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Author(s): Miguel A. Kiguel and Nissan Liviatan

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The Business Cycle Associated with Exchange Rate-Based Stabilizations

Miguel A. Kiguel and Nissan Liviatan

This article examines the effects of disinflation on economic activity in countries characterized by chronic inflation. Such countries have a long history of inflation at rates exceeding those in industrial countries as well as labor and capital markets that have adjusted to function in an inflationary environment. A sample of disinflation programs in several Latin American countries and in Israel demonstrates that stabilization efforts in countries with chronic inflation often do not induce the usual Phillips curve tradeoff in the medium run. Specifically, stabilization programs that use the exchange rate as the main nominal anchor are often associated with a business cycle that begins with a boom and ends with a recession. Stabilization programs that use money supply as the nominal anchor generally induce the expected Phillips curve result: lower inflation is accompanied by a recession after the program is implemented.

This article examines the effects of disinflation on economic activity in countries characterized by chronic inflation, a term coined by Pazos (1972). In these countries there is a long history of inflation at rates exceeding those in industrial countries, and labor and capital markets have adjusted to function in an inflationary environment.

It is generally believed that stabilization programs aimed at stopping inflation involve an initial cost in loss of output because of rigidities in past nominal contracts (as in Fischer 1988 and Taylor 1979) or because of credibility problems. The costs of disinflation are therefore borne in the early stages of stabilization and fall later as the link with the past is severed and credibility is restored. This classical scenario of an initial recession followed by resumption of normal activity is indeed observed when low or moderate inflations are stopped. The best known recent examples from industrial countries are the stabilization policies in the United Kingdom and the United States in the early 1980s, whereas among developing countries Costa Rica (1982-83) and the Philippines (1983-84) had two recent programs. (For other examples, see Cline and Weintraub

Miguel A. Kiguel and Nissan Liviatan are both with the Country Economics Department at the World Bank. The authors are grateful to Michael Bruno, Guillermo Calvo, Vittorio Corbo, Allan Drazen, and Carlos Vegh for useful comments and discussions and thank Jariya Charoenwattana for research assistance.

1981.) In all of these episodes inflation fell gradually but persistently, and once the objective of reducing inflation was achieved, economic activity recovered, usually reaching prestabilization levels.

The classical recessionary scenario is also observed in chronic inflation economies that implemented orthodox stabilization programs, which used money as the nominal anchor (money-based stabilizations or MBS). A good example is the monetarist Chilean program of 1974–75, in which tightened monetary and fiscal policies led to a deep recession. Likewise attempts in 1990 to bring down inflation in Argentina, Brazil, and Peru through a monetary crunch led to a fall in economic activity. These programs were not very successful in achieving significant and sustainable reductions in inflation.

The experience with stopping hyperinflations is different. As Sargent (1982), Dornbusch and Fischer (1986), and Sachs (1986) among others document, hyperinflations have been stopped quickly and with relatively small costs. These were orthodox stabilization programs, which relied on tight fiscal policy; stabilization of, or in some cases fixing, the exchange rate; and no use of price controls. Although new evidence suggests that these programs were recessionary (for example, Wicker 1986), the induced recessions were less severe than those resulting from programs aimed at eliminating moderate inflation.

In this study we show that the relation between disinflation and output assumes an entirely different form in chronic inflation countries that used the *exchange rate* as the nominal anchor (we shall refer to it as exchange rate-based stabilization or ERBS). These countries experienced a small (or no) recession initially, quickly followed by reductions in inflation, which were accompanied by expanding output above the historical trend and falling unemployment. The expansionary phase sometimes lasted for several years before ending in a recession. In most of these programs inflation was reduced gradually, and hence the programs did not achieve the spectacular results achieved in ending hyperinflations. The main exceptions were the heterodox programs, in which rapid reductions in inflation were achieved by combining the use of the exchange rate as the nominal anchor with price and wage controls.

Given the differences in the outcomes of ERBS programs aimed at stopping hyperinflations and chronic inflation, it is difficult to argue that the effect on output is primarily due to the exchange rate policy as such. The view taken here is that the business cycle observed in ERBS in chronic inflation countries results from the combination of using the exchange rate as the anchor and the lack of credibility in the program's success. The perception of the program as temporary induces a boom in demand in anticipation of a collapse, which raises the level of economic activity following implementation of the ERBS. It will be argued that an expected collapse of a MBS does not generate the same expansionary response.

There are several differences between hyperinflationary and chronic inflation economies, which lead to differences in the credibility of disinflation policy. In hyperinflations the stabilization program is credible because the inflation pro-

cess is explosive and agents realize that there is no alternative to immediate stabilization. In addition in hyperinflations it is easy to identify the change of policy regime, which occurs when the money financing of extremely large fiscal deficits is ended. Finally, hyperinflation in Europe and Bolivia occurred in traditionally low-inflation economies where price stability was considered the normal state of affairs, which made stabilization more credible. Chronic inflation economies, in contrast, have developed a highly sophisticated ability to live with inflation, which makes stabilization postponable and therefore less credible. Also accelerations of inflation in these economies are more difficult to diagnose; in particular they are quite often unrelated (directly) to fiscal causes. Uncertainty about the causes of inflation tends to reduce credibility in stabilization policies. Finally, a long tradition of failed stabilizations in most chronic inflation economies makes any new attempt rather dubious. (These considerations are discussed in greater detail in Kiguel and Liviatan 1988.)

The article is organized as follows. Section I develops a simple analytical framework that shows that MBS and ERBS programs are likely to have different outcomes. After briefly examining MBS programs, section II discusses the main stylized facts concerning the business cycles in the ERBS. Section III elaborates on the reasons for the differences in the outcomes of ERBS and MBSS, and section IV concludes with some policy issues.

I. DIFFERENCES BETWEEN MONEY-BASED AND EXCHANGE RATE-BASED STABILIZATIONS

The possibility that disinflation programs that use money as the nominal anchor lead to different outcomes than those that use the exchange rate was raised by Rodriguez (1982, 1984), Fischer (1986), Helpman and Razin (1987), and Calvo and Vegh (1990) among others. Rodriguez (1984) develops a useful framework that produces the type of asymmetry in output cycles observed in the programs analyzed here. As in the work of Fischer, the results largely depend on the existence of inflationary rigidities (or price stickiness). The basic model assumes two goods: tradables and nontradables. The price of tradables is determined according to purchasing power parity, whereas the price inflation of nontradables is determined by expectations of future inflation and the excess demand prevailing in that market. Rigidities in the inflation process are introduced through the assumption of adaptive expectations. Finally, it is assumed that there is perfect capital mobility (in the sense that the interest rate parity condition holds), whereas the expected rate of depreciation is determined by the expected rate of inflation in nontradables and by the difference between the actual and the long-run equilibrium real exchange rate.

Under these conditions the real interest rate, r , is given by

$$(1) \quad r = i - \pi^e = i^* + \beta(\epsilon^e - \pi_N^e) + k$$

where i is the nominal domestic interest rate, π^e is the expected rate of inflation,

i^* is the foreign interest rate, β is the weight of nontradables in the price index, ϵ^e is the expected rate of devaluation, π_N^e is the expected rate of inflation in nontradables, and k is a constant risk factor. When the official rate of devaluation (ϵ) is reduced, expectations on the devaluation rate will follow closely if the policy is credible. However, when inflationary expectations on nontradables exhibit downward rigidity (relative to ϵ), the fall in the expected devaluation rate will depress the real interest rate, thereby stimulating demand.

Within this framework Rodriguez (1984) shows that a disinflation policy based on reducing the rate of growth of the money supply results in a real appreciation, increased real interest rates, reduced domestic absorption (that is, recessionary pressure), and an improved trade balance. Alternatively, a disinflation program based on reducing the rate of devaluation of the exchange rate, as in Rodriguez (1982), results in a reduced real interest rate and an appreciated real exchange rate (the latter effect resulting from price stickiness). Although the impact on aggregate excess demand is in principle ambiguous (because the changes in the real exchange rate and the real interest rate exert pressures in opposite directions), Rodriguez shows that initially the interest rate effect dominates. Eventually, the real appreciation effect dominates and eliminates excess demand. If the Rodriguez model is modified appropriately, the cycle in demand will be associated with corresponding cycles in output and the trade balance.

In Fischer (1986, 1988), where price stickiness results from staggered, long-term nominal wage contracts in a setting of rational expectations, the author arrives at conclusions similar to those in Rodriguez (1984) with respect to the recessionary effects of MBS programs. He also points out that ERBS programs can have an initial expansionary effect because of the falling real interest rate. On the basis of numerical simulations, however, he concludes that in ERBS programs the more likely outcome is the recessionary scenario.

As will be argued later, agents' perception of a stabilization program as temporary (the credibility problem) can introduce a difference between the output patterns in the two policies. This difference is likely to arise if agents shift expenditures to the present in anticipation of a failure of the ERBS that will be associated with a balance of payments crisis. However, a failure of a MBS does not lead to intertemporal expenditure switching because the central bank does not commit its reserves to support the exchange rate (so there is no anticipation of a balance of payments crisis).

These arguments provide a basis for expectations of an asymmetry in the adjustment of the economy under monetary and exchange rate rules. These issues will be discussed in more detail after the empirical evidence on stabilization programs under both rules has been reviewed.

II. EMPIRICAL EVIDENCE ON THE BUSINESS CYCLE IN EXCHANGE RATE-BASED STABILIZATIONS

This section presents the stylized features associated with ERBS. As a background the outcomes associated with MBS are discussed.

Money-Based Stabilizations

The outcomes of MBS programs are well documented for industrial countries. Two recent programs are those of the United States under Volcker (see Dornbusch and Fischer 1987) and the United Kingdom under Thatcher (see Sargent 1986). Spain implemented a lesser known money-based program in the late 1970s. Examples of money-based programs in chronic inflation countries that will be referenced here are the 1958 program in Argentina under Frondizi, the Chilean program of 1974–75, the initial phase of the Argentine program under Martinez de Hoz in 1976–77 (all described in Kiguel and Liviatan 1988), and three programs launched in 1990 in Argentina, Brazil, and Peru aimed at stopping hyperinflation.¹

The monetarist phase of these programs consisted of a sharp tightening in monetary policy, although in most cases, and certainly in all of the Latin American experiences, the target rate of monetary growth was not explicitly announced. In two cases—Chile and Argentina in the mid-1970s—the monetary tightening was part of an initial stage of an anti-inflation process, and the programs later on switched to ERBS. This change in strategy has not yet materialized in the very recent stabilization attempts in Brazil and Peru but has already taken place in the Cavallo stabilization in Argentina in 1991.

As is well known, MBS programs are recessionary in industrial countries. A tightening of monetary policy in the United States and the United Kingdom in the late 1970s and early 1980s brought down inflation, but at the cost of higher unemployment and lower output growth. It is not difficult to find other money-based programs in industrial countries with similar outcomes. The disinflation program in Spain in 1977–80, for example, also induced a recession; a sharp contraction in monetary growth led to a drop in inflation and growth in gross domestic product (GDP) as well as an increase in unemployment during the first two years of the program.

The recessionary effect of money-based programs is also observed in chronic inflation countries. For example, the fiscal MBS programs of Argentina of the late 1950s and the Argentine and Chilean programs of the mid-1970s had a clear recessionary effect on domestic output and employment (especially in Chile). In the more recent (1990) programs in Argentina, Brazil, and Peru, where tight money was a central part of the stabilization effort, the initial reduction in inflation (from hyperinflation levels) was associated with a deepening of the prevailing recessionary trend. In the programs in which the exchange rate was allowed to float, the recessionary impact was accompanied by an increase in real interest rates and a real appreciation as predicted by theory (in Brazil the real appreciation was observed in the parallel (free) exchange rate) and in most cases by an improvement in the trade balance. Chile of the mid-1970s is the one case where the MBS did not lead to real appreciation, although this is perhaps ex-

1. The recent programs in Argentina, Brazil, and Peru are not yet discussed in published form, but basic facts are available from the authors upon request.

plained by the fact that the exchange rate was sharply devalued to offset a severe deterioration in the terms of trade.

Exchange Rate-Based Stabilizations

This study concentrates on ERBS programs in chronic inflation countries in Latin America—namely Argentina, Brazil, Chile, Uruguay and Mexico—but includes also Israel, whose economy falls into the chronic inflation category. Each of these countries has pursued many stabilization programs, but only the 12 “major” ones, that is, those in which the public could recognize new initiatives that constituted a drastic break with previous policies, are included.² (See table 1 for program characteristics). A common feature of these programs is that each had major effects on the economy (for better or worse) and brought about significant reductions in inflation. In most cases the programs failed to stabilize inflation over a long time span (in which cases inflation accelerated), but in some instances the programs were part of a longer-term stabilization effort during which inflation was kept at a low level.

To gain an historic perspective on stabilization efforts, the empirical analysis covers programs implemented during the past three decades. In general the stabilization programs of each decade shared important common elements concerning the diagnosis of the causes of the inflation and the design of the appropriate policies to deal with it. For example, the stabilization programs of the 1980s—which include the Austral plan in Argentina, the Cruzado plan in Brazil, the Israeli stabilization of 1985, and the Mexican Pacto of 1988—were all heterodox programs relying on income policies. By contrast the Southern Cone stabilizations, implemented by the military governments in Argentina, Chile, and Uruguay in the 1970s (known as the *Tablitas*) were orthodox programs with a free market approach and an emphasis on liberalizing foreign trade and capital flows as part of the stabilization process. The 12 programs in the study contain several versions of exchange rate management as part of a disinflation policy, including fixed exchange rates and crawling pegs with various degrees of capital mobility (see table 1 and Kiguel and Liviatan [1990] for a fuller discussion).

In discussing the effects of ERBS on output, the balance of payments, relative prices, consumption, and investment, only the programs in Chile and Israel are presented in detail. These two representative programs share some of the important features observed in the other programs. (The complete set of figures for all the programs is presented in Kiguel and Liviatan 1990.) The basic outcomes for

2. These programs have been analyzed in numerous articles and books. The reader is referred to de Pablo and Martinez (1988) and Di Tella and Dornbusch (1989) on the Argentine stabilization programs, Di Tella (1979) on the Peronist program of 1974, Thorp (1965) on the Frondizi program of 1960, de Pablo (1974) on the Krieger-Vasena program of 1967, and Heymann (1987) and Kiguel (1991) on the Austral plan of 1985. For Chile's stabilization in the 1970s see Corbo (1985), Edwards and Edwards (1987), and Foxley (1980). For Brazil in 1964 see Simonsen (1974), and for the Cruzado in 1986 see Modiano (1988). For Uruguay in 1968 see Viana (1988) and Finch (1979), and for Mexico in 1988 see Ortiz (1990). For Israel in 1985 see Bruno and Piterman (1988).

all the programs are summarized in table 2, and figures 1–4 show more detailed results for Chile and Israel.

Real activity. In general economic expansion began soon after the stabilization programs were initiated. In Chile, where the use of the exchange rate for stabilization purposes began as early as the second semester of 1976, the whole period of ERBS up until 1982 was one of uninterrupted GDP growth. In Argentina the growth of output is evident in all five stabilizations. The upsurge of growth is also apparent in Uruguay after stabilization of the exchange rate in 1979. The more recent ERBS programs generally yielded similar results on output. Israel enjoyed high rates of growth in the business sector in the first three years of the programs; similar, although shorter, growth spans were observed in the Austral and Cruzado plans. The behavior of the unemployment rate was usually compatible with GDP growth, that is, unemployment fell in the growth phase of the cycle.

There is a slight difference between output behavior under orthodox and heterodox programs in the initial stage of the ERBS. In the orthodox programs the exchange rate policy was introduced when the inflation rate was already declining, having been dealt with initially by a monetary-fiscal package as in the Frondizi and Southern Cone stabilizations of the 1970s. In these cases there are no recessionary effects evident with the shift to a policy of reducing the rate of devaluation. In the heterodox stabilizations, however, exchange rate control was introduced along with income policies to stop the inflationary acceleration. In fact the income policies of the heterodox programs can be thought of as the counterpart to the monetary measures that preceded the ERBS in the orthodox programs of the Southern Cone. The fiscal adjustments induced an initial recessionary effect into those heterodox programs that undertook them, but the recessionary effect was both small and short-lived. When the period of exchange rate stabilization extended over a considerable time, as in the Southern Cone stabilizations of the 1970s, in Uruguay 1969, and in Israel, the recessionary phase began before the large maxi-devaluations set in.

In order to better gauge the cycle, figure 5 presents deviations of per capita income from the long-term trend. The trend was computed by fitting a linear or quadratic equation for log GDP per capita in a piecewise manner using appropriate intervals. (For Argentina the periods used to calculate the trend overlap, so the residuals from the overlapping parts were averaged.) These diagrams confirm that in 11 out of 12 cases there emerges an expansionary phase of output relative to trend in the course of the ERBS (the exception is the Brazilian stabilization of 1964–67, which was characterized by a continuous recession relative to trend). Moreover, except for the Krieger Vasena stabilization of 1967–70 in Argentina, all the expansions (relative to trend) begin around the time the exchange rate starts its role as the nominal anchor. In these respects the expansions in chronic inflation countries differ from those sometimes observed in post-hyperinflations, as in Germany, where industrial output remained well below

(Text continues on page 296.)

Table 1. Description of Exchange Rate-Based Stabilization Programs

| Country and program dates (year, quarter) | Exchange rate | Incomes policies ^a | Fiscal adjustment | Reduction in monthly inflation | | Commercial policy reform | Preceded by corrective monetary or fiscal measures | Preceded by maxi- devaluation |
|-------------------------------------------------|-------------------------------------------|----------------------------------|-----------------------------------------|--------------------------------------|-----|---------------------------------------------------|----------------------------------------------------------------|-------------------------------------|
| | | | | From | To | | | |
| Israel 1985.1-present | Fixed with infrequent adjustment | Yes (shock) | Large initial adjustment | 21.2 | 6.1 | No | No | Yes |
| Argentina (Austral) 1985.1-1986.3 | Fixed | Yes shock | Large transitory adjustment | 24.9 | 2.6 | No | No | Yes |
| Brazil (Cruzado) 1986.1-1986.4 | Fixed | Yes (shock) | No | 11.1 | 1.7 | No | No | No |
| Mexico 1988.1-present | Fixed (first year) then crawl | Yes (small shock) | Main adjustment before program | 8.2 | 2.6 | Trade and capital account liberalization | Fiscal adjustment | Yes |
| Chile 1976.3-1982.3 | Crawl, then preannounced then fixed | No | Yes | 11.2 | 6.5 | Trade and capital account liberalization | Yes | Yes |
| Uruguay 1978.4-1982.4 | Preannounced | No | Yes | 3.4 | 4.6 | Liberalization | Trade and capital adjustment | No (small fiscal) |

| Country and program dates (year, quarter) | Exchange rate | Incomes policies ^a | Fiscal adjustment | Reduction in monthly inflation | | Commercial policy reform | Preceded by corrective monetary or fiscal measures | Preceded by maxi- devaluation |
|-------------------------------------------------|--------------------------------|----------------------------------|---------------------------------------------|--------------------------------------|-----|---------------------------------------------------|----------------------------------------------------------------|-------------------------------------|
| | | | | From | To | | | |
| Argentina 1978.4-1981.1 | Preannounced | No | Moderate adjustment | 8.1 | 8.6 | Trade and capital account liberalization | Yes | No |
| Argentina 1973.3-1975.2 | Fixed | Yes | No | 5.7 | 0.8 | No | No | No |
| Argentina 1967.2-1970.3 | Fixed | Yes (gradual) | Yes | 2.5 | 2.7 | Incentives for capital inflows | No | Yes |
| Brazil 1964.2-1968.3 | Fixed with step devaluation | Yes (gradual) | Yes | 6.4 | 4.2 | No | No | Yes |
| Uruguay 1968.2-1972.1 | Fixed | Yes (shock) | Initially yes, deterioration later on | 9.5 | 1.9 | No | Yes (6 months before) | Yes |
| Argentina 1959.3-1962.2 | Fixed | No | Initially yes, deterioration later on | 9.5 | 1.9 | Incentives for foreign investment | Yes (IMF program 6 months before) | Yes |

Note: For a graphic trend of the performance of these indicators during the program, see Kiguel and Liviatan (1990).

a. "Shock" means a drastic and immediate reduction in inflation—as in a price freeze. "Gradual"—incomes policies implemented in small steps, spread over time—as in gradual adjustments of staggered wage contracts.

Table 2. Outcomes of Exchange Rate-Based Stabilization Programs

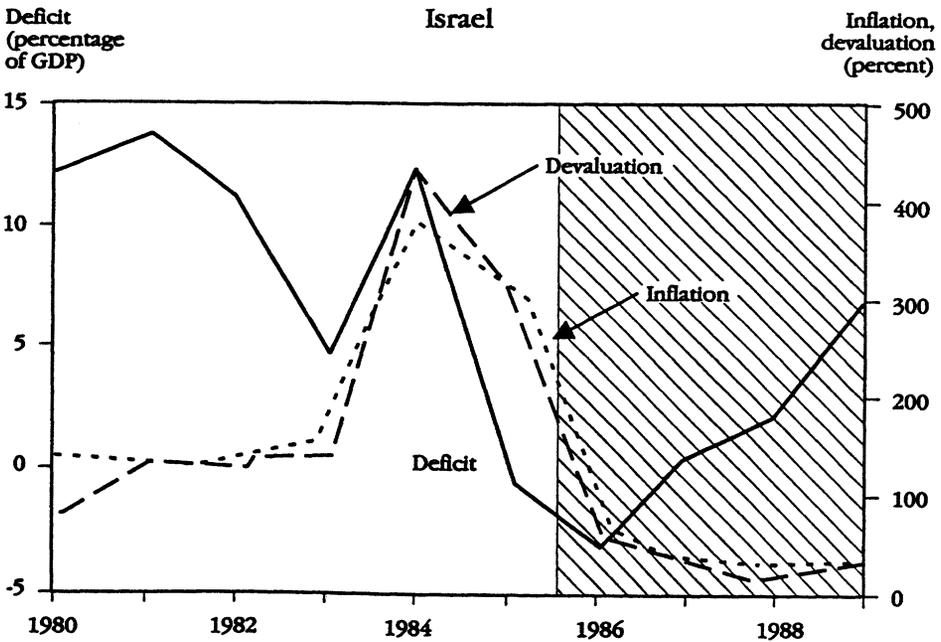
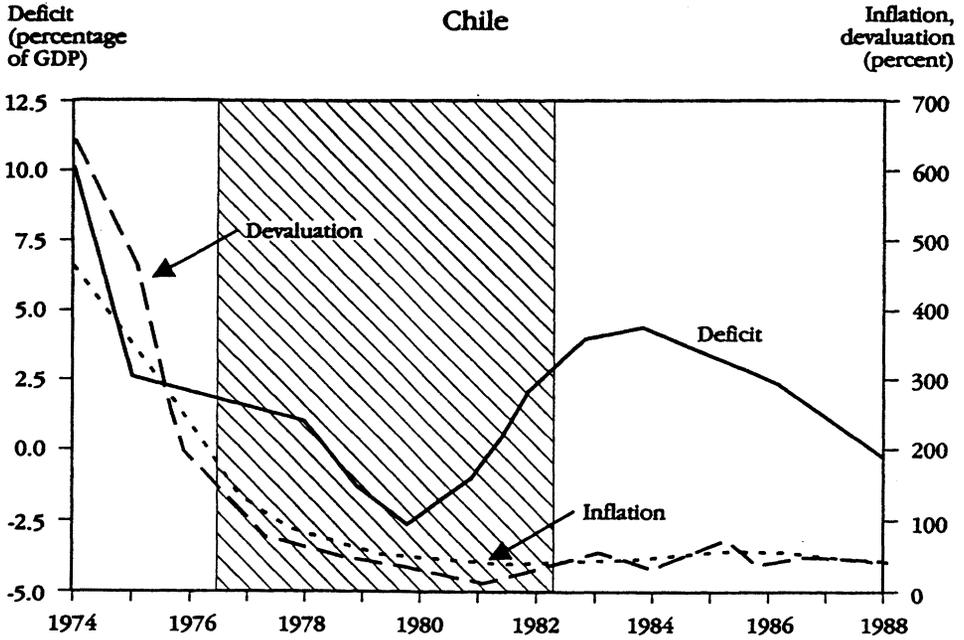
| Country and program dates (year, quarter) | Year in which upswing in GDP growth relative to trend began ^a | Current account | Was there a consumption boom? | Was there an investment boom? | Real exchange rate | Fiscal deficit/GDP | Real wages |
|-------------------------------------------|--------------------------------------------------------------------------|----------------------------------------|-------------------------------|-------------------------------|-----------------------------------------------------------------------|-------------------------------------|---------------------------------------------|
| Israel 1985.1-present | First | Improves until 1987, then deteriorates | Yes | Yes, initially | Gradually appreciates | Decreases | Increases |
| Argentina (Austral) 1985.1-1986.3 | First | Deteriorates | Yes | Yes | Appreciates | Decreases initially, then increases | Decreases |
| Brazil (Cruzado) 1986.1-1986.4 | First | Deteriorates | Yes | Unclear | Appreciates | No change | Increases |
| Mexico 1988.1-present | Second | Deteriorates | Maybe | Yes | Appreciates | Decreases | No change |
| Chile 1976.3-1982.3 | First | Deteriorates | Yes | Yes | Depreciates until 1979, then appreciates until 1981, then depreciates | Decreases | Increases until 1982.1, then decreases |
| Uruguay 1978.4-1982.4 | First | Deteriorates | Yes | No | Appreciates | Increases | Decreases |
| Argentina 1978.4-1981.1 | First | Deteriorates | Yes | Yes | Appreciates | Increases | Initially increases, then decreases in 1980 |

| <i>Country and program dates (year, quarter)</i> | <i>Year in which upswing in GDP growth relative to trend began^a</i> | <i>Current account</i> | <i>Was there a consumption boom?</i> | <i>Was there an investment boom?</i> | <i>Real exchange rate</i> | <i>Fiscal deficit/GDP</i> | <i>Real wages</i> |
|--------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------------|--------------------------------------|----------------------------------------|
| Argentina 1973.3–1975.2 | First | Initially improves until 1974.1, then deteriorates | Yes | No | Appreciates | Increases | Increases until 1974, then decreases |
| Argentina 1967.2–1970.3 | Second | Deteriorates | Yes | Yes | Appreciates | Decreases until 1969, then increases | Increases |
| Brazil 1964.2–1968.3 | Fourth | Improves until 1965, then deteriorates | Not clear | Yes | Appreciates until 1967.1, then depreciates | Decreases | Decreases until 1967.1, then increases |
| Uruguay 1968.2–1972.1 | First | Deteriorates | Yes | Yes | Appreciates, then depreciates | Decreases until 1970, then increases | Increases until 1971.1, then decreases |
| Argentina 1959.3–1962.2 | First | Deteriorates | Yes | Yes | Appreciates | Decreases 1960, then increases | Increases |

Note: For a graphic trend of the performance of these indicators during the program, see Kiguel and Liviatan (1990).

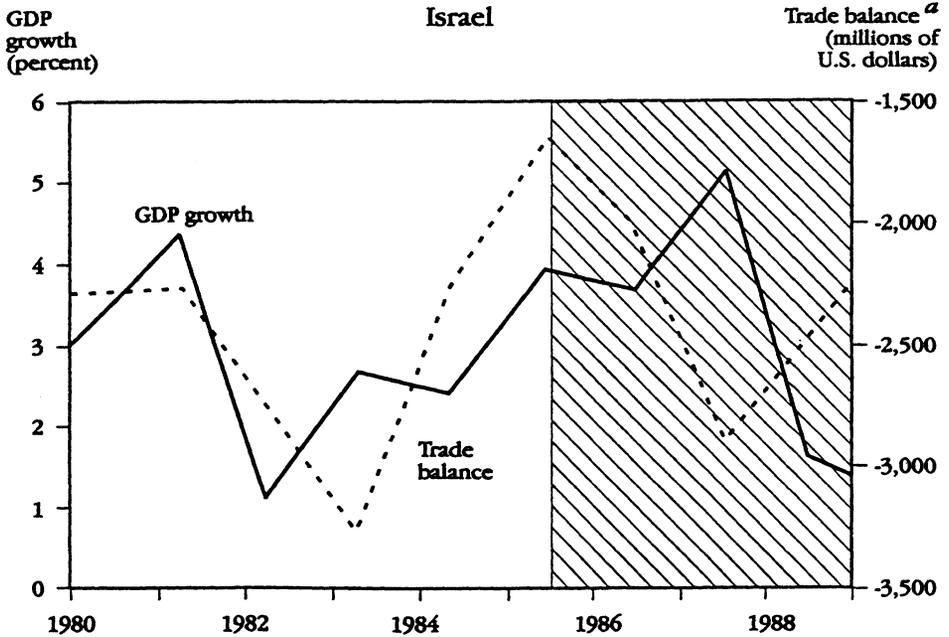
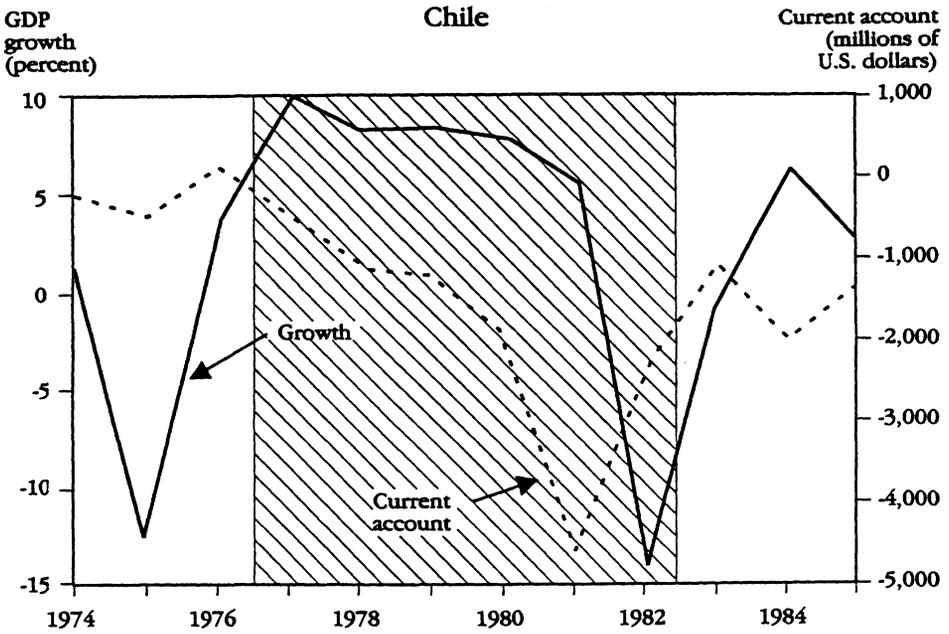
a. Refers to number of years after beginning of program.

Figure 1. *The Fiscal Deficit, Inflation, and Devaluation in Chile and Israel*



Source: For Chile, Banco Central de Chile and INE; for Israel, Bank of Israel.

Figure 2. GDP Growth and the Current Account



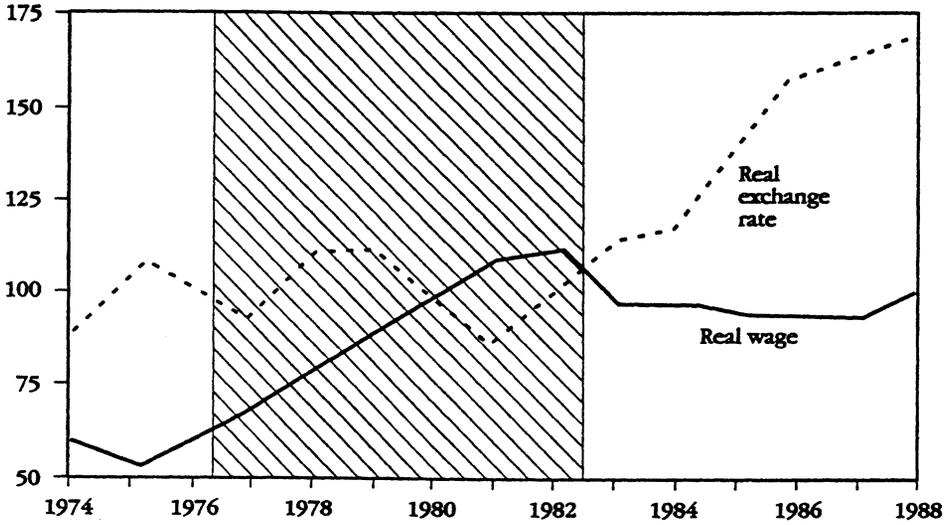
^a We use the trade balance rather than the current account balance because the latter contains a large component in the form of U.S. grants.

Source: For Chile, Banco Central de Chile; for Israel, Bank of Israel.

Figure 3. *Real Exchange Rate and Real Wage in Chile and Israel*

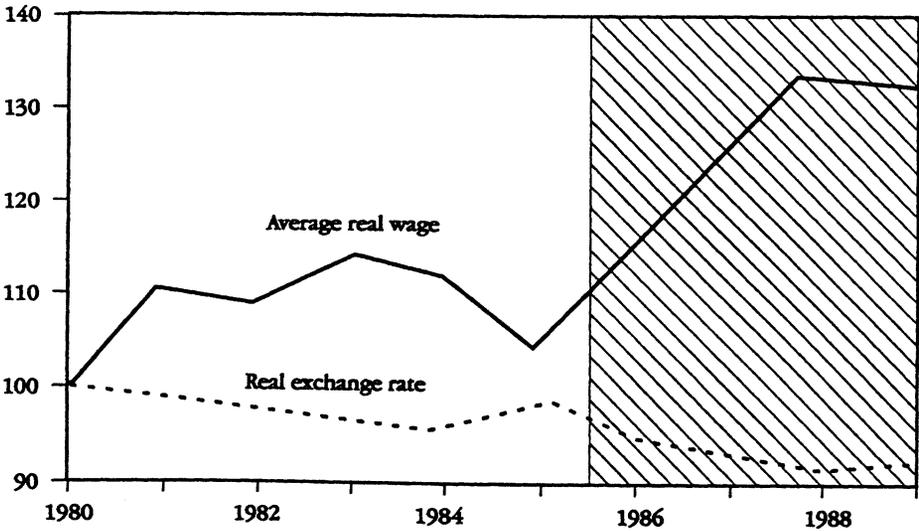
Index
1980 = 100

Chile



Index
1980 = 100

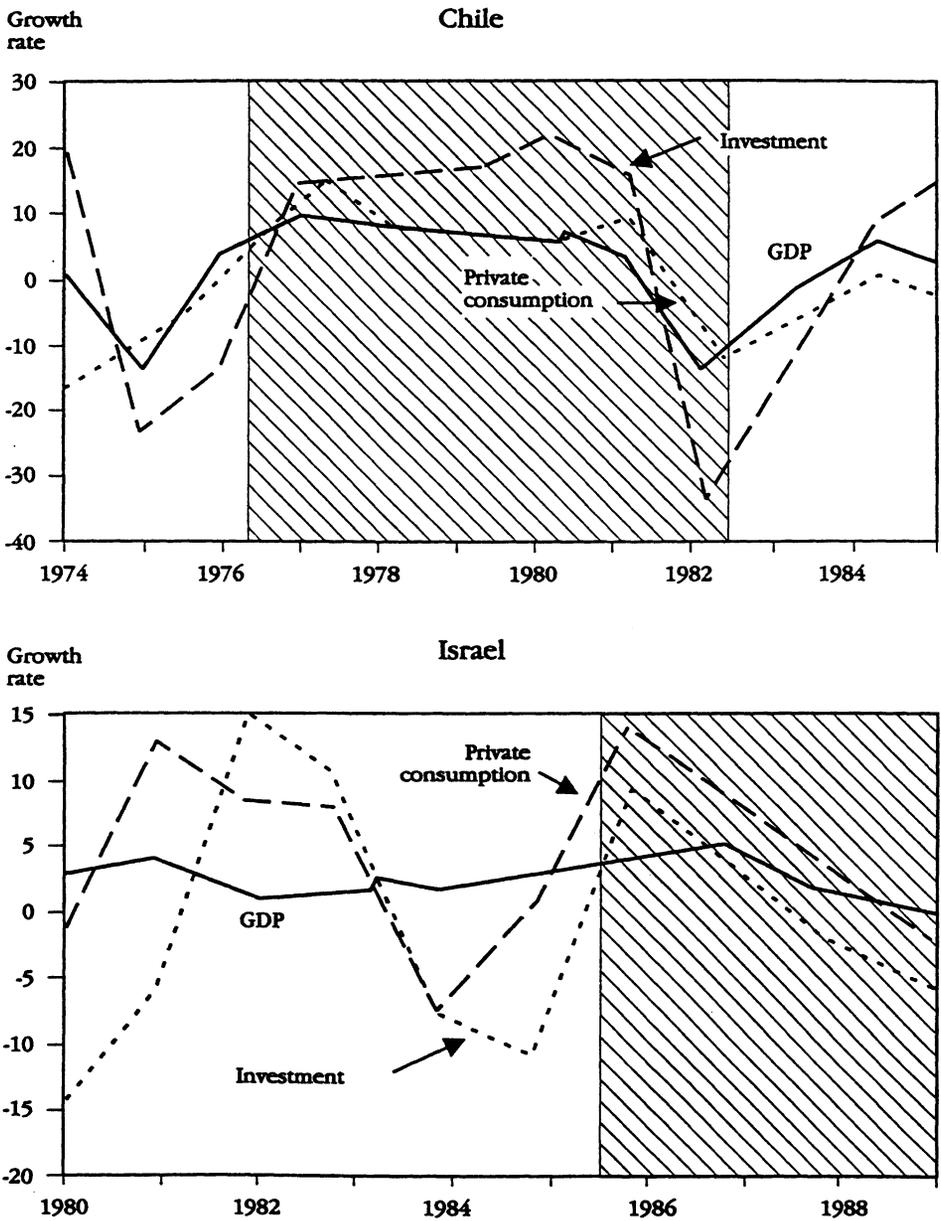
Israel



Note: The real exchange rate is the average of real prices of imports and exports.

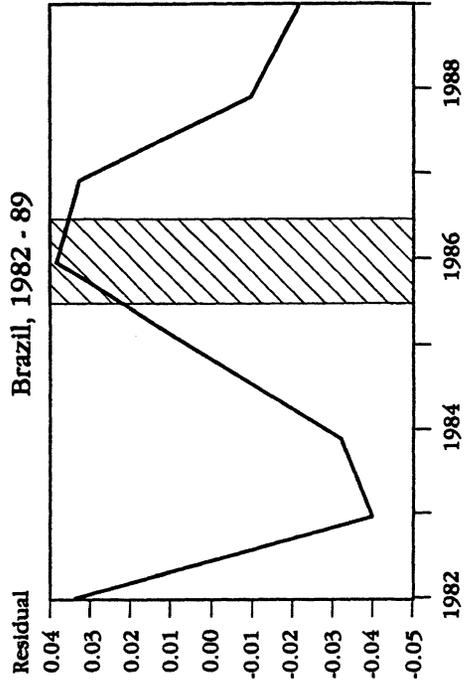
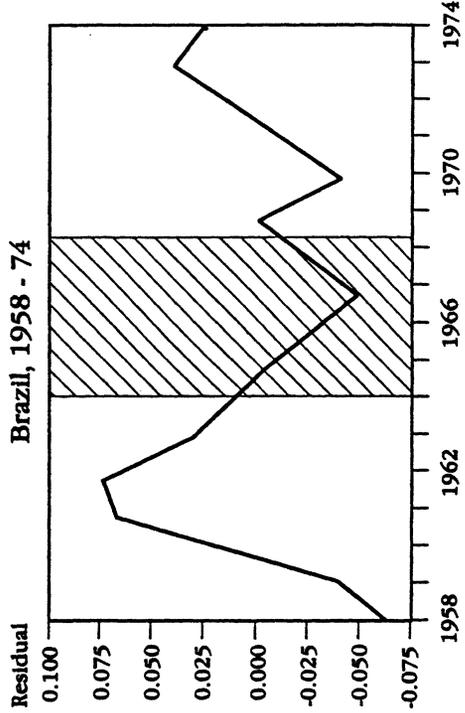
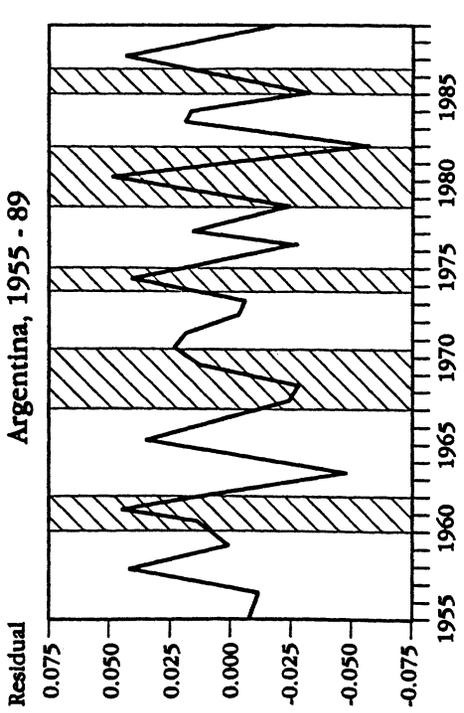
Source: For Chile, Banco Central de Chile and World Bank (various years); for Israel, Bank of Israel (various years).

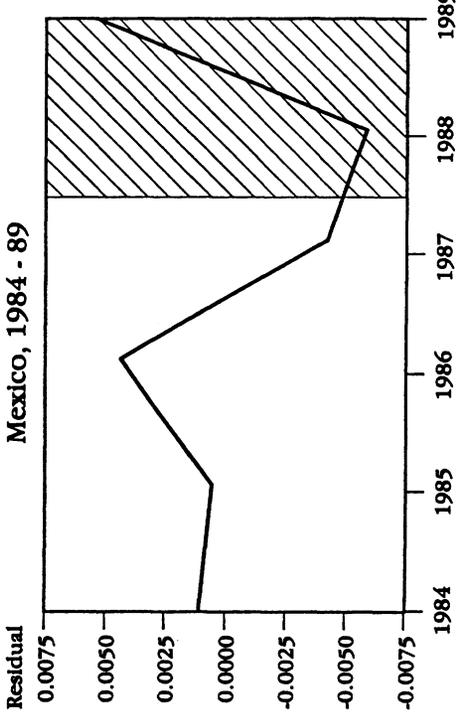
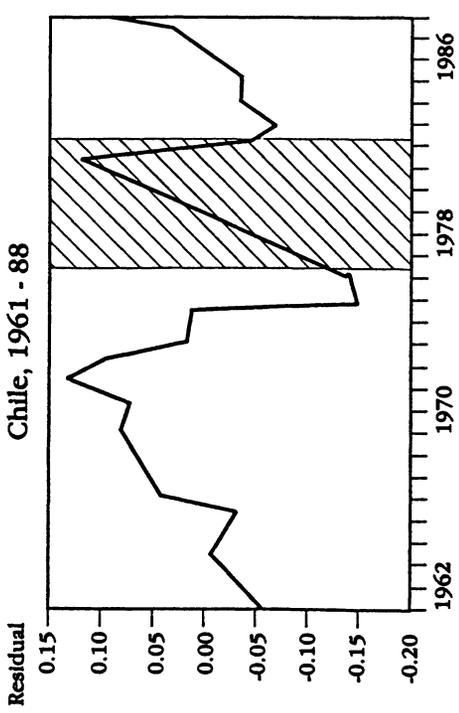
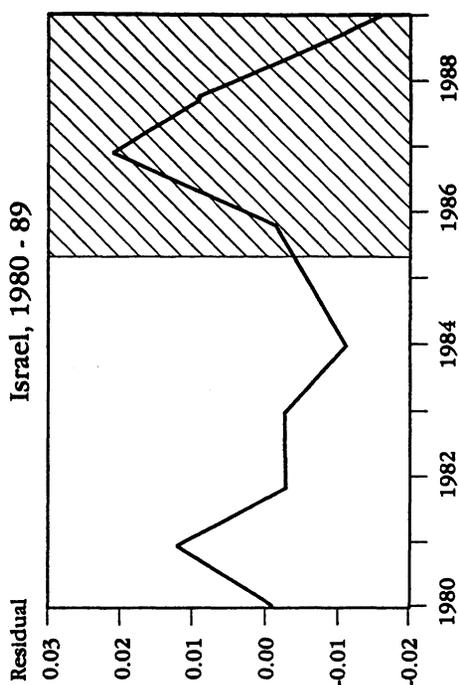
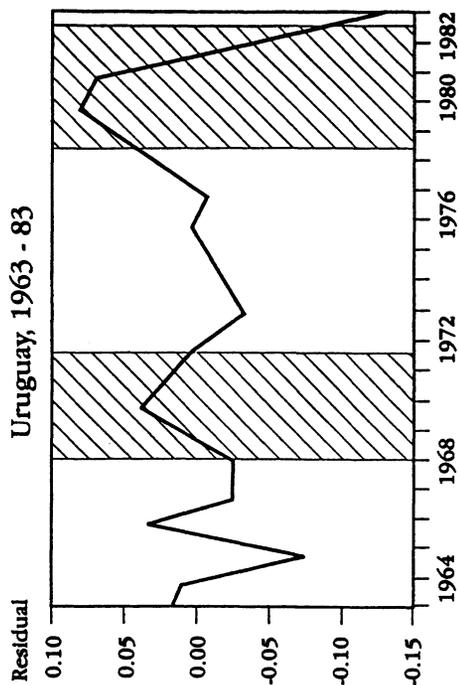
Figure 4. *Real Rates of Growth of GDP, Private Consumption, and Investment in Chile and Israel* (percent)



Source: For Chile, Banco Central de Chile; for Israel, Bank of Israel.

Figure 5. Deviations of Log GDP per Capita from Trend





Source: IMF, IFS data (various years).

trend (Garber 1982). Also most of the ERBS programs were preceded by a recessionary period relative to trend, which indicated the existence of excess capacity that may have provided suitable conditions, from the supply side, for the upswing.

The balance of payments. All ERBS programs were associated with a deterioration of the trade balance and the current account during the program. The expansionary force of these programs, from the point of view of domestic uses, was therefore even more pronounced than with the output growth criterion. During the expansionary phase, the current account typically deteriorates (as illustrated in figure 2). The capital inflows that financed these deficits were, as a rule, reversed at some later stage of the program, thus coinciding with the beginning of the recessionary phase. The inability to finance the growing current account deficits was, in most cases, the immediate reason for the end of the boom. Two important exceptions are Brazil in 1964–67, in which capital inflows continued to finance the current account deficit and made growth sustainable for many years to come, and Israel, in which the boom ended without a marked deterioration of the current account.

Relative prices. As a rule, real wages increased with the upswing of economic activity (see figure 3), although in some cases this occurred with a lag, which may be explained by the following. First, the real wage may have been raised up front in order to compensate for its anticipated erosion if the reduction in inflation was sluggish. A temporary reduction in the real wage in the early phase of stabilization would then be observed, as in the Krieger Vasena stabilization. Second, the real wage may have been deliberately kept below its equilibrium level for some time by income policies, as in Israel. The normal behavior of the real exchange rate during the boom was (as expected) in the opposite direction to that of the real wage. During the periods of a full peg, the real exchange rate fell especially quickly.

Consumption and investment. Most of the expansions in output during ERBS were accompanied by a consumption boom (see table 2). Clearly, when GDP grows faster, consumption is expected to grow faster also, although the growth in consumption should lag behind the growth in output if the stimulus to GDP did not originate from the consumption side. The term “consumption boom” refers to the case in which consumption grows faster than GDP when growth in the latter accelerates or is above normal. The most conspicuous examples of a consumption boom took place in the Peronist and Martinez de Hoz stabilizations in Argentina, Uruguay in 1969, and the Israeli program (shown in figure 4).

Increased investment played a dominant role in the expansions during the Argentine programs of the 1960s, much of it induced by government policies. In the programs of the 1970s the Chilean ERBS was driven by a continual investment boom. Although investment booms were also characteristic of the pro-

grams of the 1980s, these booms were not as large as in earlier programs (with the possible exception of Mexico). This was partly related to reductions in capital inflows and to increases in macroeconomic instability following the debt crisis of the 1980s. In Israel a short-lived upsurge in investment occurred, but the ratio of investment to GDP was lower after the stabilization than before.

The fiscal deficit. The expansion in output following implementation of the ERBS occurred in spite of sharp reductions in fiscal deficits. This is most evident in Israel, where the elimination of the fiscal deficit in 1986 coincided with a sharp consumption boom. This boom is quite surprising because the increase in taxation clearly outweighed any possible reduction in the inflation tax. A similar phenomenon occurred in Chile, where the fiscal deficit was turned into a surplus during the ERBS. And the cut in the fiscal deficit before, or along with, the expansion in aggregate demand during the early phase of the ERBS is also characteristic of all Argentine programs except the Peronist stabilization, in which the deficit increased from the start.

In most stabilizations the initial reduction in the fiscal deficit was later reversed. In the Argentine programs, in particular, the loosening of fiscal policy undermined the disinflationary exchange rate policy. The systematic nature of the fiscal reversals lends support to the view that agents might have treated the stabilizations as temporary measures, which is important for understanding the nature of the cycle. In some cases, notably in Chile and Israel, the poststabilization increases in the fiscal deficit were largely endogenous to the recessionary phase of the business cycle. In these cases the reversal in the fiscal deficit was regarded as temporary; old inflationary expectations were not therefore rekindled.

III. THEORETICAL ASPECTS OF THE ERBS BUSINESS CYCLE

One cannot expect to obtain any useful insight into the cyclical behavior of ERBS from the classical models of the representative individual in an economy with flexible prices and fully credible policies. Indeed it has been shown by Obstfeld (1985) and Calvo (1986) that, in the foregoing framework, a permanent reduction in the constant rate of devaluation is entirely neutral. The same conclusion holds for MBS (see discussion in Kiguel and Liviatan 1990). In order to explain the boom in output and demands (and the subsequent recession), as well as the behavior of the current account and relative prices during ERBS programs, considerations of credibility and of price stickiness must be introduced.

In section I, following Rodriguez and Fischer, it was shown that since a reduction in the real interest rate stimulates aggregate demand, an ERBS implemented in the presence of inflationary rigidities or price stickiness can generate an expansionary phase. To what extent is this real interest rate factor relevant for the explanation of the actual cycles in ERBS programs? It seems that in the Southern Cone stabilizations in the late 1970s the reduction in the real interest

rates was quite evident. Thus Corbo (1985) reports that the Tablita policy in Chile, and the increased capital inflows with which it was associated, led to downward pressure on domestic interest rates, which stimulated a rise in aggregate demand. Similar findings are reported in Ramos (1986) for the early stages of all the Tablita policies for lending rates. It is also interesting that in all Southern Cone Tablitas of the late 1970s, recession along with high real interest rates began before the collapse of the exchange rate regime, as suggested by the modified Rodriguez model.

The fall in real interest rates in the early stages of the Tablitas is a property that was not shared by the stabilization programs of the 1980s, partly because the debt crisis limited capital flows. Real interest rates in Israel and Mexico rose to extremely high levels during stabilization, which may be related to the lower degree of credibility in these programs due to the sharp reduction of inflation with the aid of controls. The rise in the *ex ante* real rates was smaller but apparently still significant. In Israel an estimate of π^e computed from capital market data shows that the *ex ante* real interest rate on bank loans rose quite significantly in the early stage of stabilization (Bank of Israel 1985). It seems therefore that in these cases something more than the Rodriguez interest rate mechanism is needed to explain the expansion.

The foregoing models of Fischer and Rodriguez assume that the disinflation program is eventually successful. The fact that so many stabilization programs fail, however, must lead to pessimistic views about the chances of any new program to succeed. The very expectation that the stabilization is only temporary may give rise, in the early stages, to an expansion of aggregate demand.

The issue of expectations that stabilization is temporary has been investigated in recent papers by Calvo (1986, 1987, 1991). These cash-in-advance models show that agents who expect stabilization to be temporary will shift part of their future consumption expenditures to the present. In the present, when the rates of devaluation and inflation are low, the cost of holding money (which is necessary to carry out purchases) is also low, whereas the opposite is true for future periods when high inflation is expected to resume. This gives rise to increased expenditures in the stabilization period, accompanied by current account deficits and real appreciation. All these features are clearly consistent with the phenomenon of the consumption boom and the related developments described earlier.

Calvo's model is a Ricardian one, with the property that a permanent reduction in the (constant) rate of devaluation is neutral. This underscores the fact that the initial consumption boom is related entirely to expectations of temporariness. Unlike the Rodriguez and Fischer models, where the boom is the result of an initial reduction in the real interest rate, the rise in consumption in Calvo's model is caused by a temporary reduction in the nominal interest rate. The level of the real interest rate, which is constant in Calvo's model, has nothing to do with the cyclical behavior of demands. This helps to explain the emergence of the consumption boom in programs where the real interest rate was very high, as in Israel.

The cash-in-advance setting, which stresses the role of liquidity, seems (implicitly) to be related more closely to a consumption boom in terms of durables. Indeed the data for Israel show that durable purchases increased tremendously in 1986, (up 47 percent from the previous year) after the ERBS program was implemented in July 1985.

Somewhat paradoxically, one can arrive at similar conclusions about the consumption boom if one assumes that consumers view the stabilization as permanent and that the reduced uncertainty about relative prices and about government policies enhances productivity. This sort of expectation may raise agents' expected permanent income and thus raise consumption. This theory, however, cannot explain the cyclical nature of the consumption boom unless it is assumed that in each case the expectations were incorrect. The explanation based on expected temporariness of the ERBS is more robust in the sense that it can explain the cyclical behavior of consumption regardless of whether agents' expectations turn out to be correct or incorrect (see Kiguel and Liviatan 1990 and Calvo and Vegh 1990).

An alternative model of the cycle, which is again based on expectations of temporariness (but not in a cash-in-advance setting) and on a boom of durables purchases was formulated recently by Drazen (1990). He shows that when the fixed exchange rate policy is expected to collapse at some definite date, there will be a run on imported durables just before the collapse. This may be a result of hedging against devaluation when there is no free access to foreign exchange or in anticipation of the imposition of quantitative restrictions following a balance of payments crisis. In this case the ERBS will not induce an initial boom. When the date of collapse is uncertain, however, the wave of durables purchases will be spread over the span of the stabilization program. This will cause a boom in domestic output when expenditures on durables are complementary to consumption of domestically produced goods. Drazen's argument may be extended to claim that when the collapse takes the form of a balance of payments crisis, agents will expect a sharp tightening of credit conditions after the crisis and consequently will be motivated to advance all kinds of expenditures to the present. Drazen's model also can explain the phenomenon of the recession in output starting before the collapse of the exchange rate regime; this will occur when the realization of the collapse happens to occur at a relatively distant date in the future.

Drazen provides data on booms in expenditures on durables during ERBS programs in Argentina, Chile, and Mexico, which supplement the data here from Israel and provide more evidence supporting the theory that the motivation to advance purchases on durables is one of the important driving forces of the business cycle in an ERBS.

Since real wages tend to rise with the expenditure cycle, it is conceivable that the former may actually cause the latter because of the higher propensity to spend out of wage income. To be an adequate explanation, however, it has to be shown, first, that real wages affect demand more strongly than supply and, second, that real wages should rise more in an ERBS than otherwise.

The answer to the first question is certainly unclear from the theoretical point of view (see Krugman and Taylor 1978 and Lizondo and Montiel 1989). As for the second one, it is often mentioned (especially for the Chilean *Tablita*) that lagged wage indexation will cause real wages to rise when inflation is falling. However, this explanation does not work for the heterodox programs in which the foregoing type of inertia is eliminated at the outset.

Apart from the effects of disinflation on demand, there may be expansionary effects originating from the supply side. The strong effect of exchange rate stabilization on prices, which we often find in an ERBS, may increase efficiency by reducing excessive variation in relative prices and by shifting resources out of excessive financial and speculative activities. However, the latter effect operates only in the longer run. In the medium run the effect of restructuring the economy toward a low inflation environment may well be recessionary (see Garber [1982] for an example from the German stabilization).

The real interest rate effect, which is expansionary in the Rodriguez-Fischer models for an ERBS, works in an opposite manner in a MBS. With wage or price stickiness a monetary crunch will raise the real interest rate. (With perfect capital mobility this entails an initial real appreciation and an expected devaluation, as in Dornbusch's overshooting theory.)

If Calvo's (1986) model is adapted to a MBS, temporariness will still lead to a consumption boom. This boom requires an initial drop in prices; consequently, downward price rigidity may nullify the expansionary effect. Calvo and Vegh (1990) show that, in a model with staggered prices, a temporary ERBS is expansionary whereas a MBS is contractionary.

If one takes the view that expectations of a collapse associated with a balance of payments crisis and imposition of quantitative restrictions induce an advancement of purchases that generate a business cycle in an ERBS, then it is easy to see this factor does not operate in a MBS. In a MBS the central bank does not commit its foreign exchange reserves to protect the disinflation policy, and therefore the issue of the balance of payments crisis does not arise.

The forgoing analysis dealt with some general considerations that may explain expansionary tendencies in ERBS programs. In practice one may usually identify specific factors that contributed to the expansion of output in individual cycles. It is conceivable that these factors were no less important in generating the booms than the exchange rate policy itself. In some other cases the interaction of the exchange rate stabilization strategy with other factors created a mechanism for unsustainable expansion.

Most ERBS programs were initiated under favorable external conditions, which made it possible in some cases to pursue expansionary policies simultaneously with disinflation policies. In some cases, especially in the early stabilizations in Argentina, the pegging of the exchange rate was part of a broader development strategy that favored foreign investment and considered a stable exchange rate as part of the required financial environment. This approach may have resulted in both disinflation and expansion.

In some cases, as in the *Tablita* policies in the Southern Cone, the ERBS was part of a package that included the liberalization of the trade and capital accounts. Some authors stress the expansionary effect of the latter (Corbo 1985 and Edwards and Edwards 1987), but liberalization of the trade account can also be expansionary if it is perceived to be temporary.

IV. POLICY ISSUES

The business cycle phenomenon associated with an ERBS does not in itself imply that this policy cannot be part of a longer-term successful process, as has been demonstrated in such countries as Chile and Israel. However, even in these cases the variation in economic activity and in consumption over time is undesirable for several reasons. First, a stable path of consumption will be preferred to a variable one when consumers have a concave utility function for consumption (see Calvo 1986). Second, excessive purchases of capital goods during the expansionary phase (in anticipation of a failure of the exchange rate policy) lead to an inefficient allocation of investment. Third, the difficulty in correcting both the overvaluation and the excessive real wages exacerbates the recessionary phase and leads to an unnecessary loss of output.

For most programs that turn out to be temporary, there are additional problems. In these cases the failure of an ERBS can destabilize the inflationary process, as was clearly the case in the aftermath of the Austral and Cruzado plans. The loss of credibility resulting from failure to stabilize implies that future stabilizations must employ even harsher policies, leading to more severe recession and loss of output.

This raises the question of whether the stabilization cycle is unavoidable in practice and, if not, what can be done to mitigate its effect? As for the first question, the evidence from the stabilizations of Brazil 1964–67 and Mexico 1988–89 show that the excessive expansionary phase can be avoided. This may have been possible in the Mexican case because fiscal adjustment was carried out long before 1988. In fact the fiscal deficit was drastically cut as early as 1983, and the budget even showed an operational surplus in 1987. Although the Mexican experiment is still very young and definite conclusions cannot yet be reached, it seems advisable to implement fiscal adjustment before stabilizing the exchange rate in order to enhance the credibility of the program. This, of course, may not be politically feasible; in Mexico this stepwise procedure was facilitated by the need to use recessionary fiscal measures to deal with the balance of payments crisis in the early 1980s.

Given the difficulties encountered in the ERBS, should policymakers prefer the MBS? Or can conditions be specified that can guide policymakers in choosing between the two strategies? It is certainly arguable that if the delayed recession cannot be avoided in the ERBS then it might be preferable to have it earlier by implementing a MBS. Formulation of this choice in terms of “recession now (MBS) or recession later (ERBS)” relates to the discussion in signaling theory (as in

Vicker 1986) of whether it is preferable to establish credibility up front by adopting a drastic policy (such as a MBS) or postponing the confrontation to a later date and accepting, for the time being, the cost associated with lack of credibility (as with the business cycle of the ERBS).

The conclusion from signaling theory (Kiguel and Liviatan 1988) is that a drastic policy may be preferable when initial credibility is low. In the current context this means that a MBS is preferable when the economy has a long history of failed stabilizations, as is quite common in Latin America. Indeed the recent preference for a strict MBS in Argentina and Brazil in 1990, after the failure of many stabilizations in the 1980s, seems to support this view.³ However, when credibility is relatively high (that is, relative to the standards of chronic inflation countries), perhaps as a result of a basic improvement in the external position, an ERBS is preferable because the cost of not establishing initial full credibility in nominal anchors is relatively low. An ERBS was thus the appropriate policy choice in the case of Israel. The ERBS strategy has the additional advantage of making the fiscal adjustment transparent because of the relative stability of prices. And it is much easier for the public to monitor the exchange rate rule as compared with the complexity of monitoring some money supply anchor. Thus the policymaker may hope to alter the public's views on credibility during an ERBS by adhering to the exchange rate rule and by adopting a strict fiscal adjustment. Consequently, the recessionary phase may turn out to be relatively mild.

Another policy option is to adopt a stepwise disinflation strategy with an ERBS followed by a MBS. This may allow the policymakers to reap some of the gains of both policies. Chile, for example, did quite well after abandoning its fixed exchange rate regime in 1982—economic growth resumed jointly with a real devaluation and a stable, low level of inflation. Two difficulties arise with the proposed switch of anchors. First, if the excessive real appreciation during the ERBS is due to lack of credibility in the adherence to the nominal anchor, then this credibility issue will reappear in connection with the money supply rule as well. Second, adopting the money supply anchor is problematic if the economy remains highly indexed. With indexation, monetary shocks are translated very easily into price shocks, which may undermine credibility in price stability (given incomplete information about the source of the shocks). Chile overcame this difficulty by abolishing formal wage indexation, a decision that was facilitated by the balance of payments crisis of 1982. By contrast Israel remains highly indexed and so must continue with a policy of infrequent step devaluations, thus relying on the exchange rate as the nominal anchor and going through the ERBS business cycle. Its comfortable external position continues to support this reliance on the exchange rate as the anchor.

3. The shift to an ERBS in Argentina in 1991 took place after considerable gains in credibility of the disinflation process.

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