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Monetary policy uncovered - Flying blind: The federal reserve's experiment with unobservables

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Public Policy Brief

Monetary Policy Uncovered

Flying Blind: The Federal Reserve's Experiment with Unobservables

Dimitri B. Papadimitriou
L. Randall Wray

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The Jerome Levy Economics Institute is publishing this *Public Policy Brief*, without necessarily endorsing its proposals, to make a constructive contribution and advance the debate on this issue.

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Preface

On August 10, 1994, Federal Reserve Chairman Alan Greenspan testified before the Commerce, Consumer, and Monetary Affairs Subcommittee of the House Committee on Government Operations that, given the complexity of the U.S. economy, firm-level evidence and informal discussions with business leaders should be given strong consideration in determinations of mounting inflation. In other words, the Federal Reserve has suspended its reliance on economic indicators or statistical models and is now going to rely increasingly upon anecdotes as omens of impending inflation.

Less than a week later the Federal Open Market Committee commanded its fifth increase in the federal funds rate so far this year. The Federal Reserve, whose self-proclaimed mission includes ensuring price stability and promoting confidence in financial markets, has again relied on rising interest rates as the instrument of economic stabilization. But what is the justification for yet another boost in interest rates?

As attested to by this *Public Policy Brief*, recent history suggests that the Fed is on a fruitless search to identify a monetary target that is both a reliable harbinger of inflation and can be influenced directly by the Fed. After Chairman Paul Volcker's experiments with M1, the Fed was forced to ease monetary policy and abandon M1 in favor of M2. Chairman Greenspan stayed with this course after his appointment in 1987, and it, too, proved unreliable (the rate of growth of M2 failed to reach the midpoint of the Fed's target range for six straight years through 1993).

In adopting this tight stance, however, the Fed has contributed to causing what it fears; the increases in the federal funds rate are acting as the very source of Chairman Greenspan's often-cited expectation of inflation. The Federal Reserve's rate hikes have generated increased uncertainty destabilizing financial markets and heightened inflationary fears. In essence, the Federal Open Market Committee is the Fed's own worst enemy, creating a vicious cycle of inflation expectations fueled by rate increases justified by inflation expectations.

It is now apparent that the only justification for the Fed's frequent changes of policy is an intuition as to what will lower inflation expectations and a hunch that lower expectations are necessary to prevent a future acceleration of inflation. There is no clear evidence at the present time, however, to suggest that inflation is likely to accelerate. There are still more than 8 million unemployed, with many more involuntarily working part time; the consumer price index is running at a 2.9 percent annual rate, only slightly higher than last year's; productivity growth is expected to be high; wage growth is still moderate; and the international climate is favorable for continued low inflation. As Chairman Greenspan continues to search for new clues to the inflation riddle, it becomes increasingly clear from his statements that the Fed's policy has become rudderless. By focusing exclusively on inflation, the Federal Reserve risks undermining an economy still recovering from a deep and long recession.

Dimitri B. Papadimitriou
Executive Director

September 1994

Flying Blind: The Federal Reserve's Experiment with Unobservables

Dimitri B. Papadimitriou
L. Randall Wray

Introduction[1]

In the past decade and a half U.S. monetary policy has deviated radically from that of the postwar period as it embarked on a series of policy experiments generally designed to fight perceived inflationary pressures. While it is true that monetary policy since the Treasury-Fed Accord of 1951 has periodically tightened to fight inflation, policy became much more interventionist and aggressive with the appointment of Paul Volcker and, later, Alan Greenspan, as successive chairmen of the Federal Reserve Board. In addition, monetary policy has gradually abandoned other goals as it has come to focus almost exclusively on price stability (and, perhaps at times, on the foreign exchange value of the dollar). Beginning in 1979 the Federal Reserve under Chairman Volcker pushed interest rates above 20 percent (the prime rate aver-

aged 20.3 percent in the third quarter of 1981) and unemployment rates above 10 percent in its pursuit of money targets and stable prices, resulting in the deepest recession since the Great Depression. Similarly, under Alan Greenspan the Federal Reserve pushed interest rates to nearly 11 percent in the first quarter of 1989 (when inflation was less than 5 percent), contributing to a long recession from which the economy is still recovering. More recently the Fed has tightened five times to fight perceived inflationary pressures.

In our view, it is not a coincidence that the tenure of chairmen Volcker and Greenspan overlaps, to a great extent, the period that S Jay and David A. Levy (1991) call the "contained depression" and that Wallace Peterson (1994) calls the "silent depression." While we do not attribute this prolonged period of subpar economic performance solely to misguided monetary policy, we do believe that the nearly single-minded pursuit of stable prices by the Federal Reserve since 1979 has contributed to the high levels of unemployment, low productivity growth, and reduced economic growth experienced by the U.S. economy during the 1980s and 1990s (when compared with the performance enjoyed between World War II and the early 1970s).

During the past 15 years the Federal Reserve has experimented with, or seriously considered the use of, a wide variety of targets including reserve aggregates (both borrowed and nonborrowed reserves), monetary aggregates (various measures of M1, M2, and even M3), P-star, price indexes, gold prices, real (ex ante) "equilibrium" interest rates, and expected inflation. Each of these targets has been claimed by one or more members of the Board of Governors to be linked to inflation (or future inflation), often with little theoretical or empirical justification. Even if one were to accept that the Federal Reserve's sole goal should be to stabilize prices, there simply is nothing approaching a consensus among economists that any of these targets is reliably linked to changes of price levels. As one target was shown to be a poor predictor of inflation, the Federal Reserve adopted yet another target. It has become increasingly apparent that Fed policy is rudderless.

When monetarist theory formed the basis of policy, frequent intervention by the Federal Reserve to maintain money growth close to targets had a theoretical justification accepted by at least part of the economics profes-

sion; Federal Reserve policy in the 1980s was at least coherent. However, the experience of the 1980s has discredited monetarism and the use of monetary targets. There is no longer any theoretical justification for frequent, active intervention by the Federal Reserve into financial markets because there is no consensus regarding a single target variable to be used in policy formulation to achieve the goals of monetary policy. We believe that given the current degree of uncertainty among economists regarding the links among macroeconomic variables, it is not possible for the Federal Reserve to follow a rule that would target a variable in order to generate price stability.

Statements by various Federal Reserve officials seem to reflect a growing sense of uncertainty regarding guides to be used in policy formation. In candid remarks some Federal Reserve officials have admitted that they rely on hunches, intuition, and anecdotal evidence when deciding whether to change the policy stance. Our purpose in this *Public Policy Brief* is not to criticize the Federal Reserve for the apparent inability to settle on a single target. Formulating monetary policy has always been something of an art, and given the level of development of monetary theory, it must remain so. The radical deviation from traditional monetary policy that began in 1979 with the announcement of monetary targets appeared to offer an alternative to the art of policy formulation—the Federal Reserve could simply announce that the money supply would grow at a constant rate and then hit its targets. This was a mistake. However, as we return to the traditional methods of policy formulation, the Federal Reserve must use its artful, discretionary intervention more sparingly and more carefully; radical policy shifts should be undertaken only in exceptional circumstances.

Low inflation is a worthwhile goal, but the Federal Reserve must recognize that economists have not reached agreement regarding the causes or the costs of inflation; they have not reached a consensus that the costs of fighting inflation are substantially less than the benefits of stable prices. As such, single-minded pursuit of stable prices is neither justifiable nor desirable; nor has any coherent theory regarding the method by which the Federal Reserve could stabilize prices yet emerged. The Federal Reserve must also recognize that economists are uncertain how to achieve stable prices and are divided over whether stable prices are worth the costs. When a variety of economic data give conflicting signals

regarding inflationary pressure, when the sources of inflationary pressure are not certain, when the Federal Reserve is relying on hypotheses and intuition (as members of the Federal Open Market Committee themselves have indicated) to predict future inflation, and when practically all current data indicate the absence of inflationary pressures, it is not appropriate for the Federal Reserve to make a major policy shift.

In 1996 the nation will mark the fiftieth anniversary of the Employment Act of 1946, which set "maximum employment, production, and purchasing power" as the "policy and responsibility" of the federal government. It has been 17 years since that law was strengthened with the passage of the Full Employment and Balanced Growth Act of 1978, which specified the goal of a 3 percent unemployment rate to be achieved for workers over the age of 20 years by 1983. But that goal was not achieved in any year since 1978. In fact, the unemployment rate since 1978 for workers over 20 has averaged more than 6 percent, or twice the target. In contrast, the 3 percent goal was bettered four times during the 1960s, and the unemployment rate for adult males averaged less than 3.8 percent for the entire period from World War II to 1978. After 1978 adult males had an unemployment rate above 3.8 percent in every year save two. While many factors have contributed to the much higher unemployment rates since 1978, we believe that the Federal Reserve's pursuit of stable prices has played a continuing and significant role. It is time to direct monetary policy away from the pursuit of a single goal to include the congressionally mandated goal of "maximum employment." As of June 1994, 8 million Americans were officially unemployed, another 4 million were involuntarily working part-time, and millions more were out of the job market because they did not believe they would be able to find jobs. Monetary and fiscal policies are failing to live up to the promises of the congressional mandates.

As we will discuss, some people within and outside the Federal Reserve have pushed for tighter monetary policy to fight what they believe are inflationary pressures. In addition, others have pushed for policy that would raise short-term interest rates in the belief that this would lower inflation expectations and, thus, long-term interest rates. More recently, instability in foreign exchange markets and depreciation of the dollar against the yen and mark have led some to call for tighter monetary policy to "protect" the dollar. While we agree that under some conditions it

might be necessary to adopt tight policy to fight inflation, to lower long-term interest rates, or to strengthen the currency, we believe that current conditions do not warrant tight policy. Indeed, we believe that the tighter policy stance taken by the Federal Reserve between February and August 1994 (in which the federal funds rate was raised five times) was a mistake. Unless unemployment rates fall precipitously and capacity utilization rates rise quickly, we can see no justification for further interest rate increases.

The experience of working with a variety of targets (including reserve and monetary aggregates and the recent shift to real interest rates and inflation expectations) has cast doubt on the likelihood that a single variable will be shown to be closely and reliably linked to future inflation; it is even less likely that such a variable, should it be found, could be controlled by the Federal Reserve. In short, we see no reason to suppose that the Federal Reserve will discover a target variable whose control will lead to stable prices. We do not believe that the Federal Reserve knows (or will soon know) how to achieve stable prices. We do not believe that economists have sufficient knowledge to calculate the costs of achieving stable prices in terms of unemployment and lost output. Given these uncertainties and the inherent vagaries of economic projections, we believe it is best for the Federal Reserve to take a less active role in the economy. In particular, we do not believe that conditions over the past six months have warranted the Federal Reserve's action to increase short-term interest rates by 175 basis points. This has unnecessarily endangered the recovery, kept long-term interest rates high, led to instability in stock, bond, and foreign exchange markets, increased the government deficit, and burdened homeowners with higher mortgage payments.

Volcker's Federal Reserve: The Experiment in Practical Monetarism

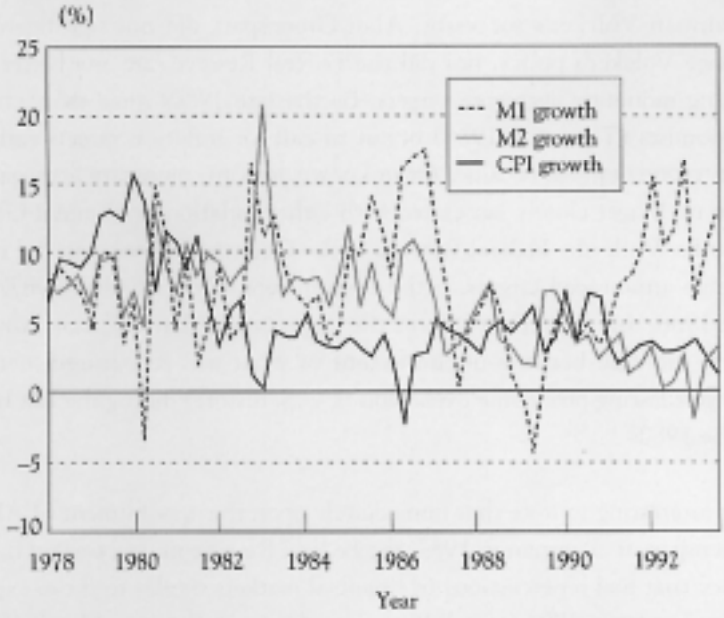
A radical shift in monetary policy began in 1979 when Federal Reserve Board Chairman Paul Volcker announced that the Federal Reserve would no longer target interest rates, but would instead target monetary aggregates (with particular attention paid to M1, the narrowest definition of money) in an attempt to implement "practical monetarism" (Fazzari and Minsky 1984, M. Friedman 1984, Greider 1989). Such tar-

gets are consistent with monetarist theory, which claims that money aggregates are closely related to nominal income and GNP in the short run and to the rate of inflation in the long run. By pursuing tight money (monetarist) policy and hitting money supply targets, the Federal Reserve would have purported control over the rate of inflation and, according to monetarists, would have induced only minimal and temporary negative impacts on real output and employment. In practice, this meant that the Federal Reserve would target low rates of growth of bank reserves, which through the deposit multiplier would translate into low rates of growth of monetary aggregates. In turn, this would generate low rates of inflation without entailing dramatic decline of production and employment. Academic studies had claimed to show that the Federal Reserve would be able to regulate the rate of growth of monetary aggregates tightly enough to hit targets; this would then allow it to eliminate inflation (Balbach 1981, Brunner 1968).

By the late 1980s no economic theory had been more thoroughly discredited than this simple monetarist theory of the relation between monetary aggregates and the rate of inflation (B. Friedman 1988). The Federal Reserve's experiment brought record interest rates. These rates contributed to unemployment rates not seen since the 1930s and negative rates of real GNP growth—the worst recession since the Great Depression. Moreover, a long list of other maladies can be traced at least in part to the great monetarist experiment (the Savings & Loan fiasco, a burgeoning trade deficit, record government budget deficits, and rising debt ratios of domestic firms and foreign countries).

The severity of the recession forced the Volcker-led Federal Reserve to ease monetary policy and to abandon M1 targets (Fazzari and Minsky 1984). The empirical correlation between M1 and inflation (and nominal income) fell apart, forcing reevaluation of monetarist doctrine, as can be seen in Figure 1. Some researchers found that the correlation between M2 and inflation survived the Federal Reserve's experiment, encouraging it to adopt M2 as its new target in 1983, although intermediate targets for M1 were still reported. Finally, M1 was dropped altogether as a target in 1986 as its rate of growth exploded beyond the established targets, even as disinflation allowed price increases to reach the lowest levels in nearly a generation.

Figure 1 Inflation, M1, and M2 growth. The figure represents the inflation rate as measured by quarterly changes in the consumer price index and quarterly changes in M1 andM2.



Source: National Income and Product Accounts and the Forecasting Center of The Jerome Levy Economics Institute.

Most surprising about the monetarist experiment, however, was the eventual breakdown of any observable relationship between any monetary aggregate and either the rate of inflation or the rate of nominal GNP growth. Indeed, during the 1980s the rate of inflation was negatively correlated with the rate of M1 growth and essentially uncorrelated with the rate of M2 growth as shown in Figure 1. Furthermore, the rate of growth of the money supply exploded even as the rate of inflation fell, precisely when the Federal Reserve targeted money aggregates and tried to hit lower targets. By 1988 doubts about the usefulness of monetary targets were raised by both economists associated with Keynesian theory (B. Friedman 1988) as well as by those associated with monetarism (Thornton 1988), and questions were raised about the Federal Reserve's ability to hit money targets and about the relationship between monetary aggregates and inflation. Previous studies that had purportedly demonstrated these propositions were now thought to have merely reported spurious correlations.

Greenspan's Federal Reserve: Moving Targets and Soft Landings

Chairman Volcker's successor, Alan Greenspan, did not significantly change Volcker's policy, nor did the Federal Reserve fare any better in hitting monetary aggregate targets. By the late 1980s some monetarist economists (Thornton 1988) began to call for inflation targets rather than money targets because, for unknown reasons, monetary aggregates were no longer closely associated with either inflation or nominal GNP growth. While the Federal Reserve under Chairman Greenspan did not change announced targets, it did tighten monetary policy in 1987, in late 1988, and in early 1989 on the expectation that inflation would again increase because of the extent of what was recognized as the "longest lasting peacetime expansion of U.S. history" during the last half of the 1980s.

It is interesting to note that immediately upon the appointment of Alan Greenspan as chairman in 1987, the Federal Reserve moved toward tight policy that had repercussions in financial markets similar to those experienced so far in 1994 (as will be discussed below). Between March 1986 and February 1987 total bank reserves had been growing at an average rate of nearly 2.5 percent per month. The Federal Reserve tightened policy, causing reserves to fall by nearly 6 percent in February and by a total of 2.54 percent over the next 10 months (so that average reserve growth from February to December 1987 was –0.23 percent per month). The interest rate on long-term government bonds rose from 7.64 percent in the first quarter of 1987 to 9.08 percent in the third quarter. Capital losses in bond markets led to a run to the short end of the market; the run spread to the stock market, contributing to the crash of October 1987. The Federal Reserve was forced to ease policy temporarily to stop the expanding financial crisis. As Giordano (1987) reported, the Federal Reserve pumped more liquidity into financial markets than it had during any previous financial crisis. Once the immediate crisis abated, the Federal Reserve returned to tight policy. As we will argue below, the Federal Reserve's tightening in early 1994 had a similar (although smaller) effect on financial markets.

Between mid-1988 and mid-1989 the Greenspan-led Fed raised the discount rate 11 times in 11 months and held it at 7 percent through 1990 (Church 1994). The announced goal of the Federal Reserve was to achieve a "soft landing" through tight policy in order to prevent inflation from developing—even though actual inflation was not accelerating and the primary indicator used by monetarists of forthcoming inflation, the rate of growth of the money supply, did not foretell rising inflation rates. The rates of growth of M1, M2, and M3 were equal to (or below) the rate of inflation from 1988 through 1990, which should have indicated to a monetarist that policy was already disinflationary, if not deflationary. A deep and prolonged recession was the result.

In 1993, for the sixth straight year, the rate of growth of M2 failed to reach the midpoint of the target range. Indeed, the rate of growth of M2 did not even reach the floor of the Federal Reserve's target range in 1992 and 1993, even though the Federal Reserve continually revised its targets downward. Close examination of the Federal Open Market Committee (FOMC) policy directives of 1992 shows a split in the interpretation of the Federal Reserve's inability to hit its targets (Ritter 1993). The fundamentalist monetarist members of the FOMC advocated monetary ease to raise the rate of growth of M2 to the level they believed consistent with adequate growth of real GNP (Ritter 1993). These members interpreted money growth rates as indicating excessive monetary tightness. On the other hand, the practical monetarists urged tighter directives because they believed the low interest rates and steady, positive inflation rates revealed excessive monetary ease (Angell 1994, Meltzer 1994, Murray 1991, Zuckerman 1993). The latter view is apparently still shared by the majority of the presidents of the district Federal Reserve banks, most of whom are "inflation hawks" (Ritter 1993, Zuckerman 1993).[2] Furthermore, the rates of growth of M1 and of bank reserves have once again exploded—which a monetarist could take as evidence of future inflation.

Chairman Greenspan's policy statements are consistent with the practical monetarists' view. In spite of the lack of evidence of the existence of inflationary pressures, these nonexistent pressures are continually cited as justification for restraint and for concern. As a result, the Federal Reserve had not lowered the discount rate since the third quarter of

1992, in spite of the sluggish recovery; on the contrary, from February to August 1994, it had raised the federal funds rate five times. Chairman Greenspan even took the unusual step of calling press conferences to announce rate increases, perhaps to forestall the movement in Congress for open FOMC meetings and for making the minutes public, but perhaps also to justify his controversial policy of tightening. Recently, the chairman claimed that the Federal Reserve's

> job is not yet complete . . . judging from the remaining inflation premium embodied in long-term rates. . . . [A] persistent inflation [has] devastating effects on our economy and society. [Having] paid so large a price in reversing inflation processes to date, it is crucial that we do not allow them to re-emerge. . . . [There] has emerged a growing consensus throughout the world that a monetary policy geared towards the pursuit of price stability over time is the central bank's most significant contribution to achieving maximal growth of a nation's well being. (Greenspan, 1994b, pp. 5, 12)

Owing to the unsatisfactory experience with monetary aggregate targets, some have turned to price targets as a substitute. W. Lee Hoskins, former president of the Federal Reserve Bank of Minneapolis, has recently claimed that there is near-universal support for the proposition that the Federal Reserve can control the price level but cannot control the rate of growth of GNP (Hoskins 1991). Jerry Jordan, president of the Federal Reserve Bank of Cleveland, has proposed a consumer price index (CPI) target. If, for example, average consumer prices for 1982–1984 are set equal to an index of 100, then the target should be 155 for the year 2000 (the index currently would be about 145); after the year 2000 the Federal Reserve should maintain price stability (defined as maintaining the index within plus or minus three points from 155) forever (Jordan 1993). Each year the Federal Reserve would announce short-term targets consistent with attaining the long-term target (that is, the index set at 155). According to Jordan, this would eliminate inflation expectations and would generate the expectation that the purchasing power of the dollar would be fixed by 2000.

Others have called for a gold price target, and even Chairman Greenspan has given some support to this. According to former Board of Governors (BOG) member Wayne Angell, since monetary aggregates such as M2 have become unreliable as predictors of forthcoming inflation,

> monitoring commodity prices is probably a better way to go. They—particularly the price of gold—are a signal that a lower value of money is driving the acquisition rate for all assets. . . . [W]e do best, and grow the most, when . . . the permanent goal is zero inflation. . . . [A]t this point in our financial history the price-level prediction in the price of gold provides the best single indicator for monetary neutrality in the reserve currency country of the world. . . . [T]he price of gold needs to be brought down. (Angell 1994)

Chairman Greenspan noted in 1993 that "the price of gold, which can be broadly reflective of inflationary expectations, has risen sharply in recent months," using this as part of the justification for the May 1993 shift toward an asymmetric directive, biased in the direction of tighter policy (Greenspan 1993, p. 5). Chairman Greenspan argued again in 1994 that the price of gold "has been especially sensitive to inflation concerns," citing rising gold prices as an indication of inflation expectations (Greenspan, 1994a, p. 14). The chairman's announcements notwithstanding, BOG member Lawrence Lindsey rejected the use of gold prices, stating, "If that's what the Chairman believes, that's fine; it's not my view that gold forms a key or central variable" (Bradsher 1994).

It cannot be overemphasized how radical a proposal this is. While the gold standard was long used to stabilize exchange rates among countries, to our knowledge, no country has ever tried to stabilize domestic commodity prices in terms of gold, nor has any country tried to stabilize the domestic price of gold without adopting fixed exchange rates and an international gold standard. Furthermore, there is no reason to believe that bringing down the price of gold would have any predictable effect on the rate of growth of domestic price levels. Finally, the theoretical justification for the gold standard has usually relied on the presumption that central bank domestic policy would be passive and that domestic prices would be flexible.

The Federal Reserve Chairman's Policy Statement of July 1993

In his testimony before the Subcommittee on Economic Growth and Credit Formation of the House Committee on Banking, Finance and Urban Affairs on July 20, 1993, the chairman announced an abrupt

change of "guides" to be used for Federal Reserve policy. While the Federal Reserve would continue to report targets for monetary aggregates —as required by the Humphrey-Hawkins Act of 1978—these would not actually be used as guides for policy formulation. Instead, the Federal Reserve would use real interest rates as the guides, particularly for longer-term policy. It was emphasized, however, that this shift in targets did not represent a shift in Federal Reserve goals: "to foster maximum sustainable economic growth and rising standards of living. *And in that endeavor, the most productive function the central bank can perform is to achieve and maintain price stability*" (Greenspan 1993, p. 10; emphasis added). Thus, real interest rates would be targeted in order to implement a policy whose goal was to eliminate inflation.

The chairman explained that this shift away from monetary aggregate targets was necessary because "the historical relationships between money and income, and between money and the price level, have largely broken down, depriving the aggregates of much of their usefulness as guides to policy" (p. 9). He also noted that even the P-star model that was based on a long-term relationship between M2 and prices no longer served as a useful guide to policy. He argued that "if the historical relationships between M2 and nominal income had remained intact, the behavior of M2 in recent years would have been consistent with an economy in severe contraction" (p. 8).

However, the Federal Reserve Board of Governors and the Federal Reserve district bank presidents predicted continued "moderate" growth, with real GDP growing at a rate of 2.5 percent in 1993 and between 2.5 to 3.25 percent for 1994. Rather than predicting a sluggish economy, as traditionally would be indicated by growth of M2, the Federal Reserve was concerned that inflation was not declining and might be on the verge of accelerating. Thus, monetary policy would have to be "alert to the possibility that an ill-timed easing" might raise inflation expectations, pushing interest rates higher and reducing economic growth (p. 4). While M2 performance would appear to prescribe further easing of monetary policy, the Federal Reserve had not moved to ease policy since September 1992 because "the stance of policy has appeared broadly appropriate to the evolving economic circumstances" (p. 4). Hence, monetary aggregates were no longer a useful guide to policy because they

seemed to indicate a resumption of recession, while the Federal Reserve feared that there was greater danger of accelerating inflation or, at least, of expectations of accelerating inflation. The Federal Reserve, thus, desired to use a guide that more closely reflected its view that these dangers were present. According to Chairman Greenspan's testimony, the correct real interest rate to be used as a guide would be that which "if maintained, would keep the economy at its production potential over time" (p. 10). This was denoted as the "equilibrium real rate—or, more appropriately, the equilibrium term structure of real rates" (p. 10). This appears to be an adaptation of the "natural rate" approach to interest rates. If the current real interest rate exceeds the natural rate (Chairman Greenspan's equilibrium rate), this will disinflate the economy; he associated real rates "below that level with eventual resource bottlenecks and rising inflation, which ultimately engenders economic contraction" (p. 10). The appropriate equilibrium real rate depends on "the ebb and flow of underlying forces," that is, on those forces that affect spending decisions (p. 10). According to the chairman's testimony, it is the long-term real rate that is important for decision making, but the Federal Reserve directly affects only the short-term real rate (the Federal Reserve affects long-term real rates only through impacts on inflation expectations); however, if the short-term real rate is substantially below the long-term real rate, this must indicate the market expects the short-term rate will rise to prevent inflation.

It was readily acknowledged by the chairman that one cannot estimate the equilibrium real rate "with a great deal of confidence," but one could be sure that estimates can be accurate "enough to be useful for monetary policy" (p. 10). Furthermore, he admitted that real rates are not observable; but, again, he asserted that they can be estimated with sufficient accuracy using data on nominal rates and estimates of expected inflation. Using such information, Chairman Greenspan concluded that real short-term rates were at that time nearly zero, while real long-term rates were substantially higher. This indicated to the chairman that "short-term real rates will have to rise" in order to avoid "substantial inflationary imbalances" (p. 10). This was to signal that the Federal Reserve had already eased policy as much as it believed prudent and that its future policy would be biased toward monetary restraint, which, in turn, would raise the real rates to the equilibrium rates thought to be consistent with price stability.

Again, the Fed appears to have adopted a tight policy because of concern with inflation and inflation expectations. According to Chairman Greenspan, "the news on inflation this year [1993] must be characterized as disappointing" (p. 6) and even "disturbing" (p. 4); he claimed that inflation expectations had risen during the first half of 1993 and feared that unless inflation expectations and price pressures were contained, these would raise long-term interest rates and stall economic expansion. Furthermore, he claimed that increased inflation is correlated with reduced growth of productivity—a finding he attributed to the propensity of economic agents to mistake nominal price changes for real (relative) changes. Finally, he argued that inflation raises the effective taxation of investment and saving, leading to reduced capital formation, and that if, as the Federal Reserve contends, monetary policy can induce price stability, then it will lead to lower long-term interest rates and will foster capital accumulation and productivity growth.

The announcement of new targets for monetary policy was met with surprise. Economists from a broad cross section of theoretical approaches rejected the new policy as unworkable and inadequately grounded in economic theory. Paul Samuelson (1993) argued that in a recession there is nothing wrong with negative real interest rates and there is no reason why there should be a positive real return on highly liquid transactions accounts in any case. According to Samuelson, the Federal Reserve's new choice of targets was actually undertaken because the previous target (M2) could not be used to justify its desire to tighten the screws to fight inflation. Henry Kaufman (1993) argued that the Federal Reserve's asymmetric directive (of May 1993) was premature, that there was no evidence of accelerating inflation, and that the world needed a coordinated effort to bring worldwide interest rates down. Importantly, Kaufman wrote: "What I do not favor is a preemptive move toward restraint on the pretext that this would somehow shore up the Federal Reserve's 'credibility' in the financial markets and, in so doing, relax market concerns about inflation prospects"; indeed, this would be "a policy argument that has an unfortunate tone of self-righteousness, rather than a firm analytical grounding. As a policy position, it is especially bizarre at the present time when, if anything, the financial markets have shown themselves to be quite comfortable with the overall stance of monetary policy" (p. 18).

Yet, we note the Federal Reserve embarked on exactly such a "bizarre" policy three months later. Neal Soss (1993) rejected real interest rate targets because of "operational questions" and "analytical ambiguities." According to Soss, "real interest rates can be judgmentally inferred, but never objectively observed . . . at best, the Federal Reserve can capture only a glimmer of real rates through the gossamer of the real and money economy's performance. How, then, can the Federal Reserve Board expect to use such an intangible and unobservable concept as a practical target for its open market operations?" (p. 28). Robert Brusca (1993) also rejected Chairman Greenspan's "disappointment" over inflation figures: "The Fed has no basis for being despondent about inflation's normal to excellent cyclical showing" (p. 30). In a letter to President Clinton, House Banking Committee Chairman Henry Gonzalez (1993) claimed that "current policies are certain to lead to continued stagnation, decline, and hardships for millions" (p. 31).

It should be noted that even the Federal Reserve agreed that economic performance in 1993, and that projected for 1994, did not signal dangers of an overheated economy. The Federal Reserve's own projections for 1993 were real GNP growth of 2.5 percent and 2.5 to 3.25 percent for 1994. Given excess capacity and rapid growth of new capacity (which the Federal Reserve estimated at more than 2.25 percent for 1993), as well as high unemployment levels (more than 8 million unemployed, plus 4 million involuntarily employed part-time, plus millions more outside the labor force), this rate of economic growth would not have indicated danger of accelerating inflation. Instead, the Federal Reserve's inflation fears were based primarily on the belief that low *ex ante* real short-term interest rates and higher long-term interest rates signaled significant expectations of inflation, indicating to the Federal Reserve that the market expected rising inflation.

As we shall see, Chairman Greenspan did not explicitly retreat from his July proposal in later testimonies; however, he did not emphasize the real interest rate target again. Instead, he focused on the role that inflation expectations play in generating inflation, called for policy that would more directly take account of these expectations, and justified further interest rate increases as required to lower inflation expectations. In the next section, we will examine two subsequent testimonies. We will then test Chairman Greenspan's proposed real interest rate target and

examine the appropriateness of choosing inflation expectations as a monetary policy target. Our analysis leads us to conclude that the Federal Reserve has offered neither a workable proposal nor a reasonable justification for recent tightening of policy or, for that matter, for continual active intervention into financial markets. Finally, we will close by suggesting an alternative to the Federal Reserve's recent proposals.

Chairman Greenspan's Policy Statements of February and June 1994

In the Board of Governors of the Federal Reserve System's *Monetary Policy Report to the Congress Pursuant to the Full Employment and Balanced Growth Act of 1978* on February 22, 1994, it was noted that "long-term inflation expectations remain stubbornly above recent inflation rates" (BOG 1994, p. 1).[3] According to the report, continued accommodative monetary policy would have "posed the threat that capacity pressures would build in the foreseeable future to the point where imbalances would develop and inflation would begin to pick up" (p. 1). As a result, the FOMC moved to push up the federal funds rate by one-quarter of one percentage point in a preemptive strike against future inflation. The FOMC reiterated the Federal Reserve's belief that the "historical relationships between the aggregates and spending" had deteriorated so that, "given uncertainties about velocity behavior," reported monetary targets would not be given as much weight in decision making as they had been in the past.

Monetary policy would remain focused on price stability: "In the area of monetary policy, the challenge is to build on the favorable price performance of late in a situation in which the economy will likely be operating closer to full capacity than it has in recent years. With success in keeping the economy on course toward the long-run goal of price stability, the prospects for sustained expansion will be greatly enhanced" (p. 4).

The report acknowledged, however, that recent and current evidence did not indicate that inflation was rising: "the CPI for commodities other than food and energy rose only 1.6 percent over the four quarters of 1993, a percentage point less than in 1992"; indeed, the rise in the CPI exclud-

ing food and energy "was the smallest increase in that measure in more than twenty years" (p. 16). Similarly, "the producer price index for finished goods . . . increased just 0.2 percent over the four quarters of 1993. An identical increase was reported in the PPI for finished goods other than food and energy; the increase in this measure was the smallest in its history, which goes back to 1974" (p. 18). On the other hand, "inflation expectations, as reported in various surveys of consumers and other respondents, flared up for a time during 1993. The surveys have continued to show one-year expectations of price change running somewhat higher than the actual increases of recent years. Longer-run expectations of price change have remained higher still" (p. 18).

According to the BOG's report, during 1993 "with money market rates remaining in a range not much, if at all, above the core rate of inflation . . . the members of the FOMC viewed that a tightening in reserve conditions at some point would likely be needed to avoid pressures on capacity and a pickup in inflation" (p. 19). As a result, the federal funds rate was increased one-quarter of one percentage point in February 1994, and policy tightening has occurred four times since then. The BOG's report admitted that when policy first became biased toward tightening (in May 1993 with the asymmetric directive), "slack in the economy remained appreciable, which weighed against any pickup in inflation, but inflation expectations were in danger of ratcheting higher, with possible adverse consequences for inflation itself" (p. 20). Although unemployment had risen before the July 1993 meeting, the FOMC "agreed that it was necessary to remain especially alert to the potential for a pickup in inflation" and retained the asymmetric bias toward tightening. By the August 1993 meeting of the FOMC, data indicated that production and spending "had a weakish cast," while "readings on inflation were encouraging" (p. 21). Even inflation expectations declined, leading to a symmetric directive, which was retained in September. By the last two meetings in 1993, however, the FOMC became convinced that the "next move in policy would be to tighten" (p. 21). At the first meeting of 1994, data on real GNP growth, prices of commodities, and falling slack in labor and product markets convinced the FOMC to "trim back some of the stimulus . . . before it fed through to higher inflation" (p. 21).

One justification widely reported in the press for the move toward tighter money policy was the belief that higher short-term rates would cause long-term rates to decline. Indeed, President Clinton cited this belief in statements that supported the Federal Reserve's shift of policy, on the expectation that falling long rates would ensure sustained economic growth and would enable the administration to achieve deficit reduction in line with projections of the Omnibus Budget Reconciliation Act of 1993 (OBRA93) (Galbraith 1994). Governor John LaWare later indicated that he, too, thought long-term rates might fall: "I had thought that a move by us at that time would be more likely to stabilize or maybe even bring down the long-term rate" (Bradsher 1994). This was based on the "Fisher effect" theory in which nominal interest rates are said to equal some real interest rate plus expected inflation. As the chairman stated in July 1993 and again in February 1994, real short-term rates were barely above zero, while real long-term rates were significantly higher (the term structure of interest rates—a function of the difference between long rates and short rates—was abnormally steep because long-term rates were much higher than short-term rates). According to the Federal Reserve and many other observers, the high long-term rates were due to inflation expectations that remained stubbornly high; if expectations of inflation could be lowered, the long-term rates would fall. If the Federal Reserve pushed up short-term rates and if this signaled to markets that inflation would not be tolerated, inflation expectations would be lowered; then long-term rates would actually fall and the yield curve would flatten as the gap between long rates and short rates closed. Chairman Greenspan has emphasized that it is the long-term interest rate that is important to economic decisions.

However, long rates rose immediately on the announcement of the February change of policy. Subsequent tightening generally pushed long-term rates even higher (although they did fall temporarily at some points in the following six months), so that, on net, long-term mortgage rates rose by three-quarters of one percentage point between January and June 1994; some long-term rates rose more than the increase of short-term rates (Galbraith 1994). This was in contrast to the experience during 1993, when the short-term rate was held steady: "longer-term interest rates fell as much as 1 percentage point over the course of 1993, to settle at levels not seen on a sustained basis since the later 1960s" (BOG 1994, p. 19). Incongruously, the report noted that expected inflation "moved

up from an average of 3.8 percent in the final quarter of 1992 to an average of 4.7 percent in the third quarter of 1993," and "longer-run expectations of price change have remained higher still" (p. 18). Thus, during 1993 long-term interest rates fell as short-term rates held steady, although inflation expectations remained relatively high (that is, above actual inflation) and even increased during the year—in direct contrast to the Federal Reserve's argument that high expected inflation was keeping long rates up. However, the BOG attributed the falling long-term rates to investor confidence concerning "prospects for low inflation and reduced federal budget deficits" (p. 19).

On June 22, 1994, Chairman Greenspan presented testimony before the House Committee on the Budget. He argued that the FOMC (apparently with the exception of Governor LaWare) had realized as early as February that "long-term rates would move a little higher temporarily as we tightened," but that even in the absence of tighter policy "longer-term rates eventually would have increased significantly," reflecting "increased uncertainty, as well as expectations of a stronger economy" (Greenspan 1994b, pp. 2–3). This seemed to indicate that President Clinton and other commentators misunderstood the Federal Reserve's February change of policy, which was recognized even at that time by the FOMC as likely to push up long-term rates rather than reduce them as many had been led to expect by the February report and by Chairman Greenspan's testimony of February 22, 1994. Presumably, the Fed believed that long-term rates could eventually come down as economic growth declined, as inflation expectations fell, and as uncertainty was reduced. However, the chairman argued that uncertainty actually increased because rising interest rates "triggered a reexamination by investors of their overly sanguine assumptions about price risk in longer-term financial assets" (p. 3). Thus, the tighter policy generated a run out of long-term assets as investors "fled toward more price-certain investments at the short end of the yield curve" (p. 3). This run was intensified by flows out of bond mutual funds as "investors, fearing further rate increases and awakening to the nature of the risk they had taken on, shifted funds back into shorter-term money market mutual funds and into deposits" (p. 3). Chairman Greenspan acknowledged that the Federal Reserve had realized that its policy change "could impart uncertainty to financial markets," but believed "timely action" would reduce "the degree and frequency of tightening that might be needed in the

future" (pp. 3–4). Thus, Chairman Greenspan admitted that the February and subsequent testimony and policy actions contributed to rising uncertainty, to rising expectations of further interest rate hikes, and to a run out of the longer-term end of the market that raised long rates. But this was justified on the basis that even greater short-term interest rate hikes would have been required in the absence of the Federal Reserve's preemptive strike. Thus, the Fed conceded that its February tightening increased uncertainty, generated a run out of longer-term assets, and pushed up long-term rates—all of which were the opposite of results anticipated by many observers at the time of the tightening, but were the results that the Fed had privately expected.

As the Chairman put it, "some critics of our latest policy actions have noted that we tightened policy even though inflation had not picked up. That observation is accurate, but is not relevant to policy decisions" (p. 4). This is because "shifts in the stance of monetary policy influence the economy and inflation with a considerable lag, as long as a year or more. . . . the challenge of monetary policy is to interpret current data on the economy and financial markets with an eye to anticipating future inflationary or contractionary forces and to countering them by taking action in advance" (p. 4). The emphasis of policy, therefore, must be on variables that can predict inflation far enough in advance that policy changes can be undertaken at least a year in advance of the emergence of inflationary pressures.

Unfortunately, the Federal Reserve systematically examined and rejected virtually every economic variable traditionally thought to predict forthcoming inflation. First, Chairman Greenspan rejected "high levels of resource utilization" as good predictors of inflation, because "through much of this nation's history, we had periods of tightened labor and product markets with only transitory effects on the general price level" (pp. 4–5). In three separate testimonies he rejected the use of monetary growth rates as indicators of future inflation. He rejected the traditional Phillips curve, arguing "over the longer term, no trade-off is evident between inflation and unemployment" (p. 6). Further, he dismissed capacity utilization as a predictor of inflation. He noted that rising capacity will help to reduce inflationary pressures, and the "Federal Reserve's own index of output capacity in manufacturing increased 2.25

percent last year and is likely to surpass that performance in 1994," thus, reducing any inflationary pressures. In any case, "firms historically have been able to 'stretch' capacity . . . [thus] . . . there is no clear-cut 'trigger point' for capacity utilization as a signal for emerging inflationary pressures" (p. 9). Similarly, in testimony before the Joint Economic Committee of Congress on January 31, 1994, Chairman Greenspan had emphasized that "the rate of price change depends crucially on price expectations, and not on the degree of slack" (Beadsher 1994).

In earlier testimony Chairman Greenspan had noted that present and recent inflation figures did not appear to be rising and stated that oil prices were actually declining. Although some commodity prices had risen in early 1994, he argued that "in the past such price data have often been an indication more of strength in new orders and activity than a precursor of rising inflation throughout the economy. In the current period, overall cost and price pressures still appear to remain damped" (Greenspan 1994a, p. 11). Along the same lines, he dismissed wage increases as a possible inflationary source, noting that "advances in productivity early this year are holding down unit labor costs" (p. 11). He dismissed rising private borrowing as well, having been shown to be "a highly imperfect indicator of inflation in recent years" (p. 11). Finally, he observed that "fiscal restraint and weak foreign economies" will have some disinflationary effects, but believed the effects "are likely to be less than feared" (p. 16).

Finally, Chairman Greenspan had earlier dismissed current inflation as only of "limited use as a guide to the appropriateness of current instrument settings" (Greenspan 1994a, p. 14). In addition to the inherent lags involved, he argued that "price measurements over short time spans are subject to transitory special factors" (p. 14). Indeed, the Federal Reserve's concern with inflation and inflation expectations conflicts with accumulating evidence that conventional measures of inflation are seriously upwardly biased. Peter Schulkin (1993) notes that conventional indexes mismeasure improvements of quality, substitution of cheaper goods (taken into account only once each decade), and purchases at discount outlets, and these measures include taxes (so that rising taxes are counted as inflation). Even the BOG concludes that inflation measures are biased upward by as much as 1.8 percentage points (although it adopts 1.0 per-

centage point as the most likely bias). Michael Bryan and Stephen Cecchetti (1993) cite studies showing that the bias due to introduction of new goods adds 0.5 to 1.0 percentage points to measured inflation; the discount outlet substitution bias is estimated to be 0.25 to 2.0 percentage points for food and 0.25 to 1.0 percentage points for energy. Given these measurement errors, the CPI target or Chairman Greenspan's zero inflation target would actually lead to deflation. Indeed, current inflation figures are nearly within the upper limit of the range the BOG admits could represent merely measurement error.

The variables traditionally used to predict inflation were rejected on the basis that they have performed poorly in the past or that their current values do not indicate inflation is imminent or both. Chairman Greenspan suggested that the Federal Reserve will continue to use a number of indicators as a basis of policy, even though he listed only "credit market developments" (Greenspan 1994a, p. 18). Much of his February 22, 1994 testimony, however, was devoted to the role that inflation expectations play and to the use of inflation expectations "as a direct guide to policy" (p. 14). According to Chairman Greenspan:

> A clear lesson we have learned over the decades since World War II is the key role of inflation expectations in the inflation process . . . lower inflation and inflation expectations reduce uncertainty in economic planning and diminish risk premiums for capital investment. . . . [The] reduced inflation expectations of recent years have been accompanied by lower bond and mortgage interest rates, slower actual inflation, falling trend unemployment, and faster trend productivity growth. . . . *[The] implication is clear: when it comes to inflation expectations, the nearer zero, the better.* It follows that price stability, with inflation expectations essentially negligible, should be a long-run goal of macroeconomic policy. We will be at price stability when households and businesses need not factor expectations of changes in the average level of prices into their decisions. How these expectations form is not always easy to discern, and they can for periods of time appear to be at variance with underlying forces. (p. 13, emphasis added)

In conclusion, he claimed Federal Reserve policy had helped to lower inflation expectations over the past several years even while it had been accommodative; according to Chairman Greenspan, even easy money policy can lower inflation expectations if it is "in the context of a thorough analysis of the prevailing situation" (p. 13). High expected infla-

tion, then, could be fought either with tight or easy money policy, depending on the "context." One could not necessarily determine whether the Fed was fighting inflation by merely examining the tightness of policy since easy policy could fight inflation if it lowered expectations. In evaluating the Federal Reserve's current policy, Chairman Greenspan provided the method to be employed: "The test of successful monetary policy in such a business cycle phase is our ability to limit the upward movement of long-term rates from what it would otherwise have been with less effective policy" (p. 14). If policy lowers long-term rates, it is successfully fighting inflation.

Applying the proverbial "the proof is in the pudding" test, the Federal Reserve's policy shift since February 1994 has been a resounding failure by Chairman Greenspan's own criteria (see also Galbraith 1994). Long-term interest rates immediately rose, as we mentioned earlier, indicating either that the shift in policy led markets to believe inflation would be higher than they had previously expected or that the steep yield curve actually reflected the fear that the Federal Reserve would raise interest rates (rather than a fear of inflation). As acknowledged in the June 1994 testimony, the Federal Reserve's action led to a run out of the long end of the market (which was in contrast to the Federal Reserve's desire, if it wanted to stimulate sustainable, long-term growth), as, according to Chairman Greenspan, investors "fearing further rate increases and awakening to the nature of the risk they had taken on" shifted back to shorter term assets (Greenspan 1994b, p. 3). Thus, long-term rates had been high because the market quite correctly feared "further rate increases"; once these became a reality, the bond market plummeted and stock prices experienced increased volatility because additional rate hikes were feared.

Over the past year the radical shift in policy announced by Chairman Greenspan in four testimonies, as well as the five occasions on which the Federal Reserve raised short-term interest rates, violated the goals of monetary policy as laid out by the chairman in June 1994: "Most importantly we can reinforce ongoing trends in the private sector that enhance our productive potential by helping to create a stable environment for sustainable noninflationary economic growth. Stability in economic conditions boosts confidence and makes long-range planning by

businesses and households much easier" (Greenspan 1994b, p. 11). Unstable interest rates, uncertainty over actions to be taken at FOMC meetings, and unstable exchange rates generated by rudderless central bank policy have all reduced stability, confidence, and the ability to engage in long-run planning. The upward movement of interest rates will increase the government deficit (directly through interest payments on government debt and indirectly through lower tax revenues), raise the burden on debtors (the typical home mortgage payment rose by $100 per month this spring), reduce some interest-sensitive spending, and slow the growth of employment as it retards the recovery. If this leads to lower investment, it will also lead to lower growth of productivity and capacity—exactly the opposite effect predicted by the Federal Reserve Board. Finally, there is no evidence (yet) that the Federal Reserve's moves since February have lowered inflation expectations, and the policy has caused investors to shun the long-term end of the market because of the fear of further rate hikes that would cause capital losses. The yield curve will remain steep because high long-term rates are required to compensate holders of long-term bonds for the capital losses they would suffer when the Fed further tightens. By Chairman Greenspan's test (falling long-term rates), the policy is clearly a failure and did not lead to the desired result.

On a different but related score, investors recently have bet against the dollar, causing it to reach postwar lows against the yen (and also to fall against the mark). Many analysts had called on the Federal Reserve to try to defend the dollar with an interest rate hike at its July meeting, but the Federal Reserve waited until August to raise interest rates again. In any case, analysts have argued that speculators are trying to force the hand of the Federal Reserve to see whether it will defend the dollar with higher interest rates; should the Federal Reserve (and other central banks) attempt to do so but fail, spectacular profits can be made. We do not believe there is a "dollar crisis" and suspect that uncertainties generated by recent Federal Reserve policy played some role in creating problems in the market for dollars. It should be noted that before February 1994, even with low and stable short-term interest rates, with an economy that was outperforming those of nearly all our trading partners, with inflation averaging 2.75 percent for 1993 (the same as for early 1994), the United States faced no dollar "crisis." The run on the dollar began

only after the policy shift and after interest rates rose, that is, after the Federal Reserve's policy change created uncertainty and caused losses in bond and stock markets. It is now apparent that foreign investors, like domestic investors, are avoiding the long end of the market. The premium that must be paid by long-term assets over that paid by short-term assets must be sufficient to compensate holders for capital losses that will occur when the Federal Reserve raises interest rates further. For this reason, it is unlikely that a tighter money policy would be able to stem a run out of dollar-denominated long-term assets because the likely capital losses would swamp any rise of yields due to tighter policy. Indeed, any reasoned analysis should have predicted that rather than calming any inflation fears foreign investors might have had, the Federal Reserve's recent tightening only generated capital losses and disrupted the long end of the market.

An *Ex Post* Scorecard for Chairman Greenspan's Policy: Would Random Policy be Better?

While the Federal Reserve's current policy clearly failed by Chairman Greenspan's own test, we analyzed the data since 1959 to determine how well Chairman Greenspan's proposals would have fared had they been adopted in the past. We must from the outset state some caveats.

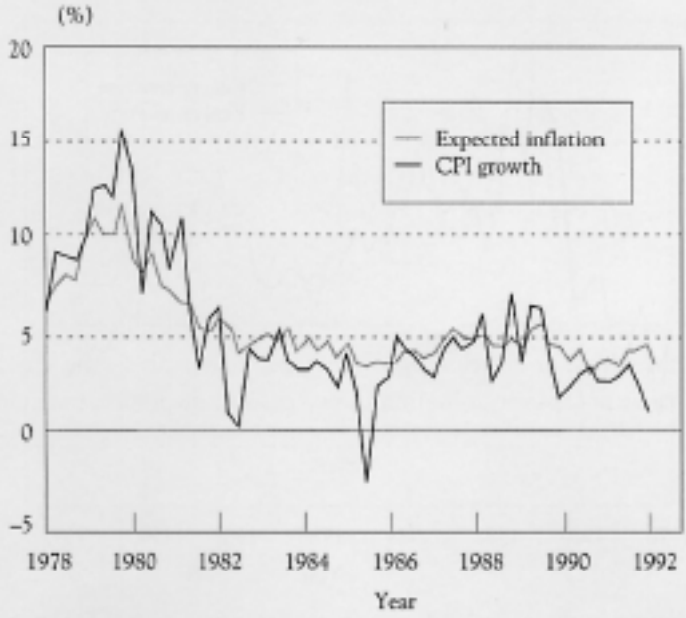
First, when Chairman Greenspan advocated a real interest rate target, he did not state what the "equilibrium" real rate would be and, in fact, hinted that it might vary depending on economic conditions. However, most economists who adopt an equilibrium approach argue that the economy cannot remain out of equilibrium for an extended length of time. Thus, over a long period the economy should be "near" equilibrium on average; while the equilibrium real interest rate might vary (due to shocks to the economy) over the very short run, over long periods it should remain relatively stable. (This would not be true of nominal interest rates, fluctuations of which would depend on inflation expectations according to the Fisher effect.) We take the long-term average real interest rate as a proxy for the equilibrium rate, while recognizing that this will introduce error into the analysis should permanent changes to economic conditions (structural shifts) have occurred over the period.

Second, Chairman Greenspan does not define terms such as "accelerating inflation" and "disinflation" sufficiently well to operationalize them. We define accelerating inflation as an increase of inflation by one percentage point or more within one year, and disinflation as a decrease by one percentage point or more within one year. This is admittedly somewhat arbitrary; however, we believe that changes less than this would probably not be viewed as significant. Furthermore, the standard deviation of inflation over this period is about three percentage points; relative to the standard deviation, a one percentage point change of inflation is significant enough that it probably would not be dismissed as "white noise."

Finally, we test whether real interest rates can predict if capacity utilization will increase or decrease by a "significant" amount. In this case, we use a change of capacity utilization by two percentage points or more over a year as a measure of significance; the standard deviation was about 4.5 over this period. Again, we admit that this is somewhat arbitrary. In our first test of Chairman Greenspan's rule, we will use an *ex post* real interest rate—obtained by subtracting actual inflation from nominal short-term interest rates—to eliminate problems of measurement of inflation expectations and gaps in data. Over the very short run expected inflation is highly correlated with actual inflation; as we will use a three-month interest rate, there will be little difference between the *ex post* and *ex ante* real rates. (See Figures 2 and 3 for a comparison of actual and expected inflation for a portion of the period under examination.)

If the Federal Reserve had adopted a real interest rate target in the past, how often would it have correctly read economic conditions? Over the entire examined period the real *ex post* short-term interest rate averaged just less than 1.5 percent, with a maximum of nearly 9.5 percent and a minimum of –5.5 percent. Assuming that the average real rate of 1.5 percent is a proxy for Chairman Greenspan's "equilibrium" real rate, then a real rate above this should indicate an economy facing disinflationary pressures, and a rate below this should presage dangers of accelerating inflation. At the same time the average inflation rate achieved over the period was 4.7 percent, with a maximum of 15.8 percent and a minimum of –2.2 percent; the average capacity utilization rate over the period was 82 percent with a minimum of 71 percent and a maximum of 92 percent.

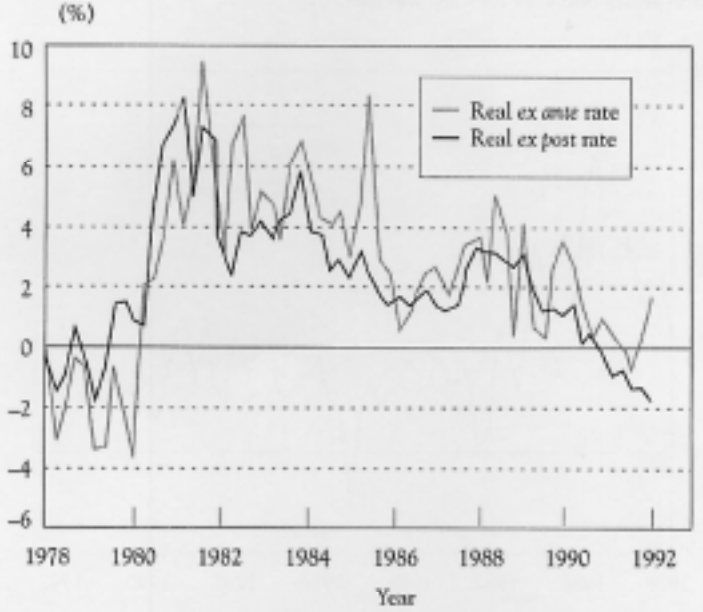
Figure 2 Actual and Expected Inflation Growth. The figure represents the inflation rate as measured by quarterly changes in the consumer price index and expected inflation as measured by the University of Michigan's expected inflation series one year forward forecast.



Source: The Forecasting Center of The Jerome Levy Economics Institute. The authors wish to acknowledge the Federal Reserve Bank of Cleveland for assistance with this data.

Table 1 is a "scorecard" for Chairman Greenspan's proposed policy. Assume that he plans to implement tight policy when the real interest rate drops below 1.5 percent to fight what he believes are inflationary pressures and to implement easy policy when the real interest rate is above 1.5 percent. As Table 1 shows, there were 65 quarters in which Chairman Greenspan would have adopted easy policy. However, 48 of these quarters were followed by accelerating inflation (as discussed above, defined as a rise of inflation by one percentage point or more within the following four quarters), so Chairman Greenspan's policy would have been mistaken 74 percent of the time. Indeed, as the table shows, he would have adopted the incorrect policy 96 percent of the time between 1959.2 and 1971.1, 50 percent of the time between 1971.1 and 1983.1, and 66 percent of the time between 1983.2 and 1993.3.

Figure 3 Real *Ex Ante* and Real *Ex Post* Interest Rates. The figure represents the annualized, real *ex ante* and *ex post* short-term interest rates on three-month Treasury bills.



Source: National Income and Product Account and the Forecasting Center of The Jerome Levy Economics Institute.

The policy would not have worked much better during periods of low real rates, when he would have adopted tight policy on the expectation that inflation would accelerate. There were 73 quarters in which the real rate fell below 1.5 percent, suggesting to Chairman Greenspan that tight money policy would be required to stem future inflation. However, 37 of these quarters were followed by declining inflation. This policy would have been incorrect 100 percent of the time between 1983.2 and 1993.3, 28 percent of the time between 1971.2 and 1983.1, and 60 percent of the time between 1959.2 and 1971.1, for an overall score of 51 percent incorrect policy responses.

In addition, the real interest rate often misinterprets the "tightness" of the economy as measured by the capacity utilization rate (Table 2). Chairman Greenspan claims that when the real short-term interest rate is below "equilibrium," bottlenecks will follow as capacity utilization

Table 1 Chairman Greenspan's Scorecard: Inflation

Period	Number of Quarters with Real STr > 1.5 Percent	Number of Quarters with Inflation > 4.7 Percent	Number of Quarters with Inflation < 4.7 Percent	Number of Quarters Followed by Accelerating Inflation	Chairman Greenspan Adopts Wrong Policy (%)
1959.2–1971.1	23	2	21	22	96
1971.2–1983.1	12	8	4	6	50
1983.2–1993.3	30	4	26	20	66

Period	Number of Quarters with Real STr < 1.5 Percent	Number of Quarters with Inflation > 4.7 Percent	Number of Quarters with Inflation < 4.7 Percent	Number of Quarters Followed by Accelerating Inflation	Chairman Greenspan Adopts Wrong Policy (%)
1959.2–1971.1	25	8	17	10	60
1971.2–1983.1	36	28	8	26	28
1983.2–1993.3	12	4	8	0	100

Notes: STr is the real short-term interest rate as measured by subtracting the inflation rate (as measured by the quarterly rate of change in the consumer price index) from the three-month Treasury bill rate. Owing to data limitations, it was assumed that the inflation rate will not rise above 2.3 percent within four quarters following 1993.3.

Source: Authors' calculations based on *National Income and Product Account*.

rises. This would generate inflation. In other words, when the short-term interest rate is below 1.5 percent, capacity utilization is expected to rise, generating inflationary pressures that can be lessened if the Federal Reserve adopts tight policy. Similarly, when the real interest rate is above 1.5 percent, capacity utilization is expected to fall. As Table 2 shows, there were 65 quarters when the real rate was above 1.5 percent and 73 quarters when it was below 1.5 percent. When the real rate was above 1.5 percent, the capacity utilization rate tended to be below its long-run average (82 percent); this is consistent with Chairman Greenspan's belief, but it should be noted that even in this case, high real interest rates are associated with high capacity utilization 38 percent of the time. (Furthermore, the correlation says nothing about causation: it is possible that low capacity utilization is associated with low inflation which causes high real, or residual, interest rates.) When real rates are below 1.5 percent, the capacity utilization rate is just as likely to be above normal as it is to be below normal, which contradicts Chairman Greenspan's belief. However, from Chairman Greenspan's perspective, real rates are more important as predictors of future bottlenecks or slack. Therefore, we examined the four-quarter period following each real interest rate observation to see whether a real rate below 1.5 percent predicts rising capacity utilization rates and whether a real rate above 1.5 percent indicates falling capacity utilization rates. As discussed above, we define a rise or fall of capacity utilization as an increase or decrease of capacity utilization by two percentage points or more over any quarter within four quarters of the period under observation. This is actually a relatively relaxed condition as there is wide fluctuation of capacity utilization rates over the typical four-quarter period.

As Table 2 shows, when the real rate is above 1.5 percent (suggesting to Chairman Greenspan that easy money policy is required to prevent depressionary influences), the chairman would have chosen the wrong policy 61 percent of the time between 1959.2 and 1971.1, 42 percent of the time between 1971.2 and 1983.1, and 90 percent of the time between 1983.2 and 1993.3, for an overall average of 71 percent incorrect policy choices. In other words, in most cases, relatively high real interest rates did not foretell falling capacity utilization rates, so that easy policy was not indicated. (By a stricter test, in which the average capacity utilization over the four quarters following the quarter under observation falls by two percentage points, Chairman Greenspan would

Table 2 Chairman Greenspan's Scorecard: Capacity Utilization

Period	Number of Quarters with Real STr > 1.5 Percent	Number of Quarters with Capacity Utilization > 82 Percent	Number of Quarters with Capacity Utilization < 82 Percent	Number of Quarters Followed by Decrease of Capacity Utilization	Chairman Greenspan Adopts Wrong Policy (%)
1959.2–1971.1	23	16	7	9	61
1971.2–1983.1	12	0	12	7	42
1983.2–1993.3	30	9	21	3	90

Period	Number of Quarters with Real STr < 1.5 Percent	Number of Quarters with Capacity Utilization > 82 Percent	Number of Quarters with Capacity Utilization < 82 Percent	Number of Quarters Followed by Increase of Capacity Utilization	Chairman Greenspan Adopts Wrong Policy (%)
1959.2–1971.1	25	15	10	8	68
1971.2–1983.1	36	22	14	19	47
1983.2–1993.3	12	0	12	4	67

Notes: STr is the real short-term interest rate as measured by subtracting the inflation rate (as measured by the quarterly rate of change in the consumer price index) from the three-month Treasury bill rate. Owing to data limitations, it was assumed that capacity utilization will not fall below 78.8 percent or rise above 82.8 percent within four quarters following 1993.3.

Source: Authors' calculations based on *National Income and Product Account*.

have chosen the incorrect policy more than 78 percent of the time.) On the other hand, when the real rate is below 1.5 percent (suggesting to Chairman Greenspan that tight money policy is required to prevent bottlenecks), the chairman would have chosen the incorrect policy 68 percent of the time between 1959.2 and 1971.1, 47 percent of the time between 1971.2 and 1983.1, and 67 percent of the time between 1983.2 and 1993.3, for an overall average of 58 percent incorrect policy responses. These tests, then, lead us to conclude that real interest rates do not correctly predict future capacity utilization rates and cannot be used to guide monetary policy designed to affect capacity utilization with a lag of up to a year.

It should be noted that these tests assume the Federal Reserve did not actually adopt the "correct" (that is, Chairman Greenspan's) policy. For example, if the Federal Reserve adopted tight policy each time the real rate fell below 1.5 percent, this would (according to Chairman Greenspan's theory) prevent inflation so that Table 1 would report a policy error (because the low real interest rate would not be followed by inflation). This would require either that the target chosen in the past (whatever it might have been) consistently correlated with Chairman Greenspan's target or that policy just happened to react in a manner consistent with Chairman Greenspan's proposal. Thus, the results of Table 1 will hold only if policy in the past was "random" with respect to Chairman Greenspan's target variable. If the Federal Reserve actually (perhaps unknowingly) followed Chairman Greenspan's rule, then the table might report a score of 100 percent wrong policy responses; if the Federal Reserve had actually adopted perverse policy (that is, the opposite of Chairman Greenspan's rule), then the table could report no policy errors.

In order to test whether the Federal Reserve was unknowingly adopting Chairman Greenspan's policy, we analyzed Federal Reserve discount window policy to determine whether an observation of a real short-term interest rate above 1.5 percent was followed within three quarters by monetary ease, defined as a decrease of the discount rate by at least one-quarter of one percentage point within three quarters. Similarly, when the real interest rate was below 1.5 percent, "correct" policy would have raised the discount rate by at least one-quarter of one percentage point within three quarters. Of course, the parameters of this test are somewhat arbitrary. However, Chairman Greenspan's intention appears to be

to adopt policy that could operate with a lag of about a year. Real interest rates can be calculated at least monthly. It is reasonable to assume that the Federal Reserve could and would respond within three quarters to a change of real interest rates if it were to pursue Chairman Greenspan's proposal. We have adopted a one-quarter of one percentage point change to the discount rate as the minimum significant change on the basis of recent Federal Reserve behavior. (We have used the discount rate rather than the federal funds rate in order to reduce the influence of demand-side market forces so we can focus on Federal Reserve policy; we recognize, however, that recent Federal Reserve policy has focused on the federal funds rate rather than on the discount rate.) Table 3 presents the results.

As Table 3 shows, when the real short-term rate is above 1.5 percent, the Federal Reserve is more likely to adopt tight money policy (an incorrect response) than it is to adopt easy money policy. It adopts Chairman Greenspan's "correct" policy only 29 percent of the time (19 out of 65 quarters). On the other hand, when the real rate is below 1.5 percent, the Federal Reserve is much more likely to adopt easy policy ("incorrect"), adopting the "correct" (tight) policy 26 percent of the time (19 out of 73 quarters—although some of this might be attributed to the Federal Reserve's bias toward tight policy, which was adopted 50 times, while easy policy was adopted 45 times). The Federal Reserve adopts perverse policy 40 percent of the time when the real interest rate is above 1.5 percent and 42 percent of the time when it is below 1.5 percent (it takes no policy action about 30 percent of the time). Table 3 shows that the incorrect policy responses of Tables 1 and 2 cannot be attributed to the Fed's unknowing adoption of Chairman Greenspan's policy.

We ran a test that would combine the real interest rate signal, the Federal Reserve's reaction, and the eventual results. If the real interest rate signal predicts inflation, the Federal Reserve does not tighten, and inflation still does not occur, this is unambiguously a case in which the real interest rate target gives the wrong signal. In contrast, the real interest rate signal is unambiguously correct when it signals inflation, the Fed does not ease policy, and inflation occurs. All other cases would involve some ambiguity. Table 4 presents the results.

Table 3 Actual Policy Adopted

Period	Number of Quarters with Real STr > 1.5 percent	Tight Policy Adopted	Easy Policy Adopted
1959.2–1971.1	23	5	7
1971.2–1983.1	12	7	4
1983.2–1993.3	30	14	8
Period	**Number of Quarters with Real STr < 1.5 percent**	**Tight Policy Adopted**	**Easy Policy Adopted**
1959.2–1971.1	25	3	10
1971.2–1983.1	36	11	19
1983.2–1993.3	12	5	2

Notes: STr is the real short-term interest rate as measured by subtracting the inflation rate (as measured by the quarterly rate of change in the consumer price index) from the three-month Treasury bill rate. Easy policy is defined as a decrease of the discount rate by one-quarter of one percentage point or more within three quarters; tight policy is defined as an increase of the discount rate by one-quarter of one percentage point or more within three quarters.

Source: Authors' calculations based on *National Income and Product Account*.

As Table 4 shows, there were 73 quarters in which the real interest rate was less than 1.5 percent, signaling to Chairman Greenspan that inflation should accelerate. Of these, the Federal Reserve did not tighten policy 39 times (an incorrect policy response); it did not loosen policy 38 times (this includes 34 quarters after which policy was tightened, plus four in which the Federal Reserve took no action). Of the quarters in which the Federal Reserve reacted incorrectly, only 9 were actually followed by acceleration of inflation, while 30 were not. This means that the real interest rate unambiguously gave the wrong signal 30 times out of the 73 quarters in which it signaled accelerating inflation, or 41 per cent of the time. Of the 38 quarters in which the Federal Reserve did not loosen policy, 28 were followed by acceleration of inflation and 10 were not. Thus, the real interest rate target unambiguously gave the correct signal 28 times out of 73 quarters, or 38 percent of the time. In conclusion, once we focus only on the unambiguous cases, we find that the real interest rate target gives the wrong signal more often than it gives the correct signal regarding accelerating inflation.

Table 4 Real Interest Rates, Federal Reserve Reaction, and Inflation Results

	Number of Quarters in Which Real STr < 1.5 percent	Of Which Fed Does Not Tighten Policy	Of Which Fed Does Not Loosen Policy
Inflation accelerates	36	9	28
Inflation does not accelerate	37	30	10
Total	73	39	38

Note: STr is the real short-term interest rate as measured by subtracting the inflation rate (as measured by the quarterly rate of change in the consumer price index) from the three-month Treasury bill rate.

Source: Authors' calculations based on *National Income and Product Account*.

Chairman Greenspan has also claimed that expected inflation is a good predictor of future inflation; indeed, expected inflation seems to be the only guide analyzed by the chairman that has yet to be dismissed. We will first analyze whether expected inflation has been a good predictor of inflation and then determine whether use of expected inflation in the past would have led to correct policy responses. In 1980 respondents to surveys predicted inflation would average 9 percent over the next decade; actual inflation turned out to be only half that. "This peak in 10-year expectations occurred about eight years after (ex post) inflation peaked and converged only slowly to the lower level of inflation experienced in the decade" (Carlson 1993). Any policy based on longer-term inflation expectations during the 1980s would have seriously overestimated inflationary pressures.

Indeed, the evidence suggests that rather than expected inflation predicting inflation, inflation expectations are formed on the basis of current inflation along with past inflation.[4] To determine whether expected inflation would serve as a useful target for monetary policy, we looked at data since 1978 (owing to data limitations, we could not examine earlier years) on expected inflation, actual inflation, and Federal Reserve policy to see whether an increase in inflation expectations could be used as the basis of policy actions to be taken in advance of accelerating inflation.

Assume that Chairman Greenspan's policy would use expected inflation as a guide for policy; if expected inflation has risen by at least one percentage point over the previous four quarters, Chairman Greenspan will adopt tight policy (defined, as above, as an increase of the discount rate by at least one-quarter of one percentage point over the following three quarters) on the anticipation that actual inflation will rise by at least one percentage point over the next four quarters. We examined whether an increase in inflation expectations had, in the past, correctly anticipated future inflation; we next examined whether the Federal Reserve had knowingly or unknowingly followed this policy in the past.

Table 5 shows that between 1978.4 and 1992.3 there were 7 instances in which rising expectations of inflation were followed by accelerating actual inflation; there were 3 instances in which rising expectations of inflation were not followed by accelerating actual inflation. There were 22 observations in which expected inflation was not rising, but actual inflation did accelerate, and 24 observations in which expected inflation was not rising, and actual inflation did not accelerate. Overall, rising expected inflation is followed by rising actual inflation 70 percent of the time. However, instances of accelerating actual inflation were predicted by rising expected inflation only 24 percent of the time; in most cases expected inflation did not correctly anticipate inflation.

It is possible that perverse policy generated the accelerating inflation that the expected inflation series could not anticipate. It does not appear that the Federal Reserve was adopting an expected inflation guide over the period analyzed. In 8 out of 10 cases (80 percent) in which the expected inflation guide predicted accelerating inflation, the Federal Reserve did adopt tight money policy—a "correct" policy response. Interestingly, of the 2 cases in which the Federal Reserve did not adopt tight policy, neither was followed by accelerating inflation; however, in 7 of the 8 cases in which the Federal Reserve did adopt tight policy, inflation accelerated. Of the occasions in which tight policy was adopted, 13 out of 21 (62 percent) were not indicated by the expected inflation guide. Thus, it does not appear that the Fed was adopting an expected inflation guide over the period analyzed. There were 22 occasions on which the expected inflation guide did not indicate accelerating inflation and actual inflation accelerated anyway. Of these, the Federal Reserve adopted easy money

Table 5 The Expected Inflation Target

	Actual Inflation Accelerated	Actual Inflation Did Not Accelerate	Tight Policy Adopted	Easy Policy Adopted
Expected inflation increased	7	3	8	2
Expected inflation did not increase	22	24	13	25
Total	29	27	21	27

Note: Expected inflation is measured by the University of Michigan's expected inflation series one year forward forecast.

Source: Authors' calculations based on *National Income and Product Account*.

policy in 8 out of 22 (36 percent); on these occasions, it could be argued that the easy money policy generated the inflation. However, in another 8 cases (36 percent) the Federal Reserve adopted tight policy and inflation accelerated anyway; in the remaining 6 cases (27 percent) the Federal Reserve did not change policy and inflation accelerated. Thus, in the majority of cases where the expected inflation guide does not predict the accelerating inflation that actually occurs, the acceleration of inflation cannot be attributed to easy money policy.

An Alternative Approach to Monetary Policy

The period from World War II to the late 1960s or early 1970s has frequently been called the "golden age" of U.S. economic history. It is beyond the scope of this *Public Policy Brief* to review in detail all the factors that contributed to the superior economic performance over this period (see Fazzari 1995, Galbraith 1995, Kregel 1995, Wray 1995). We will focus, instead, only on the Federal Reserve's aggregate monetary policy. The key difference between the early postwar period and the late postwar period is the degree of commitment of the Federal Reserve to stable, and generally low, interest rates. After World War II, the Federal Reserve was committed to "pegging" U.S. government bond prices. As a result, between the first quarter of 1946 and the first quarter of 1948, the discount rate remained at 1 percent; it then remained below 2 percent

until the end of 1955—a period of ten years in which it did not fluctuate by more than one percentage point. In 1951 the Federal Reserve abandoned the interest rate peg with its Treasury-Fed Accord. Over time the Federal Reserve gradually abrogated its commitment to low and stable interest rates. Still, until 1966 the Federal Reserve maintained the discount rate below 4 percent and the three-month Treasury bill rate well below 5 percent. In 1966 the Federal Reserve (apparently due to fear of forthcoming inflation) pushed the discount rate to 4.5 percent and the Treasury bill rate above 5 percent; the first financial crisis of the postwar period resulted (Minsky 1986, Wolfson 1986). After 1966 the Federal Reserve embarked on a series of attempts to "fine-tune" the economy through the use of tight money policy each time there was fear that inflation would accelerate. In late 1969, from 1973 to 1974, from 1978 to 1985, and from 1988 to 1990 the Federal Reserve pushed short-term rates higher and in each case financial crises and/or recessions ensued.

The transition to attempts at fine-tuning has led to much greater interest rate instability (see Table 6). From mid-1959 to 1966 the standard deviation of the three-month Treasury bill rate was 0.61, while that of long-term government securities was only 0.14. For the Treasury bills, the standard deviation increased to 1.27 for 1966 to 1978 and to 2.96 for 1978 to 1993; for long-term securities, the standard deviation rose to 0.84 and 1.87 for these periods. Between 1978 and 1993 the maximum three-month Treasury bill interest rate was over 15 percent, and the minimum was less than 3 percent; between 1959 and 1966 the maximum was 4.3 percent and the minimum was 2.32 percent. This recent interest rate instability has increased uncertainty, increased the difficulty of writing forward money contracts, and contributed to the growth of derivatives as economic agents tried to hedge interest rate risk. While Chairman Greenspan refers to the costs of uncertainty generated by inflation, we believe the costs of uncertainty generated by unstable interest rates (and exchange rates) may be as important, if not more important. Indeed, the explosion of the derivatives market, which entails substantial costs and risks, is evidence that markets believe interest rate instability is costly.

We want to emphasize again our belief that active Federal Reserve policy is sometimes warranted; we agree that the Federal Reserve must retain some discretionary power to take aggressive action when such

Table 6 Volatile Interest Rates

	Mean	Standard Deviation	Maximum	Minimum
1959.2–1993.3				
Long-term government securities (composite)	7.25	2.61	14.00	3.00
Three-monthTreasury bills	6.18	2.80	15.09	2.32
1959.2–1965.4				
Long-term government securities (composite)	4.04	0.14	4.35	3.80
Three-month Treasury bills	3.18	0.61	4.30	2.32
1966.1–1977.4				
Long-term government securities (composite)	6.08	0.84	7.27	4.44
Three-month Treasury bills	5.59	1.27	8.39	3.43
1978.1–1993.3				
Long-term government securities (composite)	9.51	1.87	13.60	6.15
Three-month Treasury bills	7.91	2.96	15.09	2.98

Source: Authors' calculations based on *National Product and Income Account.*

action becomes necessary. However, the escalation of its intervention into the economy that has occurred under the leadership of chairmen Volcker and Greenspan has raised uncertainty, increased instability in domestic financial markets, contributed to instability of the dollar in foreign exchange markets (a topic beyond the scope of this *Public Policy Brief*), generated costs of hedging and increased interest rate and default risk, and had deleterious consequences for economic growth. A comparison of the results of Federal Reserve policy before 1966 and after 1966 suggests that policy directed at stabilizing interest rates more successfully accomplishes the goals outlined in the 1946 Employment Act and the 1978 Full Employment and Balanced Growth Act. The period before 1966 witnessed lower unemployment *and lower inflation* than the period after 1966 when the Fed increased its intervention.

Previous to Chairman Volcker's experiment in practical monetarism, the Federal Reserve employed tight money policy to fight perceived inflationary pressures usually in response to expansionary fiscal policy. For

example, the Federal Reserve's move to tight policy in 1966 was in the context of a high employment economy with rising government defense expenditures during the Vietnam War. Although the Federal Reserve's movement to tight policy in 1979 occurred during high unemployment, the tight policy during the early 1980s was frequently justified as necessary to reduce inflationary pressures thought to result from the large and rising government deficits during President Reagan's terms. However, the recent tightening of monetary policy under Chairman Greenspan has occurred while government deficits have been falling and after the president and Congress reached agreements that will substantially reduce fiscal stimulus. Thus, unlike previous periods in which tight money policy could be justified on the basis that fiscal policy was excessively stimulative, the current tightening comes while fiscal policy is widely believed to be moving to reduce the stimulus. Indeed, many economists have argued that the fiscal stance is even recessionary; many have called on President Clinton to increase public infrastructure spending, largely due to the fiscal stimulus it would provide.

The evidence also suggests that Chairman Greenspan's proposed targets (whether real interest rates or expected inflation) would have led to incorrect policy much of the time in the past, and there is no reason to expect these will perform any better in the future. By Chairman Greenspan's own admission,[5] (1) our understanding of the economy is imperfect and the measurement of important variables like inflation is imprecise, (2) no variables (other than expected inflation, which the chairman admits is difficult to measure and which our tests have rejected as unreliable) are sufficiently well correlated with inflation to allow their use in policy formation, (3) the impact of monetary policy on the economy is subject to long, uncertain, and variable lags, (4) economic theory does not provide unambiguous guidance for the formation of monetary policy, and (5) there is no consensus regarding how the Federal Reserve can stabilize prices even if, as Chairman Greenspan claims, there is growing consensus that central bank policy should stabilize prices. We, however, do not agree that this should be the sole goal of monetary policy, nor does Congress, which has twice directed the Federal Reserve also to pursue full employment (setting an unemployment rate of 3 percent as the target, defined as full employment).

The Fed has moved to tighten policy this year while citing a variety of arguments to justify its actions. However, recent statements have suggested that Fed policy is based on hunches rather than on any specific indicators. According to Governor LaWare, "I get a feel for what I think is going on based on the information—not only the anecdotal information in the press and the statistical information assembled and compiled by the staff here, but also from the general tone of the markets. I'm probably least sensitive to the money figures because I don't know what they mean anymore" (Bradsher 1994). Noted monetarist Jordan admits "In the last 30 years, economists have uncovered little additional information about how monetary policy works, except for the finding that expectations of future policy are vitally important in the process" (Jordan 1993). David Jones, a longtime Fed watcher, says that "policy has become more intuitive over the last year" (Bradsher 1994). Bradsher reports that "Fed officials in effect rely on educated hunches of what they should do, rather than following the dictates of computer models or a couple of key indicators" (Bradsher 1994). And, finally, Governor Lindsey's statement summarizes the problem faced by the Federal Reserve: "I came on believing what I had been taught—and taught as a professor—which was M2. I don't think I can use it anymore. [Instead] we look at a whole raft of variables—we ignore nothing *and focus on nothing*" (Bradsher 1994, emphasis added).

The Federal Reserve's stance from mid-1992 to February 1994 was the correct policy: by holding the discount rate at 3 percent, the Federal Reserve allowed short-term rates to fall quickly, and long-term rates were gradually declining. The economy began to recover from a prolonged recession; firms and households were able to refinance at lower interest rates, reducing debt loads and allowing them to undertake new spending; unemployment fell; the government interest burden declined and the federal budget deficit was reduced; financial institutions and markets recovered; and the dollar held steady in foreign exchange markets (although it fell against the yen, which is exactly what it should have done given the large U.S. trade deficit with Japan). The experience since February 1994 stands in stark contrast to the relative tranquility of that period. The tighter monetary policy was a mistake, and it would be an even greater mistake to tighten further.

Conclusion

The experiment of targeting monetary aggregates was a failure. Chairman Greenspan has proposed replacing monetary aggregates with either real interest rate or expected inflation targets. This *Public Policy Brief* has cast some doubt on Chairman Greenspan's choice of a real interest rate target for monetary policy. We have also argued that had the Chairman adopted such a target in the past, this would not have helped to stabilize the economy. We also cast doubt on the use of expected inflation data series as the basis of policy formulation. Chairman Greenspan has argued that current conditions indicate inflation will soon accelerate, imposing intolerable costs on society. It is apparent that the only justification for frequent changes of policy is to a great extent the Federal Reserve's intuition regarding what will lower inflation expectations and the Federal Reserve's hypothesis that lower inflation expectations are necessary to prevent a future acceleration of inflation. We see little evidence that inflation is likely to accelerate: manufacturing globally is operating far below capacity; real wages are falling in the United States and in other developed economies; labor productivity has risen rapidly in the United States; many eastern European countries are set to increase exports; unemployment rates are high among most member nations of the Organization for Economic Cooperation and Development (OECD); and low-wage, high-unemployment countries in the developing world can increase exports to meet any rise of world demand. *And we do not agree that the moderate inflation achieved recently entails significant costs. Indeed, the benefits to be gained by eliminating this inflation cannot be expected to exceed the costs that would be engendered by higher unemployment, greater uncertainty, and lost output.* Until economists obtain a clearer estimate of the costs of inflation, of policies that can be used successfully to fight inflation, and of the costs of fighting inflation, pursuit of zero inflation as the ultimate goal of monetary policy must be seen as an insupportable, risky, and excessively radical proposition.

What is most apparent from recent policy statements is that the Federal Reserve's policy has become increasingly rudderless. The Federal Reserve appears to be "flying blind," choosing target variables that reflect "hunches" that inflation will rise. The result is a series of destabilizing

policy changes that disrupt financial markets and have negative impacts on the "real" sector (that is, on employment and investment decisions). Rather than watching inflation or other economic variables, Wall Street is watching the Federal Reserve, trying to guess what the Federal Reserve might do next. Even the noted monetarist William Poole argues, "It's a very dangerous game to play, to drag out whatever indicator is pointing in the right direction" (Bradsher 1994).

We believe inflation has been, is, and is likely to be well within acceptable limits. Federal Reserve policy should be refocused on providing a stable financial sector (through lender of last resort policy and maintenance of low interest rates). This will help to provide an environment in which employment can rise. Given the current state of the economy, it is far more important to focus on full employment than on inflation.

Thus, we call on the Federal Reserve to hold U.S. interest rates steady and to work with other central banks to move toward an accommodative stance that would allow interest rates to fall worldwide. This will help to generate a worldwide recovery. Should a concerted effort by central banks to stimulate recovery around the world eventually lead to excessively high economic growth, then at that time a consensus may develop that central banks should (in conjunction with fiscal policy) move toward a tighter stance to reduce inflationary pressures. With an estimated 35 million people unemployed in OECD countries—a total that rivals the worst years of the Great Depression—we are far from that position today.

Notes

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2. In the first four years of Alan Greenspan's tenure there were a total of 20 dissenting votes cast at FOMC meetings for tighter money policy, of which 18 came from Federal Reserve district bank presidents; of 23 dissenting votes cast for easier money policy, only 2 came from Federal Reserve district bank presidents (Murray 1991).

3. At that time Chairman Greenspan presented testimony that was published in an Executive Summary (Greenspan 1994a).

4. Over the period from 1979.1 to 1993.3 we calculate that the correlation of inflation (as measured by changes of the CPI) with contemporaneous and lagged values of the median one-year-ahead inflation expectations decreases steadily with the length of the lag, from 0.89 for contemporaneous inflation expectations to 0.87 for a one-quarter lag, to 0.83 for a two-quarter lag, to 0.82 for a three-quarter lag, and to 0.73 for a four-quarter lag. Similarly, in simple OLS regressions of inflation on expected inflation, correlation coefficients and t-statistics decrease steadily as the length of lag on expected inflation increases. In regressions that include a constant and one expected inflation variable, the values for R-squared and t-statistics (in parentheses) are: contemporaneous, R-squared = 0.80 (15.1); one-quarter lag, R-squared = 0.75 (13.1); two-quarter lag, R-squared = 0.70 (11.5); three-quarter lag, R-squared = 0.67 (10.7); four-quarter lag, R-squared = 0.53 (8.0). (Durbin-Watson statistics decrease steadily from 1.93 to 1.04 in these regressions, indicating that positive serial correlation is a problem as the lag increases so that reported standard errors are probably too small—and R-squared too high—in the regressions with greater lags.)

5. Chairman Greenspan's testimony of August 10, 1994 (Greenspan 1994c) reaffirmed the difficulties in forecasting the performance of the U.S. economy given the imprecise measurement of official statistics such as the CPI and other price indexes that often tend to overstate inflation.

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