THE WORLD BANK ECONOMIC REVIEW

Moderate Inflation

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Inflation persists at moderate rates of 15 to 30 percent in all the countries that successfully reduced triple digit inflations in the 1980s. Several other countries, for example Colombia, have experienced moderate inflation for prolonged periods. Theories of persistent inflation can be classified into those that emphasize seigniorage as a source of government finance and those that emphasize the costs of ending inflation. We examine the sources and persistence of moderate inflation episodes. Most episodes of moderate inflation were triggered by commodity price shocks and were brief; very few ended in higher inflation. This article presents case studies of eight countries, including three that now suffer from moderate inflation and four that successfully moved down to single-digit inflation rates. The roles of seigniorage, indexation and disindexation, the exchange rate commitment, and monetary and fiscal policy are examined. The evidence suggests that seigniorage plays no more than a modest role in the persistence of moderate inflations and that such inflations can be reduced only at a substantial short-term cost to growth.

Much attention has been paid to the process and stabilization of extreme inflations, at rates well in excess of 100 percent a year (Bruno and others 1988, 1991; Dornbusch, Sturzenegger, and Wolf 1990). Much less attention has been devoted to the inflationary problem in countries that are stuck with stubborn low, double-digit inflation of around 20 percent a year, often in the aftermath of stabilization programs that have successfully brought extreme inflations to an end. In the context of European disinflations in the 1980s, a parallel discussion has focused on how the European Monetary System (EMS) may have played a central role in allowing such countries as Ireland and Italy to reduce their inflation rates to single-digit levels.

We focus in this article on the behavior of inflation in countries that occupy the inflationary middle ground, with persistent annual inflation rates of 15 to 30

percent. An example, shown in figure 1, is Colombia, where inflation has hovered in the 20 to 30 percent range for more than a decade. The same pattern of persistent inflation in the 20 percent range has prevailed in Bolivia, Chile, Costa Rica, Egypt, El Salvador, Ghana, Hungary, Iceland, Israel, Mexico, and South Africa. In each instance, inflation is too high to be disregarded and to permit a fixed exchange rate. But it is evidently also too low to warrant the apparent political and economic costs of a frontal attack on the problem.

We seek to answer three basic questions about moderate inflations. First, what are the causes of moderate inflation? Second, are these inflations stable, or does a moderate inflation rate tend to increase unless definite policies are put in place to reduce it? And third, what policies will move a country from the moderate-inflation range to single-digit inflation?

We start by reviewing positive theories of inflation, including those that focus on seigniorage as well as those that emphasize Phillips curve-type tradeoffs. From there we proceed to a statistical overview of countries that have experienced periods of moderate inflation. We catalog moderate-inflation episodes since the mid-1950s, detailing whether the country moved out of the moderate-inflation category successfully by reducing inflation, moved out unsuccessfully by moving on to higher inflation, or remained in about the same inflationary range.

Figure 1. *The Rate of Inflation in Colombia, 1971–91*
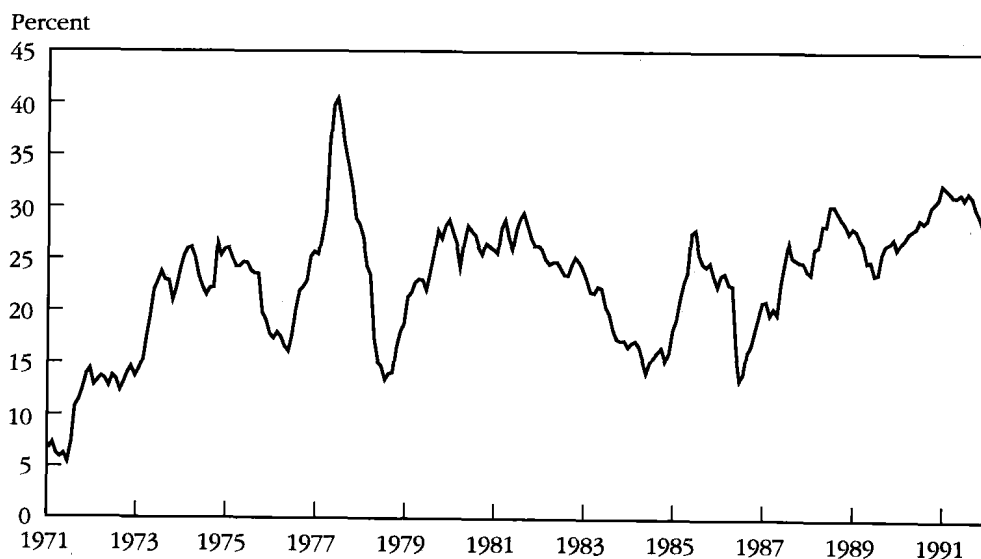
Note: The rate of inflation is measured by the change in the 12-month consumer price index. Data are monthly from January 1971 to December 1991.
Source: International Monetary Fund, *International Financial Statistics* (various issues).

Table 1. *Inflationary Experience in the Eight Case Studies*

Current moderate inflation		Former moderate inflation	
Reached from high inflation	*Reached from low inflation*	*Inflation now high*	*Inflation now low*
Chile	Colombia	Brazil	Indonesia
Mexico			Ireland
			Korea, Rep. of
			Spain

We then present eight brief case studies of countries that have experienced moderate-inflation episodes: Brazil, Chile, Colombia, Indonesia, Ireland, the Republic of Korea, Mexico, and Spain. Their inflationary experience is summarized in table 1. We are particularly interested in the countries that successfully disinflated from the moderate range. So far as we are aware, Indonesia is the only country that in the period since 1960 has suffered sustained extreme inflation (more than 100 percent) and then stabilized to the single-digit range. Of course, the classic hyperinflation countries achieved that feat earlier. In the case studies, we pursue the factors that determined the choice between allowing the inflation to continue and disinflating. We detail the implementation of disinflation policies in those countries that succeeded in stabilizing, by examining the exchange rate commitment and the use of incomes policy and trade liberalization, as well as by examining monetary and fiscal policies. We also discuss the costs of stabilization.

In the concluding section we draw on the case studies to summarize some lessons about disinflation from moderate inflation.

I. WHY IS THERE INFLATION?

There are basically two answers to the question of why there is inflation. One is that inflation is an integral part of a country's public finances. The other is that inflation continues because it is too hard or too costly to stop.

Inflation and Public Finance

At least since the 1920s it has been understood that money creation is one way of financing budget deficits. In his classic article, Keynes (1923, chapter 2), in commenting on the hyperinflation experiences of Germany and Russia, vividly pointed out how even the weakest government always has one way left to pay its bills, namely, printing money. It might be thought that the seigniorage argument is relevant only to economies with extremely high inflation, but of course that is not the case. (See, for example, Phelps 1973 and Fischer 1983 on optimal inflation in a theory of public finance.) As table 2 shows, inflationary money creation accounts for a significant portion of government revenue even in economies with moderate rates of inflation.

Table 2. *Inflation and Seigniorage in Three Countries with Moderate Rates of Inflation*
(percent)

Country	Inflation	Seigniorage[a]	Seigniorage as a percentage of government revenue[b]
Colombia, 1976–85	23.4	2.5	17.6
Greece, 1982–87	19.7	2.6	11.2
Portugal, 1982–87	19.3	3.5	6.5

a. Change in high-powered money as a percentage of GDP.
b. Government revenue including seigniorage.
Source: International Monetary Fund, *International Financial Statistics* (various issues).

What predictions can we make from the seigniorage argument? In his classic work, Cagan (1956) introduced the notion of a revenue-maximizing rate of inflation and showed that most countries undergoing hyperinflations were inflating at well beyond revenue-maximizing rates. Friedman (1971) noted the role of real income growth as a source of seigniorage revenue. The revenue from money creation can be written as the sum of two terms, the first arising from inflationary money creation, the second from growth-induced increases in money demand:

$$(1) \qquad \dot{M}/P = [\pi + (n + \eta g)]m$$

where M is the quantity of high-powered money, P an index of prices, π the rate of inflation, n the growth rate of population, η the income elasticity of real money demand, g the growth rate of real per capita income, and m per capita real balances. Friedman focused on the tradeoff between the seigniorage revenue from inflationary money creation, πm, and the revenue that accrues from money creation linked to economic growth, $(n + \eta g)m$. With higher rates of inflation, real balances are lower and hence the growth benefits apply to a smaller base.

Suppose the demand for real cash balances takes the Cagan form, $M/P = Nf(y)e^{-b\pi}$, where N denotes the population size. Then the revenue-maximizing rate of inflation, π^*, is given by

$$(2) \qquad \pi^* = 1/b - (n + \eta g)$$

where the term $(n + \eta g)$ is the Friedman modification. At high inflation rates, however, the Friedman modification leads to relatively little change in the revenue-maximizing inflation rate. Cagan (1956) estimates b (denoted α in his paper) to be about six months, or 0.5 years. With $b = 0.5$, the peak of the seigniorage Laffer curve would be reached at 200 percent a year. Assuming that η is unity, the revenue-maximizing inflation rate would be 190 percent, even for a real growth rate as high as 10 percent a year. The illustrative calculations in table 3 show how sensitive the revenue-maximizing inflation rate is to the estimate of b, and how relatively insensitive it is to the Friedman correction.

Table 3. *The Revenue-Maximizing Rate of Inflation in the Friedman Approach*
(percent per year)

Rate of growth of real per capita income, g (percent)	Value of b			
	0.25	0.50	1.00	5.00
0.00	398.0	198.0	98.0	18.0
0.03	393.5	193.5	93.5	13.5
0.06	389.0	189.0	89.0	9.0

Note: The revenue-maximizing rate of inflation is calculated using equation 2, with $n = 0.02$ and $\eta = 1.5$.

Bailey (1956) was the first to study the *optimal*-inflation tax rate, which is of course below the revenue-maximizing rate. The optimal inflation rate is calculated by equating the marginal social cost of raising government revenue through inflation with the marginal social cost of alternative sources of revenue. Bailey's calculations, which do not take account of growth, imply that

$$(3) \qquad\qquad \pi^{**} = \mu/(1 + \mu)b$$

where π^{**} is the optimal-tax inflation rate and $(1 + \mu)$ is the marginal social cost of raising an extra dollar in tax revenue. Table 4 shows tax-optimal inflation rates calculated from equation 3.

The Bailey analysis appears to put tax-optimal inflation rates in the moderate-inflation range.[1] However, we are skeptical of the public finance argument for moderate inflation, because of the costs of inflation other than those arising from the need to economize on money holding and because of the gradual shift away from money holding that is common in moderate-inflation as well as high-inflation economies. We do, however, accept the implication of the Bailey analysis that inflation rates will be higher in countries where alternative sources of revenue are costly. Bailey's results thus help account for generally higher inflation rates in Latin American countries, which have had great difficulty raising normal tax revenues.

1. Bailey obtained a low, tax-optimal rate of inflation because he assumed a very low collection cost (only 7 percent of revenue) and had a high *b* (0.75).

Table 4. *The Optimal Rate of Inflation in the Bailey Approach*
(percent per year)

μ	Value of b		
	0.25	0.50	1.00
0.1	36.4	18.2	9.1
0.2	66.7	33.3	16.7
0.5	133.3	66.6	33.3

Note: The optimal rate of inflation is calculated using equation 3.

Game-Theoretic Complications

The central point of the simplest game-theoretic equilibrium models is that the public adjusts to any credible change in policy. But if the government has an incentive to mislead the public, then the public anticipates this possibility and the only viable equilibrium is one where the government's marginal incentive to cheat is balanced by the marginal cost of doing so. This is typically a "worse" equilibrium than could be attained if opportunistic government behavior could be ruled out.

Barro (1983) and Bruno (1991) have placed the seigniorage argument in a game-theoretic context using the Barro-Gordon (1983) approach to the problem of precommitment (see, too, Kiguel and Liviatan 1990). Consider a policymaker who maximizes an objective function that has both seigniorage and the inflation rate as arguments:

(4) $$V = \pi L(\pi^*) - \tau \pi^2 / 2.$$

The policymaker optimizes conditional on the rate of expected inflation, π^*, and would like the public to have low expectations of inflation, so that the money base on which the inflation tax is imposed is high. But the equilibrium under rational expectations requires that the public's expectations be correct, so that in equilibrium, $\pi = \pi^*$. The equilibrium inflation rate in a situation without precommitment is therefore given by

(5) $$\pi = L(\pi)/\tau.$$

Figure 2 shows the conventional seigniorage-Laffer curve, OL, for a Cagan demand function with maximum revenue at point A and the corresponding inflation rate of π_0. Bruno and others (1991) show that the equilibrium game-theoretic inflation rate may exceed the revenue-maximizing rate of inflation. Two competing considerations enter. Although the marginal collection cost of seigniorage, $\tau \pi$, works to dampen inflation, the absence of precommitment tends to raise the inflation rate.

If the only social cost of inflation were the area under the demand curve for money, then the game-theoretic analysis would imply a higher inflation rate than the optimal-tax analysis. This expanded model of seigniorage could therefore support the notion of equilibrium inflation rates in the 15 to 30 percent range.

Implications for Stabilization

The seigniorage argument—whether in the optimal-tax or the game-theoretic mode—makes inflation plausible because, within a given tax structure, inflation is a relatively low-cost way of raising revenue. But clearly that is only true within a given structure. If the marginal cost of raising government revenue can be lowered through tax reform, then the optimal inflation rate will be reduced as well. In this perspective, tax reform accompanies and supports inflation stabilization.

Figure 2. *Seigniorage and Inflation*
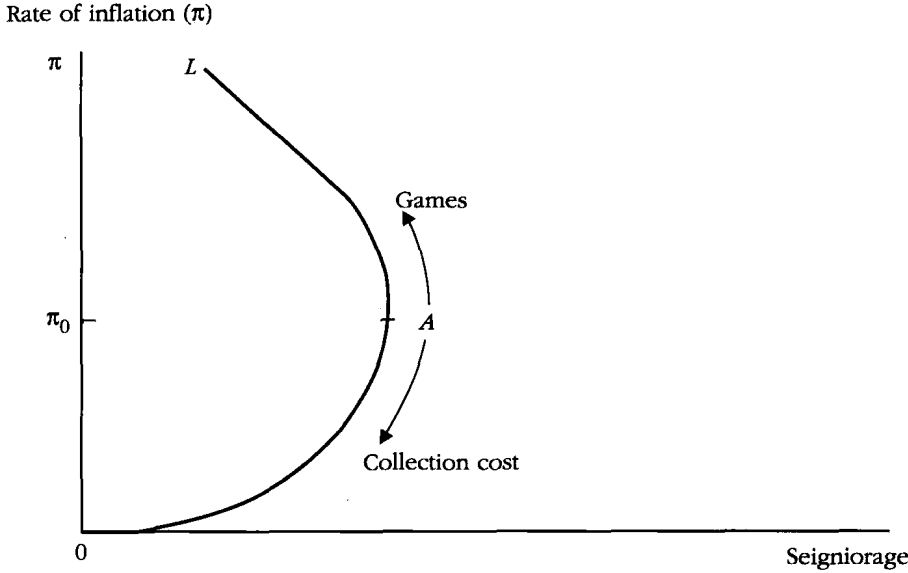
Rate of inflation (π)

Inflation and Unemployment

The main alternative game-theoretic model of inflation also focuses on the lack of precommitment, but the cornerstone of the game is unemployment rather than seigniorage. It is assumed that wages and prices are fully flexible and there would be no problem in shifting to a noninflationary equilibrium if only the government could credibly commit itself. But the government has an incentive to cheat and surprise.

In Barro and Gordon's (1983) model the government minimizes a loss function, V, in which the arguments are the deviation of unemployment from the government's desired unemployment rate, ku^*, and inflation. Because of distortions, for example in the tax structure, or of taste differences, the government's target rate of unemployment is only a fraction (k in equation 6) of the natural rate at which the labor market clears and that governs inflation dynamics:

$$(6) \qquad\qquad V = (u - ku^*)^2 + \alpha\pi^2 \qquad\qquad 0 < k < 1.$$

In the labor market, inflation depends on inflationary expectations (π^*) and on the discrepancy between the actual (u) and natural (u^*) rates of unemployment:

$$(7) \qquad\qquad \pi = \pi^* - \beta(u - u^*).$$

The government maximizes V subject to the inflation equation (equation 7),

taking inflationary expectations as given. In equilibrium the solution must satisfy $\pi = \pi^*$. Equilibrium inflation therefore is

$$(8) \qquad\qquad \pi = (1 - k)u^*/\alpha\beta.$$

Inflation in this model is strictly the result of a lack of precommitment. Equilibrium inflation does not come as a surprise, and as a result it fails to reduce unemployment below the natural rate. The equilibrium level of inflation is higher, the higher the wedge between the natural and target rates of unemployment, the more the government is concerned with the employment objective rather than with inflation, and the smaller the impact of unemployment on inflation.

This model could support the idea of steady inflation at 20 or 30 percent. However, the parameters that appear in equation 8 have not been estimated in a way that makes it possible to narrow down the implied range of inflation.

The general spirit of this model can be taken in several directions. One possibility is that the public does not know the characteristics of the policymaker. In this case, learning and reputation building come into play (see Andersen 1989; Persson 1988; Persson and Tabellini 1989; Driffill 1989; Blackburn and Christensen 1989). Taking account of reputation generally reduces the equilibrium inflation rate below that implied by equation 8, but also suggests—realistically—that inflation rates are likely to be lower in countries with more stable governments, where policymakers and the institutions in which they operate have the opportunity to establish reputations.

The central place of precommitment and reputation in game-theoretic models supports the notion embodied in the creation of independent central banks: that institutions should be designed to reduce the incentives for opportunistic behavior and ambiguity about preferences. For example, appointing conservatives to run the central bank would lead to lower inflation. So would positive disincentives for policymakers to create inflation.

Inflation Too Costly to Stop

A different motive for inflation comes from the observation, or at least the belief, that inflation is costly to stop. One might call this the "Brookings School" view. Once commonplace (see, for example, Tobin 1980 discussing the prospects for disinflation in the 1980s), it came under attack in the 1980s, notably by Sargent (1982, 1986). Sargent brought evidence from the end of hyperinflations, and from the United Kingdom and France in the 1920s, to shift the focus of attention to the credibility issue and away from the notion of price stickiness that does not result from the slow adjustment of expectations.

A typical persistence model is presented in the following equations, where w denotes wage inflation and e the rate of depreciation of the exchange rate. The disturbance term, ψ, is expressly recognized, because supply shocks play an important role in the inflation process:

(9) $$\pi = \alpha w + (1 - \alpha)e + \psi \qquad\qquad 0 < \alpha < 1$$

(10) $$w = \pi_{-1} - \lambda u$$

(11) $$e = \beta\pi + (1 - \beta)\pi_{-1} \qquad\qquad 0 < \beta < 1$$

(12) $$\pi = \pi_{-1} + \theta\psi - \alpha\lambda\theta u \qquad \theta = 1/[1 - \beta(1 - \alpha)]$$

(13) $$u = u_{-1} - \tau(m - \pi) - \phi(e - \pi).$$

The model includes cost-based pricing (equation 9), a wage-setting equation (10), and an exchange rate rule (11). These three equations imply an accelerationist Phillips curve (equation 12); the model is completed by an aggregate demand equation with real money growth and real depreciation as the driving forces (equation 13). The model *assumes* persistence, because lagged inflation appears mechanically as a determinant of current wage and price inflation.

Indexation

In economies where inflation is substantial—say, 20 percent a year—some implicit or explicit form of indexation is unavoidable. Indexation increases inflationary inertia for at least two reasons. First, indexation leads to longer contracts than would exist in its absence, and longer contracts generally increase inertia.[2] Second, the typical indexing formula used in practice tends to make the real wage a negative function of the inflation rate.[3] This means that the real wage rises when inflation is reduced, implying higher unemployment.[4]

If wages are set by a formula depending mainly on the past behavior of inflation, there will be very little scope to enlist forward-looking expectations effects in disinflating. When inflation is chronic, either a suspension of indexation or else protracted high unemployment will be inevitable in the process of stabilization. As equation 10 shows, if current wage inflation is determined by past price inflation, then more work has to be done by unemployment to bring down wage inflation.

Combining Inertia and Expectations

The above model neglects explicit expectations. In the overlapping-contract models of Fischer (1977, 1986), Taylor (1980, 1983), and Dornbusch (1980), expectations are forward-looking but long-term contracts introduce an element

2. Taylor (1982) and Fischer (1986) show that indexation can speed up the response of prices to a reduction in money growth. The comparison that is being made in these papers is between indexed wages and wages that are predetermined in contracts of the same length; the response is more rapid with indexed wages because they adjust sooner to any initial reduction in inflation achieved by policy.

3. This relationship has been examined by Modigliani and Padoa-Schioppa (1978) and Simonsen (1986); see Fischer (1988, equation 20).

4. Of course, the short-run impact of higher real wages also works through the demand side and on that account may well raise output, notably in the nontraded goods sector. This theme is familiar from the literature on contractionary devaluation.

of inertia (see, too, Fellner and others 1982). In these rational expectations models, inflation is still linked to the past because existing wage settlements include expectations based on past information. But the more forward-looking the pricing and the shorter the contracts, the less recessionary a disinflation will be—provided, of course, that the change in policy affects expectations of future prices and wages.

With full credibility, policies that stabilize inflation without creating unemployment can, in principle, be designed in these models. However, nonrecessionary disinflation in these models typically takes very long and starts with either an increase in the money stock or a very slow reduction in money growth, which immediately raises the issue of credibility. The job can be done faster if unemployment is allowed, but the assumption of full credibility will, in practice, not be satisfied, and that may raise the unemployment cost substantially.[5]

Innovations in Credibility Management

Recent policy experiments have focused on enhancing credibility along with actual monetary disinflation. In Chile, for example, the Central Bank was formally made independent of the government in 1989. In New Zealand an elaborate agreement between the Treasury and the Central Bank in 1989 obliged the latter to achieve a stable price level by the end of 1992. Canada, too, is attempting to reduce inflation by amending the law to make price stability the Bank of Canada's sole policy target. Although the Canadian package is less ambitious than that of New Zealand, it, too, attempts to lower the cost of disinflation by directly influencing expectations (see Lipsey 1990, and the Bank of Canada's February 26, 1991, press release in Selody 1990). In Europe the EMS has served as a credibility-enhancing mechanism.

Summary

The policymaker who disinflates has to deal with two elements central to different models—seigniorage and the mechanics of wage-price dynamics. Significant amounts of seigniorage—2 to 3 percent of gross national product (GNP)—are typically being collected in countries with moderate inflation, and inflation will not stop in these countries unless the government deals with the fiscal problem by cutting expenditures or raising taxes.

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5. Calvo (1983a, 1983b) has proposed a model of forward-looking price setting in which one can investigate the effect of a change in the monetary growth rate. A change in money growth immediately changes the inflation rate, but not the price level. Fuhrer and Moore (1990), noting that Calvo's model cannot account for sticky inflation, offer an ad hoc adaptation. Ball (1990, 1991), addressing the same issue, recognizes that in a Taylor setting, the level of prices—not their rate of change—has inertia. He concludes that disinflation ought to result in a boom, because the lower expectation of future prices leads, through the Taylor wage- and price-setting assumptions, to a reduction in the current price level and thus higher real balances. The standard outcome is that the start of a credible disinflation should be accompanied by a step *increase* in the money supply, to provide for the increased real balances demanded as a result of lower expected inflation. This mechanism is not present in the Ball model.

Second, inflationary inertia, whether resulting from the slow adjustment of expectations or from the presence of contracts, has to be taken into account. A convenient starting point is to go back to equation 9, adding and subtracting lagged inflation on the right-hand side:

(9a) $$\pi = \pi_{-1} + \alpha(w - \pi_{-1}) + (1 - \alpha)(e - \pi_{-1}) + \psi.$$

The equation underlines the persistence of inflation. Inflation today will be equal to inflation yesterday except for any combination of the following:

- Wage inflation falls below past price inflation. (This requires a break with any implicit or explicit backward-looking indexation. The suspension of indexation, or introduction of an incomes policy, could accomplish this.)
- Exchange depreciation falls below the rate of past inflation.
- Favorable supply shocks lead to disinflation without the need for the exchange rate or wages to take the lead.

More generally, for inflation to fall, there has to be a major break in the process whereby each sector, including the monetary authorities, accommodates the inflation rate of every other sector. Use of the exchange rate to initiate a disinflation is very common, but it risks leading to a situation of overvaluation, which then greatly complicates the unwinding phase. Policies that attempt to reduce inflation by stabilizing the nominal exchange rate or other government-controlled prices run enormous risks of unsustainability if inflation fails to respond. Thus there can be no way of pursuing these policies to the bitter end; if they fail to reduce inflation, at some stage they have to be abandoned.

Sometimes the inflationary process is broken into by a change in the wage rules that move from compensating for past erosion of the purchasing power of wages to a forward setting based on expected inflation. If the stabilization program is indeed accompanied by a fundamental change in fiscal policy, then inertia can be reduced by a one-time suspension of indexation rules—for example, that workers and asset-holders forgo one inflation adjustment. Provided the new policies are consistent with low inflation, indexation can later be restored if that has to be done. But if all else fails, high unemployment will have to be used to slow inflation by reducing wage and demand pressures; that has been the rule in successful programs.

In the case studies below we will highlight how the problem of cutting into the inflationary process was addressed in each instance.

II. STATISTICAL OVERVIEW

There is need for a working definition of moderate inflation. The rate has to be high and persistent enough to set it apart from the problems of the United Kingdom or the United States, yet low enough to put it in a category clearly distinct from high, extreme, or hyperinflation. We define a moderate-inflation episode as one in which the annual inflation rate is in the 15 to 30 percent range for at least three years.

The emphasis on the inflation being sustained is essential to set the experiences apart from supply-shock inflation. The upper limit of the range is not very important—whether to end at 25 or 30 percent—but the lower limit does affect the number and length of episodes. The duration is more significant; there would be many more episodes if we used a two-year duration and far fewer if we used a four-year duration—as can be seen in table 5, which presents a list of the episodes of moderate inflation in the period since 1950, as well as in table 6, which lists moderate-inflation episodes by their duration. (Data are incomplete for the 1950s, and the weight of the experience therefore comes from the post-1960 period.)

Table 5 includes 55 episodes, drawn from the behavior of inflation in 131 countries. Just over half of these episodes—28 of them—started during the oil price shocks and lasted no more than four years. Clearly, many of the moderate-inflation episodes were triggered by commodity price shocks. Table 5 leads us to raise a number of questions: Is there a high incidence of repeat offenders? The answer is clearly no. Where do countries that find themselves in moderate-inflation spells come from and where do they go? Most countries come from low inflation. Leaving moderate inflation, they typically stay, on average, in the neighborhood of moderate inflation, or go back to a lower inflation rate. Very few transit to higher inflation. In table 5, of the 48 cases for which post-episode information was available, 32 had average annual inflation rates below 15 percent for the following three years, 10 had annual inflation rates that averaged

Table 5. *Inflation Rates before, during, and after Episodes of Persistent Moderate Inflation since 1950*

Country	Period of moderate inflation[a]	Average annual rate of inflation		
		During the period	Three years before the period	Three years after the period
Pacific				
New Zealand	1975–77	15.3	8.7	14.3
	1980–82	16.2	13.3	9.7
Europe				
Finland	1974–76	16.3	8.2	9.3
Greece	1979–87	20.7	12.7	15.6
Iceland	1986–89	21.6	48.4	—
Ireland	1974–76	18.6	9.7	11.5
	1980–82	18.6	11.4	8.2
Italy	1974–77	17.8	7.1	16.0
	1980–82	18.5	14.7	11.6
Poland	1983–86	17.5	43.8	112.1
Portugal	1974–85	22.7	8.9	10.2
Spain	1974–80	17.6	9.3	13.7
Turkey	1955–59	18.0	11.9	1.6
	1973–77	19.0	11.4	71.4
United Kingdom	1974–77	18.1	8.6	13.2
Yugoslavia	1971–75	19.3	7.9	13.1
	1977–79	16.5	18.9	34.1

Table 5. *(continued)*

Country	Period of moderate inflation[a]	Average annual rate of inflation		
		During the period	Three years before the period	Three years after the period
Africa				
Ethiopia	1977–79	15.7	14.6	5.5[b]
Liberia	1973–75	17.5	1.6	6.4[b]
Seychelles	1972–75	20.6	—	13.9
Sierra Leone	1974–76	17.2	3.3	13.5[b]
Somalia	1974–76	17.3	1.0	15.0[b]
South Africa	1985–87	17.0	12.8	13.9
Sudan	1973–75	21.8	6.3	12.7
	1979–81	25.2	22.5	36.7
Swaziland	1979–81	18.3	11.0	12.0
Zaire	1972–74	20.3	6.7	66.0
Zambia	1976–78	18.3	8.2	11.4
Asia and Pacific				
Korea, Rep. of	1974–76	21.5	9.5	14.3
	1979–81	27.8	13.3	4.3
Pakistan	1973–75	23.6	5.1	7.8
Western Samoa	1981–83	18.4	15.4	9.4
Middle East				
Bahrain	1973–78	18.5	4.2	5.8
Egypt	1982–84	16.0	13.6	18.6
	1986–90	20.5	15.0	—
Iran, Islamic Rep. of	1980–83	20.8	16.5	11.8
Israel	1987–90	18.3	224.2	—
Syria	1980–82	17.3	7.1	10.9[b]
Latin America and Caribbean				
Bolivia	1987–90	15.3	4,435.8	—
Brazil	1968–72	20.7	45.9	23.1
Chile	1965–68	24.3	—	27.6
	1986–89	17.8	26.0	—[b]
Colombia	1973–76	22.1	9.7	25.2
	1978–89	23.1	25.4	—
Costa Rica	1987–90	18.3	13.0	—
El Salvador	1979–81	15.6	10.7	12.2
	1987–89	20.8	21.9	25.5
Grenada	1977–81	19.6	—	6.5
Guyana	1978–83	17.5	8.4	16.0
Haiti	1973–75	18.2	4.7	3.6
Mexico	1974–76	18.3	7.4	21.6
Paraguay	1955–57	20.4	69.7	8.1
Trinidad and Tobago	1973–75	17.9	5.1	10.9
	1979–81	15.5	10.9	13.4
Uruguay	1969–71	20.4	96.0	83.6

— Not available.

Note: All spells shown as ending in 1988 or earlier were completed. Some that were shown as ending in 1989 may not have been completed (data for 1990 were not available for all countries). Spells shown as ending in 1990 may be continuing.

a. Moderate inflation is defined as an annual inflation rate of 15 to 30 percent for at least three consecutive years.

b. Includes year(s) in which the inflation rate was between 14 and 15 percent.

Source: International Monetary Fund, *International Financial Statistics* (various issues).

Table 6. *Duration of Episodes of Moderate Inflation since 1950*

Item	Consecutive years of moderate inflation[a]							
	3	4	5	6	7	8	9	12
Number of episodes	31	12	6	2	1	0	1	2
Percentage of total	56.4	21.8	10.9	3.6	1.8	0	1.8	3.6

a. Moderate inflation is defined as an annual inflation rate of 15 to 30 percent for at least three consecutive years.

between 15 and 30 percent, and only 6 had annual inflation rates that averaged more than 30 percent.

Table 6 summarizes the persistence of moderate-inflation episodes. The table shows the number of spells listed in table 5 that were of a given duration. Thus, for example, more than half the moderate-inflation spells lasted only three years. The evidence thus shows that most countries that enter the moderate-inflation zone do not stay there very long: for most countries moderate inflation is a transitory experience. In very few countries does moderate inflation become a way of life: there are only six spells where inflation is in the 15 to 30 percent range for more than five years. The two longest spells are those of Portugal and Colombia, each lasting 12 years (and Colombia's still continues).

III. CASE STUDIES

In this section we offer several case studies, representing different transitions into or out of moderate inflation, as shown in table 1. We start with the countries that are currently experiencing moderate inflation after stabilizing a high inflation—Chile and Mexico. Other countries in this situation are Israel and Bolivia. We then examine the case of Colombia, which, having reached moderate inflation from low inflation, is the country with the longest-lasting moderate inflation. We turn next to Brazil, which stabilized a high inflation successfully and reached moderate inflation in 1968, but then failed to stay in this region and returned to high inflation. We conclude with four countries that have successfully reduced moderate inflations and now experience low inflation—Republic of Korea, Indonesia, Ireland, and Spain.

Chile

Chile is today seen as *the* example of successful macroeconomic stabilization and structural adjustment. There is no question about the success, but there should also be no illusion about the cost at which these accomplishments were attained—violent political repression for almost two decades and mass unemployment until very recently.

Table 7 reviews key Chilean variables in the 1980s, and figure 3 shows the path of inflation.

Table 7. *Macroeconomic Variables in Chile, 1980–89*

Year	General government budget deficit[a]	Real interest rate[b]	Unem-ployment rate[c]	Real wage index[d]	Real exchange rate[d]	Inflation rate (percent)	Seign-iorage[e]
1980	5.5	12.2	14.5	88	95	35.1	2.4
1981	2.4	28.8	13.7	103	108	19.7	−0.7
1982	−2.2	35.1	27.2	103	97	9.9	−1.7
1983	−2.6	15.9	36.5	92	89	27.3	0.8
1984	−2.9	11.4	28.3	92	90	19.9	0.9
1985	−2.3	11.1	23.9	88	80	30.7	0.8
1986	−0.0	7.7	18.9	90	89	19.5	—
1987	0.5	9.4	16.2	89	66	19.9	—
1988	−0.3	9.9	12.0	95	61	14.7	—
1989	—	—	—	—	62	17.0	—

— Not available.
a. Percentage of GDP.
b. Realized active rate (percent).
c. Includes participants in government work program.
d. 1980–82 = 100.
e. The change in money base as a percentage of GDP.
Source: International Monetary Fund, *Government Financial Statistics* (various issues); International Monetary Fund, *International Financial Statistics* (various issues); CIEPLAN (various issues); Morgan Guaranty (various issues).

Figure 3. *The Rate of Inflation in Chile, 1978–92*
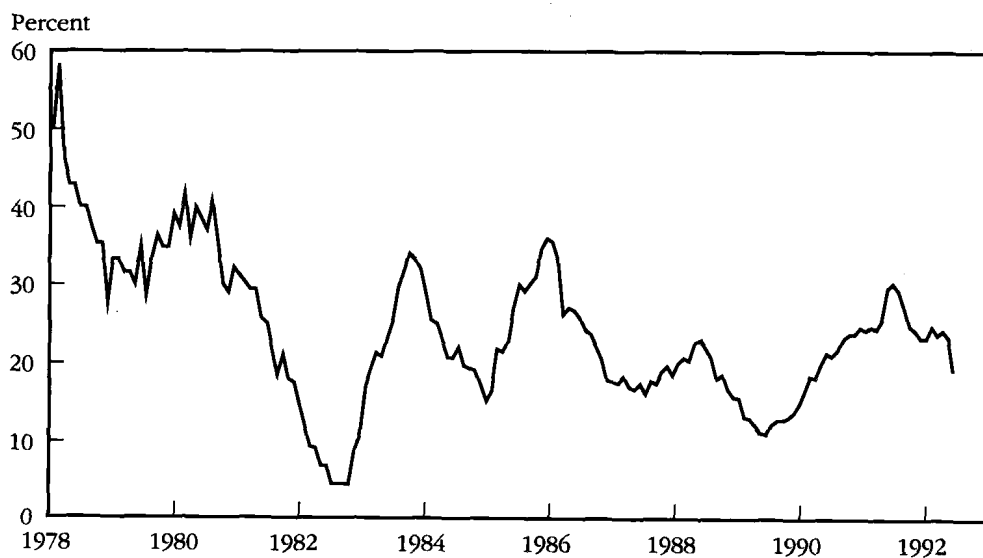
Note: The rate of inflation is measured by the change in the 12-month consumer price index. Data are monthly from January 1978 to March 1992.
Source: International Monetary Fund, *International Financial Statistics* (various issues).