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The world's central bankers and their staffs meet regularly, in venues from Basle to Washington, to share ideas and discuss common problems. Perhaps these frequent meetings help explain why changes in the tactics and strategy of monetary policymaking—such as the adoption of money growth targets in the 1970s, the intensification of efforts to reduce inflation in the 1980s, and the recent push for increased institutional independence for central banks—tend to occur in many countries more or less simultaneously. Whatever their source, major changes in the theory and practice of central banking are of great importance, for both individual countries and the international economy. In this article, we discuss a new strategy for monetary policy known as "inflation targeting," which has sparked much interest and debate among central bankers and monetary economists in recent years. This approach is characterized, as the name suggests, by the announcement of official target ranges for the inflation rate at one or more horizons, and by explicit acknowledgment that low and stable inflation is the overriding goal of monetary policy. Other important features of inflation targeting include increased communication with the public about the plans and objectives of the monetary policymakers, and, in many cases, increased accountability of the central bank for attaining those objectives.

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Inflation targeting in various forms has been adopted in recent years by a number of industrialized countries, including Canada, the United Kingdom, New Zealand, Sweden, Australia, Finland, Spain and Israel.[1] Table 1 offers some details about the specific plans in each country. There are also important elements of inflation targeting, as we discuss below, in the long-standing and well-regarded monetary policy approaches of Germany and Switzerland. In the United States, inflation targeting has been advocated by some influential policymakers, and Senator Connie Mack (R-Fla.) has introduced a bill that, if passed, would establish price stability as the primary goal of monetary policy [S.R. 1266, 104th Cong. 1st sess.]. Finally, the Maastricht treaty mandates price stability as the primary objective of the European Central Bank, and it seems likely—if European monetary union in fact occurs—that the ECB would incorporate major elements of the inflation targeting approach in its procedures (Issing, 1996).

We begin our discussion of inflation targeting with some details of how this approach has been implemented in practice. We focus on the practice of inflation targeting, rather than the theory, because we believe that the rhetoric associated with inflation targeting is often misleading. In particular, we will argue that actual experience with this approach shows that inflation targeting does not represent an ironclad policy *rule*, as some writers on the subject and even some advocates of this approach seem to assume. Instead, inflation targeting is better understood as a policy *framework*, whose major advantage is increased transparency and coherence of policy, and in which fairly flexible, even "discretionary" monetary policy actions can be accommodated.[2] We next discuss in more detail why viewing inflation targeting as a framework, rather than a rule, blunts some of the arguments that have been made against it and in general enhances the appeal of this approach. This is not to say that valid questions do not remain about this strategy for monetary policy; in the final portion of the paper we discuss some important additional issues and draw conclusions about the usefulness of the inflation targeting framework.

Inflation Targeting in Practice

Although every country that has adopted inflation targeting has customized the approach in various ways, certain empirical generalizations about this strategy can be made.

The hallmark of inflation targeting is the announcement by the government, the central bank, or some combination of the two that in the future the central bank will strive to hold inflation at or near some numerically specified level. As can be seen in Table 1, inflation targets are more often than not specified as ranges—

[1] Detailed analyses of experiences with inflation targeting can be found in Goodhart and Vinals (1994), Leiderman and Svensson (1995), Haldane (1995) and McCallum (1996), among others.

[2] King (1996) adopts a similar view.

Table 1
Operational Aspects of Inflation Targets

Country (date of adoption)	*Target Series Definition*	*Target Level (percentage annual inflation)*	*Time Horizon*
Australia (1993)	Underlying CPI (excluding fruit and vegetables, petrol, interest costs, public sector prices and other volatile prices)	2–3	Ongoing
Canada (February 1991)	Core CPI (excluding food, energy and first-round effects of indirect taxes)	1–3	18 months
Finland (February 1993)	Underlying CPI (excluding government subsidies, indirect taxes, housing prices and mortgage interest payments)	about 2	Ongoing
Israel (December 1991)	CPI	8–11	1 year
New Zealand (March 1990)	Underlying CPI (excluding changes in indirect taxes or government changes, significant changes in import or export prices, interest costs and natural disasters)	0–2 (until November 1996; 0–3 thereafter)	1 year
Spain (January 1995)	CPI (excluding first-round effects of indirect tax changes)	below 3	Through 1997
Sweden (January 1993)	CPI	2 ± 1	Ongoing
United Kingdom (October 1992)	RPIX (RPI excluding mortgage interest payments)	lower half of 1–4 until spring 1997; 2.5 or less thereafter	Until the end of this Parliament

for example, 1–3 percent—rather than single numbers, and they are typically established for multiple horizons ranging from one to four years. However, there are exceptions to both observations; indeed, Germany, with the longest experience with inflation-focused monetary policy, specifies its implicit inflation target as a point and only for a one-year horizon. Initial announcements of inflation targeting generally allow for a gradual transition from the current level of inflation to a desired steady-state level, usually the level deemed consistent with price stability. "Price stability" never in practice means literally zero inflation, however, but usually something closer to a 2 percent annual rate of price change, for reasons we discuss later.

There is a lively debate over whether targeting should be of the inflation rate per se or of the price level. Of course, a targeted price level need not remain constant indefinitely, but could be allowed to drift upward in a predetermined way over time (Goodhart and Vinals, 1994; Svensson, 1996). The relative disadvantage of targeting the inflation rate is that unanticipated shocks to the price level may be

treated as bygones and never offset; as a result, forecasts of the price level at long horizons might have a large variance under inflation targeting, which presumably impedes private-sector planning.[3] On the other hand, strict price-level targeting requires that overshoots or undershoots of the target be fully made up, which reduces the variance of long-run forecasts of prices but could impart significantly more volatility into monetary policy in the short run.[4] In practice, central banks tend to compensate partially for target misses, particularly at shorter horizons.

Associated with the announcement of inflation targets there is usually some statement to the effect that control of inflation is the "primary" or "overriding" goal of monetary policy and that the central bank will be held accountable for meeting the inflation targets. For example, Section 8 of the Reserve Bank of New Zealand Act of 1989 assigns the central bank the statutory responsibility "to formulate and implement monetary policy directed to the economic objective of achieving and maintaining stability in the general level of prices," with no mention of competing goals. Section 9 of the act requires the Minister of Finance and the Governor of the Reserve Bank to negotiate and make public a Policy Targets Agreement (PTA), setting out specific inflation targets. In other countries, such as Switzerland, Canada and the United Kingdom, the inflation goal is embodied in public statements by the central bank rather than mandated by law.

The rationale for treating inflation as the primary goal of monetary policy is clearly strongest when medium- to long-term horizons are considered, as most economists agree that monetary policy can affect real quantities, such as output and employment, only in the short run. Of course, some economists of new classical or monetarist persuasions might claim that inflation should be the sole concern of monetary policy in the short run as well, arguing that using monetary policy for short-run stabilization of the real economy is undesirable, infeasible, or both. However, in practice no central bank has of yet completely forsworn the use of monetary policy for short-run stabilization, and so the phraseology "primary" or "overriding" must be taken to refer to the longer term.

The degree to which the central bank is held formally accountable for inflation outcomes varies considerably. The New Zealand law links the tenure of the governor of the Reserve Bank to the achieving of the inflation targets, and thus comes closest to providing an explicit "incentive contract," as proposed by Persson and Tabellini (1993) and Walsh (1995).[5] In other countries, no explicit sanctions on the central bank for missing the target are given; presumably, however, missing the target badly would impose implicit institutional or personal costs in terms of lost reputation or prestige. It is rather early in many of the inflation-targeting experiments to judge

[3] Technically, ensuring only that the inflation rate is stationary may leave a unit root in the price level, so that the forecast variance of the price level grows without bound. This problem is analogous to the issue of "base drift" in the literature on money-growth targeting.

[4] However, Svensson (1996) gives examples in which price-level targeting actually reduces the volatility of output.

[5] Svensson (1997b) relates inflation targeting to the contracting approach.

the extent to which the prospective penalties for missing announced targets will constrain central bank behavior.

Despite the language referring to inflation control as the primary objective of monetary policy, as we have said, inflation-targeting central banks always make room for short-run stabilization objectives, particularly with respect to output and exchange rates.[6] This accommodation of short-run stabilization goals is accomplished through several means. First, the price index on which the official inflation targets are based is often defined to exclude or down-weight the effects of "supply shocks;" for example, the officially targeted price index may exclude some combination of food and energy prices, indirect tax changes, terms-of-trade shocks, and the direct effects of interest rate changes on the index (for example, through imputed rental costs). Second, as already noted, inflation targets are typically specified as a range; the use of ranges generally reflect not only uncertainty about the link between policy levers and inflation outcomes but is also intended to allow the central bank some flexibility in the short run. Third, short-term inflation targets can and have been adjusted to accommodate supply shocks or other exogenous changes in the inflation rate outside the central bank's control. A model here is the Deutsche Bundesbank's practice of stating its short-term (one-year) inflation projection as the level of "unavoidable inflation." In the aftermath of the 1979 oil shock, for example, the Bundesbank announced the "unavoidable" inflation rate to be 4 percent, then moved its target gradually down to 2 percent over a six-year period. In other cases, the central bank or government makes explicit an "escape clause," which permits the inflation target to be suspended or modified in the face of certain adverse economic developments.

In making inflation, a goal variable, the focus of monetary policy, the inflation-targeting strategy in most cases significantly reduces the role of formal intermediate targets, such as the exchange rate or money growth. To the extent that intermediate targets are used, it is emphasized that the inflation goal takes precedence in case of conflict. Unconditional commitment to an intermediate target is of course inconsistent with inflation targeting (except in the unusual case that the intermediate target effectively summarizes all current information about inflation at the forecast horizon). The fact that in most countries the relation between intermediate targets, such as money growth, and the central bank's goal variables has proven to be relatively unreliable—the so-called "velocity instability" problem—is a major motivation for dropping formal intermediate targets and instead attempting to target the goal variable directly.

On the other hand, since targeting inflation directly requires that the central bank form forecasts of the likely path of prices, close attention is typically paid to a variety of indicators that have shown predictive power for inflation in the past. For example, as an aid to inflation forecasting, monetary policymakers in Canada

[6] Another short-run objective that is almost always retained by inflation-targeting central banks is the maintenance of financial stability. For example, see Mishkin (forthcoming).

and Sweden make use of a "monetary conditions index," a weighted combination of the exchange rate and the short-term interest rate, in conjunction with other standard indicators such as money and credit aggregates, commodity prices, capacity utilization and wage developments.[7]

In most inflation-targeting regimes, the central bank publishes regular, detailed assessments of the inflation situation, including current forecasts of inflation and discussions of the policy response that is needed to keep inflation on track. A good example is the Bank of England's *Inflation Report*, published quarterly, which contains detailed analyses of factors likely to affect the inflation rate as well as probabilistic forecasts of inflation, assuming no change in interest rates. The central banks of Canada and Sweden release similar documents, and the Reserve Bank of New Zealand is required to issue a policy statement at least every six months. As we discuss further below, the use of such reports reflects a key objective of inflation targeting, which is improved communication with the public about monetary policy, its goals and, in particular, the long-run implications of current policy actions.

The adoption of inflation targeting is often linked with changes in the laws or administrative arrangements associated with the central bank. Typically, reforms are in the direction of increased independence for the central bank, particularly in respect to its choice of instrument settings.[8] This seems to be a logical consequence of making price stability the overriding goal of policy, since the central bank is the best place to make the technical decisions necessary to achieve price stability and to make judgments about whether the pursuit of other objectives is consistent with this goal. Exceptions to this observation are the United Kingdom and, to a lesser extent, Canada, where despite the commitment to inflation targeting, the government, rather than the central bank, retains the final control over monetary policy. However, even in the British case the adoption of inflation targeting seems to have increased the relative influence of the central bank, as the *Inflation Report* and the timely publication of the minutes of the monthly meeting between the Governor and the Chancellor of the Exchequer provide an independent forum for the bank to express its views; in effect, the government must rationalize for the public any deviations of its policies from those recommended by the bank.

Most or all of the characteristics of inflation targeting described in this section

[7] Users of the monetary conditions index would probably argue that treating the MCI simply as a forecasting variable is oversimple; they tend to view the MCI more specifically as a measure of how overall monetary conditions are affecting aggregate demand and thus as a potential guide to policy actions. See Freedman (1994) for further discussion.

[8] Debelle and Fischer (1994) make the useful distinction between goal independence and instrument independence for the central bank. Goal independence implies the unilateral ability of the central bank to set its inflation targets and other goals, while instrument independence means that, although goals may be set by the government or by the government in consultation with the central bank, the central bank is solely responsible for choosing the instrument settings (for example, the level of short-term interest rates) necessary to achieve those goals. Instrument independence would seem to be the form of independence that maximizes central bank accountability and minimizes opportunistic political interference, while still leaving the ultimate goals of policy to be determined by democratic processes.

apply to countries adopting this approach within the last eight years or so; as noted in the introduction, these include Canada, the United Kingdom, New Zealand, Sweden, Australia, Finland, Spain and Israel. Germany and Switzerland, which have conducted inflation-focused monetary policies since the mid-1970s, are better viewed as "hybrid" cases, which meet some but not all of the above criteria. These two countries differ from the "pure" inflation targeters primarily in their greater focus on money growth as an intermediate target, and indeed, the Bundesbank has emphasized the superiority (in their view) of money targeting as a means of insuring monetary discipline and transparency (for example, Deutsche Bundesbank, 1995, pp. 67–8). In fact, many observers (including ourselves) would argue that the distinction between inflation and money targeting is overstated and that monetary policies in both countries are driven in the medium and long term primarily by inflation goals. For example, the Bundesbank's money growth targets are derived, using the quantity equation, to be consistent with an annual inflation target, given projections of the growth of potential output and of possible changes in the velocity of money. This inflation target, in turn, has been brought down steadily over time and has remained at 2 percent—the level deemed consistent by the Bundesbank with price stability—since 1986. Further, the Bundesbank has shown itself quite willing to miss its money targets when pursuing these targets threatens to conflict with the control of inflation (von Hagen, 1995; Bernanke and Mihov, 1997).

All in all, the philosophy guiding German and Swiss monetary policies seems relatively consistent with the one motivating the self-declared inflation targeters. The main practical difference between the two sets of countries is that the Germans and Swiss believe that the velocity of money has been relatively more stable in their countries, and so they view money-growth targeting as a useful tool for implementing their inflation objectives. It is also true that Germany and Switzerland have been less explicit in stating their inflation targets; neither central bank publishes a regular inflation report per se. But this distinction seems relatively unimportant; inflation developments receive prominent attention in the regular publications of both banks. Moreover, there may be less need for public declarations given the long-standing commitment of the Bundesbank and Swiss National Bank—and the popular support for that commitment—to price stability. The examples of Germany and Switzerland are important because, unlike the other countries mentioned, these two countries have been following their monetary policy strategies fairly consistently for more than two decades, rather than for only a few years; thus, their experiences may provide researchers attempting to assess the value of inflation-focused monetary policy with useful information.

A Framework, Not a Rule

The motivations for an inflation-targeting approach have been varied. In a number of cases, such as those of the United Kingdom and Sweden, the collapse of an exchange rate peg led the monetary authorities to search for an alternative

"nominal anchor" for monetary policy, a way of reassuring the public that monetary policy would remain disciplined. The demise of a fixed-exchange-rate regime similarly motivated the adoption of a money-focused approach by Germany in the mid-1970s. Some countries, such as Canada, came to inflation targeting after unsuccessful attempts to use a money-targeting approach. For example, in the case of Canada, by 1980 inflation was as high as it was in 1975 (10 percent per year) despite adherence to monetary targets that led to lower money growth rates (Howitt, 1993). In other cases, countries that by tight monetary policies had succeeded in reducing their core rate of inflation adopted inflation targeting as an institutional means of locking in their inflation gains.

Developments in macroeconomic theory also played some role in the growing popularity of the inflation targeting approach. These familiar developments included reduced confidence in activist, countercyclical monetary policy; the widespread acceptance of the view that there is no long-run tradeoff between output (or unemployment) and inflation, so that monetary policy affects only prices in the long run; theoretical arguments for the value of precommitment and credibility in monetary policy (Kydland and Prescott, 1977; Calvo, 1978; Barro and Gordon, 1983); and an increasing acceptance of the proposition that low inflation promotes long-run economic growth and efficiency.

Unfortunately, the interpretation of inflation targeting in terms of some longstanding debates in monetary economics has also been the source of confusion. For many years the principal debate about the best approach for monetary policy was framed as an opposition between two polar strategies, termed "rules" and "discretion." Advocates of rules—such as the fixed rule for money growth proposed by Milton Friedman, or a gold standard—argued that "tying the hands" of policymakers will prevent the monetary authorities from implementing counterproductive attempts at short-run stabilization and will thus eliminate the inflationary bias inherent in discretionary monetary policy. Supporters of discretionary policymaking—under which the central bank is left free to "do the right thing" as economic conditions evolve—stress the inability of ironclad rules to deal with unforeseen shocks or changes in the structure of the economy.

For various reasons, including the rhetoric of some of its proponents, inflation targeting is sometimes interpreted as falling on the "rule" side of this traditional dichotomy (for example, Friedman and Kuttner, 1996). We view this characterization of inflation targeting as a mistake; indeed, we would go farther and say that the traditional dichotomy of monetary policy strategies into rules and discretion is itself misleading. In particular, some useful policy strategies are "rule-like," in that by their forward-looking nature they constrain central banks from systematically engaging in policies with undesirable long-run consequences; but which also allow some discretion for dealing with unforeseen or unusual circumstances. These hybrid or intermediate approaches may be said to subject the central bank to "constrained discretion." We argue below that inflation targeting should be viewed in this way, rather than as a rigid policy rule.

If inflation targeting is interpreted as a rule in the classic Friedman sense, then

it would have to be conceded that this approach is vulnerable to some important criticisms. First, the idea that monetary policy has (essentially) no legitimate goals besides inflation would find little support among central bankers, the public and most monetary economists. Second, given that central banks do care about output, employment, exchange rates and other variables besides inflation, treating inflation targeting as a literal rule could lead to very poor economic outcomes. As Friedman and Kuttner (1996) emphasize, much in the same way that money-growth targeting in the United States was done in by unpredicted shocks to the velocity of money, so an exclusive emphasis on inflation goals could lead to a highly unstable real economy should there be significant supply shocks, such as large changes in the price of oil.

Finally, critics of inflation targeting *as a rule* might well ask what is gained by the loss of flexibility entailed by precommitting monetary policy in this way. The academic literature on rules argues that tying the hands of policymakers will reduce the inflation bias of discretionary policy and perhaps allow for less costly disinflations, as increased credibility leads inflation expectations to moderate more quickly. However, critics of inflation targeting could point out that, although inflation-targeting countries have generally achieved and maintained low rates of inflation, little evidence supports the view that these reduced rates of inflation have been obtained at a lower sacrifice of output and employment than disinflations pursued under alternative regimes (at least so far). Even the Deutsche Bundesbank and the Swiss National Bank, whose pursuit of low inflation over the last two decades has presumably given the maximum credibility, have been able to achieve inflation reductions only at high costs in lost output and employment (Debelle and Fischer, 1994; Posen, 1995). Nor is there evidence that the introduction of inflation targets materially affects private-sector expectations of inflation, as revealed either by surveys or by the level of long-term nominal interest rates. Inflation expectations have come down, in most cases, only as inflation-targeting central banks have demonstrated that they can deliver low inflation (Posen and Laubach, 1996).

These objections are certainly important, as far as they go. However, again, they derive much of their force from the assumption that inflation targeting is to be viewed as an ironclad rule. As we have said, we believe that interpreting inflation targeting as a type of monetary policy rule is a fundamental mischaracterization of this approach *as it is actually practiced by contemporary central banks*. First, at a technical level, inflation targeting does not qualify as a policy rule in that it does not provide simple and mechanical operational instructions to the central bank. Rather, the inflation targeting approach enjoins the central bank to use its structural and judgmental models of the economy, in conjunction with all relevant information, to determine the policy action most likely to achieve the inflation target, and then to take that action. Unlike simple policy rules, inflation targeting never requires that the central bank ignore information that bears on its achieving its objectives. Second, and more importantly, inflation targeting as it is actually practiced contains a considerable degree of what most economists would define as policy discretion. Within the general constraints imposed by their medium- to long-term inflation

targets, central bankers have in practice left themselves considerable scope to respond to current unemployment conditions, exchange rates and other short-run developments.

The 1989 reform of the Reserve Bank of New Zealand, for example, is often held up as an example of the rule-making impulse. It is important to note that New Zealand is the most extreme of all the inflation-targeting countries in its use of formal institutional constraints on policy. Even so, the New Zealand law does provide the central bank some discretion and flexibility; for example, the target inflation series excludes movements in commodity prices; the target may be readjusted if necessary in the judgment of the bank in response to supply or terms-of-trade shocks; the inflation target is specified as a 3 percentage point range rather than as a single number; and there is an explicit escape clause that permits amending the target in the face of unexpected developments. In practice, inflation targeting in New Zealand has been implemented even more flexibly. Inflation was brought down to its current low level only gradually; and when inflation moved briefly above the target range in 1996, the Parliament did not seriously consider its option of replacing the governor of the central bank.

If inflation targeting is not a rule in the way this term is usually understood, then what is it, and what good is it? We believe that it is most fruitful to think of inflation targeting not as a rule, but as a framework for monetary policy within which "constrained discretion" can be exercised. This framework has the potential to serve two important functions: improving communication between policymakers and the public, and providing increased discipline and accountability for monetary policy.

In terms of communication, the announcement of inflation targets clarifies the central bank's intentions for the markets and for the general public, reducing uncertainty about the future course of inflation. (Of course, this assumes that the announcements are believable and believed; more on this later.) Arguably, many of the costs of inflation arise from its uncertainty or variability more than from its level. Uncertain inflation complicates long-term saving and investment decisions, exacerbates relative price volatility, and increases the riskiness of nominal financial and wage contracts. Uncertainty about central bank intentions may also induce volatility in financial markets—a common phenomenon in the United States, where stock market analysts parse every sentence uttered by the Fed chairman in search of hidden meanings. Inflation targets offer transparency of policy; they make explicit the central bank's policy intentions in a way that should improve private-sector planning, enhance the possibility of public debate about the direction of monetary policy, and increase central bank accountability. Transparency has been claimed as a positive feature of other policy strategies, such as money-growth targeting, but we doubt that concepts like the growth rates of particular money aggregates are nearly so understandable to the general public as is the predicted rate of change of consumer prices.

To see the practical advantage of policy transparency, consider the familiar scenario in which an upcoming election or a slow economic recovery induces the

government to pressure the central bank to apply some short-run stimulus. In an inflation-targeting regime, the central bank would be able—indeed, would be required—to make explicit that the short-run benefits of this policy (faster real growth) may well be purchased at the price of medium- and long-term inflation. These projections could then be debated by politicians, press and public, but at least the issue of long-run inflation effects would be on the table, serving as an explicit counterweight to the short-run benefits of monetary expansion. Making the linkage of short-term policies and long-term consequences explicit would clarify for the public what monetary policy can and cannot do.

Aggregate supply shocks, such as oil price shocks, present a thornier policy problem. If a severe supply shock hits the economy, keeping medium-term inflation close to the long-run target could well be very costly in terms of lost output. However, in practice, a well-implemented inflation-targeting regime need not strongly constrain the ability of the monetary authorities to respond to a supply shock. Remember, the inflation target itself can be and typically is defined to exclude at least the first-round effects of some important supply shocks, such as changes in the prices of food and energy or in value-added taxes; the use of target ranges for inflation gives additional flexibility. Escape clauses, which permit the central bank to change its medium-term targets in response to major developments, are another possibility. We have seen, for example, that the Bundesbank's one-year inflation targets were often defined by its view of how much inflation was "unavoidable," rather than by its long-run objective of price stability. Thus, intermediate-run inflation targets can be used to define a transition path by which the temporary inflation induced by a supply shock is eliminated gradually over time. Relative to a purely discretionary approach, the inflation-targeting framework should give the central bank a better chance of convincing the public that the consequences of the supply shock are only a one-time rise in the price level, rather than a permanent increase in inflation. A relevant example occurred in Canada in 1991, shortly after their implementation of inflation targeting, when a sharp increase in indirect taxes caused a blip in the price level but had no apparent effect on the underlying inflation rate.

The idea that inflation targeting requires an accounting of the long-run implications of short-run "discretionary" actions is also central to the argument that inflation targeting helps to discipline monetary policy. In practice, exactly who needs disciplining may differ from country to country, depending on politics, institutional arrangements and personalities. In the macroeconomic literature on central bank credibility, it is the central bank that needs discipline, because it is assumed to desire an unemployment rate lower than the natural rate. This desire leads the monetary authority to try to "fool" the public with surprise inflation, inducing producers (who confuse nominal and real price increases) to increase output and employment above the natural rate. If the public has rational expectations, however, it will anticipate the central bank's actions, and producers will not be fooled, so that in equilibrium the economy

will suffer higher-than-optimal inflation with no benefits in terms of lower unemployment.[9]

If a story along these lines describes the actual situation in a given economy, then an inflation-targeting framework will not *directly* prevent the counterproductive attempts of the central bank to engage in excessive short-run stimulus. In this respect, inflation targeting is inferior to an ironclad rule, if such could be implemented. However, in contrast to the purely discretionary situation with no explicit targets, under inflation targeting the central bank would be forced to calculate and to publicize the implications of its short-run actions for expected inflation in the long run (and again, these projections would be subject to scrutiny and debate). To the extent that the central bank governors dislike admitting publicly that they are off track with respect to their long-run inflation targets, the existence of this framework would provide an additional incentive for the central bank to limit its short-run opportunism.

Although the theoretical literature typically posits the central bank as the entity who chooses to inflate opportunistically, we suspect that in most cases the executive and legislative branches of the government have the greater incentive to engage in such behavior, often because of approaching elections. Central bankers, in contrast, tend to view themselves as defenders of the currency. This view may be the result of intentional appointments of "tough" central bankers (for reasons described by Rogoff, 1985), or it may just be that self-selection and socialization act to make central bankers relatively hawkish on inflation. But in either case, the existence of longer-term inflation targets can prove a useful device by which the central bank can protect itself politically from overexpansionist pressures. In particular, by making explicit the long-run, as well as the short-run, implications of overexpansionist policies, the central bank may be better able to get the support it needs to resist such policies. Our impression is that the Bank of England, for example, has on occasion used numerical inflation targets in precisely this way.

Further Issues with Inflation Targeting

If viewed as a framework rather than as a rule, inflation targeting can confer some important advantages. It provides a nominal anchor for policy and the economy. By communicating the central bank's objectives and views, it increases the transparency of monetary policy. It has the potential to provide increased discipline and accountability for policymakers. Importantly, it may be able to achieve all this without entirely giving up the benefits of discretionary policies in the short run. These optimistic conclusions notwithstanding, important questions and controver-

[9] McCallum (1997) argues that the central bank can simply choose not to behave myopically, and the public's expectations will come to reflect this more farsighted behavior. He also points out, however, that to the extent time inconsistency is a problem, it will affect the government as well as the central bank; we agree, as we discuss below.

sies remain around inflation targeting, even when interpreted in the way that we prefer. Let us consider a few of these.

Which Inflation Measure? What Target Value?

A critical aspect of the design of an inflation-targeting regime is the definition of the price series to be used in the inflation target. The series needs to be considered accurate, timely and readily understood by the public, but may also need to allow for individual price shocks or one-time shifts that do not affect trend inflation, which is what monetary policy should influence. As Table 1 indicates, all inflation-targeting countries have chosen some variant of the consumer price index (CPI) as their target series. However, this choice is not typically the "headline" CPI figure, but an index that excludes some components or focuses on "core" inflation; clearly, it is incumbent on the central bank to explain its choice of index and to help the public understand its relation to the headline index.

In all inflation-targeting regimes, the inflation objective has been set at a low number, 4 percent or less. Is this the ideal range for the inflation target? Or would a somewhat higher range for inflation, which might involve lower initial output cost to attain, be acceptable?

Obtaining direct empirical confirmation of a link between inflation and economic performance is very difficult. Inflation is, after all, an endogenous variable; and so we rarely if ever see variation in inflation that is not associated with some third factor, such as supply shocks or political instability, which would plausibly affect other elements of economic performance as well.[10] As a result, economists' views on the subject have been based largely on prior arguments, intuition and indirect evidence. That conceded, it is nevertheless clear that the professional consensus, which at one time did not ascribe substantial costs to moderate inflation, has over the past few decades begun to take the costs of inflation more seriously. For example, Feldstein (1996) has emphasized the importance of inflation-induced inefficiencies, via the tax code, on capital formation. Fischer (1993) and others have provided some evidence that macroeconomic stability, including control of inflation, is an important precondition for economic growth. Shiller's (1996) opinion surveys of public attitudes about inflation, while confirming economists' suspicions that the public is confused about even the definition of inflation, also show that people believe inflation to be highly uneven in its distributional impacts and hence corrosive of the social compact. A strengthening preference for low inflation is quite visible in policy circles, perhaps most strikingly in the tough limits on inflation imposed by the Maastricht treaty on countries that want to join the European currency union.

Given the growing consensus that the long-term goal of monetary policy should be a low inflation rate, there remains the question of how low it should

[10] Studies that attempt to overcome these problems include Lebow, Roberts and Stockton (1992) and Barro (1995).

be. It seems clear that an inflation target of zero or near zero is not desirable, for several reasons. First, much recent research suggests that official CPI inflation rates tend to overstate the true rate of inflation, due to various problems such as substitution bias in the fixed-weight index and failure to account adequately for quality change. Studies for the United States have estimated this overstatement of inflation to be in the range of 0.5 to 2.0 percentage points per year.[11] Thus, as a practical matter, even if the central bank chooses to pursue a zero rate of true inflation, the target for the measured inflation rate should be greater than zero.

Putting aside measurement issues, there are other risks of setting the inflation target too low. In a much discussed recent article, Akerlof, Dickens and Perry (1996) point out that if nominal wages are rigid downward (a possibility that they argue is consistent with the evidence), then reductions in real wages can occur only through inflation in the general price level. Very low inflation therefore effectively reduces real-wage flexibility and hence may worsen the allocative efficiency of the labor market; indeed, the authors perform simulations suggesting that inflation rates near zero would permanently increase the natural rate of unemployment.[12] Another danger of setting the inflation target too low is that there is a greater chance that the economy will be tipped into deflation, with the true price level actually falling—as may have happened during the recent recession in Japan. As pointed out in the literature on financial crises, persistent deflation—particularly if unanticipated—can create serious problems for the financial system, interfering with its normal functioning and precipitating an economic contraction (Bernanke and James, 1991; Mishkin, 1991).

These risks suggest that the inflation target, even when corrected for measurement error, should be set above zero, as has been the practice of all inflation-targeting countries to date. Indeed, a potentially important advantage of inflation targeting is that it provides not only a ceiling for the inflation rate, but also a floor. Inflation targeting thus acts to attenuate the effects of negative, as well as positive, shocks to aggregate demand. An interesting historical example is that of Sweden in the 1930s, which adopted a "norm of price stabilization" after leaving the gold standard in 1931. As a result, Sweden did not undergo the devastating deflation experienced by other countries during the Great Depression (Jonung, 1979).

[11] This bias was the subject of an official report to the Senate Finance Committee, the so-called Boskin report (Boskin et al., 1996). See also Moulton (1996) and Shapiro and Wilcox (1997).

[12] The force of this argument should not be overstated. First, the inflation rates which Akerlof, Dickens and Perry (1996) argue would significantly affect the natural rate of unemployment are really quite low, for example, measured rates (as opposed to "true" rates) of inflation of 2 percent per annum or less. Second, their simulation studies do not take into account forces that may work in the opposite direction: for example, Groshen and Schweitzer (1996) point out that high and variable inflation rates may increase the "noise" in relative wages, reducing the efficiency of the process by which workers are allocated across industries and occupations; thus higher inflation can represent sand as well as grease in the wheels of the labor market.

Is Inflation Sufficiently Predictable and Controllable to be "Targeted"?

It has been noted by several authors that inflation is very difficult to predict accurately, particularly at both very short and very long horizons (Cecchetti, 1995). This lack of predictability poses two important problems for the inflation targeting strategy. The first is strictly operational: given the long lags between monetary policy actions and the inflation response, low predictability suggests that accurate targeting of inflation could be extremely difficult. The second issue has to do with the central bank's credibility: if inflation is largely unpredictable, and hence not finely controllable, then it will be difficult to judge whether the central bank has made its best effort to hit the inflation targets. For example, the central bank could always argue that wide misses were the result of bad luck, not bad faith; since central bank forecasts of inflation contain substantial judgmental components, such claims would be difficult to disprove. This possible escape hatch for the central bank weakens the argument that inflation targeting increases accountability of monetary policy and suggests that building up credibility for its inflation-targeting framework could be a long and arduous process.

While we agree that inflation targeting is less effective, the less predictable or controllable is the inflation rate, several observations should be made. First, statistical measures of predictability are themselves likely to be sensitive to the monetary policy regime in place. Inflation was no doubt difficult to predict during the 1970s, when monetary policymakers tried to deal with oil price shocks and other stagflationary pressures without a coherent, clearly articulated framework. In contrast, the stability of the inflation rate in the United States and other industrialized countries since the mid-1980s, a period during which the maintenance of low and steady inflation has received much greater weight in central bank decision making, suggests that inflation will be easier to predict in the future.

Second, the relative unpredictability of goal variables is not in itself an argument for the use of intermediate targets in the conduct of monetary policy. As Svensson (1997a) points out, from an optimal control perspective, the best possible intermediate target is the current forecast of the goal variable itself—in this context, inflation. Using an intermediate target such as money growth is acceptable in an optimal control framework only if the intermediate target contains all information relevant to forecasting the goal variable; in this extreme case, using the intermediate target is equivalent to targeting the forecast of the goal variable. However, if any variable other than the intermediate target contains marginal information about the future values of the goal variable, then targeting the inflation forecast strictly dominates using any single intermediate target. Thus, from a strictly operational point of view, while it is unfortunate if the goal variable is hard to predict or to control, no improvement is available by using an intermediate target.[13]

[13] In characterizing the forecast of inflation as the intermediate target, Svensson (1997a) is careful to define "forecast" to mean the forecast derived internally by the central bank using its structural model of the economy. An intriguing alternative would be to try to "target" private-sector forecasts of inflation, that is, set short-run policy instruments so that private-sector forecasts of inflation equal the announced

When the credibility of the central bank is at issue, the problem of whether to target inflation directly or to rely on an intermediate target becomes more complex. By Svensson's argument, use of the intermediate target must increase the variance of the goal variable, which is a cost of the intermediate targeting approach; the benefit, however, is that by hitting its announced target for the intermediate variable, the central bank can demonstrate the seriousness of its intentions to the public more quickly and reliably (Cukierman, 1995; Laubach, 1996). If credibility building is an important objective of the central bank, and if there exists an intermediate target variable—such as a monetary aggregate—that is well controlled by the central bank, observed and understood by the public and the financial markets, and strongly and reliably related to the ultimate goal variable, then targeting the intermediate variable may be the preferred strategy. All of these are big "ifs," particularly the last one. However, this analysis may help to explain the continued use of money-growth targets by Germany and Switzerland, where financial institutions and hence velocity have evolved rather slowly, while countries such as the United Kingdom, with a history of unstable velocity, have opted for targeting inflation directly.

Is Inflation the Right Goal Variable for Monetary Policy?

The consensus that monetary policy is neutral in the long run restricts the set of feasible long-run goal variables for monetary policy, but inflation is not the only possibility. Notably, a number of economists have proposed that central banks should target the growth rate of nominal GDP rather than inflation (Taylor, 1985; Hall and Mankiw, 1994). Nominal GDP growth, which can be thought of as "velocity-corrected" money growth (that is, if velocity were constant, nominal GDP growth and money growth would be equal, by definition), has the advantage that it does put some weight on output as well as prices. Under a nominal GDP target, a decline in projected real output growth would automatically imply an increase in the central bank's inflation target, which would tend to be stabilizing.[14] Also, Cecchetti (1995) has presented simulations that suggest that policies directed to stabilizing nominal GDP growth may be more likely to produce good economic outcomes, given the difficulty of predicting and controlling inflation.

Nominal GDP targeting is a reasonable alternative to inflation targeting, and one that is generally consistent with the overall strategy for monetary policy discussed in this article. However, we have three reasons for mildly preferring

target. Unfortunately, as shown by Woodford (1994) and Bernanke and Woodford (1996), such a policy is usually not consistent with the existence of a unique rational expectations equilibrium. However, Bernanke and Woodford also show that, while targeting private-sector forecasts is not a good idea, private-sector forecasts can typically be combined with the central bank's own information to improve the efficiency of its operating procedure. Further, private-sector forecasts that the public observes to be close to the central bank's official targets may help to provide some validation of the bank's internal procedures for forecasting and controlling inflation.

[14] Hall and Mankiw (1994) point out, however, that the equal weighting of real output growth and inflation implied by a nominal GDP targeting is not necessarily the optimal one; in general, the relative weight put on the two goal variables should reflect social preferences.

inflation targets to nominal GDP targets. First, information on prices is more timely and frequently received than data on nominal GDP (and could be made even more so), a practical consideration that offsets some of the theoretical appeal of the nominal GDP target. Although collection of data on nominal GDP could also be improved, measurement of nominal GDP involves data on current quantities as well as current prices and thus is probably intrinsically more difficult to accomplish in a timely fashion. Second, given the various escape clauses and provisions for short-run flexibility built into the inflation-targeting approach, we doubt that there is much practical difference in the degree to which inflation targeting and nominal GDP targeting would allow accommodation of short-run stabilization objectives. Finally, and perhaps most important, it seems likely that the concept of inflation is better understood by the public than is the concept of nominal GDP, which could easily be confused with real GDP. If this is so, the objectives of communication and transparency would be better served by the use of an inflation target. As a matter of revealed preference, all central banks that have thus far adopted this general framework have chosen to target inflation rather than nominal GDP.

If It's Not Broke, Why Fix It?

Friedman and Kuttner (1996) decry the tendency of economists to want to impose restrictions and rules on central bank policymaking. They survey the problems with policy rules in the past, notably the failure of money-growth targeting to become a reliable policy framework in the United States, and they correctly point out that U.S. monetary policy has performed quite well in the recent past without the benefit of a formal rule or framework. Why, they ask, should we change something that is working well, especially given our inability to know what types of challenges will confront monetary policy in the future?

We would respond that a major reason for the success of the Volcker-Greenspan Fed is that it has employed a policymaking philosophy, or framework, which is de facto very similar to inflation targeting. In particular, the Fed has expressed a strong policy preference for low, steady inflation, and debates about short-run stabilization policies have prominently featured consideration of the long-term inflation implications of current Fed actions.

To take the next step and to formalize this framework would have several advantages. It would increase the transparency of the Fed's decision-making process, allowing more public debate and discussion of the Fed's strategy and tactics and, perhaps, reducing the financial and economic uncertainty associated with the Fed's current procedures. It would create an institutional commitment to the current approach that would be less dependent on a single individual's philosophy and might thus be expected to survive when, inevitably, new leadership takes over at the Fed. Finally, inflation targeting will be easiest to implement in a situation, like the current one, in which inflation is already low and the basic approach has been made familiar to the public and the markets. By adopting this approach now when it is relatively easy politically, we could ensure that the new procedures will

be in place to provide guidance when the next difficult decisions about monetary policy have to be made.

Conclusion

It is too early to offer a final judgment on whether inflation targeting will prove to be a fad or a trend. However, our preliminary assessment is that this approach—when construed as a framework for making monetary policy, rather than as a rigid rule—has a number of advantages, including more transparent and coherent policymaking, increased accountability, and greater attention to long-run considerations in day-to-day policy debates and decisions.

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