MONETARY POLICY COMES OF AGE

A 20th Century Odyssey

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In the early 1960s the Federal Reserve (Fed) was little known outside of the financial services industry and university economics departments. Twenty years later Fed Chairman Paul Volcker was one of the most recognized names in American public life. And now hardly a week goes by when the Fed is not featured prominently in the business news. The Fed was thrust into the limelight in the intervening years when the public came to associate it with inflation-fighting policy actions that raised interest rates and weakened economic activity. Even though inflation has been held in check since the mid-1980s, the public remains acutely aware of Fed policy today.

Monetary economists and central bankers alike now understand that effective monetary policy must be built on a consistent commitment to low inflation. That is why in recent years the Fed has made low inflation a particularly high priority. The large fraction of the public having first-hand experience with high inflation naturally supports the view that inflation must be contained. As the collective memory of inflation fades, however, public support for low inflation will become increasingly difficult to sustain. A permanent national commitment to price stability requires that citizens personally unfamiliar with the trauma of high inflation understand the rationale for price stability and the tactical policy actions needed to maintain it.

This article reviews the history of U.S. monetary policy in the 20th century with the aim of providing that understanding. It identifies mistakes that led to high and volatile inflation, lessons learned from the experience, and principles applied in the pursuit of low inflation today. U.S. monetary policy came of age in the 20th century in the sense that the country left the strict rules of the gold standard for the freedom of an inconvertible paper standard, which the Fed only slowly and painfully learned to manage. What follows is the story of that 20th century odyssey.

Section 1 discusses monetary policy under the gold standard and the founding of the Fed. Section 2 outlines the main conceptual obstacles that had to be overcome in order to manage monetary policy under a paper standard. The causes and disruptive consequences of inflationary policy at mid-century are discussed in Section 3.

Certain key theoretical and practical developments paved the way for the Fed to take responsibility for controlling inflation in the early 1980s. Section 4 covers these developments. Progress in the theory of the demand for and the supply of money as well as empirical evidence supporting the theory played key roles here. The failure of nonmonetary approaches to controlling inflation was also important. The recognition that a credible Fed commitment to price stability could minimize the unemployment cost of achieving low inflation also played a role.

Section 5 recommends that the Fed be given a legislative mandate for low inflation. The case is based on hard lessons learned in the inflationary 1960s, '70s, and early '80s, and on the principles that have been applied successfully to maintain low inflation since then. The closing section summarizes the monetary policy lessons learned on the 20th century odyssey.

The author is senior vice president and director of research. It should be emphasized that the views expressed are the author's alone and not necessarily those of the Federal Reserve System.

THE UNITED STATES OF
ONE DOLLAR

1 MONETARY POLICY UNDER THE GOLD STANDARD

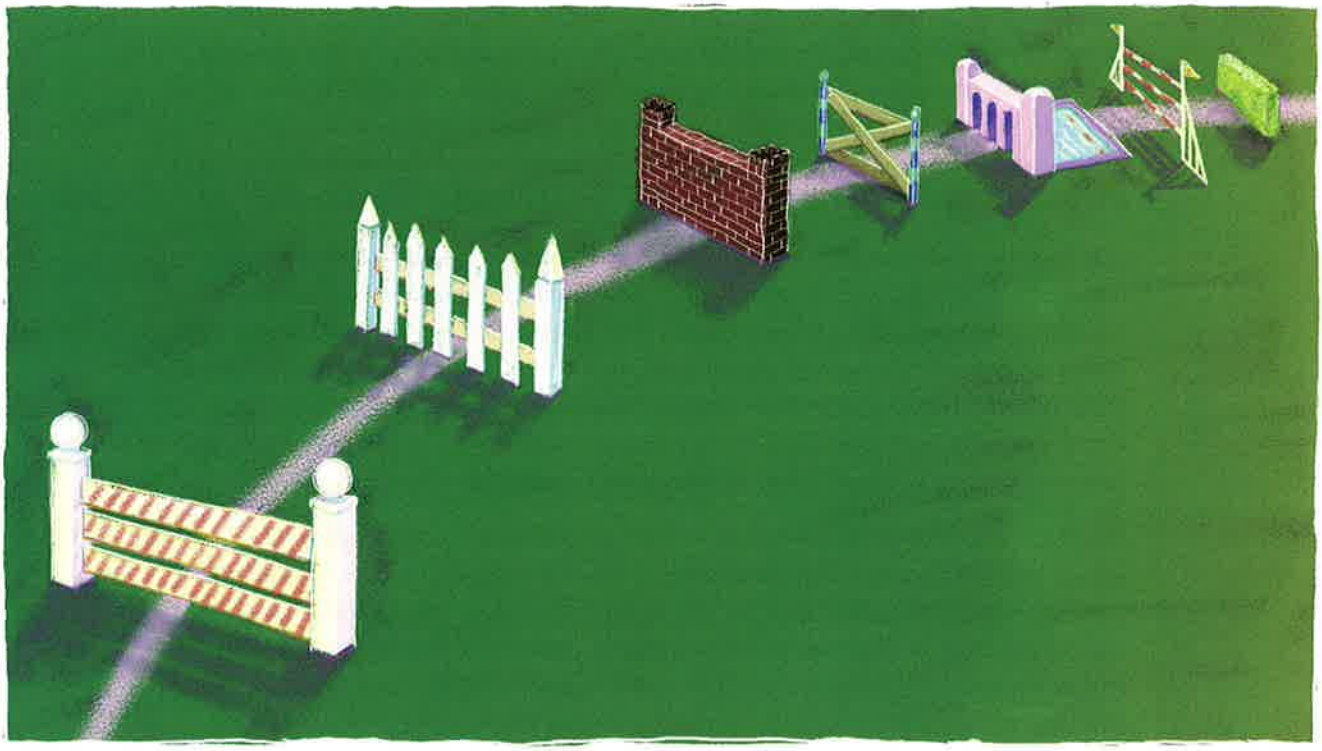
When the Federal Reserve was established in 1913, inflation was not the problem it was to become in the latter part of the century. The nation was on the gold standard and the purchasing power of money in 1913 was about what it had been 30 years before, or for that matter, 100 years before. The gold standard sharply restricted inflation by requiring that money created by the U.S. Treasury be backed by gold.[1]

The classical gold standard yielded price stability only to the extent that the Treasury's stock of monetary gold happened to expand at a rate sufficient to satisfy the economy's demand for money at stable prices. For instance, slow growth in the gold supply caused the price level to decline at over 1 percent per year from 1879 to 1897, and gold discoveries and new mining techniques caused inflation to average over 2 percent per year between 1897 and 1914. Nevertheless, by the standard of what was to come, the variation of inflation under the gold standard was very small.

Although the economy grew rapidly throughout the gold standard years, the period was marked by a number of recessions associated with temporary deflations and substantial interest rate movements. Sudden sustained short-term interest rate spikes of over 10 percentage points occurred on eight occasions between the Civil War and the founding of the Federal Reserve. Five of these spikes were associated with bank runs characterized by a demand to convert deposits into currency that could not be satisfied by the fractional cash reserves held by banks.[2]

Finally, in response to the bank panic of 1907 and the ensuing recession, the nation was no longer willing to run monetary policy entirely according to the classical gold standard rules. The Federal Reserve was established in the United States, along the lines of the Bank of England, with the power to create currency and bank reserves at least somewhat independently of the nation's monetary gold. The Fed was given authority to create currency and reserves by making loans to banks through its discount window or by acquiring securities in the money market. The Fed's mission was to provide an elastic supply of money to smooth short-term interest rates against liquidity disturbances, while preserving the link between money and gold in the long run in order to restrain inflation.[3]

Through its dominant presence in the market for currency and bank reserves, the Fed easily gained control of short-term interest rates and eliminated the kind of interest rate spikes seen earlier.[4] By smoothing short-term interest rates, however, the Fed was obliged to substitute its discretionary management of short rates for the impersonal market forces that had determined rates previously. The Bank of England had successfully managed short rates for decades in the context of the classical gold standard.[5] And the Fed could have followed similar gold standard operating procedures. However, the classical gold standard collapsed with World War I and the nation was never willing to support Fed procedures geared to defending the gold standard. The Fed was left without clear operational procedures for positioning short-term interest rates to stabilize economic activity around full employment with stable prices.



2 THE OBSTACLES TO UNDERSTANDING MONETARY POLICY

Improvements in monetary policy that seemed within reach after the founding of the Fed proved elusive. The 1930s saw the sharpest deflation, the worst banking crisis, and the longest and deepest economic depression in American history.[6] Then, beginning in the mid-1960s there were two decades of unprecedented peacetime inflation that tripled the general price level by the early 1980s.[7]

Why has it taken so long for the Fed to give price stability pride of place?[8] Initially, there was a tendency to underestimate the disruptive potential of inflation and a willingness to be tolerant of each new burst of inflation in the hope that it would soon die down. Such hope seemed reasonable since protracted peacetime inflation had never before been a problem in the United States. Another difficulty was that it took some time for economists to develop a framework capable of understanding monetary policy in the absence of a link to gold. Prior to the 20th century the world had little practical experience with monetary regimes in which money was unbacked by a commodity such as gold or silver. With some exceptions, mainly during wartime, there was little empirical evidence on such regimes and little interest in analyzing them.

The main problem was confusion within the economics profession about the determination of the general price level and the control of inflation in a regime of inconvertible paper money.[9] There was also little understanding of the role played by inflation expectations in the wage- and price-setting process and in the determination of interest rates. And the relationship between unemployment and inflation was seriously misunderstood. The resolution of these disputes provided the foundation for today's monetary policy success.

3 INFLATIONARY MONETARY POLICY AT MID-CENTURY

Largely as a result of the nation's unfortunate experience with inflation in the period from the mid-1960s through the early 1980s, monetary economists and central bankers now understand that the costs of inflationary monetary policy are significant and varied. First are the costs that even a steady, perfectly anticipated inflation imposes on society. Then there are the disruptive and destabilizing costs of unstable inflation, more difficult to quantify but substantial nonetheless. These latter costs stemmed from alternating expansionary and contractionary policy actions. Specifically, there was a tendency — known as go-stop monetary policy — for the Fed to exacerbate the cyclical volatility of inflation and unemployment. And there was a related tendency to produce rising inflation and increasingly volatile inflation expectations over time. The forces giving rise to these tendencies are identified and described below together with their disruptive consequences.

THE COST OF STEADY INFLATION

The cost of steady inflation begins with the fact that a steadily falling purchasing power of money causes people to hold less cash than they would if prices were stable. Such attempts to economize on money holdings manifest themselves in several ways. Banks invest in teller machines, people visit banks or teller machines more frequently, businesses devote more time and effort to managing their cash balances, etc.[10] Even more important, individuals and firms take steps to protect the value of their savings and investments against loss due to inflation. The effort and resources devoted to dealing with inflation are wasted from society's point of view in the sense that they could be better employed in producing goods and services.

Another major cost of steady inflation stems from the incomplete indexation of the tax system. The biggest problem in this regard results because taxes are assessed on *nominal* interest earnings and *nominal* capital gains, that is, on investment returns in dollars. Inflation causes nominal returns to rise because investors demand compensation for the declining purchasing power of money. For instance, long-term bond rates contain a premium for expected inflation over the life of the bond. Since nominal returns are taxed as income, however, inflation reduces the after-tax return to saving and investment and thereby tends to inhibit capital accumulation and economic growth.[11]

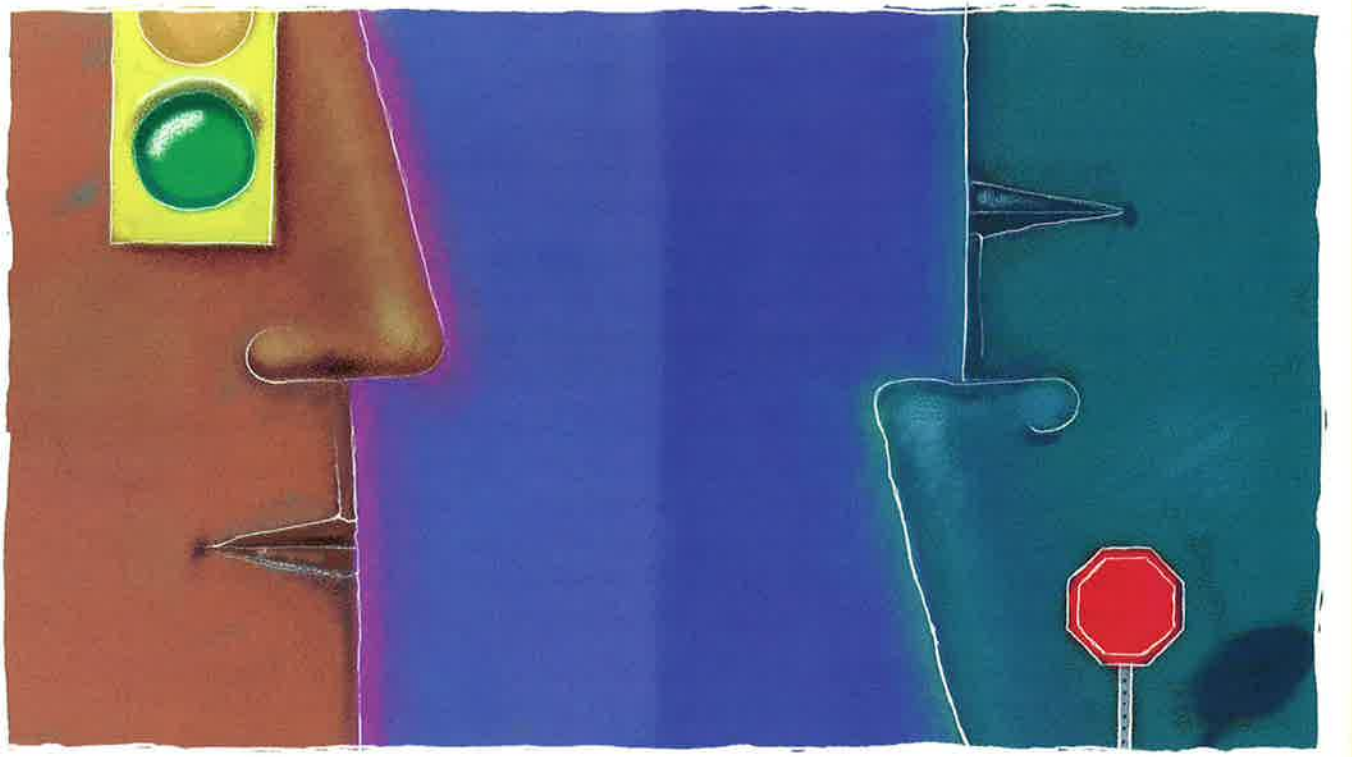
GO-STOP MONETARY POLICY[12]

A central bank such as the Fed that is charged with conducting monetary policy on a discretionary basis is naturally inclined to give considerable weight to the public's mood. Go-stop monetary policy was, in good part, a consequence of the Fed's inclination to be responsive to the shifting balance of public concerns between inflation and unemployment. Of course, difficulties in judging the strength of the economy and in gauging inflationary pressures compounded the problem, as did ignorance of the lags in the effect of policy.

For the most part the public tolerated inflation as long as it was low, steady, and predictable. When labor markets were slack, the public was even willing to risk higher inflation in order to stimulate additional economic activity. Only when economic activity was strong and inflation moved well above the prevailing trend did inflation move to the top of the list of public concerns.

It is easy to understand why inflation need not greatly concern the public when it is steady and predictable. Individuals and firms are inconvenienced only slightly by steady inflation. As long as wages, prices, and asset values move up in tandem, there are no big financial consequences, especially when inflation is low. Likewise, a temporary and modest increase of inflation around a low, well-established trend need not immediately arouse concerns.

However, a persistent departure of inflation above trend causes anxieties because people wonder where a new trend might be established. Investors worry about how much of an inflation premium to demand in interest rates; businesses worry about how aggressively to price in order to cover rising costs; and workers worry about maintaining the purchasing power of their wages.



In marked contrast to inflation, which affects all, unemployment actually affects relatively few at a given time. Even at its cyclical peaks, the unemployment rate in recent decades has risen to only about 10 percent of the labor force. The public is concerned about unemployment not so much because of those who are currently unemployed, but because people are afraid of becoming unemployed. It follows that the public is generally more concerned about unemployment when the unemployment rate is rising, even if it is still low, than when it is falling, even if it is already high.

The above-mentioned reasoning helps explain why the Fed's sensitivity to the public's concerns about unemployment and inflation tended to produce go-stop monetary policy in the 1960s and '70s. In retrospect, one observes the following pattern of events.

First, because inflation became a major concern only after it clearly moved above its previous trend, the Fed did not tighten policy early enough to preempt inflationary outbursts before they became a problem.

Second, by the time the public became sufficiently concerned about inflation for the Fed to act, pricing decisions had already begun to embody higher inflation expectations. Thus delayed, a given degree of restraint on inflation required a more aggressive increase in short-term interest rates with greater risk of recession.

Third, in any cyclical episode there was a relatively narrow window of broad public support for the Fed to tighten monetary policy. The window opened after inflation was widely recognized as the major concern and closed when tighter monetary policy caused the unemployment rate to begin to rise. The Fed often did not take full advantage of a window of opportunity to raise short rates, usually because it wanted more confirmation that higher short-term rates were required.

Fourth, it was probably easier for the Fed to maintain public support for fighting inflation with prolonged rather than preemptive tightening. A more gradual lowering of interest rates in the later stage of a recession was a less visible means of fighting inflation than raising rates more sharply earlier. Moreover, once unemployment peaked and began to fall, the public's anxiety about it diminished. Prolonged tightening was attractive as an inflation-fighting measure in spite of the fact that it probably lengthened the "stop" phase of the policy cycle.

RISING INFLATION AND UNSTABLE INFLATION EXPECTATIONS

Over time, deliberately expansionary monetary policy in the "go" phase of the policy cycle came to be anticipated by workers and firms. Workers learned to take advantage of tight labor markets to make higher wage demands, and firms took advantage of tight product markets to pass along higher costs in higher prices. Increasingly aggressive wage- and price-setting behavior tended to neutralize the favorable employment effects of expansionary policy. And the Fed became evermore expansionary on average in its pursuit of low unemployment, causing correspondingly higher inflation and inflation expectations. Lenders demanded unprecedented inflation premia in long-term bond rates. And the absence of a long-run anchor for inflation caused inflation expectations and long bond rates to fluctuate widely.[13]

The breakdown of mutual understanding between the markets and the Fed greatly inhibited the conduct of monetary policy. The Fed continued to manage closely short-term nominal interest rates.[14] But the result of an interest rate policy action is largely determined by its effect on the real interest rate, which is the nominal rate minus the public's expected rate of inflation. And the Fed found it increasingly difficult to estimate the public's inflation expectations and to predict how its policy actions might influence those expectations. Compounding the problem, enormous increases in short-term interest rates were required by the early 1980s to stabilize the economy. Stabilization policy became more difficult because the public could not predict what a given policy action implied for the future, and consequently, the Fed could not predict how the economy would respond to its policy actions.

4 THE CONTROL OF INFLATION: DISINFLATION IN THE 1980s

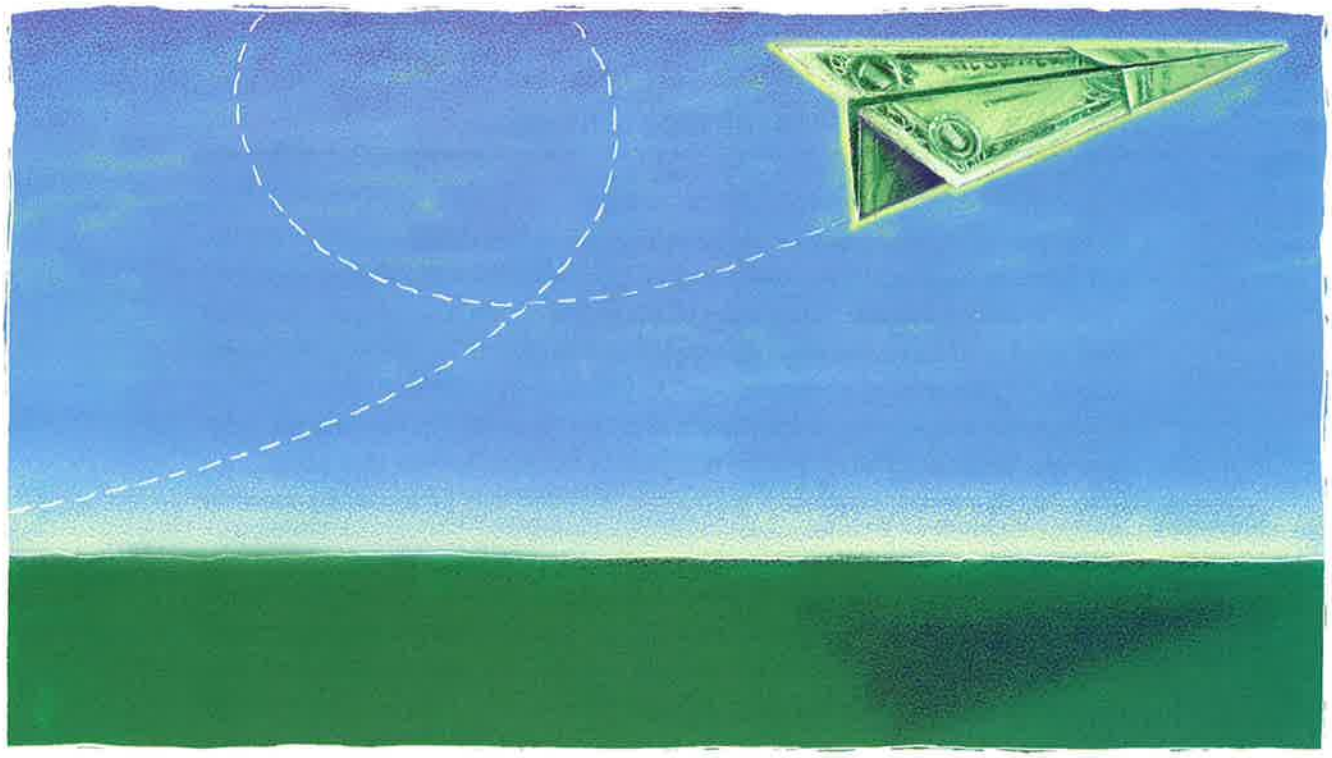
By the late 1970s, policymakers and monetary economists in and outside of the Fed had come to understand the costly and disruptive features of inflation discussed above. With considerable public support, the Fed under the leadership of Chairman Paul Volcker initiated the great disinflation in October 1979, marking the beginning of the period in which the Fed would make lowering inflation a priority. What followed was a tightening of monetary policy that succeeded in bringing the inflation rate down permanently for the first time in the post-Korean War period, first from over 10 percent to around 4 percent by 1983, and then to around 3 percent by the mid-1990s.

This section reviews three developments that paved the way for the Fed to take responsibility for price stability. Most important was the progress that economists made in understanding money demand and supply. Next was the failure of nonmonetary approaches to controlling inflation. Finally, and to a lesser extent, was the idea advanced by monetary economists that the unemployment cost of disinflation might be minimized if the disinflation were credible.

THE CENTRAL BANK'S RESPONSIBILITY FOR INFLATION

The consensus among monetary economists that central banks are responsible for inflation is built on both theory and evidence. Above all, there is the substantial body of evidence from the inflationary experiences of a great many nations, including the widespread inflation in the industrialized world during the 1960s and '70s, showing that sustained inflation is always associated with excessive money growth. The evidence also clearly indicates that inflation is stopped by slowing the growth of the money supply.[15]

The theory of money demand and supply supports the cross-country evidence by illuminating the mechanics of the link between monetary policy and inflation. The theory of money demand implies that control of the money supply is necessary and sufficient to control the trend rate of inflation. And the theory of money supply implies that a central bank can control the trend rate of money growth. As will



become clear below, money demand may be thought of as the fulcrum by which a central bank controls inflation, and the money supply may be thought of as the lever by which it does so.

MONEY DEMAND

The theory of money demand asserts that individuals and businesses choose to hold a target stock of money that is proportional to their expenditures, a target that balances the convenience of holding money against the foregone interest earnings.[16] The key implication of money demand theory for monetary policy is that there is a reasonably stable long-run relationship between a nation's demand for money and its production and exchange of goods and services.

It follows that sustained inflation results when the growth of the nation's money stock exceeds the rate of growth of the nation's physical product.[17] Prices must rise in this case because otherwise individuals and firms would spend their growing excess money balances. Since one person's expenditure is another person's receipts, the spending would put upward pressure on prices until the inflation rate matched the rate of money growth in excess of the growth of output. Only then would the ongoing increase in the stock of money be willingly absorbed by the public.

The theory of money demand also implies that the overall price level cannot move very much over the long run if the stock of money grows in tandem with the growth of output.[18] If an inflation were to start, it would reduce the purchasing power of a given nominal stock of money and cause individuals and businesses to cut their spending in an effort to maintain their inventory of monetary purchasing power. With no additional money balances forthcoming in the aggregate, such downward pressure on spending would stop the inflation.

MONEY SUPPLY

The nation's basic money supply consists of currency and checkable deposits held by households and businesses. A central bank can control the former because it has a monopoly on the creation of currency.[19] Checkable deposits are created by banks. A central bank also has the power to control checkable deposits because banks must hold reserves to service their deposits, and a central bank controls the aggregate stock of bank reserves.[20]

The financial services industry has long been creating new instruments in which the public can hold liquid balances, e.g., certificates of deposit and money market mutual funds. New liquid instruments usually do not add to the basic money supply since they are only imperfect substitutes for currency or checkable deposits.[21] Nevertheless, the introduction of money substitutes has adversely affected the predictability of money demand in the short run. In practice, however, money demand is sufficiently stable and money supply sufficiently controllable over time, so that financial innovations do not fundamentally alter a central bank's power over inflation.[22]

FAILED APPROACHES TO CONTROLLING INFLATION

A variety of nonmonetary approaches to controlling inflation were tried in the 1960s and '70s. In the United States, for example, the federal government published voluntary wage-price guidelines at various times to persuade firms and workers to forego price and wage increases deemed excessive.[23] Actual controls were imposed for a few years in the early '70s but for the most part they were lifted by the mid-'70s.[24] By the end of the period, both controls and guidelines came to be regarded as arbitrary, unfair, and ineffective. Moreover, where they were effective they often created allocative disruptions, e.g., price controls in the energy sector created shortages and long lines at gas stations.

In the early 1960s economists believed that budget policy might play a key role in fighting inflation. In the United States, however, it quickly became clear in the Vietnam War period that political concerns would immobilize fiscal policy as a practical economic policy tool. Moreover, it later became clear that the inflation of the 1970s was not closely related to the government's fiscal situation.[25]

Even after the Fed under Chairman Volcker had begun its momentous disinflation, the Carter administration imposed credit controls in early 1980 in an effort to foster the process. The credit control program caused a sharp recession with little impact on inflation and was phased out at midyear.[26]

Thus did policymakers learn the hard way that policies for stopping inflation other than monetary control didn't work. As much as anything else, the failure of non-monetary approaches to disinflation set the stage for the Fed to take responsibility for bringing inflation down.

CREDIBILITY FOR LOW INFLATION AND THE UNEMPLOYMENT COST OF DISINFLATION

In the early 1960s many economic policymakers were inclined to accept the inflationary consequences of policy actions taken to stimulate aggregate demand and employment. That inclination was based to a great extent on evidence of a century-long negative Phillips curve correlation between unemployment and (wage) inflation in the United Kingdom that appeared to offer a trade-off in which the benefits of lower inflation would have to be balanced against the costs of higher unemployment.[27]

When stimulative policy succeeded in driving down the unemployment rate in the '60s, the resulting increase in inflation at first seemed consistent with a stable Phillips curve trade-off; the rising inflation was tolerated as a necessary evil.[28] In the 1970s, however, the Phillips curve correlation broke down as inflation and unemployment both moved higher, and it became clear that high inflation could not buy permanently low unemployment.[29]

Even though protracted inflation was widely understood by the late 1970s to have costs with no offsetting benefits, it was recognized that bringing inflation down would be costly too. Previous experience with go-stop policy made it clear that there was a short-run trade-off between unemployment and inflation.[30] Policymakers expected the temporary unemployment cost of a large permanent disinflation to exceed the costs of earlier disinflations that the Fed had produced in the "stop" phase of its policy cycles.

To some degree a view then emerging in the academic community might have encouraged the Fed to pursue the disinflation. The view holds that the unemployment cost of disinflation can be minimized if a disinflation policy is credible. The idea that credibility would govern the costliness of disinflation has since become widely accepted in theory.[31] And the acquisition and maintenance of credibility for low inflation have become major practical concerns of Fed policymakers and central bankers around the world.

The idea underlying the role of credibility is that wage- and price-setting behavior is geared to expectations of money growth. The Fed supports the ongoing inflation as long as money grows in excess of output. If the Fed's disinflation is credible, the Fed slows money growth and wage and price inflation come down, too, with little effect on employment. On the other hand, if the disinflation is not credible, then wage and price inflation continues as before. If the Fed persists in slowing money growth anyway, a deficiency of aggregate demand causes unemployment as households and businesses cut spending in an attempt to maintain their targeted monetary purchasing power.[32]

In practice, disinflation is nearly always costly because credibility for low inflation is hard to acquire after it has been compromised. Moreover, a central bank's commitment to low inflation is only as credible as the public's support for it. The Fed probably embarked on the disinflation in 1979, in part, because the public finally seemed ready to accept it.

Although its discount rate changes often made the headlines prior to 1979, the Fed rarely sought publicity for its monetary policy actions. Chairman Volcker broke sharply with tradition by initiating the period of disinflationary policy with a high-profile announcement signaling that the Fed would take responsibility for inflation and bring it down.[33] In so doing, Chairman Volcker built credibility by staking his own reputation and the Fed's on achieving the low inflation objective. The unprecedented aggressive increases in short-term interest rates that followed further demonstrated the Fed's commitment to reducing inflation.[34]

Nevertheless after two decades of rising inflation, a widespread skepticism worked against Fed credibility.[35] Wage and price setters doubted that there would be sufficiently widespread public support for the Fed's disinflation. Indeed, the inflation was not broken until a sustained slowing of money growth beginning in 1981 created a serious recession that tested the Fed's determination and the public's support.[36] Although the recession was the worst since the 1930s, it was less severe than might have been expected considering the size of the accompanying disinflation. Most remarkable is that the roughly 6 percentage point disinflation occurred in just two years: 1981 and 1982. The size and speed of the disinflation suggests that the acquisition of credibility played a key role in making it happen.

5 MONETARY POLICY AT THE CLOSE OF THE CENTURY: MAINTAINING LOW INFLATION

The Fed has succeeded in maintaining low inflation for almost 15 years now. With luck the United States should enter the 21st century with inflation near what it was under the gold standard at the opening of the 20th century. Macroeconomic performance during the low inflation period has been good, especially when compared to the inflationary period preceding it. The only recession that occurred during the period, in 1990-91, was mild by recent standards. For the most part, employment growth has been strong and productivity growth seems to have picked up somewhat in the mid-1990s.[37] Moreover, both short- and long-term interest rates are around a third of what they averaged in the early 1980s and are much less volatile too.

The promise of low inflation is in large part being fulfilled. The challenge today is for the Fed to understand the secret of its success and how it can be sustained. In that regard the low inflation period has as much to teach as the traumatic period that preceded it. In reviewing below the lessons learned and principles applied, we shall see that the best way of assuring our continued monetary policy success would be for Congress to give the Fed a legislative mandate for low inflation.

LESSONS LEARNED AND PRINCIPLES APPLIED

One of the most important lessons learned from the last four decades is that credibility for low inflation is the foundation of effective monetary policy. The Fed has acquired credibility since the early 1980s by consistently taking policy actions to hold inflation in check. In effect, the Fed has reestablished a mutual understanding between itself and the markets. From this perspective, wage and price setters keep their part of an implicit bargain by not inflating as long as the Fed demonstrates its commitment to low inflation. Ironically, the Fed has learned from nearly a century of experience to pursue rule-like behavior in order to fully achieve the gains from moving away from the gold standard.

Experience shows that the guiding principle for monetary policy is to preempt rising inflation. The go-stop policy experience teaches that waiting until the public acknowledges rising inflation to be a problem is to wait too long. At that point, the higher inflation becomes entrenched and must be counteracted by corrective policy actions more likely to depress economic activity.

The main tactical problem for the Fed is to decide when preemptive policy actions are necessary and how aggressive they should be. In this regard, the Fed must be careful to consider any adverse effect a poorly timed policy tightening could have on employment and output. For that matter, the Fed must be prepared to ease monetary policy when a weakening economy calls for it. The central bank's credibility depends not only on its inflation-fighting credentials but also on its perceived competence.

A natural starting point to balance these concerns is to use a policy rule-of-thumb based on historical data to benchmark Fed policy. The stance and direction of monetary policy can then be chosen in light of historical experience conditioned on any

special current circumstances. The most relevant historical experience is, of course, the relatively brief low inflation period since the mid-1980s. As the Fed extends low inflation over time, the nation will build up a richer relevant history against which to benchmark policy.[38]

However, even our brief experience with low inflation contains useful insights such as this. In some years, such as 1994, inflationary pressures might be judged to call for a particularly aggressive preemptive tightening. At other times, such as in 1996, there might be some concern about the potential for rising inflation but enough doubt to adopt a wait-and-see attitude. The Fed's success in 1994 and 1996 suggests that the key to effective management of short-term interest rates over the business cycle is to move rates up decisively and preemptively when warranted in order to build credibility for low inflation. With credibility "in the bank," so to speak, the Fed can hold rates steady or move them down out of concern for unemployment at other times.[39] The lesson is that credibility enhances flexibility.

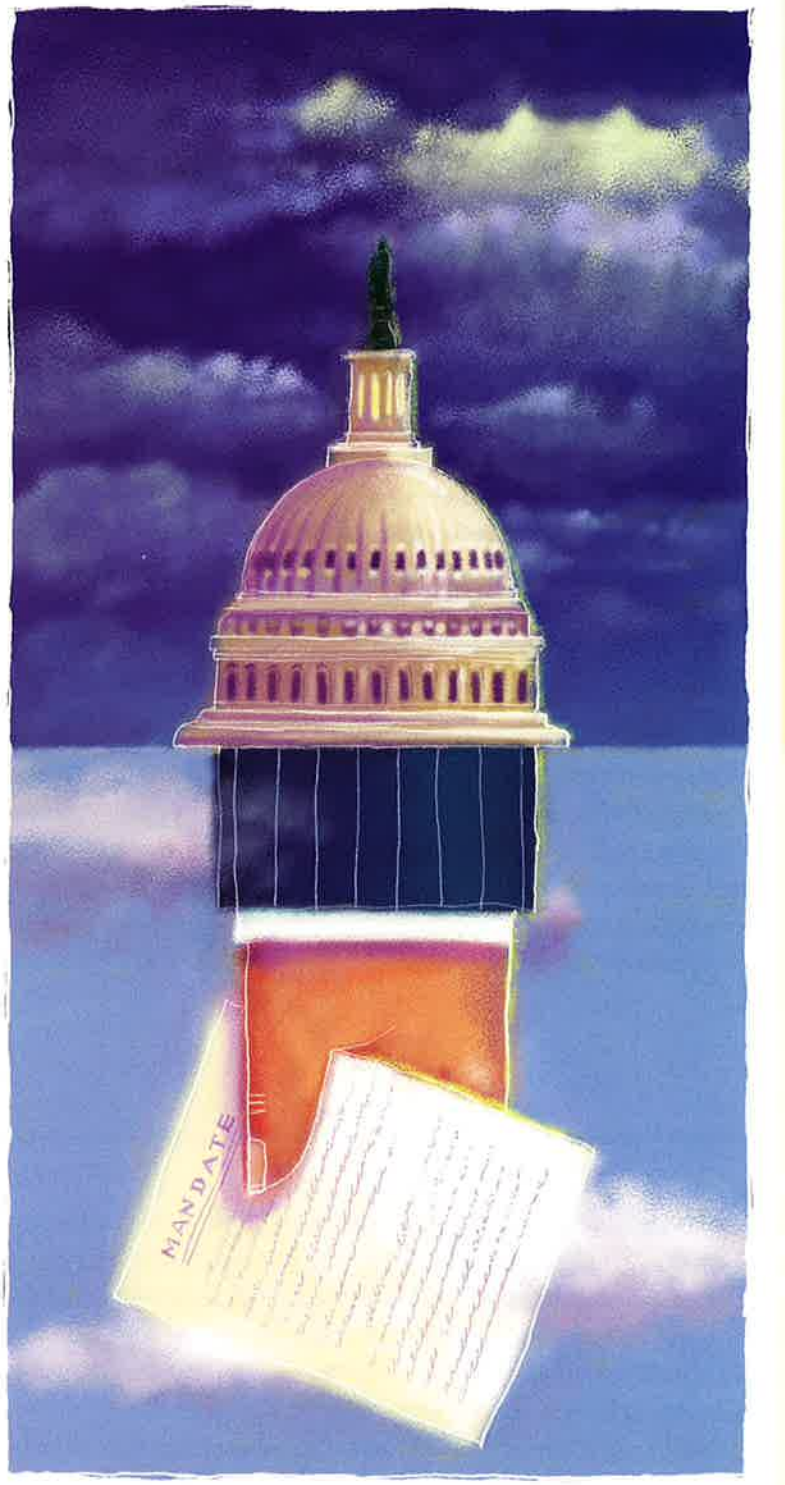
A LEGISLATIVE MANDATE FOR PRICE STABILITY

Largely as a result of the common understanding of the theory and history of monetary policy reviewed above, there is today a consensus among monetary economists and central bankers that maintaining low inflation is the foundation of effective monetary policy. Moreover, there is an emerging consensus that a central bank's commitment to price stability should be strengthened by legislation making low inflation the primary goal of monetary policy.[40]

The recommended priority for price stability derives not from any belief in its intrinsic value relative to other goals such as full employment and economic growth. Price stability should take priority for two reasons: first, the Fed actually has the power to guarantee it over the long run, and second, monetary policy encourages employment and economic growth in the long run mostly by controlling inflation.[41] Also, and this is very important, a mandate for price stability would not prevent the Fed from taking the kinds of policy actions it takes today to stabilize employment and output in the short run. What it *would* do is discipline the Fed to justify these actions against a commitment to protect the purchasing power of money.

Two often-repeated objections to a mandate for low inflation deserve mention here. One is the notion that low inflation targeting is largely irrelevant because the two enormous oil price increases in the 1970s — in 1973-74 and 1979-80 — were responsible for the worst inflation of that period.[42] The claim continues that our success in controlling inflation will be determined by whether we have large oil price shocks in the future or not. Clearly, oil price increases create a problem for the economy: the higher price of oil diverts expenditure to oil products and raises real costs throughout the economy, with adverse consequences for demand and employment in non-oil sectors.

The economy must adjust to the higher real cost of oil in any case. The problem for a central bank is to make sure that the adjustment problem is not compounded with monetary instability. A central bank with a mandate for low inflation is more likely to resist excessive monetary accommodation than one with a weaker com-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mitment to price stability. This is because an oil price shock will be less likely to set in motion wage and price increases that the central bank will be inclined to accommodate. The Fed was in just this predicament when the 1970s oil price shocks hit, since rising inflation trends were already well established before each oil shock. The destabilizing effects on inflation, inflation expectations, and employment and output would almost surely have been less troublesome in a climate of stable inflation.

A second objection to a mandate for low inflation is that it would hold back economic growth. In fact, the opposite is more nearly true. In terms of the earlier discussion of money demand and supply, trend growth of national output continually raises the demand for money, and the Fed accommodates the growing demand for money at stable prices.

Would monetary policy prevent the economy from growing faster if labor productivity unexpectedly surged? Not for long, because unemployment would begin to rise as businesses found that they could meet demand with less labor input. And the Fed would resist rising unemployment by easing monetary policy to encourage faster growth in aggregate demand. In short, the Fed's policy procedures do not "target growth." A mandate for price stability would allow the Fed to naturally and automatically accommodate an increase in productivity growth over time.

Ultimately the Fed can only secure full credibility for low inflation with the backing of the public. The public's misunderstanding of the tactics of monetary policy is particularly troublesome. For instance, media accusations that the Fed was "busting ghosts" when it ran short-term interest rates up in 1994 threatened to undermine support for preemptive policy actions that were clearly called for.[43] The task ahead must be to broaden and deepen the public's understanding and support for the strategy and tactics of monetary policy and to lock in credibility for low inflation with a legislative mandate.

6 CONCLUSION

American monetary policy has come full circle in the 20th century. Early in the century the nation overcame a long-standing distrust of government intervention in the monetary system to establish a central bank. The Federal Reserve embodied the idea that discretionary monetary policy could improve on the rules of the gold standard, rules that were seen as unduly restrictive. We now know that the faith then placed in discretion over rules was somewhat misplaced. Today, monetary economists and central bankers alike understand that effective monetary policy must be built on a consistent commitment to low inflation.

Numerous lessons were learned on the 20th century odyssey. The most important is that the Federal Reserve, through its management of monetary policy, has responsibility for inflation. This became clear partly as a result of advances in monetary theory and partly as a result of evidence on money demand and supply. It was also the result of a learning process in which nonmonetary approaches to controlling inflation were seen to fail, and the monetary approach succeeded.

Discretionary monetary policy actions in response to a financial crisis or a weak economy are essential options. But we learned that the promise of discretion can be realized fully only in the context of a monetary policy that makes price stability a priority. Otherwise discretion leads inexorably to go-stop policy that brings rising and unstable inflation and inflation expectations, with adverse consequences for interest rates and employment.

The go-stop experience taught that the Fed should fight inflation by tightening monetary policy before price pressures break out into the open. Waiting until inflation has begun to rise may better assure public support for higher short-term interest rates. But delayed tightening allows higher inflation to become more firmly established, requiring even higher rates to choke it off, with a greater risk of recession.

An emerging consensus among monetary economists and central bankers supports the need for a legislative mandate to make low inflation the primary goal of monetary policy. That recommendation has broad backing for three reasons. A central bank can guarantee low inflation over time. Monetary policy most effectively stabilizes employment over the business cycle when it has credibility for low inflation. And full credibility for low inflation needs the support of a legislative mandate.

Monetary policy has come of age in the 20th century in the sense that monetary economists and central bankers have come to terms with the past — lessons have been learned and principles have been applied successfully. The country should build on that professional consensus to broaden the public's understanding and support for price stability and the preemptive policy procedures to sustain low inflation. The nation has the opportunity to bring a tumultuous chapter in its monetary history to a close. It should grasp that opportunity and enjoy the benefits that sustained price stability would bring.

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ENDNOTES

1. Technically, the United States was on a bimetallic (gold and silver) standard until 1900. Though it is true that the money supply was limited by the size of the Treasury's gold and silver holdings, there was considerable short-run variability in the money multiplier. See Cagan (1965) and Freidman and Schwartz (1963).

2. Major banking panics occurred in 1873, 1884, 1890, 1893, and 1907.

3. This latter understanding was viewed as part of the Fed's mission, although it is implicitly, not explicitly, stated in the Federal Reserve Act of 1913 itself.

4. See Goodfriend (1988).

5. See Hawtrey (1938).

6. According to Friedman and Schwartz (1963) U.S. real net national product fell by more than one-third from 1929 to 1933, implicit prices of goods and services fell by more than one-quarter, and wholesale prices by more than one-third. More than one-fifth of the commercial banks in the United States holding nearly one-tenth of the deposits closed because of financial difficulties. As a result of the sharp contraction in economic activity, the unemployment rate peaked at over 20 percent in 1932-33, and remained above 10 percent for the remainder of the decade.

7. The Fed had already recognized inflation as a problem on three occasions prior to the mid-1960s: in the aftermath of World War II, during the Korean War and the period of the 1951 Fed-Treasury Accord, and again in the mid-1950s. See endnote 12.

8. Under the leadership of Benjamin Strong, Governor of the Federal Reserve Bank of New York, the Fed made price stability a priority briefly in the 1920s. See Hetzel (1985).

9. See, for example, Friedman (1987) and Bronfenbrenner and Holzman (1963).

10. Estimates in Lucas (1994) imply that the economization of money balances that occurred at a rate of inflation of 5 percent per year (associated with a short-term nominal interest rate of about 6 percent) wasted about 1 percent of U.S. GDP. The payment of interest on transactions deposits in recent years probably raises money balances and reduces this welfare cost somewhat. In principle, a small rate of deflation would completely eliminate such waste. In practice, however, the bulk of the welfare gain to reducing inflation is probably realized at a slightly positive inflation rate. See Wolman (forthcoming 1997).

11. Feldstein (1996) reports that the net present value of the welfare gain of shifting from 2 percent inflation per year to price stability forever is about 30 percent of the current level of GDP.

12. Friedman (1964), (1972), and (1984) discusses go-stop policy. Romer and Romer (1989) document that since World War II the Fed tightened monetary policy decisively to fight inflation on six occasions beginning, respectively, in October 1947, September 1955, December 1968, April 1974, August 1978, and October 1979. The unemployment rate rose sharply after each policy shock. Only two significant increases in unemployment were not preceded by Fed action to fight inflation. One occurred in 1954 after the Korean War and the second occurred in 1961, after the Fed tightened monetary policy to improve the international balance of payments.

13. The monthly average 30-year bond rate rose from around 8 percent in early 1978 to peak above 14 percent in the fall of 1981. The long bond rate was near 13 percent as late as the summer of 1984.

14. See Cook (1989).

15. See, for instance, Friedman (1987), Poole (1978), and Sargent (1986).

16. See McCallum and Goodfriend (1987).

17. The public's target ratio of money to expenditure may exhibit a trend at times in response to, say, rising interest rates or technical progress in the payments system. For instance, the ratio of money to expenditure will trend downward if money provides transaction services more efficiently over time. In that case, the money growth rate consistent with price stability will be below the growth of physical product.

18. See the preceding note.

19. Electronic private substitutes for government currency have become feasible recently. See Lacker (1996).

20. See Cagan (1965).

21. There have been exceptions, however. For instance, a new deposit type known as the negotiable order of withdrawal (NOW) account was introduced in the late '70s and early '80s as part of the deregulation of the prohibition of interest on checkable deposits. NOW accounts were interest-earning substitutes for demand deposits and so were immediately included in the Fed's M1 measure of the basic money supply for purposes of targeting and control. See Broaddus and Goodfriend (1984).

22. For instance, see Lucas (1988) and Meltzer (1963) on the long-run stability of the demand for M1.

23. See Heller (1966) and Shultz and Aliber (1966).

24. See Kosters (1975).

25. Government fiscal concerns are the driving force behind high inflations. See Sargent (1986).

26. See Schreft (1990).

27. See Phillips (1958).

28. See Heller (1966) and Tobin (1972).

29. See Fischer (1994), pp. 267-68.

30. King and Watson (1994), for example, report a significant negative correlation between unemployment and inflation over the business cycle.

31. Barro and Gordon (1983), Fellner (1976), Taylor (1982), and Sargent (1986) contain early discussions of credibility as it relates to monetary policy. Persson and Tabellini (1994) contains a recent survey of research on the role of credibility in monetary and fiscal policy. The new large-scale Federal Reserve Board macroeconomic model is designed to take account of different degrees of credibility in its policy simulations. See "A Guide to FRB/US" (1996).

32. What happens is this: In the first instance households and businesses attempt to exchange financial assets for money. Such actions, however, cannot satisfy the aggregate excess demand for money directly. They drive asset prices down and interest rates up until the interest sensitive components of aggregate expenditure grow slowly enough to eliminate the excess demand for money. As the disinflation gains credibility, wage and price inflation slows, and real aggregate demand rebounds until the higher unemployment is gradually eliminated.

Ball (1994) shows that a perfectly credible disinflation need have no adverse effects on employment even in a model with considerable contractual inertia in the price level.

33. The Fed did not explicitly assert its responsibility for inflation in the initial announcements of its disinflationary policy. However, by emphasizing the key role played by money growth in the inflation process, and by announcing a change in operating procedures to emphasize the control of money, the Fed implicitly acknowledged its responsibility for inflation. See *Federal Reserve Bulletin* (November 1979), pp. 830-32.

34. The Fed took short-term rates from around 11 percent in September 1979 to around 17 percent in April 1980. This was the most aggressive series of actions the Fed has ever taken in so short a time, although the roughly 5 percent increase in short rates from January to September of 1973 was almost as large. See Goodfriend (1993).

35. The collapse of confidence in U.S. monetary policy in 1979 and 1980 was extraordinary. The price of gold rose from around $275 per ounce in June 1979 to peak at about $850 per ounce in January 1980, and it averaged over $600 per ounce as late as November 1980. Evidence of a weakening economy caused the Fed to pause in its aggressive tightening in early 1980. But with short rates relatively steady, the 30-year rate jumped sharply by around 2 percentage points between December and February, signaling a huge jump in long-term inflation expectations. The collapse of confidence in early 1980 was caused in part by the ongoing oil price shock and the Soviet invasion of Afghanistan in December 1979. But the Fed's hesitation to proceed with its tightening at the first sign of a weakening economy probably also played a role. In any case, the Fed responded with an unprecedented 3 percentage point increase in short rates in March, taking them to around 17 percent. See Goodfriend (1993).

36. After making its disinflationary policy commitment in October 1979, the Fed let the growth of effective M1 overshoot its target range in 1980 and the inflation rate continued to rise, peaking at over 10 percent in the fourth quarter. Then, in sharp contrast to the preceding four years, effective M1 actually undershot its target range in 1981. Effective M1 grew around 4.6 percentage points slower in 1981 than its average annual growth over the preceding five years. Further, the actual 2 percent shortfall in M1 from the midpoint of its 1981 target was built into the 1982 target path. See Broaddus and Goodfriend (1984).

The unemployment rate rose from around 6 percent in 1978 to average nearly 10 percent in the recession year of 1982.

37. See Rudebusch and Wilcox (1994).

38. Simple policy rule specifications studied with models estimated on historical data can be of great practical value in benchmarking actual policy decisions. McCallum (1988) and Taylor (1993) present two rules, respectively, that are particularly useful in this regard. McCallum models the monetary base (currency plus bank reserves) as the Fed's policy instrument, and has it responding to a moving average of base velocity and departures of nominal GDP from a target path. Taylor models the real short-term interest rate (the market interest rate minus expected inflation) as the policy instrument, and has it responding to inflation and the gap between actual and potential GDP.

Each specification has advantages and disadvantages. Taylor's rule matches more closely the way the Fed thinks of itself as operating. But McCallum's rule makes clear that the ultimate power of the Fed over the economy derives from its monopoly on the monetary base. McCallum's rule has the advantage that it could still be used if disinflation happened to push the market short rate to zero, or if inflation expectations became excessively volatile. In either situation the Fed might be unable to use the real short rate as its policy instrument.

39. See Board of Governors "Monetary Policy Report to Congress" (1994, 1995, and 1996).

40. In 1995, Senator Connie Mack introduced a bill that would make low inflation the primary goal of monetary policy. In 1989, Fed Chairman Alan Greenspan testified in favor of a prior resolution that would have mandated a price stability objective for the Fed. Academics as diverse as Fischer (1994), Blinder (1995), and Friedman (1962) all agree that the Fed should be given some sort of mandate for low inflation. The remarkable convergence of professional thinking in favor of a mandate was evident at the Federal Reserve Bank of Kansas City's August 1996 conference on price stability. See *Achieving Price Stability* (1996).

Inflation targeting is employed by a number of central banks around the world. See Leiderman and Svensson (1995).

41. Rudebusch and Wilcox (1994) report empirical evidence on inflation and productivity growth. Dotsey and Ireland (1996) study the question in a quantitative, theoretical model.

42. Oil prices rose from around $3 to $12 a barrel during the 1973-74 oil price shock, and from about $15 to over $35 in 1979-80.

43. See Thurow (1994). By virtue of their success in keeping inflation in check, preemptive policy actions *necessarily* appear to be busting ghosts. So the appearance of ghost busting is a consequence of good monetary policy.

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