

Part I. The Rationale for Inflation Targeting

The decision to organize a country's monetary strategy around the direct targeting of inflation rests upon a number of economic arguments about what monetary policy can and cannot do. Over the last twenty years, a consensus has been emerging in the economics profession that activist monetary policy to stimulate output and reduce unemployment beyond their sustainable levels leads to higher inflation but not to persistently lower unemployment or higher output. Thus, the commitment to price stability as the primary goal for monetary policy has been spreading throughout the world. Along with actual events, four intellectual developments have led the economics profession to this consensus.

WHY PRICE STABILITY?

The first intellectual development challenging the use of an activist monetary policy to stimulate output and reduce unemployment is the finding, most forcefully articulated by Milton Friedman, that the effects of monetary policy have long and variable lags.¹ The uncertainty of the timing and the size of monetary policy effects makes it very possible that attempts to stabilize output fluctuations may not have the desired results. In fact, activist monetary policy can at times be counterproductive, pushing the economy further away from equilibrium, particularly when the stance of monetary policy is unclear to the public and even to policymakers. This lack of clarity makes it very difficult for policymakers to successfully design policy to reduce output and unemployment fluctuations.²

The second development is the general acceptance of the view that there is no long-run trade-off between inflation and unemployment.³ The so-called Phillips curve

relationship illustrates the empirical regularity that a lower unemployment rate or higher output can be achieved in the short run by expansionary policy that leads to higher inflation. As prices rise, households and businesses spend and produce more because they temporarily believe themselves to be better off as a result of higher nominal wages and profits, or because they perceive that demand in the economy is growing. In the long run, however, the rise in output or decline in unemployment cannot persist because of capacity constraints in the economy, while the rise in inflation can persist because it becomes embedded in price expectations. Thus, over the long run, attempts to exploit the short-run Phillips curve trade-off only result in higher inflation, but have no benefit for real economic activity.

The third intellectual development calling into question the use of an activist monetary policy to stimulate output and reduce unemployment is commonly referred to as the *time-inconsistency problem* of monetary policy.⁴ The time-inconsistency problem stems from the view that wage- and price-setting behavior is influenced by expectations of future monetary policy. A frequent starting point for discussing policy decisions is to assume that private sector expectations are given at the time policy is made. With expectations fixed, policymakers know they can boost economic output (or lower unemployment) by pursuing monetary policy that is more expansionary than expected. As a result, policymakers who have a stronger interest in output than in inflation performance will try to produce monetary policy that is more expansionary than expected. However, because workers and firms make decisions about wages and prices on the basis of their expectations about policy, they will recognize the policymakers'

incentive for expansionary monetary policy and so will raise their expectations of inflation. As a result, wages and prices will rise.

The outcome, in these time-inconsistency models, is that policymakers are actually unable to fool workers and firms, so that on average output will not be higher under such a strategy; unfortunately, however, inflation will be. The time-inconsistency problem suggests that a central bank actively pursuing output goals may end up with a bias to high inflation with no gains in output. Consequently, even though the central bank believes itself to be operating in an optimal manner, it ends up with a sub-optimal outcome.

McCallum (1995b) points out that the time-inconsistency problem by itself does not imply that a central bank will pursue expansionary monetary policy that leads to inflation. Simply by recognizing the problem that forward-looking expectations in the wage- and price-setting process create for a strategy of pursuing unexpectedly expansionary monetary policy, central banks can decide not to play that game. Nonetheless, the time-inconsistency literature points out both why there will be pressures on central banks to pursue overly expansionary monetary policy and why central banks whose commitment to price stability is in doubt can experience higher inflation.

A fourth intellectual development challenging the use of an activist monetary policy to stimulate output and reduce unemployment unduly is the recognition that price stability promotes an economic system that functions more efficiently and so raises living standards. If price stability does not persist—that is, inflation occurs—the society suffers several economic costs. While these costs tend to be much larger in economies with high rates of inflation (usually defined to be inflation in excess of 30 percent a year), recent work shows that substantial costs arise even at low rates of inflation.

The cost that first received the attention of economists is the so-called shoe leather cost of inflation—the cost of economizing on the use of non-interest-bearing money (see Bailey [1956]). The history of prewar central Europe makes us all too familiar with the difficulties of requiring vast and ever-rising quantities of cash to conduct daily

transactions. Unfortunately, hyperinflations have occurred in emerging market countries within the last decade as well. Given conventional estimates of the interest elasticity of money and the real interest rate when inflation is zero, this cost is quite low for inflation rates less than 10 percent, remaining below 0.10 percent of GDP. Only when inflation rises to above 100 percent do these costs become appreciable, climbing above 1 percent of GDP (Fischer 1981).

Another cost of inflation related to the additional need for transactions is the overinvestment in the financial sector induced by inflation. At the margin, opportunities to make profits by acting as a middleman on normal transactions, rather than investing in productive activities, increase with instability in prices. A number of estimates put the rise in the financial sector share of GDP on the order of 1 percentage point for every 10 percentage points of inflation up to an inflation rate of 100 percent (English 1996). The transfer of resources out of productive uses elsewhere in the economy can be as large as a few percentage points of GDP and can even be seen at relatively low or moderate rates of inflation.

The difficulties caused by inflation can also extend to decisions about future expenditures. Higher inflation increases uncertainty about both relative prices and the future price level, which makes it harder to arrive at the appropriate production decisions. For example, in labor markets, Groshen and Schweitzer (1996) calculate that the loss of output due to inflation of 10 percent (compared with a level of 2 percent) is 2 percent of GDP. More broadly, the uncertainty about relative prices induced by inflation can distort the entire pricing mechanism. Under inflationary conditions, the risk premia demanded on savings and the frequency with which prices are changed increase. Inflation also alters the relative attractiveness of real versus nominal assets for investment and short-term versus long-term contracting.⁵

The most obvious costs of inflation at low to moderate levels seem to come from the interaction of the tax system with inflation. Because tax systems are rarely indexed for inflation, an increase in inflation substantially raises the cost of capital, causing investment to drop below its optimal level. In addition, higher taxation, which

results from inflation, causes a misallocation of capital to different sectors, which in turn distorts the labor supply and leads to inappropriate corporate financing decisions. Fischer (1994) calculates that the social costs from the tax-related distortions of inflation amount to 2 to 3 percent of GDP at an inflation rate of 10 percent. In a recent paper, Feldstein (1997) estimates this cost to be even higher: he calculates the cost of an inflation rate of 2 percent rather than zero to be 1 percent of GDP.

The costs of inflation outlined here decrease the level of resources productively employed in an economy, and thereby the base from which the economy can grow. Mounting evidence from econometric studies shows that, at high levels, inflation also decreases the rate of growth of economies. While time series studies of individual countries over long periods and cross-national comparisons of growth rates are not in total agreement, the consensus is that, on average, a 1 percent rise in inflation can cost an economy 0.1 to 0.5 percentage points in its rate of growth (Fischer 1993). This result varies greatly with the level of inflation—the effects are usually thought to be much greater at higher levels.⁶ However, a recent study has presented evidence that the inflation variability usually associated with higher inflation has a significant negative effect on growth even at low levels of inflation, in addition to and distinct from the direct effect of inflation itself.⁷

The four lines of argument outlined here lead the vast majority of central bankers and academic monetary economists to the view that price stability should be the primary long-term goal for monetary policy.⁸ Furthermore, to avoid the tendency to an inflationary bias produced by the time-inconsistency problem (or uncertainty about monetary policy goals more generally), monetary policy strategy often relies upon a nominal anchor to serve as a target that ties the central bank's hands so it cannot pursue (or be pressured into pursuing) a strategy of raising output with unexpectedly expansionary monetary policy. As we will see, this anchor need not preclude clearly delineated short-term reactions to financial or significant output shocks in order to function as a constraint on inflationary policy over the long term. A number of potential nominal anchors for monetary strategy can serve as targets.

CHOICE OF TARGETS

One nominal anchor used by almost all central banks at one time or another is a target growth path for a monetary aggregate such as the monetary base or M1, M2, or M3. If velocity is either relatively constant or predictable, a growth target of a monetary aggregate can keep nominal income on a steady growth path that leads to long-term price stability. In such an environment, choosing a monetary aggregate as a nominal anchor has several advantages. First, some monetary aggregates, the narrower the better, can be controlled both quickly and easily by the central bank. Second, monetary aggregates can be measured quite accurately with short lags (in the case of the United States, for example, measures of the monetary aggregates appear within two weeks). Third, as pointed out in Bernanke and Mishkin (1992), because an aggregate is known so quickly, using it as a nominal anchor greatly increases the transparency of monetary policy, which can have important benefits. A monetary aggregate sends almost immediate signals to both the public and the markets about the stance of monetary policy and the intentions of policymakers, thereby helping to fix inflation expectations. In addition, the transparency of a monetary aggregate target makes the central bank more accountable to the public to keep inflation low, which can help reduce pressures on the central bank to pursue expansionary monetary policy.

Although the targeting of monetary aggregates has many important advantages in principle, in practice these advantages come about only if the monetary aggregates have a highly predictable relationship with nominal income. Unfortunately, in many countries, velocity fluctuations have been so large and frequent in the last fifteen years that the relationships between monetary aggregates and goal variables have broken down. Some observers have gone so far as to argue that attempts to exploit these relationships have been a cause of their breakdown. As a result, the use of monetary aggregate targets as a nominal anchor has become highly problematic, and many countries that adopted monetary targets in the 1970s abandoned them in the 1980s. Not surprisingly, many policymakers have been looking for alternative nominal anchors.

Another frequently used nominal anchor entails fixing the value of the domestic currency relative to that of a low-inflation country, say Germany or the United States, or, alternatively, putting the value of the domestic currency on a predetermined path vis-à-vis the foreign currency in a variant of this fixed exchange rate regime known as a crawling peg. The exchange rate anchor has the advantage of avoiding the time-inconsistency problem by precommitting a country's central bank so that it cannot pursue an overly expansionary monetary policy that would lead to a devaluation of the exchange rate. In addition, an exchange rate anchor helps reduce expectations that inflation will approach that of the country to which its currency is pegged. Perhaps most important, an exchange rate anchor is a monetary policy strategy that is easily understood by the public.

As forcefully argued in Obstfeld and Rogoff (1995), however, a fixed exchange rate regime is not without its costs and limitations. With a fixed exchange rate regime, a country no longer exercises control over its own monetary policy. Not only is the country unable to use monetary policy to respond to domestic shocks, but it is also vulnerable to shocks emanating from the country to which its currency is pegged. Furthermore, in the current environment of open, global capital markets, fixed exchange rate regimes are subject to breakdowns that may entail sharp changes in exchange rates. Such developments can be very disruptive to a country's economy, as recent events in Mexico have demonstrated. Defending the domestic currency when it is under pressure may require substantial increases in interest rates that directly cause a contraction in consumer and investment spending, and the contraction in turn may lead to a recession. In addition, as pointed out in Mishkin (1996), a sharp depreciation of the domestic currency can produce a full-scale banking and financial crisis that can tip a country's economy into a severe depression.

An inflation target (or its variant, a price-level target) clearly provides a nominal anchor for the path of the price level, and, like a fixed exchange rate anchor, has the important advantage of being easily understood by the public. The resulting transparency increases the potential for promoting low inflation expectations, which helps to

produce a desirable inflation outcome. Also, like a fixed exchange rate or a monetary targeting strategy, inflation targeting reduces the pressure on the monetary authorities to pursue short-run output gains that would lead to the time-inconsistency problem. An inflation-targeting strategy also avoids several of the problems arising from monetary targeting or fixed exchange rate strategies. For example, in contrast to a fixed exchange rate system, inflation targeting can preserve a country's independent monetary policy so that the monetary authorities can cope with domestic shocks and help insulate the domestic economy from foreign shocks. In addition, inflation targeting can avoid the problem presented by velocity shocks because it eliminates the need to focus on the link between a monetary aggregate and nominal income; instead, all relevant information may be brought to bear on forecasting inflation and choosing a policy response to achieve a desirable inflation outcome.

Inflation targeting does have some disadvantages. Because of the uncertain effects of monetary policy on inflation, monetary authorities cannot easily control inflation. Thus, it is far harder for policymakers to hit an inflation target with precision than it is for them to fix the exchange rate or achieve a monetary aggregate target. Furthermore, because the lags of the effect of monetary policy on inflation are very long—typical estimates are in excess of two years in industrialized countries—much time must pass before a country can evaluate the success of monetary policy in achieving its inflation target. This problem does not arise with either a fixed exchange rate regime or a monetary aggregate target.

Another potential disadvantage of an inflation target is that it may be taken literally as a rule that precludes any concern with output stabilization. As we will see in the cases later in our study, this has not occurred in practice. An inflation target, if rigidly interpreted, might lead to greater output variability, although it could lead to tighter control over the inflation rate. For example, a negative supply shock that raises the inflation rate and lowers output would induce a tightening of monetary policy to achieve a rigidly enforced inflation target. The result, however, would add insult to injury because output would decline even further. By contrast, in the absence of velocity

shocks, a monetary aggregate target is equivalent to a target for nominal income growth, which is the sum of real output growth and inflation. Because the negative supply shock reduces real output as well as raises the price level, its effect on nominal income growth would be less than on inflation, thus requiring less tightening of monetary policy.

The potential disadvantage of an inflation-targeting regime that ignores output stabilization has led some economists to advocate the use of a nominal income growth target instead (for example, see McCallum [1995a] and Taylor [1995]). A nominal income growth target shares many characteristics with an inflation target; it also has many of the same advantages and disadvantages. On the positive side, it avoids the problems of velocity shocks and the time-inconsistency problem and allows a country to maintain an independent monetary policy. On the negative side, nominal income is not easily controllable by the monetary authorities, and much time must pass before assessment of monetary policy's success in achieving the nominal income target is possible. Still, a nominal growth target is advantageous in that it explicitly includes some weight on a real output objective and thus may lead to smaller fluctuations in real output.⁹

Nonetheless, nominal income targets have two very important disadvantages relative to inflation targets. First, a nominal GDP target forces the central bank or the government to announce a number for potential GDP

growth. Such an announcement is highly problematic because estimates of potential GDP growth are far from precise and they change over time. Announcing a specific number for potential GDP growth may thus indicate a certainty that policymakers may not have and may also cause the public to mistakenly believe that this estimate is actually a fixed target. Announcing a potential GDP growth number is, therefore, likely to create an extra layer of political complication—it opens policymakers to the criticism that they are willing to settle for growth rates that are too low. Indeed, it may lead to the accusation that the central bank or the targeting regime is antigrowth, when the opposite is true—that is, a low inflation rate is a means to promote a healthy economy that can experience high growth. In addition, if the estimate for potential GDP growth is too high and it becomes embedded in the public mind as a target, the classic time-inconsistency problem—and a positive inflation bias—will arise.

The second disadvantage of a nominal GDP target relative to an inflation target is that the concept of nominal GDP is not readily understood by the public, thus making it less transparent than an inflation target. No one speaks of “headline nominal GDP growth” when discussing labor contracts. In addition, because nominal and real GDP can be easily confused, a nominal GDP target may lead the public to believe that a central bank is targeting real GDP growth, with the attendant problems mentioned above.

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