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The Scope for Inflation Targeting in Developing Countries[1]

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Abstract

Inflation targeting (IT) serves as monetary policy framework in several advanced economies, where it has enhanced policy transparency and accountability. The paper considers its wider applicability to developing countries. The prerequisites for a successful IT framework are identified as an ability to carry out an independent monetary policy (free of fiscal dominance or commitment to another nominal anchor, like the exchange rate) and a quantitative framework linking policy instruments to inflation. These prerequisites are largely absent among developing countries, though several of them could with some further institutional changes and an overriding commitment to low inflation make use of an IT framework.

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SUMMARY

Difficulties in conducting monetary policy using an exchange rate peg or some monetary aggregate as the main intermediate target led a number of industrial countries in the 1990s to adopt a framework for monetary policy that has become known as inflation targeting (IT). The framework aimed at improving inflation performance as well as the accountability and transparency of monetary policy in those countries. Though the IT framework has not been severely tested since its inception, it is widely viewed as having proved quite useful.

This paper examines the relevance of IT for developing countries. It delineates the prerequisites and building blocks of this monetary policy framework and discusses some features of its implementation in advanced economies. The paper identifies two major prerequisites for adopting an IT framework: (1) the ability to carry out a substantially independent monetary policy, especially one not constrained by fiscal considerations; and (2) freedom from commitment to another nominal anchor like the exchange rate or wages. A country satisfying these two requirements could choose to conduct its monetary policy in a manner consistent with IT, defined as a framework containing an explicit quantitative target for future inflation, a commitment to that target as an overriding objective, a model for predicting inflation, and an operating procedure for adjusting monetary instruments in case forecast inflation differs from its target.

These fairly stringent technical and institutional requirements of IT cannot be met by many developing countries because seigniorage remains an important source of financing and/or because there is no consensus that attainment of low inflation should be the overriding objective of monetary policy. We thus conclude that the way to improve the monetary and inflation performance of developing countries may not be through the adoption of a framework akin to IT, at least not in the near term.

I. INTRODUCTION

In the 1990s a number of industrial countries adopted a framework for conducting monetary policy that has become known as Inflation Targeting (IT). In most cases the adoption of this framework was a practical response to the (apparent or real) difficulties these countries had found in conducting monetary policy using an exchange rate peg or some monetary aggregate as the main intermediate target. The switch also signaled a deliberate attempt by these countries to improve their inflation record, which was generally perceived as poor by OECD standards. Improved inflation performance, as well as increased accountability of the monetary authorities and transparency in their operating procedures, were all intended to improve the credibility of monetary policy in these countries. In practice, inflation targeting has served as a pedagogical device to explain to the public the costs of expansionary monetary policy and the need to react pre-emptively to inflationary pressures. Though the actual experiences with IT are too short to form definitive conclusions, and the IT framework has generally not been severely tested since the global economic environment in the 1990s has so far been favorable to reductions in inflation, IT is widely viewed as a useful framework in countries which have practiced it.

The set of countries explicitly practicing inflation targeting at present includes only about half a dozen small- to medium-sized advanced economies. The question then arises of IT's wider applicability. This paper addresses part of this question by examining the relevance of IT for developing countries. In order to do this we first need to be clear on what IT involves, so as to assess whether developing countries satisfy the prerequisites for a successful implementation of such a policy framework. It is not our objective to provide an exhaustive survey or discussion of all aspects of IT. There is already a large number of papers, conference volumes and surveys dealing with various analytical and practical aspects of IT, and the body of literature continues to grow.[2] Despite this profusion of material, however, there remains some confusion about what IT is and entails, and how it differs from other frameworks for conducting monetary policy. Some authors attribute this unwelcome confusion to the misleading rhetoric often used in discussions of IT (Bernanke and Mishkin (1997)). Others ascribe it to the tendency to overplay the novelty value of IT (Haldane (1996)).

Whatever the reasons for the confusion, a clear presentation of the main prerequisites and building blocks of IT needed for an assessment of its wider applicability to other countries and its comparison with other monetary regimes seems to be lacking. We therefore begin in the next section by providing a conceptual framework for understanding inflation targeting.

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[2]A few examples are Haldane (1995a, 1995b, 1996), Leiderman and Svensson (1995), McCallum (1996a) and Svensson (1996, 1997a, 1997b). More recent studies include Bernanke and Mishkin (1997), Debelle (1997), Mishkin and Posen (1997) and most of the essays presented at the August 1996 Jackson Hole Conference (Federal Reserve Bank of Kansas City (1996)).

Our analysis largely draws on recent work, which reflects an emerging consensus on what IT is and is not. We focus, however, to a somewhat greater extent than other authors on institutional aspects that are taken for granted in industrial countries but may not be present in developing economies. The following section then briefly reviews the experiences of industrial countries, highlighting their common features. We then turn in Section IV to the general question of the feasibility and advisability of an IT framework for developing countries. Section V offers some concluding remarks.

II. CONCEPTUAL FRAMEWORK

The case for IT starts from the simple premise that the primary goal of monetary policy in any country ought to be attaining and preserving a low and stable rate of inflation. Until not so long ago this seemingly uncontroversial premise was at the center of prolonged and heated debates among monetary economists.[3] In fact, the widespread (though less than universal) support that currently exists for that premise among economists and practitioners alike owes much to the consensus around four basic propositions that was spurred by those debates.

The four propositions are:

(1) An increase in the money supply is neutral in the medium to long run; i.e., a monetary expansion has lasting effects only on the price level, not on output or unemployment.

(2) Inflation is costly, either in terms of resource allocation (efficiency costs) or in terms of long-run output growth (breakdown of "superneutrality"), or both.[4]

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[3] For a glimpse at the evolution of the debates on this issue over the past four decades see the volumes edited by Yeager (1962), Havrilesky and Boorman (1976), Campbell and Dougan (1986), and Dorn and Schwartz (1987). For historical perspectives on the debate, going back to the 1800s, see Dorn (1987) and Goodhart (1992).

[4] There remains some disagreement regarding the (approximate) rate of inflation at which these costs become "large" or "significant." The disagreements are relatively more important on the relationship between inflation and output growth. Examples of these are the fairly different estimates of the rate(s) of inflation at which the negative correlation between inflation and growth becomes statistically significant in recent cross-country studies (cf., Fischer (1993), Barro (1995), Sarel (1996), Bruno (1995a) and Bruno and Easterly (1995)). Interestingly, in the case of welfare or efficiency costs of inflation differences among the various estimates available (cf., Driffill et al. (1990)) have nonetheless allowed a consensus to emerge around the appropriateness—if not optimality—of aiming policy at a *low but not zero*

(continued...)

(3) Money is not neutral in the short run; i.e., monetary policy has important transitory effects on a number of real variables such as output and unemployment. There is, however, at best an imperfect understanding of the nature and/or size of these effects, of the horizon over which they manifest themselves and of the mechanisms through which monetary impulses are transmitted to the rest of the economy.[5] And, a corollary of (3),

(4) Monetary policy affects the rate of inflation with lags of uncertain duration and with variable strength, which undermine the central bank's ability to control inflation on a **period-by-period basis**.

A fifth proposition that is often used by advocates of IT to provide support for the starting premise is the *inflationary bias* of monetary policy in a regime where the central bank can exercise (full) discretion in the setting of policy instruments. This "dynamic inconsistency" argument attributes the bias to the monetary authorities' inability to commit credibly to a low inflation objective in the absence of a "commitment technology"—a behavior that is nonetheless optimal under most circumstances—and stresses the need to place some sort of (external or institutional) constraints on the central bank to ensure the attainment of the low inflation objective.[6] The consensus surrounding this proposition, however, is not as broad as that for the other four—see, for example, Goodhart (1994), McCallum (1995, 1996a) and Romer and Romer (1996)—but, in the end, this does not really undermine the case for inflation targeting, only changes the emphasis placed on the arguments employed to endorse its adoption. In fact, whether dynamic inconsistency is a major problem or not, it certainly seems to be true that central banks get more public criticism for raising interest rates than for lowering them, and are subject to continual pressure to stimulate activity and/or pursue other objectives that may conflict with price stability. Inflation targeting in principle helps to redress this asymmetry by making inflation, not output or some other target variable, the explicit goal of monetary policy, and by providing the central bank a forward-looking framework to undertake a **pre-emptive** tightening of policies before inflationary pressures become visible.

Building on the above consensus, IT is seen by many as a framework capable of improving the design, implementation and actual performance of monetary policy compared to the conventional procedures followed by central banks. It does so by providing a vehicle that is consistent both with a number of recent analytical developments in the area of monetary

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[4](...continued)
rate of inflation (see, for example, Fischer (1995) and Freedman (1996)).

[5] For a recent list of competing explanations of the short-term real effects of monetary policy see McCallum (1996a, 1996b). See also the symposium on the monetary transmission mechanism in the Fall 1995 issue of *The Journal of Economic Perspectives*.

[6] A comprehensive presentation of the dynamic inconsistency argument can be found in Persson and Tabellini (1990); see also Cukierman (1992).

policy and with the four (or five) basic propositions listed above. In fact, the strength of the case for IT and its growing popularity are non-trivially related to the framework's ostensible capacity to take into account the main insights and/or policy implications of many strands of the recent literature on monetary policy including, inter alia, the "information-variables approach," advanced by Benjamin Friedman and others in the mid-1970s; the literature on "monetary policy rules," of the type suggested by Bennett McCallum and John Taylor in the 1980s; and the literature on central bank independence.

Notwithstanding the merits of an eclectic approach to the design and conduct of monetary policy, this encompassing feature of IT has, so far, delayed the formation of a consensus on the key distinguishing aspects and elements of the framework, especially from an operational perspective. This, added to the paucity of the data on actual experiences, has complicated the task of assessing the properties of inflation targeting (and its wider applicability) in a systematic way. The problem is apparent when one sees what the literature on the subject identifies most frequently as the main advantages of IT. Three features come at the top of the list:[7] the provision of a *nominal anchor* for monetary policy and inflation expectations, the increase in the *transparency* and *accountability* of the procedures followed by the monetary authorities (and the concomitant reduction of the inflationary bias of monetary policy), and the explicit role given to the *lags of monetary policy* in the (period-by-period) choice of instrument settings. But these features are hardly unique. It could be argued that a variety of frameworks for conducting monetary policy—for example, nominal income targeting—share to some degree, and surely promise to deliver, similar advantages. In fact, a number of authors have stressed this point in their assessment of inflation targeting.[8] Given the focus of this paper on the applicability of IT to developing countries, there is a need to pin down more clearly the prerequisites and defining features of this particular framework for monetary policy, and to attempt to place it more firmly in a wide spectrum of monetary regimes. We undertake this task in the remainder of the section.

Prerequisites and defining features of IT

The first requirement that must be satisfied by any country considering the adoption of IT is to have a central bank capable of **conducting its monetary policy with a degree of independence**. This does not imply necessarily that the central bank of the country in question must be fully independent (in the sense defined by Cukierman (1992), Fischer (1994) and others) but, more modestly, that the monetary authorities ought to be able to gear (more or less) freely the instruments of monetary policy toward the attainment of some nominal objective—i.e., there should exist some reasonable degree of instrument independence, but

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[7] In particular, see Haldane (1995b), Leiderman and Svensson (1995), Leiderman and Bufman (1996), Svensson (1997b) and Bernanke and Mishkin (1997).

[8] Remarks along these lines can be found, for instance, in McCallum (1996a), King (1996), Summers (1996) and Taylor (1996).

not necessarily goal independence. Admittedly, this requirement is not specific to IT; rather, it is a precondition for formulating monetary policy separately from other financial policies—especially fiscal policy. Compliance with this requirement is generally (and justifiably) taken for granted in discussions and analyses of monetary policy in industrial countries but, as will be argued below in Section IV, the issue becomes of utmost importance when trying to assess the applicability of any given monetary policy framework to less advanced economies.

In order to comply with this requirement a country will have to exhibit no significant symptoms of *fiscal dominance*—i.e., the conduct of domestic monetary policy will not be dictated or severely constrained by developments of a fiscal nature. In general terms, this implies that the public sector direct borrowing from the central bank (and the banking system) will be low or nonexistent, that the government will have a broad revenue base and therefore will not rely systematically and significantly on the revenues from seigniorage, that domestic financial markets will have enough depth to absorb placements of public (and private) debt instruments, and that the accumulation of public debt will not give rise to explosive or "unpleasant" dynamics (Sargent and Wallace (1981)). Failure to comply with these conditions will make the country vulnerable to inflationary pressures of a fiscal origin that, if left unchecked, will often induce the creation of formal and informal indexation mechanisms (especially in labor and capital markets) and impart a high degree of persistence to the nominal variables of the economy. A fiscally-driven inflation process of this type will undermine gradually the effectiveness of monetary policy to attain any nominal target, and oblige the central bank to follow an increasingly *accommodative* monetary policy. The threshold inflation rate at which monetary policy loses most of its role as a nominal anchor and becomes almost fully accommodative is not well defined analytically or empirically, but there is some agreement that a country that has experienced annual inflation rates in the 15-25 percent range for a number of consecutive years (say, three to five) will be unable to rely on monetary policy *alone* to target any significant and lasting reduction in the rate of inflation.[9]

A second requirement for adopting IT is the absence of any firm commitment by the authorities to **target the level or path of any other nominal variable**, such as wages or, especially, the nominal exchange rate. In fact, a country that chooses a *fixed exchange rate* system subordinates its monetary policy to the exchange rate objective and is unable to target any other nominal variable on a lasting basis, especially in the presence of capital mobility (a feature that is particularly relevant for the more advanced developing countries which are also the most likely candidates to adopt an IT framework).[10] Variants of a fixed exchange rate

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[9] For recent analyses of the role of fiscal and monetary policies in moderate-to-high inflation episodes, and the ensuing stabilizations, see Dornbusch (1982), Dornbusch and Fischer (1993), Bruno (1991, 1993, 1995a, 1995b), and Heymann and Leijonhufvud (1995).

[10] This is not to say that pegging the exchange rate may not be inspired by the ultimate

(continued...)

system—e.g., crawling pegs or target zones—relax these strictures somewhat and allow the authorities to gear monetary policy at some other nominal objective in addition to the exchange rate including, in principle, the rate of inflation. In theory, then, a nominal (non-fixed) exchange rate target could coexist with an inflation target "as long as it is clear that the inflation target has priority if a conflict arises" (Leiderman and Svensson (1995)). In practice, however, such coexistence might well be problematic, since the authorities will typically be unable to convey *ex ante* those priorities to the public in a credible manner. Under those circumstances, the public would have to *infer* the authorities' priorities from their actual responses in those instances where the nominal exchange rate target came under pressure. But therein lies the problem: there is no assurance that either of the two main courses of action open to the authorities in situations of exchange rate pressure—i.e., adjust the instrument settings to preserve the nominal exchange rate target or allow the exchange rate to move beyond the pre-established range—would convey the appropriate signal to the public and/or increase the credibility of the authorities. Without question, the surest (and safest) way of avoiding these problems in contexts where the inflation target is the main policy objective would be to refrain from making strong commitments about the expected or desired level or time path of the nominal exchange rate.

A country that satisfies these two basic requirements could, in principle, conduct its monetary policy in a manner consistent with IT. To do so, the authorities would need to put in place a framework for monetary policy containing four essential elements:[11] (i) explicit *quantitative targets* for the rate of inflation some period(s) ahead; (ii) clear and unambiguous indications that the attainment of the inflation target constitutes the *overriding objective* of monetary policy in the sense that it takes precedence over all other objectives; (iii) a methodology ("model") for producing *inflation forecasts* that uses a number of variables and indicators containing information on future inflation; and (iv) a *forward-looking* operating procedure in which the setting of policy instruments depends on the assessment of inflationary pressures and where the inflation forecasts are used as the *main intermediate target.* The preceding list *assumes*, other than compliance with the two basic requirements, that the country's monetary authorities possess the technical and institutional capacity to model and forecast domestic inflation, have some knowledge or estimate of the time it takes for the

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[10](...continued)
objective of price stability, but simply that the stated exchange rate objective necessarily becomes the main intermediate target of monetary policy.

[11] Despite some differences in emphasis, a large majority of studies on IT mention these four elements as key ingredients of the framework; see Haldane (1995a, 1995b), Lane et al. (1995), Green (1996), Freedman (1996), Svensson (1997b) and Bernanke and Mishkin (1997).

"inflation determinants" to have their full effect on the inflation rate,[12] and have a well-informed view of the way in which monetary impulses affect the main macroeconomic variables as well as of the relative effectiveness of the various policy instruments at their disposal.

A schematic representation of monetary policy under IT

The foregoing discussion implies that the policy-setting behavior of the monetary authorities in a country that follows an IT operating procedure can be usefully illustrated by the following feedback (or, more precisely, feed-forward) rule:[13]

$$\Delta R_t = \gamma \, ({}_t\pi^e_{t+j} - \pi^*_{t+j}) \qquad (1)$$

where R_t represents the preferred instrument of monetary policy, π_k is the rate of inflation in period k, ${}_t\pi^e_{t+j}$ is the authorities' expected rate of inflation in period $t+j$ conditional on information at time t (assuming no subsequent policy changes), π^*_{t+j} is the inflation target for period $t+j$ (which may, in principle, be time-varying), γ is a feedback parameter,[14] and j is the number of periods (assumed greater than zero) it takes for the policy instrument R to have its maximum effect on inflation.

The feedback rule (1) shows clearly that in order to follow an IT procedure the monetary authorities must have a well-defined inflation target (π^*), a preferred policy instrument, approximate knowledge of j, and some view of the *expected* rate of inflation in

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[12] The literature on IT often refers to this period as the "control lag" or "policy effectiveness interval," and typically assumes—based on available estimates for industrial countries—that its average length is in the order of 18-24 months. See, for example, Leiderman and Svensson (1995), Haldane (1996), Freedman (1996) and Svensson (1996, 1997b).

[13] The presentation in the next few paragraphs draws on Haldane (1996). In practice the operating procedure may require following more complex feedback rules, for instance when policy instruments affect inflation with a long distributed lag.

[14] The sign of γ will depend on the choice of the policy instrument R. If R represents a price-related instrument such as the discount rate or repo rate, then $\gamma > 0$, whereas if it represents a quantity-related instrument such as credit or base money then $\gamma < 0$. An example of a feedback rule for the short-term nominal interest rate might be (for a control lag of one period and a constant inflation target) $\Delta R_t = 1.5 \, ({}_t\pi^e_{t+1} - \pi^*)$. This would raise the *ex ante* real interest rate by half a percentage point for each percentage point increase in expected inflation.

period $t+j$. The choice and specification of the inflation target π^* depend on a number of analytical and institutional considerations that will be discussed later. The selection of the three other components of the feedback rule, on the other hand, must be firmly based on **empirical** estimates of the inflation dynamics and of the effectiveness of monetary policy in the country under consideration. These estimates will rarely reflect the outcome of a mechanical extrapolation from a single forecasting equation or model. Instead, they will often summarize the results obtained from a number of different models of the inflation process as well as the information conveyed by a range of "off-model" indicators—including the "priors" of the authorities. In this connection, it is perhaps more appropriate to interpret the expected rate of inflation in equation (1) as a *portmanteau* for a myriad of indicators and forecasts of inflation (Haldane (1996)).

What distinguishes IT from other frameworks for conducting monetary policy, therefore, is not so much the accuracy of the forecasting techniques employed in the procedure but the fact that the setting of policy instruments relies on a *systematic assessment of expected (future) inflation*, rather than on past or current inflation developments or an otherwise arbitrary assumption about future inflation. It is because of this feature that IT is said to address one of the fundamental problems of monetary policy, namely the *imperfect control* that central banks have over the current rate of inflation—i.e., proposition (4) above.

The sources of that imperfect control are many—e.g., aggregate demand and supply shocks, instability of intermediate targets (velocity shocks), information asymmetries—and so are its manifestations—e.g., a current rate of inflation that is largely predetermined at the time policy decisions are made, uncertainty about the relative strength of policy instruments, and instances of "instrument instability." In the end, all of these factors undermine the capacity of monetary policy to deliver a steady and low rate of inflation on a permanent basis. The debates on monetary policy alluded to earlier (see footnote 3) discussed all these issues extensively. For the purpose of this paper, however, it may be useful to recast the gist of some of the arguments made in those debates and illustrate their relevance for the ongoing discussion of inflation targeting.

This can be done neatly with the help of the following example taken from Cecchetti (1995).[15] Suppose that in a given country there is some agreement that inflation is actually determined by the "structural" model:

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[15] The literature on IT seems to have a preference for using simple variants of the standard expectations-augmented aggregate demand/aggregate supply model to illustrate selected features of the operation of inflation targeting—e.g., Blake and Westaway (1996), Haldane (1996), Svensson (1996, 1997a, 1997b). This paper departs from that practice and uses instead a "generic" representation of the relation between monetary policy and inflation, mainly because the output gap model of inflation is not as widely accepted an analytical framework for developing countries as for industrial countries.

$$\pi_{t+1} = \alpha(L)\mathbf{R}_t + \beta(L)\mathbf{X}_t + \omega_{t+1} \qquad (2)$$

where $\mathbf{R}_t$ is a vector of policy instruments, $\mathbf{X}_t$ is a vector of inflation determinants, $\alpha(L)$ and $\beta(L)$ are lag polynomials, and ω_{t+1} is a stochastic term (a "shock") in period $t+1$ that is not known in period t.

In general, monetary policy can be characterized as the period-by-period setting of policy instruments in response to the observed realization of the determinants against the background of a given nominal objective (i.e., an inflation target) or, in terms of this particular example, as:

$$\mathbf{R}_t = \gamma(L)\mathbf{X}_t + \upsilon_t \qquad (3)$$

where some of the terms in $\gamma(L)$ can be zero, since policy need not react to every element in $\mathbf{X}_t$, and υ_t is a random term representing implementation errors (which may be zero as well).

Equations (2) and (3) imply that the reduced form for inflation will be:

$$\pi_{t+1} = \delta(L)\mathbf{X}_t + \varepsilon_t \qquad (4)$$

where $\delta(L) = \alpha(L)\gamma(L) + \beta(L)$, and ε_t depends on ω_{t+1} and υ_t.

Several aspects of the "imperfect controllability" problem of monetary policy are borne out by this simple example. First, by construction, *current* inflation is predetermined at the time the authorities choose the setting of policy instruments. Second, the relation between monetary policy and inflation is subject to lags, involves many parameters, and may not be time invariant. In particular, changes in monetary policy (i.e., changes in $\gamma(L)$—prompted, for instance, by changes in the relative weight placed on some determinant or by a change in the intermediate target) will change the correlation between $\mathbf{X}$ and π in equation (4).[16] A related source of instability stems from uncertainty about the "true" coefficients of the model (Brainard (1967)). Concretely, if the parameters of $\delta(L)$ were not known with certainty, a monetary policy aimed at controlling the rate of inflation might *increase* rather than *decrease* the variance of inflation. Third, in the case where the lags in $\delta(L)$ are known (fixed) and non-zero, and shocks υ_t are uncorrelated with $\mathbf{X}_t$, a monetary policy aimed at minimizing the variance of inflation around a fixed (constant) target rate will require setting the policy instruments in every period according to:

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[16] This simple version of the Lucas (1976) critique captures the essence of the problems of "long and variable lags" and varying effectiveness of monetary policy.

$$\alpha(L)\,\mathbf{R}_t = -\beta(L)\,\mathbf{X}_t + \alpha(L)\,\upsilon_t \qquad (5)$$

Two implications of following this "optimal" policy are readily apparent. First, inflation becomes completely uncorrelated with its determinants, as its law of motion collapses to $\pi_{t+1} = \omega_{t+1} + \alpha(L)\upsilon_t$. And second, contrary to the case where the lags in $\alpha(L)$ are not known with certainty (i.e., are stochastic), it actually becomes possible to design an "activist" monetary policy that offsets fully the effects of (long) lags and past disturbances on the rate of inflation. Even so, controlling inflation through this type of activist policy may produce instances of "instrument instability," requiring ever larger changes in the policy instruments to offset their own lagged effects.[17] This can be seen clearly in (5), where nothing guarantees that the lag polynomial $\alpha(L)$ has stable roots.

Advocates of IT argue that such a procedure lessens all the problems noted above by gearing monetary policy at the expected rate of inflation some periods ahead (i.e., beyond period $t+1$ in the preceding example) and by relying on more than one inflation forecast. These two features, the argument goes, allow the authorities to focus the public's expectations on a horizon where monetary policy can confidently influence the rate of inflation while preserving some room for a judicious smoothing of their policy instruments; also, they force the central bank to assess on a continuous basis the information content of numerous inflation determinants, thus enabling it to detect breaks in empirical relationships at an early stage. This approach to monetary policy, which has been called by some "multiple indicators approach," suggests that, in practice, the term ${}_t\pi^e_{t+j}$ in equation (1) often summarizes a number of different forecasting procedures, some judgmental, with possibly shifting weights attributed to each measure of expected inflation.

The summary measure of the expected rate of inflation, ${}_t\pi^e_{t+j}$, constitutes the *main intermediate target* of monetary policy under IT.[18] Operationally, the authorities will try to maintain the difference between ${}_t\pi^e_{t+j}$ and π^*_{t+j} in equation (1) permanently within a target band. If at any point in time that difference is zero or (slightly) negative, the authorities will have a firm basis to assume that the inflation target π^* remains attainable at the prevailing (and expected) configuration of the variables in $\mathbf{X}$ and $\mathbf{R}$, and that no policy change is needed.

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[17] The concept of "instrument instability" was developed by Holbrook (1972). Simply stated, it may occur when the *current* effects on the target (goal) variable of a given change in a exogenous (policy) variable are small and the *lagged* effects are large, creating a path for the instrument that is dynamically unstable.

[18] Svensson (1996, 1997b) argues that this summary measure, the authorities' inflation forecast, possesses features that make it the *ideal intermediate target* for monetary policy, since it is highly correlated with the goal, and is both easier to control and to observe than the goal.

Conversely, if the difference results in a non-negligible positive number, the authorities will have strong indications that the inflation target is not likely to be attained in period $t+j$. In that case, in line with the feedback rule (1), or some variant of it,[19] the authorities will normally be expected to adjust the policy stance and change the policy instrument (ΔR_t) until the discrepancy between the updated inflation forecast and the inflation target is eliminated.[20]

Issues in the implementation of IT

The simple example outlined above abstracted, on purpose, from a number of implementation issues that require explicit decisions from the authorities. Analytically, these issues can be classified in two broad categories: those that deal with the *specification* of the inflation target π^*, and those related to the *institutional arrangements* that support the framework for monetary policy. Decisions concerning the specification of the inflation target comprise, inter alia, choosing on which *price index* to define the target, choosing between setting the target in terms of the *price level* or the *rate of inflation*, choosing a *numerical value* for the target, its *horizon* and its *time path* (e.g., one period or multi-period, a declining path or a flat path), deciding whether to define the target as a point estimate with or without a *band* (*"tolerance interval"*) and, in case they opt for one, choosing the width of the band, and deciding whether and how to specify "*escape clauses*" or *exemptions* to the inflation target in particular circumstances. Choices related to the institutional setting include: deciding whether to make compliance with the inflation target(s) a *formally mandated objective* or, simply, an operational requirement of monetary policy, deciding how best to integrate IT with the country's decision making process on macroeconomic policies, and, in particular, with the *policy cycle* (which entails clarifying to the public *what*, *when* and *by whom* matters related to the conduct of monetary policy are decided), and choosing specific vehicles to enhance the *transparency* and *accountability* of monetary policy (e.g., periodical releases of inflation forecasts, improved means of informing the public of decisions affecting the setting of policy instruments, etc.).

The literature on IT contains long and detailed discussions of all these issues.[21] At a general level, many of those discussions revolve around a *credibility/flexibility tradeoff*:

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[19]Clearly, if the effects of the policy instrument build up over time, a trade-off may arise between changing the instrument early by a modest amount and changing it later, but more sharply.

[20]In practice, implementation of IT in industrial countries (see Table 2) has tended to be asymmetric in that monetary easing—i.e., declines in official interest rates—has not typically been prompted by the expectation that inflation would be **below** a target range; instead, easing seems to have been a response to weak economic activity.

[21] In particular, see Haldane (1995a, 1995b), Lane et al. (1995), Walsh (1995), Freedman (1996), Bernanke and Mishkin (1997) and, especially, Debelle (1997).

choices that are normally perceived as having the capacity of enhancing the credibility of the inflation targeting framework typically carry a cost in terms of the authorities' loss of short-term flexibility to exercise discretion in certain circumstances—though in the long run, acquiring credibility may also enhance flexibility. At an individual country level, however, the arguments used in the discussions of the various alternatives are often more elaborate and at times fairly complex (for example, on the relationship between the "escape clauses" of the inflation targets and the optimal degree of accommodation to aggregate supply shocks, or on the extent to which a particular application of inflation targeting conforms with the main requirements of an "optimal incentive contract" for the central bank). There may be an emerging consensus on some of these issues—notably, on the advantages of specifying the target in terms of the rate of inflation rather than the price level and on defining the target in terms of a price index that is well known and widely used by the public such as the CPI (perhaps purged of a few items not linked to domestic demand pressures)—but the jury is still out on many others. Unfortunately, the actual experiences with this type of framework are too recent and diverse to be of use for settling any argument about the marginal contribution of a particular aspect of its implementation, so that decisions on many of these implementation issues will continue to be guided by pragmatic considerations. This is the view of, among others, Bernanke and Mishkin (1997), who pointedly observe that, in the cases they examine: "the (choices and) views on (these) subject(s) have been largely based on prior arguments, intuition and indirect evidence."

IT as a monetary regime

Another key aspect of the debate on IT where consensus remains elusive is on the type of monetary regime that inflation targeting represents.[22] The main themes in dispute in this area are the *novelty value* of IT (in particular, its similarities and differences with "traditional" operating procedures of monetary policy such as money targeting), the *rule-like features* of IT (or, equivalently, the scope for discretion that IT provides to the monetary authorities) and the *output-stabilizing properties* of IT (i.e., the framework's implications for the short-run

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[22] A "monetary regime" is a concept that goes beyond the operating procedures of monetary policy and captures as well the interactions between the authorities and the public that are consistent with the "rules of the game." It corresponds broadly to Lucas' (1976) definition of a *policy*—i.e., the coefficients of a system of policy reaction functions that specify how policy instruments are adjusted systematically to movements in other variables. A more complete (and simpler) definition is that of Leijonhufvud (1984), who characterizes a monetary regime as "a system of expectations governing the behavior of the public **and** a consistent pattern of behavior on the part of the monetary authorities that sustain those expectations." On the whole, the discussion on IT has not been carried out explicitly in these terms even though they have been used widely in the monetary policy literature to conduct comparisons across monetary standards or regimes (see, for example, Campbell and Dougan (1986) and Goodhart (1992)). It will be argued below that this shortcoming has impaired reaching a rapid consensus on the main characteristics of inflation targeting.

behavior of output and unemployment). As several authors have noted,[23] lack of agreement on *basic terminology* has been an important obstacle in this regard. Many of the terms on which discussions on IT are cast—from "targeting" to "rules"—simply mean different things to different people.

Many have argued that the confusion noted above is simply another manifestation of the embryonic stage of the debate on IT and, therefore, largely unavoidable. There is much truth in this view, especially when stated as lucidly as in McCallum (1996a): "the issues at hand concern institutional arrangements that should be judged on the basis of their effects on the operating characteristics of economies over long spans of time—the average performance, that is, over a number of cycles . . . from that perspective it will be *another decade or two* before the potential advantages or disadvantages of [inflation targeting] will be clearly evident" (pages 13-14, italics added). Knowing this, however, does not make the need for a systematic assessment of inflation targeting and for a clarification of its main characteristics as a monetary regime any less pressing. Table 1, taken from Lindsey (1986), seems useful in this context. The purpose of the table is to provide a simple—albeit imperfect—vehicle where alternative monetary regimes can be classified on the basis of two central characteristics: their *policy structure* (i.e., the systematic component of the operating procedure of monetary policy)[24] and their *policy mode* (i.e., the degree of discretion granted to—and exercised by—the monetary authorities). The five types of policy structures identified in the table along with the two types of policy modes form *ten general categories* of monetary regimes. Because the demarcations imply a high level of generality, each cell should be thought of as containing a large number of options aligned on imprecise metrics, both horizontally and vertically (this consideration is especially important when moving along the "policy mode" dimension since there is no simple way of measuring the degree of discretion). Thus, for example, point **A** in the upper-left cell (nondiscretionary simple rules without feedback from other economic variables) could denote either an irrevocably fixed exchange rate (e.g., a currency board) or a *k-percent* money-growth rule à la Friedman. A point like **B**, in comparison, would represent a regime where simple rules without feedback are altered on rare occasions through discretionary actions of the authorities (e.g., a once-and-for-all devaluation of the exchange rate parity or a change in the money growth rule from k percent to $k+x$ percent).

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[23] In particular, see Haldane (1995a, 1996) and Bernanke and Mishkin (1997). See also McCallum (1996b, 1997).

[24] In his article, Lindsey actually uses the terminology of Lucas (1976) to define a policy structure as: "a general classification [that] groups together systems of reaction functions with qualitatively similar structures, despite differences among them in the particular values of the reaction coefficients or in the particular functional forms" (Lindsey (1986), page 170).

Table 1. Alternative Monetary Policy Regimes

	Type of policy mode	
Type of policy structure	Nondiscretionary	Discretionary
Simple rules without feedback	A	B
Simple feedback rules	C	
Intermediate nonmonetary targeting with feedback		D
Intermediate monetary targeting with feedback	E	
Ultimate targeting with continuous feedback to instruments		IT

Source: Lindsey (1986).

Most (if not all) of the frameworks for monetary policy that are the subject of recent (and not-so-recent) debates have a place in Table 1. For instance, in addition to the types of regimes that could be represented by points **A** and **B** discussed above, the table has an (approximate) place for the *simple base money rules* proposed by McCallum and others in the early 1980s (say, a point like **C** in the second row), for the numerous proposals embodying some sort of *nominal income targeting*—including those advocated by Tobin (1983) and others that give a high degree of discretion to monetary authorities (and, thus, would correspond to a point like **D**), for the many variants of *money targeting* procedures that were in vogue in industrial countries in the 1970s and 1980s and which have since fallen in disfavor (except, perhaps, in the Bundesbank which, presumably, would still place itself at a point like **E**), and for the proponents of the *information variables approach*—e.g., Friedman (1975, 1994)—who would advocate dispensing with all types of formal intermediate targets and replacing them with an "engineering efficient" procedure whereby the operating instruments of monetary policy are adjusted continuously in response to information about movements in the ultimate target.

From the preceding discussion, and, especially, from that of equations (1) to (5), it is quite apparent that inflation targeting belongs somewhere in the fifth row of Table 1. However, it also follows from the earlier discussion that pinning down the regime's precise location on the "policy mode" dimension is inherently difficult given the variety of technical and institutional arrangements that have underpinned this type of framework in practice. Notwithstanding these difficulties, the (admittedly light) weight of the evidence accumulated so far suggests that an inflation targeting regime would typically be located somewhere near the left border of the lower-right cell of Table 1—i.e., a regime characterized by a policy structure of *ultimate targeting with continuous feedback* and a *mildly discretionary* policy mode (point **IT**). Portraying inflation targeting in this way makes it easier to reconcile many of the seemingly unrelated characterizations of the framework that one encounters in the literature, from the "constrained discretion" of Bernanke and Mishkin (1997), to Haldane's insistence on the "near equivalence" of IT with money targeting procedures that rely on information variables (Haldane (1995a, 1995b)), to the "target-rule" label proposed by Svensson (1996). More important, it provides the basic means to conduct discussions on IT from a perspective that is, arguably, broad enough to relegate the problems of terminology to a secondary plane and, thus, allows future debates to focus squarely on the main features of IT as a distinct monetary regime.

III. COMMON FEATURES OF THE EXPERIENCE WITH INFLATION TARGETING IN ADVANCED ECONOMIES

As noted in the Introduction, starting in the early 1990s a number of small- to medium-sized industrial countries decided to conduct their monetary policy using an inflation targeting framework. The first country to adopt explicitly this type of framework was New Zealand, and its example was followed—though not replicated exactly—soon thereafter by (in chronological order) Canada, the United Kingdom, Finland, Sweden, Australia, and Spain. No attempt will be made here to provide a comprehensive description and comparison of the experiences of these countries, as this ground is well covered in the existing (and growing) literature on IT—in particular in the volumes edited by Leiderman and Svensson (1995) and Haldane (1995b), and in Debelle (1997). We will simply highlight some common features of these experiences that, in our view, are particularly relevant for the discussion of the following sections. Table 2 contains information that is useful for surveying the IT experience of advanced economies.

The first common feature, which is obvious but basic, is that inflation targeting was associated with a high degree of exchange rate flexibility. Indeed, in many of the countries IT was adopted in the aftermath of a failed attempt to use the exchange rate as the main anchor of monetary policy (e.g., the U.K., Sweden, and Finland). In others, like Canada, it was associated with a decision by the authorities to place less emphasis on resisting exchange rate fluctuations. Spain would seem to provide an exception to this pattern, as it adopted IT while retaining its ERM central parity—admittedly with much larger bands of fluctuation after the

Table 2. Advanced Economies with Explicit Inflation Targeting Frameworks: Selected Features

Country	Date of Adoption	Target Rate and Horizon	Price Index	Other Details
New Zealand	March 1990	0 – 2 percent [1] through the 5-year tenure of the Governor of the Reserve Bank	Consumer price index (CPI) excluding interest cost components, indirect taxes and subsidies, government charges, and significant price effects from changes in the terms of trade.	Target set in Policy Target Agreements (PTA) between the Minister of Finance and the Governor of the Reserve Bank of New Zealand.
Canada	February 1991	1 percent - 3 percent through 1998	CPI excluding food, energy, and the effect of indirect tax changes.	Target set by the Minister of Finance and the Governor of the Bank of Canada.
United Kingdom	October 1992	2½ percent, plus or minus 1 percent.	Retail price index excluding mortgage interest payments (RPIX).	Target set by the Chancellor of the Exchequer.[2]
Sweden	January 1993	2 percent (with a tolerance band of ±1 percent) in 1996 and beyond	CPI	Target set by the Bank of Sweden
Finland	February 1993	About 2 percent in 1996 and beyond	CPI excluding indirect taxes, government subsidies, house prices, and mortgage interest payments.	The target rate has no explicit band. Target set by the Bank of Finland.
Australia	1993	Underlying inflation of 2 percent - 3 percent, on average, over the cycle	CPI excluding the impact of interest rates on mortgage and other interest payments, indirect tax changes, and certain other volatile price items.	Target set by the Reserve Bank of Australia and endorsed by the government in the Statement on the Conduct of Monetary Policy by the Treasurer and the Governor of the Reserve Bank.
Spain	November 1994	Less than 3 percent by 1997, 2 percent by 1998[3]	CPI	Target set by the Bank of Spain.

Source: IMF (1996), Box 8, updated as necessary.

[1] Subsequently increased to 1-3 percent.

[2] In May 1997, the Chancellor of the Exchequer announced that the Bank of England would be given operational independence to set interest rates in order to achieve the inflation target (which would still be set by the UK Treasury). Inflation outside the target range would require the Governor to write an open letter to the Chancellor to explain the reasons for the deviation.

[3] Announced in December 1996.

exchange rate crisis of July 1993. However, Spain's commitment to inflation targeting has also been viewed by the authorities as a means of attaining the overriding goal of monetary union with its EU partners.

The second common feature is that all countries that adopted IT had a measure of central bank independence, at least as concerns: (i) the links between the central banks' actions and the financing of government budgets (i.e., the degree of "fiscal dominance"), and (ii) the central banks' ability to operate freely their monetary policy instruments (i.e., the degree of "instrument independence").[25] Also, in practice, the central banks of all the countries that adopted IT use short-term interest rates as their main operating instrument, and rely on well developed financial markets to transmit the effects of changes in the instrument to aggregate demand and inflation.

The third feature is that the inflation targets set in all the countries were forward looking, not because they involved a firm commitment to preventing any shock from leading to a deviation of inflation from its current target value, but because they represented a promise to offset the forecastable effect of shocks on future inflation over a horizon of between one and two years. It is also noteworthy that in all cases the inflation target was defined in terms of at least a notional target range or "tolerance interval" (although in the cases of Australia and Finland the range was not specified clearly) rather than as a point estimate.

Fourth, all these countries used IT as a tool for building the credibility of their macroeconomic policy framework. In most cases this task was facilitated by the fact that inflation targets were set by mutual agreement between the fiscal and monetary authorities, thus tending to reduce the public's perception of conflicting objectives of economic policy. Moreover, IT has often been used as a pedagogical device for explaining the effects of monetary policy to the public, for instance through the release of inflation reports (notably in the United Kingdom and Canada), and for increasing the accountability of the monetary authorities (for instance by linking the terms of the "contract" for the central bank's governor to the actual performance of monetary policy, as in New Zealand). Using IT for these purposes has presupposed a non-negligible degree of initial credibility, thus enabling the central banks to influence the public's expectations through their official announcements and analyses, as well as a certain degree of economic sophistication of the public.

Finally, an important common feature is that inflation targeting was not introduced in contexts of moderate or high inflation, but rather in situations where the inflation rate was fairly low (less than 10 percent in all the countries). This feature is likely to have contributed to the initial degree of credibility in the framework, and reduced the risks of either having to announce a very drastic reduction of inflation (with possible high output costs and large

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[25] In the case of the United Kingdom, instrument independence was enhanced in May 1997 by the incoming Labour administration (see Table 2).

margins of error) or to set targets that may have been interpreted by the public as a signal that the central bank was tolerating (or ratifying) undesirably high rates of inflation.

IV. GENERAL ISSUES CONCERNING THE APPLICABILITY OF INFLATION TARGETING IN DEVELOPING COUNTRIES

This section examines the feasibility and applicability of inflation targeting in developing countries. More specifically, it addresses two questions: first, under what conditions does the inflation targeting framework outlined in the preceding sections constitute a procedure that *can* be adopted by certain developing countries? And second, what aspects of the conduct of monetary policy in some of these countries are on the contrary *least consistent* with inflation targeting? We approach these questions from the general perspective of the prerequisites for an effective inflation targeting framework identified in Section II, namely, the central bank's scope for conducting an independent monetary policy and the undisputed primacy of the inflation objective. We also discuss some issues related to the specification of the inflation target of particular relevance for developing countries. The section ends with a brief description of the main features of the monetary policy framework in a few developing economies.

As is customary for studies dealing with developing countries, our analysis starts from the basic proposition that these countries comprise a very heterogeneous group. On matters related to monetary policy and financial markets this proposition is more than just a neutral disclaimer. Despite some general trends toward greater reliance on indirect instruments of monetary policy, increased access to international capital markets and financial sector reform (IMF (1995); Fry et al. (1996)), the diversities of monetary experiences and the differences in the degree of financial development in these countries remain wide, and do not allow many generalizations. Moreover, standard indicators of interest rates, financial deepening, and the level of income have not yet produced a widely accepted classification or ranking of developing countries by degree of financial development (McKinnon (1991); Pill and Pradhan (1995)). This state of affairs makes the task of evaluating the net benefits for these countries of adopting a monetary regime like IT extremely difficult. Besides stressing the differences across groups of countries throughout the discussion, the analysis in this section tries to deal with the problem of heterogeneity by presenting data supportive of some of our arguments and by reporting the results of a questionnaire designed to identify the main operating procedures of monetary policy in a number of developing countries that were regarded as potential candidates for adopting IT. Nonetheless, the nature of the analysis remains largely exploratory and argumentative, rather than empirical.

Scope for independent monetary policy

In Section II we argued that the two main determinants of the scope for independent monetary policy, and thus the main prerequisites for the adoption of an IT framework, in any given country were: (i) the degree of fiscal dominance, and (ii) the absence of firm

commitments by the authorities to target other nominal variables that might conflict with the inflation objective. The extent to which a developing country complies with these two prerequisites at a particular point in time normally reflects the confluence of structural and transitory elements. The fact that these elements often reinforce each other makes the task of assessing the degree of compliance quite exacting.

In a few extreme cases it is readily apparent that the basic requirements for adopting IT are not satisfied. For example, in economies where the rate of inflation has stayed in the chronic to high range (say, above 30-40 percent per annum) for a number of years all nominal variables will tend to display a high degree of inertia and asynchronization, and monetary policy will be largely accommodative. In situations like this, as noted earlier, monetary policy will only be as good as fiscal policy and will generally have short-lived and unpredictable effects on the rate of inflation. The foremost priority of economic policy in these contexts should be attaining a lasting reduction in inflation through a comprehensive stabilization program comprising fiscal consolidation, a break in monetary financing of the government, and the choice of one or more nominal variables to anchor inflation expectations.[26] Conducting monetary policy in a manner consistent with IT will only be an option once the fiscal roots of the problem are eradicated and the rate of inflation falls to moderate levels. Another clear example where IT is not an option for the monetary authorities is given by those economies that belong to a currency union or that choose to fix their nominal exchange rate to the currency of a major trading partner. As mentioned before, these countries subordinate their monetary policy to the exchange rate objective, which becomes the main intermediate target of monetary policy and a major source of policy credibility. In these economies, the authorities implicitly accept the rate of inflation of their main trading partner(s) as their own inflation target and are committed to giving priority to preserving the parity whenever a (potential) conflict of policy objectives arises.

For the majority of developing countries, however, the degree of compliance with the basic prerequisites of IT is more difficult to assess. Fiscal dominance does not always lead to unsustainably high or rapidly rising rates of inflation; the extent to which monetary policy accommodates passively other nominal variables and shocks in the economy becomes apparent only at high rates of inflation and is influenced by a host of country-specific factors (e.g., formal and informal indexation practices); and the middle-of-the-road exchange rate arrangements currently in place in many of these countries (i.e., managed floats, crawling bands) afford the monetary authorities considerable discretion for ranking their external and domestic objectives in a less-than-fully transparent manner, sometimes for relatively long periods.

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[26] See the references listed in footnote 9; see also Calvo and Végh (1994), and Végh (1992).

Recent attempts to extend the research agenda on central bank independence (CBI) to developing countries have had to confront these problems.[27] A common finding of all these studies is that, despite the wide range of country experiences, central banks in developing countries face environments that *differ radically* from those faced by central banks in advanced economies. In particular, the studies conclude that many of the insights and implications of the literature on CBI have limited applicability in a developing country context because the central bank's scope for conducting an independent monetary policy in these economies tends to be hampered by the presence of three related factors: heavy reliance on seigniorage, shallow capital markets, and fragile banking systems.

The reliance on seigniorage is perhaps the simplest and most common manifestation of fiscal dominance. The link between the government's ability to raise revenues from conventional sources and its recourse to revenues from seigniorage and the inflation tax is well documented both analytically and empirically (Phelps (1973); Fischer (1982)). In developing countries such a link is typically much stronger, and hence the reliance on seigniorage much heavier, than in advanced economies due to a number of structural features (e.g., concentrated and unstable sources of tax revenue, poor tax collection procedures, skewed income distribution and political instability), as well as to the proclivity of these countries to abuse this source of revenue, as opposed to issuing debt or cutting government expenditures, during times of crisis (Easterly et al. (1994)).

Shallow capital markets are also a common, though more subtle, manifestation of fiscal dominance. They are often a by-product of government schemes to extract revenue from the financial system through various forms of financial repression including, inter alia, interest rate ceilings, high reserve requirements, sectoral credit policies and compulsory placements of public debt (McKinnon (1991); Fry et al. (1996)).[28] In some low-income countries, however, undeveloped capital markets may be a cause as much as a consequence of fiscal dominance. Economies that have imperfect access to international capital markets, limited fiscal flexibility, low levels of domestic wealth and a small financial system constrain the government's capacity to issue domestic debt to finance transitory revenue shortfalls, leaving seigniorage and other forms of financial repression as the only options. Regardless of the causality, however, the evidence on the adverse effects of financial repression on the development of domestic capital markets and overall economic performance are indisputable (McKinnon (1991); Levine (1997)), and so is the fact that the conduct of monetary policy in contexts of severe financial repression becomes essentially a quasi-fiscal activity (Fry (1993)).

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[27] In particular, see Cukierman (1992), Mas (1995), and Fry et al. (1996); see also Willett et al. (1995).

[28] Government revenues from these sources are particularly difficult to detect and quantify, but the few estimates available suggest that they can often be sizable; see, for example, Giovannini and de Melo (1993).

Fragile banking systems are one obvious consequence of prolonged periods of financial repression. But it is typically in the aftermath of financial sector reforms that they impart an *independent* influence on the conduct of monetary policy in developing countries. It is in these contexts where the conflicts between the objectives of attaining price stability and restoring (preserving) banking sector profitability reach proportions rarely observed in advanced economies. In fact, a number of recent studies have found that banking crises have been more severe in developing than industrial countries—with estimates of resolution costs reaching up to 25 percent of GDP in some extreme cases (Goldstein and Turner (1996))—and have often been associated with balance of payments problems (Kaminsky and Reinhart (1996)). This evidence suggests that considerations of sequencing and a clear ranking of policy objectives are paramount in the early stages of financial liberalization, when central banks have *de facto* limited scope for a monetary stance based on high real interest rates (McKinnon (1991)).

Tables 3 and 4 present some evidence on the relative importance of two of the three factors just mentioned for a large sample of countries. Table 3 contains estimates of the revenues from seigniorage, the rate of inflation, and the fiscal deficit for 79 countries from 1980 to 1995. For each variable, the table presents the average for seven country groups (Advanced Economies, Inflation Targeting countries, Africa, Asia, Asia excluding China, Latin America and Caribbean, and Middle East and Europe) over three periods (1980–91, 1992–95 and 1980–95), as well as data for selected individual countries; each entry in the table represents the average annual estimate of the corresponding variable for the period and group (country) in question. Following Fischer (1982), the annual revenues from seigniorage in each country were calculated as the yearly change in the monetary base divided by nominal GDP[29]; the annual rate of inflation was defined as the percentage change in the average CPI from one year to the next; and the annual estimate of the fiscal deficit was computed as the overall balance of the central government divided by nominal GDP[30]. Data sources and other details of the calculations are described in Appendix I.

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[29] Despite its shortcomings (Drazen (1985); Fry et al. (1996)), this simple measure of seigniorage remains widely used. We calculated a second measure closer to the concept of government revenues from the erosion of real money holdings, but the overall picture of Table 3 did not change much. Table 4 presents the estimates of this alternative measure of seigniorage for a subset of countries. For broadly comparable cross-country evidence on the revenues from seigniorage during a similar period see Cukierman et al. (1992), De Haan et al. (1993), Flood and Mussa (1994), Easterly et al. (1994), and Fry et al. (1996).

[30] More satisfactory measures, such as the overall balance for the general government or for the non-financial public sector, were not available for many countries on a comparable basis. Use of central government data is likely to *underestimate* the size of fiscal imbalances, especially in federal states or in countries with large and inefficient public enterprises.

TABLE 3. Seigniorage, Inflation, and Government balance for Selected Countries, 1980-95 1/

	Seigniorage 2/			CPI Inflation			Govt. balance 3/		
	1980-91	1992-95	1980-95	1980-91	1992-95	1980-95	1980-91	1992-95	1980-95
Advanced Economies (21) 4/	**0.75**	**0.32**	**0.64**	**7.2**	**3.3**	**6.2**	**-3.8**	**-4.7**	**-4.0**
United States	0.35	0.44	0.37	5.4	2.8	4.8	-3.5	-3.3	-3.4
Germany	0.48	0.30	0.44	2.9	3.5	3.1	-2.4	-1.6	-2.2
Japan	0.63	0.32	0.55	2.6	0.9	2.2	-3.1	-3.0	-3.1
Inflation Targeting countries (7)	*0.59*	*0.54*	*0.58*	*8.0*	*2.7*	*6.7*	*-2.4*	*-5.7*	*-3.2*
Developing and Transition Economies, by Region 4/									
Africa (19)	**1.42**	**1.31**	**1.41**	**19.6**	**22.2**	**20.2**	**-5.2**	**-4.7**	**-5.1**
South Africa	0.78	0.37	0.68	14.7	10.3	13.6	-3.9	-6.5	-4.6
Asia (13)	**1.53**	**2.04**	**1.79**	**7.6**	**7.1**	**7.5**	**-3.2**	**-1.3**	**-2.7**
China	3.54	7.75	6.52	6.5	16.1	8.9	-1.8	-1.9	-1.8
Asia excluding China (12)	*1.34*	*1.57*	*1.39*	*7.8*	*6.5*	*7.5*	*-3.3*	*-1.2*	*-2.8*
India	2.09	2.23	2.12	9.5	9.6	9.5	-8.1	-6.2	-7.6
Indonesia	0.80	1.00	0.85	9.5	8.8	9.3	-0.7	-0.3	-0.6
Korea	0.79	1.12	0.87	8.5	5.4	7.7	-1.2	0.1	-0.9
Malaysia	1.42	3.63	1.97	3.5	3.9	3.6	-6.3	0.8	-4.5
Philippines	1.40	1.39	1.40	15.0	8.4	13.3	-3.0	-1.5	-2.6
Singapore	1.57	1.22	1.48	2.9	2.3	2.8	5.2	13.1	7.2
Taiwan Prov of China	2.80	1.41	2.45	4.5	3.8	4.3	0.0	-1.9	-0.5
Thailand	0.94	1.39	1.05	5.8	4.6	5.5	-1.2	2.3	-0.3
Eastern Europe									
Hungary	0.42	4.12	2.52	12.7	23.1	15.3	-1.3	-6.1	-2.5
Poland	7.01	2.23	5.81	99.5	34.6	83.3	-2.3	-3.9	-2.7
Latin America & Caribbean (15)	**3.22**	**2.37**	**3.00**	**251.4**	**110.1**	**216.1**	**-3.3**	**-0.8**	**-2.6**
Argentina 5/	4.58	0.91	3.66	678.5	10.8	511.6	-5.2	0.1	-3.9
Brazil	4.35	7.46	5.13	535.9	1319.6	731.8	-0.7	-0.3	-0.6
Chile 5/	1.70	1.53	1.66	21.8	11.9	19.3	0.9	2.8	1.4
Colombia	2.20	1.97	2.15	24.5	23.3	24.2	-2.3	-0.5	-1.9
Mexico	3.72	0.69	2.96	61.7	16.8	50.5	-6.8	0.1	-5.1
Middle East & Europe (9)	**2.37**	**1.60**	**2.18**	**22.9**	**13.8**	**20.6**	**-7.2**	**-4.3**	**-6.4**
Egypt	6.53	3.02	5.66	17.9	12.7	16.6	-16.9	-2.8	-13.4
Israel 5/	1.92	0.53	1.57	111.1	11.3	86.1	-10.8	-3.2	-8.9
Turkey	2.98	3.14	3.02	53.3	84.0	60.9	-3.3	-4.7	-3.6

Source: Authors' calculations based on IFS and WEO databases; see Appendix I.

1/ Period averages, in percent.

2/ Defined as the annual change in the monetary base divided by nominal GDP, except for Argentina, Chile, Israel and Uruguay (see footnote 5).

3/ Central Government balance divided by nominal GDP.

4/ Number of countries in parentheses.

5/ Due to the presence of indexed and/or remunerated deposits in the monetary base, seigniorage was defined as the annual change in M1 divided by nominal GDP in Argentina, Chile and Uruguay, and as the change in monetary base excluding foreign currency deposits divided by nominal GDP in Israel.

TABLE 4. Central Bank Independence, Seigniorage, and Indicators of Financial Deepening in Selected Countries, 1980-95 1/

Country	CBI rank 1980s 2/	Seigniorage to GDP Measure I 3/	Seigniorage to GDP Measure II 4/	Inflation tax rate 5/	Real interest rate on deposits 1980-89 6/ geometric average	Real interest rate on deposits 1980-89 6/ standard deviation	Broad Money to GDP	Nom.GDP per capita (US$) 7/
Denmark	1	0.50	0.22	4.8	2.7	1.4	56.9	33,034
Germany	2	0.44	0.29	3.0	2.6	0.9	59.8	29,565
United States	3	0.37	0.26	4.5	4.8	1.8	64.3	27,574
Canada	4	0.19	0.22	4.7	4.3	1.5	49.6	19,249
Norway	5	0.28	0.36	5.7	-0.2	5.1	57.9	33,490
Sweden	6	0.65	0.47	6.4	2.5	2.6	51.4	26,070
United Kingdom	7	0.20	0.25	5.7	0.7	2.1	70.0	18,986
Australia	8	0.42	0.32	5.8	3.1	2.9	49.9	19,257
France	9	0.25	0.31	5.1	-0.1	3.3	67.9	26,829
Hungary	10	2.52	3.69	12.7	-1.8	2.2	44.0	4,354
Spain	11	1.61	1.30	7.7	0.9	2.4	76.1	14,465
New Zealand	12	0.12	0.23	7.5	2.1	4.2	47.9	16,650
Greece	13	2.37	1.70	11.6	-3.1	4.1	49.9	10,947
Thailand	14	1.05	0.44	5.1	6.0	5.0	61.4	2,728
Nigeria	15	2.10	2.19	20.3	-6.1	9.2	27.5	692
Tanzania	16	3.01	3.00	23.0	n.a.	n.a.	35.5	146
Kenya	17	1.71	1.31	12.8	0.1	4.8	31.6	302
Philippines	18	1.40	0.95	11.1	-0.3	10.9	32.6	1,072
Nepal	19	1.64	0.89	8.3	n.a.	n.a.	26.3	207
Ghana	20	2.38	2.42	26.2	n.a.	n.a.	15.4	363
India	21	2.12	1.30	8.7	-0.3	2.7	45.7	345
Zimbabwe	22	1.26	1.07	14.7	-4.6	5.5	28.9	541
Egypt	23	5.66	5.10	14.1	n.a.	n.a.	86.3	1,000
Israel	24	1.57	1.60	33.1	n.a.	n.a.	78.8	15,689
South Africa	25	0.68	0.58	11.9	n.a.	n.a.	55.9	3,153
Indonesia	26	0.85	0.52	8.5	5.4	6.1	29.8	1,034
Costa Rica	27	4.18	3.32	18.1	n.a.	n.a.	41.4	2,516
Korea	28	0.87	0.51	6.8	4.0	4.6	37.5	10,146
Uruguay	29	2.88	3.06	37.2	4.6	9.1	48.6	5,598
Zambia	30	2.86	3.04	33.8	-14.8	9.2	27.6	420
Peru	31	5.70	5.57	52.7	-36.9	22.6	19.9	2,363
Mexico	32	2.96	3.22	29.6	-6.2	13.3	26.1	3,164
Venezuela	33	1.82	2.00	21.8	-7.3	12.8	33.3	3,529
Turkey	34	3.02	2.98	36.5	-5.0	14.5	26.5	2,696
Botswana	35	1.81	0.95	10.7	n.a.	n.a.	26.6	2,806
Chile	36	1.66	1.34	15.9	7.8	9.6	37.0	4,868
Brazil	37	5.13	5.26	72.1	-5.2	8.3	29.3	4,370
Argentina	38	3.66	3.66	55.5	-16.1	15.5	19.3	8,139

Sources: CBI rank from Cukierman (1992), Table 21.1; annual data on real interest rates from Easterly et al. (1994), Statistical Appendix, Table A.4; all other series: authors' calculations based on IFS and WEO databases.

1/ Period averages, in percent; unless otherwise indicated.

2/ Ranking of central banks by overall index of independence during the 1980s as reported in Cukierman (1992), Table 21.1. Countries in the list ranked from high to low overall central bank independence.

3/ Annual change in the monetary base divided by nominal GDP, except for Argentina, Chile, Israel and Uruguay (see Table 3, footnote 5).

4/ Annual monetary base multiplied by the inflation tax rate and divided by nominal GDP, except for Argentina, Chile and Uruguay (where annual M1 was used) and Israel (where foreign currency deposits were excluded from the monetary base).

5/ Defined as: [CPI inflation/(100+CPI inflation)], a bounded measure of the real losses on holdings of money balances.

6/ Geometric mean and standard deviation calculated from raw series on annual ex-post real returns on domestic currency deposits in the banking system in the period 1980-1989 reported in Easterly et al. (1994); raw series for Hungary, New Zealand, United States and Uruguay obtained from other sources (see Appendix I).

7/ Nominal GDP in current US dollars of 1995 divided by total population.

The table reveals at least four interesting regularities: First, as expected, the reliance on seigniorage is considerably higher in developing countries than in advanced economies. Whereas in the former the average annual recourse to seigniorage ranges from 1.4 to 3 percent of GDP, depending on the region, in advanced economies annual average revenues from seigniorage in the last sixteen years have been consistently below one percent of GDP.

Second, the aggregate relationship between average fiscal deficits, inflation and seigniorage varies considerably across regions and country groups. For example, the (average) fiscal deficits in Asia and Latin America are quite similar, but the differences in their inflation performance and recourse to seigniorage are staggering. Also, fiscal deficits in Africa are twice the size of those in Latin America but their average inflation and reliance on seigniorage are much lower. Similarly, the average fiscal deficit in advanced economies is higher than the average for Asia and Latin America—and only 20 percent lower than the average for Africa—even though they have by far the best record in terms of inflation and the lowest reliance on seigniorage. The apparent lack of association among these three variables is partly due to measurement problems (especially for the fiscal deficit) but, more fundamentally, is a reflection of the non-linearities that characterize the relationship between fiscal deficits and inflation (Bruno (1995a); Easterly et al. (1994)) and, hence, of the shortcomings of these indicators as proxies for the degree of fiscal dominance.

Third, for the period as a whole, the average reliance on seigniorage in the seven countries that adopted an IT framework was similar to the average for all advanced economies, but higher than in the U.S. and Germany. Also, as noted earlier, the improvement in the inflation performance in those countries following the adoption of inflation targeting was commensurate with the general trend towards lower inflation observed in all advanced economies in the 1990s.

And fourth, the average reliance on seigniorage and the inflation performance in a number of high-middle income developing countries (such as Indonesia, Korea, and, more recently, Israel, Mexico and South Africa) do not seem much different from the averages recorded by the seven IT countries in the period that preceded the adoption of the inflation targeting framework.

Table 4 presents data for those countries used in the calculation of the group averages of Table 3 for which Cukierman (1992) estimates an overall index of central bank independence for the decade of the 1980s.[31] Aside from the ranking of overall CBI the table

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[31] The index is based on the predicted values of the rate of depreciation of the domestic currency (a monotonic transformation of the rate of CPI inflation) for the 1980s obtained from regressions that included indicators of legal independence and turnover rates of central bank governors as explanatory variables. Different regressions were used for industrial and developing countries. This procedure yields an "inflation-based" overall index (and ranking) of

(continued...)

contains two alternative measures of the average annual recourse to seigniorage in each country between 1980 and 1995, a measure of the average tax rate on money holdings during the same period, and four proximate indicators of the degree of financial deepening: the average ratio of broad money to GDP, the level of GDP per capita in 1995, and, for 30 of the 38 countries, the (geometric) average and the standard deviation of the ex-post real return on domestic currency deposits in the banking system in the period 1980-1989.[32] The data presented in the table indicate that there is an inverse relationship between the degree of central bank independence, the reliance on seigniorage and the tax rate on money holdings (the coefficient of correlation between the CBI index and the two measures of seigniorage is about -0.6, while that between the CBI index and the inflation tax rate is -0.7). The sign and size of these simple correlations are not altogether surprising, however, considering that the CBI index was derived from the predicted values of regressions that used the inflation tax rate as the dependent variable (see footnote 31). The relationship between the CBI index and the indicators of financial deepening is somewhat more interesting: for this group of countries, the degree of central bank independence is *positively* correlated with the average level of real interest rates on bank deposits, the average ratio of broad money to GDP and the level of GDP per capita, and *inversely* related, and strongly so, with the volatility of real interest rates.[33] These findings are suggestive of the existence of some type of relationship between the degree of financial development and the central bank's ability to conduct an independent monetary policy or, equivalently, of the incompatibility of financial repression and central bank independence.

The above correlations can also be seen as consistent with the "political constituencies view" of central bank independence.[34] According to this view both the rate of inflation and the degree of CBI in any given country are determined *simultaneously* by the interaction of political constituencies, and this equilibrium cannot be altered simply by designing legislation or institutions aimed at securing and preserving monetary stability. In particular, supporters of this view argue that the large inverse correlation between inflation and CBI commonly found

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[31](...continued)
CBI; see Cukierman (1992), Chapter 21.

[32] The different time periods covered by the indicators of CBI and real interest rates (the 1980s) and by the other five variables in the table (averages for 1980-95 in four cases, plus the GDP per capita in 1995) are a consequence of the lack of comparable data on the former variables for the 1990s (see Appendix I). The results in the table were broadly similar when we used the averages for 1980-91 for the two measures of seigniorage, the inflation tax rate and the ratio of broad money to GDP, and the level of GDP per capita in 1991.

[33] The corresponding correlation coefficients between the CBI index and those four variables are, respectively, 0.45, 0.56, 0.71, and -0.78.

[34] See Goodman (1991), Posen (1993, 1995), and Mas (1995).

in studies on industrial countries (and also apparent in Table 4) is spurious, as it is driven by a key excluded factor which they refer to as: effective financial sector opposition to inflation (FOI). The essence of the argument is that financial intermediaries are strongly averse to inflation, because their main activity consists of transforming short-term liabilities into longer term largely non-marketable assets, and therefore will tend to use their political clout to oppose inflationary policies, including by lobbying for greater central bank autonomy. In the case of developing countries, the argument goes, FOI typically tends to be much weaker due to a number of structural features related to the high degree of fiscal dominance and financial repression—e.g., proliferation of inefficient public banks undertaking a variety of quasi-fiscal activities, extensive regulation of financial market transactions—and to the equally high degree of polarization and political instability.[35] These features produce a small and uncompetitive private financial sector that cannot offer an effective counterweight to competing interest groups that favor expansionary fiscal and monetary policies, hence leading to high inflation and low CBI (Mas (1995)).

Whether the fundamental determinants of CBI are to be found on the type of political-economy considerations stressed by the advocates of the FOI argument or on the more conventional view that sees the attainment of monetary stability as the end-result of a drawn out process of economic and financial market reform remains an open question. What seems clear from both the preceding discussion and the existing empirical evidence is that in a large number of developing countries (and transition economies) fiscal dominance and a poor financial market infrastructure constrain severely the scope for an independent monetary policy. In fact, for most of these countries attainment of effective instrument independence by the central bank will most likely have to await a comprehensive public sector reform that broadens the tax base and reduces the government's reliance on seigniorage and other revenues from financial repression, the abatement of inflation to at least low double-digit levels, and the revamping of the infrastructure of the banking and financial systems (Begg (1996); Fry et al. (1996)).

Nonetheless, it also follows from the previous discussion and evidence that the constraints on monetary policy imposed by fiscal dominance, high inflation and financial repression are considerably less severe for some high-middle income developing countries, especially in the 1990s.[36] For these countries, the obstacles to conducting monetary policy in a

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[35] In principle, political instability may have two opposing effects: lower the incentive for banks to invest in FOI (Posen (1993)), while at the same time provide greater incentive for any administration to push for a more independent central bank to tie the hands of the successor government (Goodman (1991)). Cukierman et al. (1992) find that political instability is associated with higher recourse to seigniorage and inflation, suggesting that the former effect probably dominates.

[36] Paradoxically, many of the countries that would seem the most likely candidates to belong

(continued...)

manner consistent with IT seem less related to considerations of feasibility, and more with the authorities' willingness to give clear priority to inflation reduction over all other objectives of monetary policy and with their ability to convey their policy objectives to the public in a credible and transparent manner. The discussion below elaborates on these themes.

Conflicts with other policy objectives

In developing countries with reasonably well-functioning financial markets, moderate to low levels of inflation, and no clear symptoms of fiscal dominance, the scope for conducting an independent monetary policy becomes crucially dependent on the exchange rate regime chosen by the authorities and on the extent of capital mobility. The interaction among these three factors is far more complex in practice than what is predicted by the standard Mundell-Fleming model. According to this model the scope for independent monetary policy in a small open economy is inversely related to the degree of fixity of the nominal exchange rate and to the degree of capital mobility. For many emerging market economies, however, it has become increasingly difficult to evaluate these two basic parameters. Fixed exchange rates have become a rarity and have given way to a variety of flexible—but still managed—exchange rate arrangements (Obstfeld and Rogoff (1995)), while access to international capital markets has increased dramatically in line with a substantial rise in the volatility of capital flows (Calvo et al. (1995)). Since these two trends have opposite effects on a country's scope for conducting monetary policy, it is not easy to ascertain *a priori* the net effect of their joint occurrence. But the complications do not end here. The more flexible exchange rate arrangements adopted by many of these countries do not seem to have led their authorities to attach a much lower weight to exchange rate objectives (nominal or real) and/or to stop using the exchange rate to guide monetary policy settings. In addition, the processes of stabilization and financial reform undertaken by several of these countries since the mid-1980s seem to have increased money demand instability (Arrau et al. (1995)), hence reducing the informational content of monetary aggregates.

Taken together, the above developments have made the tasks of conducting and evaluating monetary policy in these economies quite challenging. In fact, even at a conceptual level there seems to be less agreement than before on issues as central as the scope for (and effectiveness of) monetary policy in these countries (Frankel (1994)) or the set of indicators

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[36](...continued)
to this group are those at or near the bottom of the list in Table 4—i.e., Chile, Brazil, Mexico, South Africa and Israel. This is largely a reflection of the fact that the CBI index used in Table 4 captures only the dismal inflation performance of these economies in the 1980s and leaves out the successful disinflation that many of them have achieved in the 1990s. More fundamentally, however, the odd ranking of these (and other) countries in Table 4 illustrates the earlier noted difficulties in trying to classify developing economies by some "objective" indicator of their scope for independent monetary policy or their stage of financial development.

that should be looked at to assess the stance of monetary policy at a specific juncture (Pill and Pradhan (1995); Leiderman and Bufman (1996)). Moreover, at times it is not clear whether there is consensus that the overriding goal of monetary policy for (some of) these economies should be the control of inflation over the medium term or whether the prevailing view is that the primary goal of monetary policy should be to strike some type of balance between the (potentially) competing objectives of external competitiveness and inflation reduction on a period-by-period basis.[37]

A further complicating factor has been the lack of a coherent analytical framework for assessing *empirically* the effects of monetary policy and forecasting inflation in these countries. This tends to impair both the central banks' capacity to formulate monetary policy and the external observers' ability to assess monetary developments. Judging from the studies available, the estimation of "monetary policy reaction functions" of the type developed in the 1970s for the "typical" small open economy remains, by and large, the most popular tool for gauging empirically the effects of monetary policy in developing countries.[38] However, the main purpose of these exercises is to obtain estimates of the "offset coefficient" (i.e., the fraction of the increase in net domestic credit that is offset by a contemporaneous decline in net foreign assets) and hence assess the scope for sterilization, not to model the entire monetary transmission mechanism or the process of inflation determination. Empirical research on the former is in its infancy for developing countries. For the latter, empirical studies for these countries typically rely on simple variants of the monetarist model (where inflation is essentially determined by the disequilibria in the money market), the "fiscalist" model (where budget deficits are considered an independent driving force of inflation), and the Scandinavian model (where inflation is linked to wage pressures stemming from imported inflation and exchange rate changes); often, these models are amended to incorporate elements of inertia (persistence) in the inflation process.[39] None of these models commands

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[37] The role of monetary policy in dealing with the short-run tradeoff between the real exchange rate and inflation has been one of the main themes of the recent (and related) debates on the appropriate response to surges in capital inflows and on the causes of currency crises in emerging markets. It is beyond the scope of this paper to list all the important contributions to these ongoing debates. For some representative, and contrasting, views of the main issues involved, and their implications for monetary policy, the reader is referred to Schadler et al. (1993), Calvo et al. (1994, 1995), Frankel (1994), Obstfeld (1995), Dornbusch et al. (1995) and Leiderman and Bufman (1996).

[38] These estimates build on the seminal work by Kouri and Porter (1974); for recent applications of this methodology see Frankel and Okongwu (1996), Fry et al. (1996), and Lee (1996).

[39] For recent examples of the various approaches to modeling inflation in developing countries see Bruno (1993, 1995a), Dornbusch et al. (1990), Edwards (1995), Fry et al. (1996) and

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support comparable to that obtained by natural rate models in industrial countries, where the NAIRU and the output gap are widely regarded as useful constructs,[40] or offer a clear way of testing the various possible links between instruments and targets of monetary policy.

All these factors have a bearing on the possible adoption of inflation targeting by those emerging market economies not constrained by problems of fiscal dominance and/or financial repression. As discussed in Section II, an effective IT framework requires an unequivocal indication that the inflation target takes priority over all other monetary objectives, and a forward-looking operating procedure that uses inflation forecasts as the main intermediate target of monetary policy. These conditions are difficult to satisfy in contexts where nominal or real exchange rate stability is also a stated or implicit objective of monetary policy (as is the case, for example, when the authorities announce or adopt *de facto* a target level, path, or band for the exchange rate) or where the understanding of the empirical links between instruments and targets of monetary policy is rudimentary. The first of these problems is probably the hardest to overcome. As suggested earlier, the main difficulties stem from the lack of credible means to convey to the public the authorities' ranking of policy objectives, and from the different degree of visibility of exchange rate and inflation targets. The former implies that the authorities will be able to reveal their priorities only under the pressure of circumstances—for instance, through their policy response to situations where the nominal exchange rate approaches an edge of the exchange rate band. The latter implies that, in "normal" times, there will be a tendency for the easily monitored exchange rate target to become the focal point of private sector expectations and public debate, to the detriment of the less visible inflation target.

The experience of Israel is instructive in this regard. For a number of years Israel has used both inflation and exchange rate targets in the formulation of its monetary policy.[41] Specifically, since late 1991 the Bank of Israel has announced a year in advance a rate of crawl of the central parity of the exchange rate band that is approximately equal to the difference between the authorities' inflation target for that year and an estimate of the inflation rate of Israel's main trading partners over the same horizon. The *ex ante* consistency between the inflation and exchange rate targets, however, has been under severe strains on many occasions throughout the episode due, in particular, to unexpectedly large inflows of foreign capital. With limited scope for sterilized intervention, due to its high fiscal cost, the pressures

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[39](...continued)
Leiderman (1993).

[40] A number of recent empirical studies have re-examined the applicability of this type of models to developing countries (e.g., Coe and McDermott (1997)). The question of whether these models will (or should) become the standard approach to modeling inflation in these economies, however, remains under dispute.

[41] See Bufman et al. (1995) and Leiderman and Bufman (1996).

for exchange rate appreciation brought about by the capital inflows have forced the Bank of Israel to confront *ex post* the tradeoff between easing the stance of monetary policy to arrest the appreciation or maintaining interest rates at the levels deemed consistent with the inflation target. Most of the times, the policy dilemma has eventually been resolved in favor of the inflation target and the exchange rate band has been widened gradually, but sometimes only after a period of heavy intervention. Thus, the record so far has been mixed, both in terms of inflation reduction and of the overall credibility of the monetary policy framework. Furthermore, the potential for conflict remains. Leiderman and Bufman (1996) argue that Israel's record is partly explained by the roundabout manner in which the inflation target was adopted; in their words: "...There was considerable ambiguity in Israel about the status of the inflation target, i.e., about whether it was an official forecast or a binding policy commitment; this ambiguity may have been due in part to lack of policy transparency when the targets were first adopted "(p. 101). They go on to conclude that: "In various important cases...a conflict may develop between policies required for defending a currency band and those required for achieving the inflation target. On balance, then we would suggest treating these options as *alternatives*..." (pp. 120-21, italics added).

We agree with their conclusions. More generally, we think that as long as an inflation target coexists with other objectives of monetary policy and the central bank lacks the means to convey to the public its policy priorities and its operating procedures in a credible and transparent manner, a degree of tension between the inflation target and the other policy objectives will be unavoidable. In such circumstances, the benefits from adopting a framework akin to IT will be necessarily lower and the challenges to the conduct of monetary policy posed by the conditions currently prevailing in many emerging market economies will remain unsolved.

Specification of the inflation target

On a different level, the implementation of an inflation targeting framework in a developing country will require making the same type of decisions about the specification of the inflation target and the institutional arrangements in support of the framework that were mentioned in Section II. As has been the case in industrial economies, most of these decisions will probably have to be based on a *pragmatic assessment* of the effects that a host of factors may have on the credibility of the IT framework under specific circumstances. However, a number of features common to many developing countries suggest that in their case such assessments would be more complex in at least four areas: the choice of the level and path of the inflation target, the choice of exemptions or "escape clauses," and the treatment of administered prices.

Choosing an inflation target for the medium term presupposes that there is some notion or consensus about the optimal inflation rate—or, alternatively, the operationally relevant concept of price stability—for the economy in question. These considerations have guided the choice of the medium-term inflation target in those countries that have adopted an IT framework (Table 2) and, more generally, the concepts that underlie the debate on the

merits of price stability in advanced economies. In most developing countries, including those with some scope for an independent monetary policy, such a consensus simply does not exist. For a variety of reasons, the benefits of low and stable inflation in these economies have rarely been quantified or related to a precise numerical value (or range) for the inflation rate. As long as this situation persists, any choice of a medium-term inflation target for these countries is bound to be arbitrary. Nonetheless, there seems to be a general presumption that developing countries should probably aim at attaining a medium term rate of inflation that is somewhat higher than that of industrial countries (say, between 4 and 8 percent per year), and is allowed to fluctuate within a somewhat wider band to help accommodate larger supply shocks.

Even less can be said with regard to the speed at which the medium term inflation target ought to be attained. Some argue that once developing countries have reached a rate of inflation in the moderate to low range (say, lower than 15 percent per year) they should adopt a cautious and gradual approach to further disinflation (Dornbusch and Fischer (1993), Dornbusch et al. (1995)), but others disagree. Since the opinions on this issue are intimately linked to the earlier noted differences in views about what is (should be) the primary goal of monetary policy in these economies, there are no grounds to expect that agreement on the appropriate speed of convergence to the medium-term inflation target in developing countries can be reached quickly.

The choice of price index on which to base the inflation target is also likely to be more problematic in developing countries than in industrial economies. The fact that developing countries tend to be subject to numerous and variable supply shocks would argue in favor of removing some volatile items from the "core" (headline) inflation rate used to guide monetary policy settings. However, the need to enhance the credibility and transparency of monetary policy, and the lower quality and reliability of their statistics, would argue for defining the target in terms of the index that is most widely used by the public to monitor price developments and form inflation expectations (typically the CPI).

Lastly, in many developing countries administered or controlled prices are an important component of aggregate price indices and, thus, of the short-run behavior of inflation. In cases like this, a proper inflation forecasting procedure would need to incorporate explicit assumptions about the timing and magnitude of changes in those prices and, hence, demand a higher degree of coordination between monetary and fiscal authorities than in situations where the large majority of prices are market-determined.

The monetary policy framework in five emerging market economies

The preceding discussion has made a number of references to a group of emerging market economies where the main obstacle to the adoption of an IT framework lies not so much on the countries' inability to conduct an independent monetary policy, as on their tendency to overburden monetary policy with multiple and potentially conflicting objectives. We presented a few relevant indicators for some of these countries in Tables 3 and 4 and provided a brief discussion of the experience of Israel, but we have yet to identify more

precisely what countries belong to that group, what are the main features of their monetary policy frameworks, and how close those frameworks are to IT. To address these issues we prepared the questionnaire that is reproduced in Appendix II. The questionnaire sought to obtain information of a qualitative nature on the general operating procedures of monetary policy and, especially, on the relative importance given to inflation in the formulation and implementation of monetary policy in a specific country.[42]

To fill out the questionnaire we sought the assistance of the Fund's area departments. Concretely, we asked staff of each area department to complete the questionnaire for the countries in their region that, *in their opinion*, could be regarded as presently conducting their monetary policy within an IT framework **or** as possible candidates for future adoption of a framework of this type. Out of a total of about 150 developing and transition economies, only five countries were identified as satisfying these conditions: Chile, Colombia, Indonesia, Mexico and the Philippines.[43] Table 5 contains a summary of the responses to the questionnaire. Three answers that stand out are those to questions 1, 3, and 6: in the opinion of Fund staff, the primary goal of monetary policy in these countries rarely has been to achieve the stated inflation target; policy conflicts have been frequent and seldom resolved in favor of the inflation objective; and the overall record of compliance with quantitative inflation targets has been, at best, mixed.

The next task was to assess whether the description of the monetary policy framework provided by the staff for the five cases resembled or approximated that of a country that conducts its monetary policy in a manner consistent with IT. For this purpose we adopted the following scoring procedure: (1) we broke down the six general questions contained in the questionnaire into eighteen specific questions; (2) we ascribed numerical values to possible answers to thirteen of those questions—those which we found easiest to score; in each case we gave the highest numerical value to the answer that we thought corresponded to a country that actually used IT as a framework for monetary policy—e.g., the seven advanced economies discussed in Section III; (3) we assigned a score to the answers of the thirteen questions provided by the staff for the five cases selected; and (4) we computed two overall scores for each country: one attaching equal weight to the thirteen questions, and the other attaching twice the weight to five key questions (specifically, to questions 4, 9, 10, 12 and 17). In each case, the benchmark score for a "typical" inflation targeting country (i.e., those listed in Table 2) was intended to be 100.

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[42] Relying on information extracted from questionnaires has become standard practice in the literature on monetary policy for both industrial and developing countries; see, for example, Cukierman (1992), Cottarelli (1993), and Fry et al. (1996).

[43] The staff's responses reflect *their* views of the monetary policy framework prevailing in the countries in mid-1996, when the exercise was conducted.

TABLE 5. Monetary Policy Framework in Five Developing Countries

	CHILE	COLOMBIA	MEXICO	INDONESIA	PHILIPPINES
Question 1					
Monetary policy objectives	*Formal mandate: Not Answered* Actual practice : Three policy objectives Current account balance, inflation target, & exchange rate band	Formal mandate: low inflation Actual practice: multiple objectives (inflation, output/growth, exchange rate band)	Formal mandate: price stability Actual practice : targets on inflation & international reserves	Formal mandate: price stability & developmental objectives Actual practice : RER target; exchange rate band, money & credit targets	Formal mandate: growth with price stability Actual practice : targets on NDA and/or base money contingent on observed inflation
Authorities' priorities/ranking	1. Current account balance 2. Inflation target 3. Exchange rate band	Unclear & time varying (subject to political pressures)	*Not Answered*	1. Real exchange rate target (Time varying importance of other objectives)	*Not Answered*
Priorities conveyed to the public?	Yes; through frequent & clear public pronouncements	No; have to be inferred from public pronouncements	*Not Answered*	No; have to be inferred from development plans & public pronouncements	No; have to be inferred from press discussions of financial program
Question 2					
Model-based inflation forecasts? (main features)	Presumably exist Models' features and forecasts not shared with the public or the staff	Exist Central bank uses at least 4 models to forecast inflation & conducts inflation surveys Models' features and forecasts not shared with the public (or staff)	Do not exist as such Central bank's monetary program based on estimated demand for base money Models' features and forecasts not shared with the public	Presumably exist Multisectoral model Model's features and forecasts not shared with the public or the staff	Do not exist
Assessment of monetary policy stance					
Frequency/forum	Weekly meetings of central bank board	Weekly meetings of central bank board	Continuously	Regular meetings of Monetary Board	Weekly meetings of Monetary Board
Assessment conveyed to the public?	Some. Minutes of board meetings not released, but major decisions made public	Some, in semiannual reports to Congress (increasingly candid, but mostly focused on past developments)	Yes. Release of weekly and monthly press bulletins with data and discussion of recent financial developments	Not regularly Some views conveyed at time of statistical releases	Not regularly Views occassionally conveyed through press releases
Question 3					
Monetary policy instruments (ranked by frequency)	1. Short term interest rates (since May 95: overnight interbank rate before May 95: 90 day c.bank paper) 2. Twice weekly auction of central bank paper	1. Short term interest rates (target range for interbank rates) 2. Reserve requirements 3. OMO with short term cent. bank paper	1. Daily OMO with Treasury paper of various maturities 2. Since March 95: monthly targets on banks' cumulative balances in settlement accounts at central bank	1. OMO with 2 short term money market instruments 2. Ceilings on banks' credit (enforced through moral suasion) 3. Reserve requirements	1. Daily OMO 2. Short term interest rates (overnight interbank rates)
Full impact of monetary policy (estimates of "control lag")	Authorities estimate: unknown Unofficial estimate: 6 mths to over 1 year	Authorities estimate: 12 to 18 months Unofficial estimate: 1 to 3 years	Up to two quarters (6 months)	*Not Answered*	Authorities estimate: unknown Staff estimate: "relatively short"
Policy conflicts and resolution	Frequent conflicts between inflation & nominal exchange rate targets Inflation target normally prevails	Frequent conflicts between inflation target & output/growth objectives Inflation target rarely prevails	Frequent conflicts between inflation target & output/interest rate objectives Inflation target rarely prevails	Frequent conflicts between exchange rate objectives & money/credit/inflation targets Exchange rate targets normally prevail	Frequent conflicts between inflation target & exchange rate and interest rate targets Inflation target rarely prevails
Question 4					
Market indicators of future inflation Exist?	No. Differential yields on indexed assets provide measure of "credibility", not of expected inflation	Yes, but convey limited information (thin markets)	Yes Returns on indexed/nonindexed assets Forward exchange market	No; but some information can be extracted from bank deposit rates & forward exchange market	No
Used by the public and/or the staff?	Used by both to assess "credibility"	Used systematically by the staff, but not by the public	Used by both	Used systematically by the staff, but not by the public	*Not Applicable*
Question 5					
Quantitative inflation targets Exist? Since when?	Yes, since 1990 (when CBI law came into effect)	Yes, since 1991 (new CB law passed in late 1992)	Yes, since the mid 1980s	No "formal" annual inflation target Implicit inflation targets embedded in 5-year development plans	Yes (starting date not specified)
Features of inflation target	One year, end of period, point estimate Unadjusted CPI	One year, end of period, point estimate Unadjusted CPI	One year, end of period, point estimate Unadjusted CPI	Average annual inflation for the 5 years covered by development plan Unadjusted CPI	One year, average 12 month rate, implicit 1 percent band Unadjusted CPI
Latest inflation target (1996)	6.5%	17.0%	20.5%	5.0%	8.5%
Target announced by / at	Central bank's annual report to Congress (September of previous year)	Central bank's end of year report to Congress	Minister of Finance's presentation to Congress of budget & economic program (November of previous year)	Cabinet's presentation to Congress of budget & annual economic program	Central bank's periodic report to Congress on economic program
Sanctions/costs of breaching inflation target	No formal sanctions Political costs perceived to be small	No formal sanctions Political costs perceived to be small	No formal sanctions Political costs perceived to be small for "small overshootings"	No formal sanctions Political costs perceived to be small, as long as inflation remains below 10%	No formal sanctions Political costs perceived to be small
Question 6					
Overall record of compliance with inflation target	Good. Targets breached (modestly) only in 1993 and 1995	Poor. So far, all inflation targets breached (by an average of 3 pctge points)	Relatively good	Poor. Implicit inflation targets rarely met	Relatively good (authorities have "mostly adhered" to quantitative targets)
Official explanation for deviations	Transmission lags and "supply shocks"	Weak fiscal effort, "inertial elements", & year specific events	Supply shocks (public sector prices) & "bouts of financial turbulence"	*Not Answered*	Supply shocks

Source: Fund staff responses to Questionnaire (see text).

The results of this scoring exercise are presented in Table 6. Based on the overall scores for the five cases, **Chile** is the country that seems to come the closest to conducting its monetary policy in a manner consistent with IT—as its scores are just about one-fourth below the (implicit) *inflation targeting benchmark.* The exercise identified a second tier of countries—**Colombia, Indonesia** and **Mexico**—which curiously received the same score, i.e., all of them appear to be some 60 percent below the implicit benchmark. The results also suggest that the monetary policy framework of the **Philippines** is the one that resembles the least an IT framework.

The exercise just described suffers from numerous shortcomings and is, by necessity, of a subjective nature. Hence, all inferences derived from it have to be treated with caution. In particular, the exercise deals with monetary policy frameworks that were in place at the time the questionnaire was completed and with a sample of countries that was selected by Fund staff. That being the case, the exercise is an imperfect means for identifying the group of developing countries that currently comply (or are likely to comply soon) with the main institutional and operational requirements for adopting an IT framework, if they choose to do so. What the exercise does suggest, however, is that, as of end-1996, no developing country (especially none of the five for which the questionnaire was answered) seemed to be conducting its monetary policy in a manner fully consistent with inflation targeting.

V. CONCLUDING REMARKS

The paper has attempted to provide an analytical basis for understanding how an inflation targeting framework is applied in industrial countries, as well as a brief review of the experience of the latter with such a framework. We then proceeded to consider the framework's applicability to developing countries.

We identified what we saw as the two major prerequisites for adopting a framework of this type: a degree of independence of monetary policy, in particular, as concerns freedom from fiscal dominance; and absence of commitment to a particular level or path for the exchange rate (or for any other nominal anchor variable such as wages). We argued that a country satisfying these two requirements could choose to conduct its monetary policy in a manner consistent with inflation targeting, defined as a framework containing an explicit target for future inflation, a commitment to that target as an overriding objective, a model for predicting inflation, and an operating procedure for adjusting monetary instruments in case forecast inflation differs from its target. In many developing countries, these requirements for an effective inflation targeting strategy are not present, either because seigniorage is an important source of financing or because there is no consensus on low inflation as an overriding objective, or both. In industrial countries, inflation targeting has only been adopted from a starting point of low (less than 10 percent) inflation, considerable exchange rate flexibility, and substantial operational independence of the central bank—conditions rarely found in developing countries.

The fairly stringent technical and institutional requirements of IT and its still tentative record in just a handful of industrial countries lead us to believe that the way of improving the monetary and inflation performance of developing countries may not be through the adoption of a framework akin to IT, at least not in the near term. Over time, a strengthening of their institutions may, however, make IT an attractive option for some developing countries, especially if its robustness to shocks is demonstrated in those advanced economies that have already adopted a framework of this type. In fact, it is quite possible that inflation targeting will receive increasing consideration in developing countries as high capital mobility and instability in money demand make alternative nominal anchors less feasible.

TABLE 6. Scoring of Answers to Questionnaire

Specific question	Answers & numerical codings	Question Weight	Scores CHILE	COLOMBIA	MEXICO	INDONESIA	PHILIPPINES
	Question 1						
Q1	Monetary policy objectives	0					
Q2	Authorities' priorities/ranking	1	1	0	0	0	0
	Inflation target 1st: 2						
	Inflation target 2nd: 1						
	Unclear/No answer: 0						
Q3	Priorities conveyed to the public?	1	1	0	0	0	0
	Yes, clearly: 1						
	No/not clearly: 0						
	Question 2						
Q4	Model-based inflation forecasts?	2	1	1	0	1	0
	Yes, forecasts released : 2						
	Yes, forecasts not released: 1						
	No 0						
	Assessment of monetary policy stance						
Q5	Frequency/forum	0					
Q6	Assessment conveyed to the public?	1	1	1	1	0	0
	Yes, clear & forward looking: 2						
	Yes, clear & backward looking: 1						
	No/ unclear/ infrequently: 0						
	Question 3						
Q7	Monetary policy instruments (ranked by frequency)	0					
Q8	Full impact of monetary policy (estimates of "control lag")	1	2	2	1	0	1
	Model-based estimate: 2						
	Arbitrary estimate: 1						
	No estimate: 0						
Q9	Policy conflicts and resolution	2	1	0	0	0	0
	Inflation target normally prevails: 1						
	Inflation target rarely prevails: 0						
	Question 4						
Q10	Market indicators of future inflation	2	1	1	2	1	0
	Exist? Yes: 2						
	Some: 1						
	No: 0						
Q11	Used by the public and/or the staff?	1	2	1	2	1	0
	By both: 2						
	By staff: 1						
	Not used: 0						
	Question 5						
Q12	Quantitative inflation targets	2	2	2	1	2	1
	Exist? Since when?						
	Yes, for more than 2 yrs: 2						
	Yes, for less than 2 yrs: 1						
	No: 0						
Q13	Features of inflation target	1	2	1	1	3	1
	Horizon longer than 1 yr: 3						
	1yr horizon, in line w/ control lag: 2						
	1yr horizon, at odds w/ control lag:1						
	Not applicable: 0						
Q14	Latest inflation target (1996)	1	1	0	0	1	1
	Less than 15%: 1						
	More than 15%: 0						
Q15	Target announced by / at	0					
Q16	Sanctions for breaching infl target	1	0	0	0	0	0
	Formal/informal sanctions: 1						
	No formal/informal sanctions: 0						
	Question 6						
Q17	Overall record of compliance with inflation target	2	2	0	1	0	1
	Good : 2						
	Fair: 1						
	Poor: 0						
Q18	Official explanation for deviations	0					
	OVERALL SCORE (weighted)		24	13	13	13	7
	(unweighted)		17	9	9	9	5
	IT benchmark weighted max: 32						
	unweighted max: 23						
	Percent of IT benchmark weighted		*75.0%*	*40.6%*	*40.6%*	*40.6%*	*21.9%*
	unweighted		*73.9%*	*39.1%*	*39.1%*	*39.1%*	*21.7%*

Source: see text.

Country Sample, Data Sources, and Variables Description for Tables 3 and 4

Table 3

1. **Country sample**

The sample was defined starting from the set of countries consisting of all Fund members plus Taiwan Province of China, and then *deleting* countries with one or more of the following characteristics: (i) countries with population of less than 0.5 million; (ii) economies whose GDP was less than US$ 2.5 billion in 1991; (iii) countries that experienced civil strife over the period under consideration; (iv) countries for which certain data series were not available over a large portion of the period under consideration. These selection criteria produced a sample of 79 countries.

The resulting sample was divided into six broad groups and a number of subgroups. The six broad groups were: Advanced Economies (21 countries), Africa (19 countries), Asia (13 countries), Eastern Europe (2 countries), Latin America & Caribbean (15 countries), and Middle East & Europe (9 countries). The two main subgroups were those formed by the seven inflation targeting countries (a subset of the Advanced Economies), and Asia excluding China. The table reports (unweighted) average estimates of all variables for all the groups and subgroups, except Eastern Europe (where we only had data for two countries). The table also reports data for 23 individual countries; aside from the G-3, these countries consist of those emerging market economies that, in our opinion, have relatively well developed financial markets.[44] The list of the countries included in each group, arranged alphabetically, is as follows:

Advanced Economies: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States. (Of which, *Inflation Targeting countries*: Australia, Canada, Finland, New Zealand, Spain, Sweden, United Kingdom.)

Africa: Botswana, Burkina Faso, Cameroon, Congo, Gabon, Ghana, Cote d'Ivoire, Kenya, Madagascar, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, Tunisia, Uganda, Zambia, and Zimbabwe.

Asia: Bangladesh, China, India, Indonesia, Malaysia, Nepal, Pakistan, Papua New Guinea, the Philippines, Singapore, South Korea, Taiwan Province of China, and Thailand.

Eastern Europe: Hungary and Poland.

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[44] See Fry et al. (1996), Table 5.7 for a similar classification.

Latin America & Caribbean: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Jamaica, Mexico, Paraguay, Peru, Trinidad & Tobago, Uruguay, and Venezuela.

Middle East & Europe: Bahrain, Cyprus, Egypt, Israel, Jordan, Oman, Saudi Arabia, Turkey, and United Arab Emirates.

2. **Data sources**

The raw series used to construct the variables reported in the table were obtained from either the *International Financial Statistics* (*IFS*) or the *World Economic Outlook* (*WEO*) database of the IMF.[45] All data series were annual and covered the period 1980-95.

3. **Variables description**

a. *Seigniorage* was defined as the annual change in the monetary base (*IFS*, line 14) divided by nominal GDP (*IFS*, line 99b) for all countries except four. The four exceptions were Argentina, Chile, Israel and Uruguay; in these countries the presence of indexed and/or remunerated deposits in the monetary base distorted considerably the estimates of seigniorage. For three of these cases (Argentina, Chile and Uruguay), seigniorage was defined as the annual change in M1 divided by nominal GDP, whereas for Israel it was defined as the yearly change in the monetary base excluding foreign currency deposits divided by nominal GDP.[46]

b. *CPI Inflation* was defined as the percentage change in the average CPI (*IFS*, line 64) from one year to the next.

c. *Government Balance* was defined as the overall balance of the central government (*IFS*, line 80) divided by nominal GDP.

Table 4

1. **Country sample**

As indicated in the text, the 38 countries included in the table represent the intersection of the set of 79 countries used in Table 3 and the 46 countries for which

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[45] The *IFS* line number corresponding to the series used will be indicated below; in cases were *IFS* data were unavailable or incomplete the series were extracted from the *WEO* database.

[46] For a similar adjustment to Israel's data see Fry et al. (1996), page 45. On the rationale for using M1 instead of base money to compute seigniorage, see Kiguel and Neumeyer (1995).

Cukierman (1992) estimates an overall index of central bank independence (CBI) for the 1980s—see Cukierman (1992), Table 21.1.

2. Data sources

As noted above, the CBI rank was taken from Cukierman (1992). The raw series used to construct the two measures of seigniorage, the inflation tax rate, the ratio of Broad Money to GDP, and the nominal GDP per capita were obtained from either the *IFS* tapes or the *WEO* database, and covered the period 1980-95 (except for the GDP per capita). The annual series on real interest rates for the period 1980-89 were taken from Easterly et al. (1994), Statistical Appendix, Table A.4, except for the following four countries: Hungary, New Zealand, United States and Uruguay. Broadly comparable series on real interest rates for Uruguay were obtained from Rama and Forteza (1993), while those for Hungary, New Zealand and the U.S. were constructed from raw data from Boote and Somogyi (1991) in the case of Hungary and from the *IFS* tapes in the other two countries.

3. Variables description

a. *CBI rank* is the ordinal ranking of the overall index of CBI from high to low levels of independence.

b. *Seigniorage*

Measure I is the same estimate of seigniorage used for the calculations in Table 3.

Measure II was defined as the annual monetary base multiplied by the inflation tax rate (see c. below) and divided by the nominal GDP, except for Argentina, Chile and Uruguay (where annual M1 was used instead of the monetary base) and Israel (where foreign currency deposits were excluded from the monetary base).

c. *Inflation tax rate* was defined as {[CPI inflation/(100+CPI inflation)]*100}, which is a measure of the tax on the holdings of monetary balances that is bounded between 0 and 100.

d. *Real interest rate on deposits* geometric mean and standard deviation of the annual ex-post real returns on domestic currency deposits in the banking system during the 1980s (for details on the calculation of the real rates see Easterly et al. (1994), Statistical Appendix).

e. *Broad Money to GDP* defined as the sum of money plus quasi money (*IFS*, lines 34 and 35) divided by nominal GDP.

f. *Nominal GDP per capita* defined as the nominal GDP in current U.S. dollars of 1995 divided by total population.

Questionnaire: Main Features of the Monetary Policy Framework

1. What policy objectives in addition to controlling inflation (price stability) do the country's monetary authorities pursue—e.g., an exchange rate target and/or interest rates objectives, balance of payments objectives, output and employment objectives? How do the monetary authorities rank these objectives and does this ranking change over time? Do the authorities convey to the public the priorities they attach to the various policy objectives?

2. How do the authorities project the future course of inflation and how do they assess the current stance of monetary policy?

   a. In particular, do the authorities rely (to some extent) on *any type* of model-based projections? If so, briefly describe the main features of the model(s) utilized for these purposes.

   b. How often do the authorities conduct an assessment of the stance of monetary policy? Do they convey such assessments to the general public? If so, by what means (e.g., central bank reports, regular or intermittent press releases, publication of the authorities' policy deliberations), and what information is normally contained in such reports/announcements?

3. How do the authorities normally adjust the stance of monetary policy? Please list the (direct and indirect) instruments of monetary policy, ranking them by the frequency of their use. Briefly discuss the most recent episode where each of these instruments was utilized to affect monetary policy.

   a. Over what horizons do the authorities normally expect monetary policy to have a full impact on inflation and other policy objectives?

   b. Do the authorities provide an explanation to the public for modifying the stance of monetary policy? If they do, what elements/developments do such explanations normally emphasize?

   c. Have there been any recent instances of a clear conflict between the (implicit or explicit) inflation target and other policy objectives? Briefly discuss any such episodes, and indicate how the conflicts were resolved.

4. Are there any market-based indicators of the private sector's expectations of future inflation—e.g., indexed and non-indexed bonds of (various) comparable maturities, forward interest rates? Can these indicators be used to gauge the "credibility" of official announcements regarding inflation? In your view, do market participants utilize such indicators to form expectations and evaluate government policies? Are those indicators normally incorporated into the staff's assessment of the stance of monetary policy in the country?

5. Are explicit quantitative targets for future inflation announced by the country's authorities? If so, please indicate:

a. Who makes the announcement (i.e., the central bank, the Ministry of Finance, these two agencies jointly), and in what context (e.g., annual statement of monetary policy, presentation of government budget)?

b. When did the authorities start announcing quantitative inflation targets? Were these announcements part of a broader initiative to revamp the central bank's legal statutes and mandate? Was such a move followed by any discernible change in the operating procedures for conducting monetary policy?

c. How are the inflation targets specified? Concretely:

(i) What is the most recent target level of inflation?
(ii) Is the target specified as a point-estimate or a range? If it is a range, what factors determine its width?
(iii) Over what horizon is the target specified?
(iv) What price index is used for defining the targeted inflation rate?
(v) Does the inflation target accommodate "supply shocks"—i.e., terms of trade movements, changes in indirect taxes—in any way?

d. If the inflation target is breached, are there any sanctions on the agency responsible for monetary policy? If so, what are the sanctions? In your view, are there significant political costs to overshooting the inflation target?

6. What has been the authorities' record of compliance with announced quantitative targets in general, and with (implicit or explicit) inflation targets in particular, in the recent past? What, if any, justification did the authorities provide to the public in those cases where a variable deviated from its announced target? Did such deviations elicit any policy response and/or have any effect on how monetary policy was conducted?

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