

INFLATION TARGETING IN THE UNITED STATES?

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Abstract

The paper traces the origins of the case for inflation targeting in postwar US monetary history. It describes five features of inflation targeting practiced implicitly by the Greenspan Fed. It argues that (1) low long run inflation should be an explicit priority for monetary policy, (2) as a practical matter it is feasible and desirable for the Fed to strictly target its constant long run inflation objective over the business cycle, (3) strict inflation targeting can be regarded as efficient constrained countercyclical stabilization policy. Finally, the paper proposes that the Fed publicly acknowledge its implicit priority for low long run inflation, that Congress recognize that priority, and that in return representatives of the FOMC agree to participate in a monetary policy forum to better inform the congressional oversight committees about current monetary policy.

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1 Introduction

In what sense can monetary policy as currently practiced by the Federal Reserve (Fed) be characterized as inflation targeting? And what, if any, features of an inflation targeting policy regime should the Fed adopt more formally? These are the questions implicit in the title of the paper. US macroeconomic performance has improved greatly since the early 1980s. The 1980s and 1990s saw two of the longest expansions in US history and two of the mildest contractions in 1990-1 and 2001-2. This paper argues that the secret of that success can be attributed in large part to inflation targeting policy procedures that the Fed adopted gradually and implicitly since the early 1980s. Much of the paper is devoted to explaining the origins of the Fed's implicit commitment to inflation targeting. Understanding the historical record suggests that some form of inflation targeting is likely to remain at the core of Fed monetary policy indefinitely.

To a large extent the explicit adoption of inflation targeting would merely continue the approach to monetary policy developed under Chairmen Volcker and Greenspan. Nevertheless, it seems advisable to consider whether more explicit inflation targeting procedures could help the Fed to sustain good monetary policy in the future. Detailed, explicit, and transparent inflation targeting procedures have been adopted by numerous central banks abroad to build and secure credibility for low inflation. The main objection to some sort of explicit, public commitment to inflation targeting is the concern that inflation targeting would focus the Fed too narrowly on inflation at the expense of output and employment. The Fed has achieved price stability and arrived at monetary policy procedures that resemble inflation targeting by "just doing it." So one might argue that the Fed has little need to adopt inflation targeting formally. Admittedly, the priority for low inflation is "in the water" at the Fed these days, but on the other hand, "bottling" it for the future might not be a bad idea.

After all, the Fed has been extraordinarily fortunate in having had two remarkable chairmen since the late 1970s who skillfully turned monetary policy from a source of instability into a major stabilizing force for the macroeconomy. It is well to remember how uniquely qualified they were to lead the Fed. Each had decades of professional experience following the business cycle before becoming chairman, Volcker at the New York Fed and Greenspan as a private business economist in New York. Each had an intimate knowledge of financial markets and of market participants from having worked in New York. Each had prior experience in Washington, Volcker at Treasury and Greenspan at the Council of Economic Advisors. And both are trained economists. Moreover, both men personally experienced and understood as professionals the disruptive consequences of inflation. It will be difficult to find a successor to lead the Fed with all these qualifications who also can navigate the appointments process successfully. That, in particular, is why it is important to distill the essence of the implicit inflation targeting procedures developed under Volcker and Greenspan and to consider

how inflation targeting can be institutionalized to help the Fed carry on after Chairman Greenspan retires.

The paper addresses these objectives in four parts. Section 2 describes the origins of the case for price stability in the US by reviewing postwar monetary policy as practiced by the Fed and enumerating the problems created by failing to make price stability a priority. In particular, Section 2 discusses the inflationary go/stop era and the Volcker disinflation, and describes the ways in which monetary policy as conducted in the Greenspan era can be characterized as implicit inflation targeting. Section 3 considers arguments for and against making low long run inflation a priority, and whether a quantitative inflation target is a good idea. Section 4 considers inflation targeting in the short run, including complications involved in managing departures of inflation from the long run target, the feasibility and desirability of strictly targeting a constant long run inflation objective, and inflation targeting and countercyclical stabilization policy. Section 5 contains a proposal for improving the accountability and transparency of the Fed's inflation targeting policy procedures. A brief summary concludes the paper.

2 Origins of the Case for Price Stability in the US

In order to appreciate fully the rationale for inflation targeting as implicitly practiced in the US today and why inflation targeting will remain at the core of Fed monetary policy in the future, one must understand the origins of the case for price stability in the US. These are found in three distinct subperiods of postwar US monetary history: the period of inflationary go/stop policy from the late 1950s to the late 1970s, the Volcker disinflation from 1979 to 1987, and the Greenspan era from 1987 to the present. The go/stop period illustrates the consequences of failing to make low inflation a priority for monetary policy. The Volcker period illustrates the difficulty in restoring credibility for low inflation after it has been compromised. And the Greenspan era illustrates how and why the Fed has come to implicitly target low inflation in recent years. Each subperiod is discussed in turn below.

2.1 Inflationary Go/Stop Monetary Policy

The inflationary tendency evident during period of go/stop monetary policy derived initially from a desire not to repeat the disastrous deflation of the 1930s. There was a tendency to underestimate the disruptive potential of inflation and a willingness to tolerate each new burst of inflation in the belief that it would soon die down. Moreover, go/stop policy reflected the Fed's inclination to be responsive to the shifting balance of concerns between inflation and unemployment. In the go phase of the policy cycle 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. By the time the public became concerned about rising inflation, pricing decisions already embodied higher inflation expectations. At that point the Fed would *need* a recession to bring inflation and inflation expectations back down; and an aggressive increase in short term interest rates would initiate the stop phase of the policy cycle. At best, there was only a relatively narrow window of public support for the Fed to raise interest rates. That window opened when rising inflation was widely judged to be a problem and closed after tighter monetary policy caused the unemployment rate to begin to rise. Thus, the Fed found it difficult to reverse rising inflation, and the trend rate of inflation tended to ratchet up with each go/stop policy cycle.

Another reason for the rising inflation trend was that 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 behavior tended to neutralize the favorable effects of stimulative monetary policy. The Fed persisted in trying to pursue what it regarded as a reasonable balance between inflation and unemployment objectives. But the Fed became evermore expansionary on average in pursuit of low unemployment, causing correspondingly higher inflation and inflation expectations. As a result, lenders demanded ever higher inflation premia in bond rates. In the absence of an anchor for inflation, inflation expectations and bond rates fluctuated widely, destabilized the economy, and complicated countercyclical stabilization policy enormously.

The problem was that for most of the postwar period up to the Volcker disinflation beginning in 1979, the Fed tended to justify its periodic inflation-fighting actions against an implicit objective for low unemployment. In so doing the Fed made monetary policy a source of instability and wound up worsening both inflation *and* unemployment. The Fed eventually came to realize that it would have done better by justifying its actions to stimulate employment against a commitment to low inflation.

2.2 The Volcker Disinflation: 1979-1987

The case for price stability as it comes down to us today was strengthened by the difficulties in dealing with inflation during the period of the Volcker disinflation from 1979 to 1987. In particular, the Fed experienced the adverse consequences of a near total collapse of credibility for low inflation, and learned how difficult it is to pursue interest rate policy to restore credibility for low inflation once that credibility has been thoroughly compromised. Although the scale of problems for monetary policy confronting the Fed during the Volcker disinflation were far larger than those of today, the nature of the problems is similar and still relevant. This section considers, in turn, four features of this tumultuous period: the breakdown of mutual understanding between the Fed

and the public, the nature of the cost of restoring low inflation, the loss of flexibility to use interest rate policy to stabilize the output gap, and the inflation scare problem.

2.2.1 The Breakdown of Mutual Understanding Between the Fed and the Public

By the time that Volcker became Fed chairman in 1979, the sharp increase and volatility of inflation and inflation expectations born of the previous decade's inflationary go/stop monetary policy made it exceptionally difficult for the Fed to conduct macroeconomic stabilization policy. The Fed continued to make monetary policy by managing short-term nominal interest rates. But the effect of interest rate policy on the economy is determined by its effect on *real* interest rates, nominal rates minus inflation expectations. And the Fed found it increasingly difficult to judge the public's inflation expectations and how its own policy actions might influence those expectations. By then, potentially large real rate increases were necessary to stabilize the economy. Stabilization policy became more difficult because the public found it very difficult to predict what a given policy action implied for the future, and because the Fed found it very difficult to predict how the economy would respond to its policy actions. The leeway for policy mistakes was greatly enlarged because inflation and inflation expectations were highly volatile and excessively sensitive to current news on the economy.

In effect, there was a complete breakdown of mutual understanding between the Fed and the public. As a result, the Volcker Fed came to appreciate what the Fed had taken for granted previously—that monetary policy must be conducted so as to preserve that mutual understanding. Moreover, the Volcker Fed realized that price stability must be the cornerstone of that mutual understanding. And in large part, the subsequent disinflation may be seen as an effort to rebuild that mutual understanding in order to rehabilitate countercyclical stabilization policy.

2.2.2 The Cost of Restoring Credibility for Low Inflation

The Volcker disinflation made particularly clear why it is so costly to restore credibility for low inflation once it has been compromised. Consider the story of the great disinflation that occurred in 1981. In early 1981 the Fed had the nominal federal funds rate at 19 percent. As measured by PCE inflation, which was around 10 percent in Q1 1981, real short-term interest rates were then a very high 9 percent, and the aggressive disinflationary policy began to take hold by mid-1981. The NBER business cycle peak was reached in July, after which real GDP growth fell at a 6 percent annual rate in Q4 1981 and at a 5 percent annual rate in Q1 1982. Meanwhile, the Fed brought the nominal federal funds rate down from 19 percent in the summer to the 14 percent range at the end of the year, where it stayed until the summer of 1982 when the Fed brought the

funds rate down another 4 percentage points to around 10 percent. The 5 percentage point funds rate reduction through by the end of 1981 was large in nominal terms. But PCE inflation also fell by about 5 percentage points between by early 1982 to the 5 percent range. To the extent that short-term inflation expectations followed the actual decline in inflation that occurred during 1981, the Fed maintained an extraordinarily high 9 percent real funds rate *during* the recession! Amazingly, the Volcker Fed maintained 9 percent real short rate even as the recession worsened and the unemployment rate rose from around 7 percent in July 1981 toward its peak of nearly 10 percent at the recession trough in November 1982.

Why did interest rate policy remain so extraordinarily tight even after the sharp break in inflation in 1981? One reason is that the behavior of long bond rates suggested that the Fed's credibility for low inflation continued to deteriorate. The problem was that the long bond rate actually *rose* by about 3 percentage points from January 1981 to more than 14 percent in October, even as the economy weakened. And although the long rate showed some tendency to decline thereafter, it remained in the 13 to 14 percent range until it began to come down in the summer of 1982. The Volcker Fed eased the nominal funds rate sharply by 4 percentage points in August 1982 to relieve the disinflationary pressure only after evidence in the bond rate earlier that summer suggested that the Fed was beginning to acquire credibility for low inflation. That policy easing paved the way for an end to the recession, inflation stabilized at around 4 percent, and real GDP grew by a spectacular 6.7 and 4.5 percent in 1983 and 1984.

The Volcker Fed disinflation of 1981 is an extreme illustration of the point mentioned in Section 2.1 that, in practice, the Fed *needs* a recession to restore credibility for low inflation after it has been compromised. The reason is this. Eventually, the Fed can bring the inflation rate down by slowing the growth of money. If a disinflation is fully credible, then wage and price inflation can slow immediately without much effect on real interest rates or output. If, however, a disinflation is not immediately credible, then wage and price inflation continue as before. If the Fed persists in slowing money growth anyway, real interest rates rise, aggregate demand moves below potential output, employment falls, and the output gap thus created causes wage and price inflation to slow gradually. Postwar US monetary history makes clear that disinflation is costly in practice because credibility for low inflation is always hard to acquire after it has been lost. Moreover, the Fed's commitment to low inflation is only as credible as the public's support for it. And that support usually remains in question until a disinflation is nearly complete.

2.2.3 Loss of Flexibility to Use Interest Rate Policy to Stabilize Output Relative to Potential

The discussion above teaches another closely related lesson: when the Fed's credibility for low inflation is questioned, the Fed loses the *flexibility* to use interest rate policy to stabilize output relative to its potential. This rather obvious point is that when the Fed *needs an output gap* to restrain inflation and stabilize inflation expectations, it cannot also use interest rate policy to narrow that output gap. The behavior of interest rate policy in the 1981-82 recession outlined above illustrated this point nicely. The behavior of interest rate policy in the brief recession of 1980 makes this point as well, but with a slight twist.

The Volcker Fed raised the nominal federal funds rate target sharply from around 11 percent in September of 1979 to around 17 percent in April 1980 in its initial effort to bring down inflation. About half of that 6 percentage point increase in the nominal federal funds rate occurred in the fall of 1979. January 1980 later turned out to be an NBER business cycle peak, and evidence of a weakening economy caused the Fed to pause in its aggressive tightening between late 1979 and March 1980. But with the federal funds rate held steady, the long bond rate jumped by around 2 percentage points between December and February, in spite of the fact that the economy was weakening. A number of factors contributed to the unprecedented increase in inflation expectations evident in the sharp rise in the long bond rate: the ongoing oil price rise, the unprecedented rise in the price of gold, and the Soviet invasion of Afghanistan. The Fed's hesitation to proceed with its tightening probably also contributed to the collapse of credibility as it probably created doubts about the Fed's willingness to bear the output costs necessary to reduce inflation. The Fed reacted with an enormous 3 percentage point increase in the nominal funds rate in March. The short recession that occurred in the first half of 1980 probably resulted from that aggressive policy tightening in conjunction with the imposition of credit controls in March.

Thus, interest rate policy helped to precipitate the 1980 recession as it did the 1981-2 recession, and for the same reasons. The difference is that in 1980 the Fed cut the federal funds rate sharply by around 8 percentage points between April and July to act against the downturn, and the recession ended quickly with around 8 percent real GDP growth in the 4Q 1980. However, inflation remained high in 1980. The lesson of 1980 was that the Fed could not restore credibility for low inflation unless it refused to utilize interest rate policy flexibly to stabilize the output gap.

2.2.4 The Inflation Scare Problem

The Fed's credibility problems during the Volcker era showed up as "inflation scares," sharply rising long term bond rates reflecting rising long-term inflation expectations.

Inflation scares presented the Fed with a costly dilemma because ignoring them would encourage even more doubt about the central bank's commitment to low inflation. Yet raising real short rates to restore credibility for low inflation risked precipitating a recession. There were four striking examples of inflation scares in the bond rate during the Volcker era. As discussed above, the Fed's response to the first two in 1980 and 1981 did precipitate recessions in those years.

The third inflation scare occurred in 1983-4 during the recovery from the 1981-2 recession. By then, inflation was running at around 4 percent and, for the most part, it held in that range during this episode. However, the inflation scare in the bond market raised the long rate from the 10 percent range in the summer of 1983 to peak the following summer in the 13 percent range—only about 1 percentage point short of its 1981 peak even though inflation was over 6 percentage points lower in 1983 than in early 1981! The Fed reacted by moving the nominal funds rate up from the 8 percent range to the 11 percent range. Inflation remained low, so the tightening took the real short-term interest rate up by about 3 percentage points to around 7 percent briefly in mid-1984 before the inflation scare began to subside and the bond rate began to come down. In this case, the high real short rate needed to contain the scare succeeded in bringing real GDP growth down to the sustainable 2 to 3 percent range in the second half of 1984. This episode was important because it demonstrated that a well-timed and well-calibrated series of preemptive interest rate policy actions could hold the line on inflation without creating a recession. Afterward, the bond rate came down by around 6 percentage points from its June 1984 peak to the 7 percent range by early 1986, reflecting the largest acquisition of credibility for low inflation in the Fed's history.

Remarkably, even after the Volcker Fed had demonstrated its determination to act against inflation for almost a decade, there was yet another inflation scare when the bond rate rose by 2 percentage points from March to October 1987. Surprisingly, the Volcker Fed reacted little to the 1987 scare. In part, this may have been because real growth was weaker than in 1983-4, so acting against the 1987 scare would have been more likely to precipitate a recession. The scare may have occurred in part because Volcker was near the end of his term as chairman and there was doubt about whether the Fed under Volcker's successor would continue to put a priority on low inflation. In any case, the 1987 scare is particularly striking evidence of the fragility of the credibility of the Fed's commitment to low inflation, especially during a transition from one Fed chairman to another.

2.3 The Greenspan Era: 1987-Present

When Alan Greenspan succeeded Paul Volcker as Fed chairman in the summer of 1987 the inflation scare needed immediate attention. Unfortunately, the October 1987 stock market crash forced the Fed to *ease* monetary policy and to put off raising interest rates

until the spring of 1988. Judging by the behavior of the long bond rate, which did not return to its early 1987 levels until 1992, it took the Greenspan Fed around five years to overcome the 1987 inflation scare. The discussion of the Greenspan era below is in four parts. It begins by emphasizing the difficulty of reversing even an apparently minor loss of credibility for low inflation. Then, it describes the preemptive interest rate policy actions in 1994 that achieved virtual price stability and the advantages, thereafter, of having achieved full credibility for low inflation. One can see in the behavior of the Greenspan Fed the emergence of an implicit inflation targeting policy regime. The section concludes by describing and rationalizing five features of inflation targeting as implicitly pursued by the Greenspan Fed.

2.3.1 Difficulty Reversing a Minor Loss of Credibility for Low Inflation

As a result of the 1987 inflation scare and the policy easing after it, PCE inflation *rose* by over 2 percentage points from around 3 percent in 1986 to around 5.5 percent in 1990. In response, the Fed raised the funds rate by over 3 percentage points to a peak of nearly 10 percent from the spring of 1988 to the spring of 1989 to begin to reverse the rise in inflation and inflation expectations. As a result of the restrictive policy actions undertaken by the Fed and the Gulf War recession, inflation began to recede in 1991. However, the unemployment rate rose by about 1 percentage point during the recession and peaked at nearly 8 percent in June 1992. Here is another instance where, having been insufficiently preemptive on inflation (in 1987 and 1988) monetary policy was obliged to be more restrictive than otherwise. Its credibility for low inflation having been compromised earlier, the Greenspan Fed lowered the federal funds rate tentatively from a peak around 8 percent at the start of the recession in mid-1990 to 3 percent in the fall of 1992. By September 1992, inflation had come down to around 3 percent, the bond rate had finally returned to the 7 percent range, and the Fed had brought the real federal funds rate down to around zero.

The zero real short rate was in place for eighteen months from September 1993 to February 1994. During that time the unemployment rate came down to 6.6 percent, the bond rate fell to the 6 percent range, and inflation rate fell slightly. Clearly the Fed had acquired an additional degree of credibility for low inflation. To secure that credibility, however, the Fed would need to preempt rising inflation as the economy strengthened further in 1994 by raising real short rates. At a minimum, the Fed would have to move real short rates up from zero to a range historically consistent with sustainable growth without inflation. In part, preemptive policy was motivated by yet another inflation scare in the bond market. The more than 2 percentage point increase in the bond rate from late 1993 to November 1994 indicated that the Fed's credibility for low inflation still was not secure.

2.3.2 Preemptive Interest Rate Policy in 1994

The series of policy actions that lifted the real funds rate by 3 percentage points from February 1994 to February 1995 marked the Greenspan Fed's first preemptive action against inflation. Like the Volcker Fed's 1983-4 actions, the Greenspan Fed's 1994 preemptive policy held the line on inflation without creating unemployment. After falling to the mid-5 percent range during 1994, the unemployment rate moved up only slightly to 5.8 percent in April 1995 and began to fall again. The 1994 tightening proved once more that well-timed preemptive interest rate policy is nothing to be feared. By January 1996, the bond rate was down to around 6 percent again, the inflation scare was contained, and there was widespread talk of the "death of inflation."

The successful preemptive policy in 1994 brought the Greenspan Fed to virtual price stability. Inflation and inflation expectations were anchored better than ever before. Inflation has remained low ever since. And long bond rates have remained in the 5 to 6 percent range with no evidence of inflation scares. Remarkably, price stability was maintained even though the economy grew in the 4 percent range from 1996 through 1999, and the unemployment rate fell to 4 percent for a while. The fact that the economy ran this gauntlet without an increase in inflation or an inflation scare further reinforced the Greenspan Fed's credibility for low inflation.

2.3.3 Advantages of Full Credibility for Low Inflation

Three closely related advantages of full credibility for low inflation were apparent during the second half of the Greenspan era. First, full credibility helped the economy to operate well beyond a level that might have created inflation and inflation scares in the past. Second, when in 1999 and 2000 the Fed set out to slow the growth of real aggregate demand to a more sustainable rate, it raised real short rates to the 5 percent range, somewhat below the range of real short rates it had targeted in previous periods of policy restraint. Less real rate restraint was necessary in 2000, as it was in 1994, because the Fed did not have to restore low inflation or its credibility for low inflation after they had been compromised. Having attained price stability, the Fed did not *need* a recession to bring inflation and inflation expectations down. The Fed's objective in 2000 was *only* to bring aggregate demand into line with potential output so that the expansion would not end with an outbreak of inflation, an inflation scare, or an unsustainable real boom and bust.

Third, when the expansion *did* end in an unsustainable boom and bust, the fact that inflation and inflation expectations were well anchored enabled the Greenspan Fed to cut the nominal federal funds rate *very* aggressively from 6.5 percent to 1.75 percent in 2001 to cushion the fall in aggregate demand and employment. Amazingly, the Fed was able to cut the real federal funds rate by 4 or 5 percentage points to around zero

without a hint of an inflation scare. Since the Greenspan Fed did not *need* a recession in 2001, it had the *flexibility* to cut the real funds rate aggressively to prevent one. Evidence suggests that the Fed's aggressive policy easing in 2001 may have prevented the recession entirely in the absence of the September 2001 terrorist attack.

2.4 Five Features of Inflation Targeting by the Greenspan Fed

When one considers the Greenspan era as a whole, it would appear that the Greenspan Fed adopted gradually and implicitly an approach to monetary policy that can be characterized as inflation targeting. To begin with, the Greenspan Fed must have appreciated something like the case for price stability described above as it originated in the years of go/stop policy and during the Volcker disinflation. Moreover, Chairman Greenspan testified in 1989 in favor of a qualitative zero inflation objective for the Fed defined as a situation in which “the expected rate of change of the general level of prices ceases to be a factor in individual and business decisionmaking.” Thus, it is plausible to think that the Greenspan Fed set out to achieve low enough inflation to make that definition of price stability a reality. This is the *first* sense in which it is plausible to think that the Greenspan Fed has adopted an implicit form of inflation targeting.

However, the Greenspan Fed clearly did not follow a singleminded focus on achieving low inflation. Had it done so, it surely could have restored low inflation and credibility for low inflation lost in 1987-1988 sooner than it did. Apparently, a judgement was made that given its initial credibility problems, attempting to act against inflation too aggressively would have come at too great a cost in lost employment and output. A decision was made that the relatively small slippage in inflation and credibility for low inflation that occurred in the late 1980s could be contained eventually without a terribly aggressive monetary tightening. Instead, a firm, mildly restrictive, interest rate policy was pursued to build back credibility for low inflation gradually. In other words, the Greenspan Fed displayed great patience in overcoming the effects on inflation and Fed credibility of the unfortunate initial conditions (the 1987 inflation scare and stock market crash) that it started with.

Moreover, the Greenspan Fed did not proceed to deliberately push the inflation rate down to price stability after 1992 in a way that might have been costly in terms of employment and output. Instead, preemptive policy was utilized in 1994 as part of the transition to price stability. The Fed held real short rates near zero for a year and a half until the economy showed strength in 1994 and then acted to *preempt* what might have been a cyclical increase in inflation. Holding the line on inflation proved to be a virtually costless way of moving the economy to price stability and fully securing the Fed's credibility for low inflation.

The way the Greenspan Fed handled the restoration of credibility for low inflation before before 1992 and the push to price stability after 1992 demonstrates a *second*

sense in which it may be said to have targeted inflation. Again, it is plausible to think that price stability was the goal. But it is clear that the Greenspan Fed practiced a form of *flexible* inflation targeting in its pursuit of price stability.

Arguably, it is plausible to think that the Fed has finally achieved price stability in the sense that a measure of inflation favored by the Chairman, core PCE inflation, has remained in the 1 to 2 percent range since the mid-1990s. It is difficult to imagine the circumstances that would cause the Greenspan Fed to *deliberately* target core PCE inflation above 2 percent in the long run or the short run. This is the *third* sense in which it might be said that the Greenspan Fed has adopted an implicit form of inflation targeting.

Likewise, it is hard to imagine any circumstances in which the Greenspan Fed would *deliberately* target core PCE inflation less than 1 percent. There is no reason to take the inflation rate lower than that given the risks of deflation and the problems associated with the zero bound on nominal interest rates. This is the *fourth* sense in which it might be said that the Greenspan Fed has adopted an implicit form of inflation targeting.

Finally, it is clear that the Greenspan Fed practices inflation targeting in large part to enhance the flexibility of interest rate policy to stabilize the output gap over the business cycle. For instance, the discussion above explained how the Greenspan Fed exploited its full credibility for low inflation to lower short term interest rates flexibly against the 2001 recession. In this sense, inflation targeting as practiced by the Greenspan Fed involves a *fifth* characteristic: constrained countercyclical stabilization policy. In other words, the Greenspan Fed appears willing to pursue activist countercyclical interest rate policy as long as inflation and inflation expectations remain anchored in or near the long run target range.

3 Should Low Long Run Inflation be Made a Priority?

Although the US has never targeted inflation formally the Fed, as never before in its history, has made price stability a priority. Given that the record shows the Greenspan Fed to be pursuing inflation targeting implicitly, we ask what features of those implicit inflation targeting procedures could be usefully institutionalized. We use the case for inflation targeting developed in Section 2 to help answer that question. In this section we consider only whether the Fed should make low long run inflation a priority. We begin with arguments supporting a priority for price stability. Then we consider opposing arguments and counterarguments. And finally we consider the case for a quantitative long run inflation target.

3.1 Arguments Supporting a Priority for Price Stability

A priority for low long run inflation would derive not so much from a belief in its intrinsic value relative to other goals such as full employment and economic growth. That priority would derive from the fact that the Fed has demonstrated over the past two decades that it can achieve and maintain low inflation over the long run; and from the evidence suggesting that the Fed's acquisition and maintenance of credibility for low inflation has been beneficial for macroeconomic performance in the US. Moreover, the US monetary policy record outlined in Section 2 suggests that the *flexibility* to pursue short run stabilization policy has been enhanced by a credible commitment to low inflation. Arguably, that credibility would be strengthened if the Fed announced publicly a long run low inflation target.

Another reason for the Fed to commit itself publicly to a low inflation objective is that since 1994 the Fed has been announcing its current federal funds rate target changes publicly. That instrument transparency has been all to the good, since it has enhanced the public's understanding of monetary policy. However, that transparency has made every federal funds rate policy action the subject of intense public debate. And the combination of *instrument transparency and goal opacity* has the potential to create problems. One such problem surfaced when Congress questioned the series of preemptive interest rate policy actions in 1994, and took the unprecedented step of inviting all 12 reserve bank presidents to testify before the House and Senate Banking committees to explain their views on monetary policy. Those hearings were seen by many as a threat to price stability, and probably contributed to the severity of the inflation scare in bond rates that occurred in 1994. Now that price stability has been achieved, and the transition costs are behind us, the Fed's commitment to long run price stability ought to be clarified to minimize the risk of such conflicts in the future.

3.2 Opposing Arguments and Counterarguments

The most fundamental argument against making low long run inflation a priority is that it might unduly constrain interest rate policy from stabilizing output relative to its potential in the *short run*. The concern is that, in practice, the Fed might become more timid in using interest rate policy flexibly to stabilize real economic activity over the business cycle for fear of destabilizing inflation. This possibility must be taken seriously. But the policy record outlined above shows that the Fed's power to stabilize the output gap over the business cycle was considerably *increased* as inflation and inflation expectations became more firmly anchored.

The second argument against formally adopting a low long run inflation objective is that there is little to be gained, since the Fed has achieved and maintained low inflation by "just doing it." The Greenspan Fed appears to have acquired near full credibility

for low inflation without a formal priority for low inflation. And there is every reason to think that the Greenspan Fed will continue to pursue successfully implicit inflation targeting as described above with or without a more formal inflation objective. This argument seems to take it for granted that the Fed needs no institutional help in carrying on after Chairman Greenspan is gone.

The third argument admits that a legislative mandate for low long run inflation would be helpful. The opposition comes from the fact that it would be awkward for the Fed to announce such a priority for low long run inflation unilaterally. To be sure, the Fed is an independent central bank in the sense that its interest rate policy actions are not subject to further evaluation by other authorities. And Congress did not object to the Volcker disinflation and the Greenspan Fed transition to price stability. Yet, the Fed is supposed to take its goals from Congress. The current understanding between the Fed and the Congress would appear to amount to a “don’t ask, don’t tell” equilibrium. Congress doesn’t ask the Fed whether it places a priority on low long run inflation, and the Fed does not say whether it has such a priority. This argument points out that both the Fed and the Congress appear to be satisfied with don’t ask, don’t tell. So the status quo is satisfactory.

The problem with this argument is that waiting for the climate of opinion in Congress to move in this direction poses some risks. Currently, a large fraction of the public has had first-hand experience with inflation and naturally supports the view that it must be contained. But as the Fed succeeds over time in maintaining low inflation that collective memory will fade. At some point, Congress will be less likely to mandate a priority for price stability. If the Greenspan Fed, in its capacity as the repository of central banking expertise in the US, believes that monetary policy would benefit from a legislatively mandated priority for a long run low inflation objective, then it should *ask* Congress for one. The time is right to do so. Because price stability has been achieved, there are no more transition costs to worry about. More important, the public has great confidence in the Greenspan Fed, and no future Fed will have as much personal experience with or understanding of the reasons why monetary policy would benefit from such a mandate. Institutionalizing that knowledge and experience in a mandate will go a long way to insuring that future generations don’t repeat the negative experience with inflation.

3.3 The Case for a Quantitative Long Run Inflation Target

There are six reasons why the Fed should adopt a quantitative range for its long run inflation objective. First, the Fed could choose the measure of inflation to target from any number of candidate measures which have been exceptionally stable since the mid-1990s. Second, Fed staff routinely uses a quantitative working definition of low inflation that constitutes price stability for internal policy simulations. Arguably, that working

definition is the FOMC's de facto quantitative long run inflation target. Third, it makes sense to put a quantitative lower bound on inflation to protect against deflation and the problem of the zero bound on nominal interest rates. Announcing an explicit lower bound on inflation will make the public more confident that the Fed will not allow the US to fall into a Japanese style deflation/zero bound trap. That, in turn, will protect against potentially destabilizing deflation scares, to which the Fed would have to respond by pushing the nominal funds rate closer to zero. Fourth, if it makes sense for the Fed to announce an explicit lower bound on its long run inflation target to protect against deflation, then it makes sense to announce an explicit upper bound to emphasize that the Fed intends to hold the line on inflation as well. Fifth, a quantitative long run target would serve as a better benchmark against which to judge departures from price stability in the short run.

Finally, a range of 1 to 2 percent for core PCE inflation measured monthly with a 12 month lag seems a logical one to pick for the quantitative long run target. The Fed is apparently comfortable using the core PCE price index to measure inflation. Core PCE inflation has ranged between 1 and 2 percent since 1997. And given that observed stability, a 1 percentage point range should provide enough leeway for short run fluctuations of inflation. Finally, core PCE inflation would provide a more stable measure than overall PCE inflation against which to judge departures from price stability in the short run.

The main reasons for the Fed not to adopt a quantitative inflation target are three-fold. First, the Fed may not be quite sure yet what measure of inflation and target range to adopt. Second, there is no pressing need to adopt a quantitative inflation target today as discussed above. Third, the Fed's credibility for low inflation may actually be jeopardized if it cannot keep inflation within its long run quantitative target range.

4 Inflation Targeting in the Short Run

This section considers inflation targeting in the short run. It begins by outlining the complications that the Fed must confront in managing departures of inflation from the long run target range. Theory and evidence suggest that when the Fed has full credibility for low inflation, it should be able to prevent inflation from moving outside of its long run target range. The conclusion is that it is both feasible and desirable for the Fed to keep inflation within its long run inflation target in the short run. The section closes by pointing out that strict inflation targeting is compatible with stabilizing output at its potential over the business cycle in a reasonable benchmark macromodel.

4.1 Managing Departures of Inflation from the Long Run Target

Once inflation has been allowed to deviate from its long run target, for whatever reason, the Fed is confronted with the problem of how to choose the path for its interest rate policy instrument that balances the speed with which inflation is returned to target against the cost in lost output relative to potential. The Fed must decide how *fast* to rebuild credibility for its long run inflation objective? As a formal matter, the answer to this question depends on the following factors: 1) the mechanism by which interest rate policy is assumed to be transmitted to aggregate demand in the macromodel used by the Fed, 2) the specification of the relationships among aggregate demand, the output gap, and the inflation generating process in that macromodel, 3) the relative weights placed on the output gap and inflation stabilization in the Fed's (implicit) loss function, *or* 4) the length of time that the Fed allows for returning its conditional inflation forecast to the long run target, 5) any conditional information on current shocks and adjustments to the model or the loss function weights due to special circumstances or evolving economic conditions. In this framework the Fed's interest rate reaction function will depend on all information available to it affecting the conditional inflation forecast and the output gap forecast.

The complexity of the elements involved shows how difficult it is for the Fed to manage inflation once it moves outside its long run target range. Arguably, the inflation generating process is the weakest part of the macromodel. The cost in terms of lost output relative to potential of returning inflation to its long run range depends on the credibility of the Fed's commitment to do so. And the historical record discussed in Section 2 suggests that such credibility is sensitive to the Fed's actions *themselves* in the context of other aspects of the political economy in a way that is difficult to model. In any particular case the Fed must *judge* the extent to which drawing out the return of inflation to its long run target might be counterproductive by *reducing* the credibility of its intention to bring inflation all the way back down. That consideration must be balanced against attempting to bring inflation down before the credibility for doing so has been built up. An error in either direction would increase the output cost of restoring price stability.

Another problem arises because the Fed may tend to overstate the extent to which inflation has an inherent tendency to persist after it has been shocked. US inflation did exhibit a high degree of persistence in the past. The Fed tolerated outbursts of inflation in the go phase of the policy cycle, and showed a limited inclination to risk recession to reverse those outbursts but a willingness to accept "opportunistic" shocks that reduced inflation. Thus, both positive and negative inflation shocks tended to be propagated through time. Firms would quickly build a shock to inflation into inflation expectations and incorporate those expectations into their own price setting behavior. By underestimating its own role in creating inflation persistence in the past, the Fed

may too quick to accommodate and propagate deviations of inflation from its long run target in the present.

It is optimal to vary inflation deliberately in response to some shocks in some macro-models. However, that optimal variation depends sensitively on the details of the macromodel and on the size and type of shocks hitting the economy. Given the uncertainty about the structure of the economy, the difficulty in promptly and accurately identifying the shocks hitting the economy, and the complications discussed above—attempting to *fine tune* the variability of inflation in the short run is more likely to be counterproductive than not. In any case, the historical record suggests that the Fed’s ability to deliberately and systematically manipulate inflation in response to shocks hitting the economy is very limited. Moreover, it would open the door to inflation scares. For all these reasons the presumption must be that it is inadvisable for the Fed to attempt to deliberately vary inflation over time.

4.2 Precluding Inflation from Moving Outside the Long Run Range

Ultimately, the Fed can adhere closely to its long run inflation target only if interest rate policy can *preclude* shocks from moving inflation outside the long run target range. Is it plausible that the Fed can do so? The answer would appear to be yes, especially for an inflation index of sticky (core) prices that excludes flexible commodity and food prices. Evidence from the mid-1990s to the present suggests that inflation will remain stable over the business cycle when the Fed makes price stability a priority.

Theory suggests two reasons why the Fed has been able to stabilize inflation so well and is likely to continue to be able to do so in the future. First, credibility for low inflation is self-enforcing to a great extent. Sticky-price firms are less likely to pass cost shocks through to prices if firms expect the Fed to take the necessary policy actions before too long to make aggregate demand conform to potential output so as to relieve the cost pressures. Second, credible price stability gives the Fed more leeway to cut short term interest rates in response to a financial market crisis or to stabilize the output gap without creating inflation or an inflation scare in bond markets. Thus, the Fed cut the federal funds rate target by 75 basis points for about a year in 1998-99 in aftermath of the Russian debt default, and again when the economy turned down in 2001 without much effect on inflation or inflation expectations in either case. Arguably, interest rate policy was insufficiently preemptive in the late 1990s, but inflation and inflation expectations showed little increase.

4.3 Strict Inflation Targeting and Countercyclical Stabilization Policy

According to the argument above, strictly targeting core inflation within its long run range has much to recommend it. The strength of that argument derived in part

from the fact that doing otherwise would require the Fed to take a stand on theoretical and empirical inflation dynamics about which there is much uncertainty. This section supplements the case by pointing out that strict inflation targeting is entirely consistent with stabilizing output at its potential over the business cycle in a reasonable benchmark macromodel. In other words, strict inflation targeting can be regarded as the anchor for constrained countercyclical stabilization policy along the lines of the description of inflation targeting given in Section 2.4 as practiced by the Greenspan Fed. From this perspective, even those who care mainly about output and employment can support strict inflation targeting.

The point is clear with respect to a shock to aggregate demand. For instance, a positive shock that moves aggregate demand above potential output would increase labor demand and put upward pressure on wages. That cost pressure would be passed to sticky (core) prices in the absence of a tightening of monetary policy. However, by raising short term interest rates the Fed could bring aggregate demand back into line with potential output, move employment back down, eliminate the upward pressure on wages, and hold the line on inflation. In other words, interest rate policy can stabilize simultaneously both inflation and the output gap in the face of a shock to aggregate demand.

What about a shock to aggregate supply, such as a temporary increase in the price of oil? The question is: can the interest rate policy actions that stabilize core inflation against an oil price shock also be construed as stabilizing output relative to its potential? The answer is yes. The higher price of oil would raise the cost of production for sticky-price firms; and again that cost pressure could be passed to sticky (core) prices in the absence of a tightening of monetary policy. This time, however, to stabilize sticky (core) price inflation the Fed would have to raise real short rates and depress aggregate demand enough to *reduce* employment and wages to *offset* the effect of higher oil prices on production costs. From this perspective it would seem that the Fed faces a tradeoff between stabilizing inflation and output in the presence of an oil price shock. Yet this is not necessarily true. Real business cycle (RBC) reasoning says that the economy should produce less when the marginal cost of production is temporarily high because oil prices are temporarily high. Accordingly, since the oil price rise reduces potential output temporarily, aggregate demand should be made to fall to reflect that fact, even if that means temporarily reducing employment.

In a benchmark macromodel with sticky prices and effectively flexible wages, interest rate policy that stabilizes sticky (core) price inflation automatically makes output conform to its time-varying potential. The reason is two-fold: 1) strict inflation targeting neutralizes fluctuations in employment and output that would otherwise occur due to sticky prices, and 2) effective wage flexibility assures that output fluctuates with its potential defined as the outcome of an imperfectly competitive RBC model with a constant markup and perfectly flexible wages and prices. In the benchmark model,

therefore, strict core inflation targeting in the face of an oil price shock would cause employment and output to contract in conformity with potential output.

Of course, there is some question about the extent to which wages are effectively flexible in the economy. Nominal wages exhibit about the same temporary rigidity as nominal prices. To the extent that nominal wages are temporarily rigid, the Fed may have to push employment and output below potential as defined above in order to relieve cost pressures and stabilize core inflation against an oil price shock. Pushing employment down further would reduce labor costs by raising the marginal physical product of labor. In this case, however, the Fed would face a short run tradeoff between inflation and output relative to its potential.

That said, there are two reasons why the tradeoff may be of little concern in practice. First, an inflation target of 1 to 2 percent and trend productivity growth of around 2 percent would yield average nominal wage growth in the 3 to 4 percent range. Such high nominal wage growth should keep the economy safely away from situations in which significant downward nominal wage rigidity, as opposed to slower nominal wage growth, is required to stabilize inflation and the output gap. Second, wages may be effectively flexible in the context of long term implicit and explicit contracts that characterize most employment relationships. It would be inefficient for either firms or workers to allow temporary nominal wage rigidity to upset the terms of otherwise efficient long-term relationships. And there is scope to neutralize the effects of wage stickiness since wages already resemble installment payments in the context of such relationships. In particular, one might expect future wage adjustments to undo any effects of temporary nominal wage stickiness, so that wages would be effectively flexible. Such behavior would neutralize the allocative consequences of sticky nominal wages.

5 A Proposal for Improving the Accountability and Transparency of Inflation Targeting in the US

Theory and practice emphasize that accountability and transparency are critical for a regime that makes inflation targeting a priority. At the core of the case for inflation targeting is the idea that monetary policy encourages economic growth and stabilizes output at its potential over the business cycle in large part by anchoring inflation and inflation expectations. The need to influence expectations puts a premium on credibility, a commitment to goals, and a central bank's perceived independence and competence to achieve its objectives. Currently, these foundations of inflation targeting are secure in the US because the public has great confidence in the Greenspan Fed. If inflation targeting is to continue to be effective, the operating procedures of the Greenspan Fed must be credibly transferred to new leadership. Over time the public's confidence in monetary policy should be placed in an understanding of how inflation targeting works

rather than in the leadership of the Fed. Greater accountability and transparency for monetary policy in the US would help to achieve all these ends.

The discussion in Sections 2 and 3 suggests strongly that low inflation should be a priority for monetary policy. The argument boils down to this: few if any economists inside or outside of the Fed can imagine circumstances under which inflation in a decade or two should be much higher or lower than it is today. A public *acknowledgement* of that by the Fed would serve as a useful starting point for improving the Fed's accountability for low long run inflation. The priority for price stability would simply reflect best practice central banking as the Fed has come to understand it; hence, the Fed could assert that priority on its own initiative without direction from Congress.

A unilateral acknowledgement to that effect would be worthwhile in its own right. Openly clarifying the priority for price stability would reinforce the Fed's commitment to low inflation and enhance the credibility of that commitment. It would balance the transparency of the Fed's interest rate instrument with the transparency of its long run low inflation goal. And it would act to defuse further the idea that secrecy has any role to play in monetary policy. In this regard, the Fed could go further and acknowledge its quantitative working definition of long run price stability. If a 1 to 2 percent range for core PCE inflation is it, then then the Fed could acknowledge that it intends to keep core PCE inflation *in or near* that range indefinitely.

An acknowledgement of either a quantitative or a qualitative priority for low long run inflation would open the door for the oversight committees in Congress to *recognize* a priority for low long run inflation. By *accepting* that priority, the oversight committees could then *hold the Fed accountable* for maintaining low inflation. Presumably, the Fed would welcome being held accountable by Congress because that would secure further the commitment to low inflation.

Congress might be concerned that holding the Fed accountable for low long run inflation would skew Fed policy in the *short run* toward price stability at the expense of stabilizing output relative to its potential. The source of the problem is that it is *not feasible* to hold the Fed accountable for employment or output objectives because in the long run these are largely determined independently of monetary policy. This is the lesson of the inflationary go/stop period discussed in Section 2.1. Congress could direct the Fed to employ interest rate policy flexibly to stabilize output at its potential in the short run subject to keeping inflation in or near its long run target range. But Congress might be skeptical that such a statement alone would achieve the right *balance* between price stability and output stability, notwithstanding the argument advanced in Section 4 that the best way to stabilize output relative to its potential over the business cycle may be to strictly target inflation within its long run range.

There is a chicken and egg problem. Without an assurance that Congress recognizes a priority for low long run inflation, the Fed is unwilling to be more transparent about how it strikes a balance between inflation and output stability in the short run.

And without a mechanism by which the Fed's reasoning about short run policy can be assessed, Congress is reluctant to recognize a priority for low long run inflation.

This suggests the following proposal: in exchange for a recognition by Congress of a priority for low long run inflation, the Fed could agree to participate in a public *monetary policy forum* where the FOMC (through its Chairman and other representatives) would subject its current assessment of the economy and thinking about policy to questions from invited academic and business economists expert in monetary policy. The policy forum could meet publicly for one full day, twice a year, a month before the Fed's regular monetary policy reports to Congress in order to unearth key policy issues and better inform the congressional oversight hearings. By enabling Congress to observe the professional exchange of views on monetary policy, the forum would give Congress more insight into thinking of the FOMC..

The forum would introduce transparency into the short run policy process in the only practical way: the Fed would retain all of its current independence and flexibility to deal with the complex issues discussed in Section 4. Invited participants would be drawn from the community of professional Fed watchers, economic forecasters, and academic monetary economists. The forum could be arranged and participants invited by the Fed itself or by a private non-profit sponsor, and held independently of Congress, although representatives from Congress would be welcome to attend as observers.

The discussion would be disciplined against the congressional directive to utilize monetary policy flexibly to stabilize output at its potential over the business cycle *subject to keeping inflation in or near its long run target range*. To achieve balance in the questions and comments, the invited participants should be grouped according to whether they think that policy is too easy, about right, or too tight, and equal time should be given to all points of view. The opportunity for the FOMC to address comments and questions from all perspectives would enable the Fed to build public understanding and confidence in its own policy position. The forum would provide the Fed with regular opportunities to comment on its assessments of the economy without appearing defensive or self-congratulatory. The forum would also provide the Fed with a convenient and efficient means of acquiring regular professional advice and council on monetary policy. Finally, the forum would help to educate the press and the financial markets over time so that eventually the public's confidence in monetary policy could be based on an understanding of how inflation targeting works.

6 Conclusion

The paper began by tracing the origins of the case for inflation targeting in postwar US monetary history from the inflationary go/stop period, through the Volcker disinflation, to the period of price stability in the Greenspan era. The historical review explained

why the Fed has made price stability a priority as never before in its history and why low inflation will remain a priority indefinitely. In particular, the historical review served three purposes. First, it showed how inflation targeting works to improve monetary policy. Second, it showed why it can be said that the Greenspan Fed practices inflation targeting implicitly. Third, it showed why the Fed should continue to utilize the inflation targeting procedures developed and employed implicitly by the Greenspan Fed after Chairman Greenspan retires. This last point motivated the second half of the paper. There, consideration was given to institutionalizing inflation targeting in some way, and distilling from theory and evidence how tightly inflation should be targeted in the short run. The main findings were these: 1) low long run inflation should be an explicit priority for monetary policy, 2) as a practical matter it is feasible and desirable for the Fed to strictly target its constant long run inflation objective over the business cycle, and 3) strict inflation targeting can be efficient constrained countercyclical stabilization policy. Finally, the paper proposed that the Fed publicly acknowledge its implicit priority for low long run inflation, that Congress recognize that priority and agree to hold the Fed accountable for it, and that in return representatives of the FOMC agree to participate in a monetary policy forum to better inform the congressional oversight committees about current monetary policy.

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