However, in all of the cases that the authors select, such shocks either triggered the collapse or were the prime reason for it. In Chile and in Mexico in 1982, the currency collapsed in the wake of unprecedented hikes in world interest rates. The Finnish currency collapsed along with that of its major trading partner, the former Soviet Union (that is, the T factor dropped sharply, resulting in a depreciation of the equilibrium real rate). Does Finland's situation really a prove that there was anything wrong with adopting a fixed peg between 1980 and 1987, when it was able to reduce the inflation rate from double digits to 2.9 percent? Given the rigid Finnish labor markets and inflationary

6. Even in the case of Israel, however, my general caveat might apply today. Very recently the country got stuck at a fixed dollar exchange rate with renewed real appreciation and a substantial increase in the current account deficit that need eventually to be resolved by the right mix of fiscal and monetary policy.

behavioral norms, could the country have achieved similar convergence by any other means?

Finally, consider the three EMS examples: Italy, Spain, and the United Kingdom. It is not clear whether the authors argue that these countries should never have joined the EMS, or rather, that some situations require exchange rate realignment even within an otherwise fixed exchange rate regime. I would argue that their collapse was caused, first and foremost, by a shock brought about by the unexpected German unification. Given the German policy of fiscal expansion coupled with a sharp monetary contraction, there were only two alternatives for preventing the recession from being exported to the rest of Europe: the appreciation of the deutsche mark or the depreciation of some of the more vulnerable currencies. The relevant counterfactual is what would have happened in the absence of unification, or with German fiscal retrenchment. Is it certain that the United Kingdom, Spain, and Italy would have required a hard landing and that the EMS would not have survived over a longer period of time? Or, is it correct to argue, with the benefit of hindsight in 1995, that these three countries should have had entirely different exchange rate regimes through 1988? I would doubt it. Italy's decision, for example, to join the EMS in 1979 not only helped it to bring down inflation faster than it otherwise would have, but also, through the pressures imposed by real appreciation on the tradable goods industries, brought about a productivity increase that, in fact, appreciated the *equilibrium* real exchange rate. This interaction parallels the experience of Japan, where an extended real appreciation of the yen-to-dollar rate alongside a surplus on current account was sustainable because of rapid productivity gains.

The Lesson of the Recent Mexican Collapse

What is the lesson of the recent Mexican collapse for other countries? It is not that the real exchange rate should take over as a policy variable, or that further reduction of inflation should always be given up once moderate levels have been achieved. Rather, it is that the Nigel Lawson dictum that only the fisc matters, is wrong. In a world of free capital mobility, mistakes on fundamentals can be punished more quickly. And fundamentals should definitely include the current account deficit, as

the authors rightly argue, as well as its composition and the term composition of government debt. Recent experience has taught how important it is to watch for the source of an increase in the current account deficit when assessing the vulnerability of a country to capital flow reversals. Even if the fisc is in reasonable shape, which happens to have been the case in Mexico, an increase in the current account deficit generated by a drop in the private savings rate is ominous; an increase in investment, especially in tradable goods industries, not so. Among the Latin American economies, Chile stands out for having managed to increase both private savings and investments during the period of large capital inflows. It also managed to continue to reduce inflation while keeping the real exchange rate from appreciating excessively, because its real wages were more downward flexible.

This challenging paper forcefully points out the danger of overemphasizing the speed of disinflation convergence at the expense of the current account, especially in the presence of unexpected external shocks. The risk involved in following a certain disinflation strategy will vary from one country, or specific situation, to another. The presence of risk, however, does not undermine the basic premise on which the existing paradigm has rested.

General Discussion

Edmund Phelps interpreted this paper as differing markedly from one that Dornbusch coauthored for an earlier Brookings Panel meeting. In that paper, Dornbusch appeared to advance the general hypothesis that moderate inflation is good for developing countries, even if it is episodic, because it arises from occasional currency crises. In the current paper, the focus appears to be on the role of real shocks in bringing about currency crises. He noted that the present paper appears to look at instances of nominal devaluation as government attempts to correct real overvaluations where disinflation is too painful a means of correcting the real exchange rate. This reasoning seems to accept the presence of inflation illusion that permits devaluation to achieve real depreciation without appreciable real costs. The paper seems to advocate devaluation or disinflation, depending on whether or not the econ-

omy has experienced a real shock. Finland's devaluation is seen as appropriate because Finland had experienced a real shock requiring a real depreciation. Phelps had expected the paper to provide a post-mortem on the Mexican currency crisis arguing that, as awful as the devaluation of the peso was, disinflation would have been worse. But he found no econometric evidence or other empirical support for this idea in the paper.

Responding to Phelps, Dornbusch could not recall having said that inflation is generally good for developing countries, although he did think that, in many instances, getting from, for example, 7 percent inflation to 0 percent might not be worth the real cost in output and employment. He regarded the main motivation of the present paper as trying to explain the sudden onset of the Mexican currency crisis when it had been clear for a substantial length of time before the crisis that the peg of the nominal exchange rate was unrealistic, given the appreciation of the real exchange rate. Why did financial markets not anticipate the event when the facts were readily available in newspapers every day, and why did the government not act sooner to prevent the inevitable collapse?

He explained that the paper presents the Mexican currency crisis as part of a process whereby the government realizes that a fixed exchange rate is becoming less and less credible but reacts by committing itself ever more deeply to that policy. Then, in a setting of liberalized financial markets and a globally integrated capital market, the government borrows more, thereby buying more time and postponing the inevitable. When the collapse finally comes, usually precipitated by some minor event, it is of a very different nature from the old-fashioned pattern of spending a bit too much, becoming overvalued, having a devaluation, and then repeating the process four years later. Because governments can now support an unrealistic exchange rate for a prolonged period, adding to the potential capital outflow and eventual imbalance, when the crisis comes, it is much more severe.

Dornbusch added that for Mexico, devaluation was a preferred remedy to deflation because deflation would have imposed even higher real costs. He could not imagine the political system tolerating even higher real interest rates (which would have put even more of the financial system out of business) alongside restrictive fiscal policies, and without the advantage of a real depreciation that, at least, promoted export

growth. He noted that Argentina is in a different situation than Mexico. The establishment of a currency board in Argentina means that devaluation is not a plausible strategy. The best policy option is for the government to retain the fixed exchange rate and wait for deflation to bring the real exchange rate back down because, unlike in the case of Mexico, there is no exchange rate illusion. The danger inherent in this policy is that because deflation is a slow process, the real exchange rate adjustment may take a long time.

James Duesenberry noted that in a framework where the real exchange rate is considered a policy variable, the government must implement policies that prevent a wage-price spiral from eliminating any gains in competitiveness that a devaluation of the nominal exchange rate might bring. In this context, he emphasized the role of fiscal and monetary policies in controlling the effects of a nominal devaluation on demand, and argued that many countries fail to realize gains in competitiveness following nominal devaluations because appropriate policies are not implemented. Duesenberry also considered the circumstances in which fixing the nominal exchange rate might be beneficial. He argued that reducing excessive volatility was the main benefit of fixing the exchange rate, but warned that a country should avoid making an irrevocable commitment to a fixed rate. One danger was the possibility of initial overvaluation; another was excessive reliance on the fixed rate as a tool for fighting inflation. Duesenberry also emphasized the important role of reserves, borrowing power, and capital controls in determining whether fixing an exchange rate is a feasible strategy. He noted that in many African countries there are no reserves, borrowing power was used up long ago, and capital controls cannot be used as an effective policy tool.

Christopher Sims commented on the extensive list of countries that had experienced episodes of real exchange rate appreciation. These episodes all seem to have ended with the real exchange rate returning to pre-appreciation levels. If this is a robust finding, the real exchange rate would be one of the few economic time series that is not a random walk but rather, a series that returns to a mean or a very slowly moving trend. However, Sims noted that the criteria for measuring the real exchange rate movements—such as what peaks and troughs were chosen—were unclear. He wondered whether the reversal result depended on the definition of what constitutes an appreciation or on the period

chosen for analysis. Referring to Sims' comments, Sebastian Edwards reported on his own effort to look systematically at eighty-seven devaluations during the period 1954 to 1984, where a 10 percent fall in the nominal exchange rate from a fixed rate regime was considered a devaluation. In general the real exchange rates did tend to revert, but only very gradually, so that the series was close to a random walk by conventional statistical criteria.

Goldfajn amended Edwards' conclusion that the Chilean and the recent Mexican currency crises are unique cases, in that neither involved fiscal mismanagement, by arguing that the Finnish currency crisis ought to be included in that group. On Brazil, he noted that fixing the nominal exchange rate has been successful in reducing inflation from 45 percent per month to 25 percent per year, and concluded that a nominal exchange rate peg can be an important policy instrument in reducing inflation, even though a peg cannot last forever.

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