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# FRBSF WEEKLY LETTER

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## Monetary Policy in a Low Inflation Regime

*This Weekly Letter is adapted from the discussion at the Conference on Monetary Policy in a Low Inflation Regime held on March 4 and 5, 1994. The conference was jointly sponsored by the Center for Economic Policy Research at Stanford University and the Federal Reserve Bank of San Francisco.*

Over the last few years, the Federal Reserve System has pursued a policy of gradual disinflation, with a goal of eventually achieving "price stability." The rationale for this policy is a belief that inflation is costly, even at moderate rates. For example, inflation increases uncertainty about long-term financial plans and encourages individuals to economize unnecessarily on the use of money. Lasting price stability would benefit society by reducing these inefficiencies.

On the other hand, achieving price stability may be costly. A commitment to price stability may entail a loss of flexibility in conducting countercyclical policy. And the transition to price stability may be costly if the public doubts that it is in the central bank's best interests to see it through. Finding ways to increase the credibility of a zero-inflation policy would reduce the transitional costs.

This *Letter* reviews some recent research on the costs and benefits of reducing inflation (see the list of Conference Papers below). Before proceeding, it is worth clarifying a semantic point. When we speak of price stability, we do not mean a constant value for an index like the CPI. Price indices measure the price level with error, and it is widely believed that these errors impart an upward bias to measured inflation rates. Although the precise magnitude of this bias is unknown, William Poole suggests that measured inflation of up to 2 percent might be consistent with price stability. Since CPI inflation is currently around 3 percent, the relevant policy question is whether to reduce it to 1 or 2 percent.

### **Benefits of price stability**

Money facilitates exchange and therefore frees up resources for other uses. Anticipated inflation operates like a tax on money, because the real value of money falls as prices rise, and thus encourages individuals to economize on its use. In high-inflation economies, individuals devote a substantial amount of time to managing their money, and the financial sector employs many talented people to help. Thus anticipated inflation imposes a cost on society by drawing resources into the financial sector and away from other productive activities.

Robert Lucas's paper argues that this cost may be substantial. His estimates suggest that reducing inflation from 5 percent to zero would yield an annual benefit of roughly 0.25 to 0.5 percent of GDP. Since U.S. GDP is approximately \$6 trillion, the current "zero inflation dividend" would amount to roughly \$15 to \$30 billion.

Lucas also argues that driving the inflation rate below zero may yield further significant dividends. The optimal inflation rate, according to Milton Friedman, is the one that minimizes the opportunity cost of holding money. If money pays no interest, this occurs when the nominal interest rate is zero. Many economists believe that the annual dividend earned by going from zero inflation to Friedman's optimal rate would be very small, but Lucas estimates that this would yield an annual dividend of roughly \$36 billion.

In one respect, Lucas's estimates may be too high. His calculations are predicated on the assumption that money pays no interest. If money did pay interest, the costs of steady inflation would be substantially reduced, because interest payments would reduce the opportunity cost of holding money for any given inflation rate and thus mitigate the effects of the inflation tax. Since most M1 instruments pay explicit or implicit interest, evidence based on M1 may overstate the costs of steady inflation.

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In another respect, Lucas's estimates may understate the costs of steady inflation. While his model implies that inflation permanently lowers the level of output, it also implies that inflation has no long-run effect on its growth rate. But if inflation draws resources out of the research sector as well as the goods sector, it may adversely affect the pace of technical progress and reduce the economy's long-run growth rate as well. Technical progress is an important engine of growth, but it does not rain down like manna from heaven. An economy is likely to grow more slowly if talented individuals devote their energy to money management rather than to developing new goods or more productive ways to produce existing goods.

Brian Motley attempts to quantify the effect of inflation on long-run growth by examining statistical evidence from a cross section of countries, and he finds that high-inflation countries do tend to grow more slowly. For example, for OECD countries, his results suggest that reducing inflation from 10 to 5 percent would increase steady state output growth by 0.5 to 0.75 percentage points, although the effect would be smaller in the medium term. Since the increase in growth would accumulate year after year, it would ultimately yield huge increases in the level of income. For example, if the baseline growth rate were 2 percent, the steady state level of income would increase by 11 to 16 percent after 20 years and by 22 to 35 percent after 40 years. On the other hand, Motley finds that in advanced countries the growth effects associated with disinflation below 5 percent are rather small. For OECD countries, his estimates suggest that reducing inflation from 5 percent to zero would have a negligible effect on long-run growth.

Motley's results are subject to two caveats. First, as in any statistical research, it is difficult to interpret correlation in terms of causation. For example, a negative relation between growth and inflation could also result from adverse aggregate supply shocks. Second, his estimates are on the high end of the empirical range. Other researchers have had difficulty finding growth effects of this magnitude. Of course, since financial services add to measured GDP, an increase in financial activity might offset adverse effects on non-financial activity, thus making it difficult to detect the effect of inflation on GDP growth.

Finally, while Lucas and Motley both concentrate on the costs of anticipated inflation, many econ-

omists believe that unexpected inflation is far more costly because it increases uncertainty about long-term financial plans. Unexpected inflation randomly redistributes wealth between borrowers and lenders. Furthermore, there is a positive relation between the level and variability of inflation, so high-inflation economies also tend to be subject to greater inflation uncertainty. While the causal mechanism underlying this relation is not well understood, there is a common belief among economists that a commitment to price stability would reduce the degree of inflation uncertainty. The most important benefit of price stability may be that it would facilitate long-term financial planning.

The effects of inflation uncertainty could also be mitigated if investors were able to trade securities whose interest and principal were indexed to inflation. For example, Chairman Greenspan has proposed that the Treasury issue indexed bonds. Robert Shiller has proposed that private markets be established to trade derivative securities that would provide insurance against inflation risk. According to Shiller's plan, individuals seeking to reduce their exposure to inflation risk would purchase a security whose dividend is proportional to the realized value of some price index. If inflation turned out to be higher than expected, their insurance dividend would also be higher than expected, and this gain would partially offset losses on nominal assets. On the other side of the market, an investor would agree to pay these dividends, and thus bear the inflation risk, in exchange for some payment. The same principle could also be applied to create derivative securities that would hedge occupational, regional, or national income risks.

While these proposals are attractive in principle, they do not yet represent a practical alternative to price stability, since the proposed hedging instruments do not currently trade in the United States.

### **Transitional costs of disinflation**

The transition to price stability is likely to be costly because it may involve a period of slower growth and higher unemployment. The magnitude of the transitional cost depends on the extent to which the central bank can influence inflationary expectations. Disinflation is more costly when it comes as a surprise. If workers and firms expect high inflation, they will strike nominal wage bargains that reflect those forecasts. Then, if inflation turns out to be lower than

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expected, real wages will be too high, and unemployment will rise. On the other hand, if workers and firms expect inflation to fall, they will incorporate those forecasts into their nominal wage bargains, and the central bank may be able to reduce inflation without increasing unemployment. Thus the transitional costs of disinflation can be reduced if the central bank can reduce inflationary expectations.

However, the central bank cannot reduce inflationary expectations merely by promising to reduce inflation. The public must also believe that it is in the central bank's best interest to carry out its promise. Guy Debelle and Stanley Fischer point out that the relations between the government and the central bank are an important ingredient in achieving credibility. They argue that granting central banks the power to set policy goals is not sufficient, and may even be counterproductive. For example, the Russian central bank is independent and yet has chosen a hyperinflationary policy. The government can more effectively enhance the central bank's credibility by providing it with a clear mandate about the goals of monetary policy, by granting it the independence to choose how to achieve those goals, and by making it accountable for its performance. If the government rewards the central bank for achieving and maintaining price stability, then price setters will understand that it is in the central bank's best interests to reduce inflation and to keep it low, and this may reduce the transitional costs of disinflation.

### Costs of price stability

Another potential drawback to price stability is that the central bank may lose some flexibility in conducting stabilization policy. With a positive average inflation rate, the central bank can respond aggressively to adverse aggregate demand shocks by driving short-term nominal interest rates below the expected inflation rate, thus making short-term real interest rates negative and giving the economy a sharp countercyclical stimulus. In a zero-inflation regime, short-term nominal interest rates would already be low, thus limiting the extent to which the central bank could reduce short-term real interest rates. In principle, this may limit the central bank's ability to respond to contractionary aggregate demand shocks.

Jeffrey Fuhrer and Brian Madigan investigate whether this constraint is likely to be important

in practice. In the context of a sticky price rational expectations model, they show that the central bank retains enough leverage over short-term real interest rates to cushion the economy against most adverse demand shocks. However, when adverse demand shocks are large and are expected to persist a few quarters, the zero bound on nominal interest rates may prevent the central bank from easing as aggressively as it would in a moderate inflation regime. If large, persistent contractions in aggregate demand occur frequently, then the zero bound on nominal interest rates would be an important constraint on stabilization policy. If not, then this constraint would have little practical importance.

### Conclusion

There was a broad consensus among the conference participants that a return to inflation rates of 5 to 10 percent would be undesirable, but there was less consensus on whether further disinflation is desirable. Proponents of disinflation argue that inflation is costly even at low rates, primarily because it generates uncertainty about long-term financial plans. Opponents of disinflation emphasize that it may have large transitional costs. Policymakers do not have the luxury of waiting for a definitive resolution of this debate and therefore must choose a course of action based on ambiguous scientific evidence.

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### Conference Papers

Debelle, Guy, and Stanley Fischer. 1994. "How Independent Should a Central Bank Be?" Mimeo. MIT.

Fuhrer, Jeffrey, and Brian Madigan. 1994. "Monetary Policy when Interest Rates Are Bounded at Zero." Mimeo. Board of Governors of the Federal Reserve System.

Lucas, Robert E., Jr. 1994. "On the Welfare Costs of Inflation." Mimeo. University of Chicago.

Motley, Brian. 1994. "Growth and Inflation: A Cross Country Study." Mimeo. Federal Reserve Bank of San Francisco.

Poole, William. 1994. "When Is Inflation Low?" Mimeo. Brown University.

Shiller, Robert. 1994. "Hedging Macroeconomic and Inflation Risks." Mimeo. Yale University.

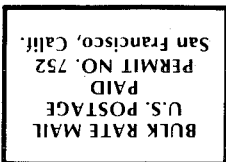
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