Volume Title: American Economic Policy in the 1980s

Volume Author/Editor: Martin Feldstein, ed.

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-24093-2

Volume URL: http://www.nber.org/books/feld94-1

Conference Date: October 17-20, 1990

Publication Date: January 1994

Chapter Title: Monetary Policy

Chapter Author: Michael L. Mussa, Paul A. Volcker, James Tobin

Chapter URL: http://www.nber.org/chapters/c7753

Chapter pages in book: (p. 81 - 164)

2 Monetary Policy

1. Michael Mussa

U.S. Monetary Policy in the 1980s

The story of U.S. monetary policy in the 1980s is fundamentally a tale of struggle and success, after a decade during which monetary policy contributed significantly to the poor performance of the U.S. economy. At the beginning of the 1980s, a great battle was waged against the demon of inflation that had damaged and distorted the U.S. economy since the late 1960s—a battle that was made necessary by the policies that nurtured the demon of inflation during the preceding fifteen years, especially during the late 1970s. In the recessions of 1980 and 1981–82, casualties from the battle ran high, with the unemployment rate rising to a postwar peak of 10.8 percent. In some areas, such as the savings and loan industry, the dead are still being counted, and the bill for their funerals is yet to be fully reckoned and paid. Nevertheless, despite the high costs of battle, a substantial and necessary victory over inflation was won in the early 1980s, and this success was sustained throughout the remainder of the decade.

Indeed, by the end of 1989, the economic expansion that began in November 1982 was already two years longer than any previous peacetime U.S. expansion. Real GNP had risen at a 4 percent annual rate from the recession trough and at a 3 percent annual rate from the preceding business-cycle peak. The unemployment rate had fallen to the lowest level since the early 1970s. Except for a temporary decline that was due to a fall in oil prices in 1986, the inflation rate ran at a steady rate close to 4 percent for the eight-year period beginning in December 1981. Judged by the objectives of the Employment Act of 1946—"maximum employment, production, and purchasing power"—the U.S. econ-

omy performed quite well after the costly victory over inflation in 1981–82, especially in comparison with its performance during the preceding decade.

Of course, economic performance was not solely determined by economic policy, and monetary policy was not the only policy to influence that performance significantly. Moreover, some aspects of U.S. economic performance and policy were not entirely satisfactory during the 1980s, including the persistence of relatively large budget and trade deficits and the failure to reduce inflation below a 4 percent annual rate. Nevertheless, an overall assessment of U.S. macroeconomic policy in the 1980s, in terms of the basic objectives of supporting sustainable growth while maintaining reasonable price stability, must be fundamentally favorable. The task of this essay is to analyze the significant contributions of monetary policy both to the macroeconomic problems confronting the U.S. economy at the beginning of the 1980s and to the generally successful record of dealing with those problems.

2.1 Assumptions and Qualifications

Monetary policy differs from most other elements of economic policy in the United States because it is under the control of a single institution—the Federal Reserve System. The most important decisions about monetary policy are made by the Federal Open Market Committee (FOMC), consisting of the seven governors of the Federal Reserve System and, on a rotating basis, five of the presidents of the twelve regional Federal Reserve banks (always including the president of the Federal Reserve Bank of New York). Since the members of the FOMC do not always share precisely the same views, the internal politics of the Federal Reserve occasionally have some importance for decisions about monetary policy.

However, within the Federal Reserve, there is general agreement about the primary goals of monetary policy—sustainable economic growth with low inflation. On the FOMC and on the Board of Governors, the chairman is usually able to shape a consensus supporting the policy that he favors. Unlike tax policy or expenditure policy or trade policy, authority over monetary policy is not divided between the legislative and the executive branches, with many powerful individuals, agencies, and interests affecting the ultimate outcome. For decisions about monetary policy, economic effects rather than political consequences are usually the dominant concern. Accordingly, this essay focuses primarily on the economic developments that influenced the conduct of monetary policy during the 1980s and on the economic effects of that policy.

Another important feature of monetary policy is that, like a military campaign, it is conducted on virtually a continual basis in real time. The FOMC meets about every six weeks to discuss the performance of the economy and to assess, and if necessary adjust, its monetary policy. In practice, the Federal Reserve tends to maintain the general stance of its policy—toward tightness or ease—for periods of many months. The analysis of monetary policy, there-

fore, can conveniently be divided into major episodes corresponding to the main thrust of the Federal Reserve's policy. However, within each major episode, decisions are continually made to adjust (or not to adjust) the degree of tightness or ease of monetary policy. The analysis of monetary policy must also be concerned with the reasons for and consequences of these adjustments.

Because of the way in which monetary policy is conducted, much of this essay is devoted to a chronological description of the main developments in the U.S. economy and in U.S. monetary policy from the late 1970s through the 1980s. This is combined with an effort to interpret the effects that monetary policy was having on the evolution of the economy and to assess critically the conduct of that policy. The interpretative effort is based not on a formally specified, statistically estimated econometric model, but rather on a broad, intuitively based understanding of how monetary policy influences the behavior of the economy. Three important presumptions underlie this assessment of monetary policy and should be explicitly stated. These presumptions are not "truths" that have been rigorously established by economic theory or empirical research. They represent my views about how monetary policy operates in the U.S. economy. They are widely shared by economic policymakers, especially at the Federal Reserve.

First is a modified version of the classic dichotomy: monetary policy exerts considerable influence on the behavior of the general level of prices (or the inflation rate) over the medium term but has only limited capacity to influence the medium or longer term behavior of real output and employment. Second, in the shorter run of a year or two years, a tighter monetary policy that tends to reduce inflation will also usually tend to reduce temporarily the growth of output and employment; but it is an unstable monetary policy, contributing to high and volatile inflation and to wide swings of economic activity, that impairs real growth in the longer term of five to ten years. Third, in the very short term, given the state of the economy, a tighter monetary policy usually means both an increase in short-term interest rates, especially the Federal funds rate, and a reduction in the rates of growth of monetary aggregates.

Several important qualifications should be noted to these general presumptions. Once monetary policy has allowed substantial inflationary pressures to build up in the economy, a determined effort to reduce inflation through a tighter monetary policy may well reduce the average real growth rate looking forward even over a medium-term period of three or four years. The presumption, however, is that, if monetary policy had more effectively resisted the rise of inflationary pressures in the first place, real growth would have been better (or, at least, no worse) in the longer term.

Monetary policy is not the only important factor influencing the behavior of the price level, especially in the short term. When the relative prices of some important commodities (such as oil) change suddenly and substantially, the general price level moves in the same direction, pretty much regardless of the stance of monetary policy. In the longer term, however, monetary policy can

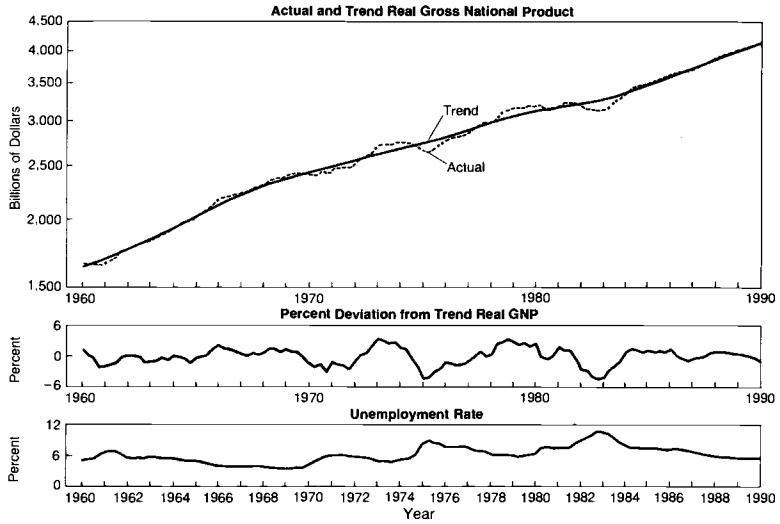

Fig. 2.1 Output measures, 1960:1–1990:1
Note: The actual and trend real GNP is the quarterly GNP in constant 1982 dollars. Logarithmic scale; trend calculated from Hodrick-Prescott filter ($L = 1{,}600$).

effectively resist a persistent rise in the rate of inflation, even if it is not the only influence on the general price level.

Monetary policy is also far from the only important factor that influences the course of economic activity. The general slowdown in the rate of real economic growth since the early 1970s, in the United States and other major industrial countries, is not plausibly the consequence of monetary policy. Even for business-cycle fluctuations in economic activity (as illustrated in fig. 2.1 by deviations of real GNP from its smoothed trend path), many factors other than monetary policy played important roles.[1] These factors include fluctuations in government spending associated with the Korean and Vietnam wars, other important fiscal policy actions of the U.S. government, the oil shocks and other commodity price disturbances of the early and late 1970s, some exogenous fluctuations in consumption and investment spending, and some important shifts in U.S. real net exports related to movements in foreign economic activity and in the foreign exchange value of the dollar. Indeed, even exogenous fluctuations in the rate of productivity growth—the central focus of "real"

1. The smoothed trend path of U.S. real GNP in fig. 2.1 is constructed by using the Hodrick-Prescott filter, which allows for some gradual change in the trend rate of growth or real GNP. There is nothing sacred about this particular filter, but it does give a generally reasonable basis for measuring business-cycle deviations of real GNP from its trend behavior. I would argue, however, that the trend line is probably a little low during 1980–83. The 1980 recession should push real GNP somewhat further below the trend line, and the 1981–82 recession should be reflected in a somewhat larger reduction of real GNP relative to trend.

business-cycle theories—probably played some meaningful role in postwar U.S. business cycles.

Monetary policy, however, was surely one important factor that influenced the course of economic activity during the recessions of 1957–58, 1960–61, 1969–70, 1974–75, 1980, and 1981–82, as well as during the growth slowdowns of 1966–67 and 1989–90. Given the longer-term movements in the trend rate of real economic growth, monetary policy also influenced the specific course of economic activity during postwar business-cycle expansions.

Discerning the effects of monetary policy on the price level and on economic activity is a difficult and somewhat imprecise task because these effects are not always stable from one episode to the next. Experience suggests that a tightening of monetary policy should be expected to slow real growth with a lag of a few months to a year or so and to slow the rate of inflation with a somewhat longer lag and conversely for an easing of monetary policy. However, a good deal depends on the context in which a monetary policy action is taken and on the effect of that action on expectations. In a strongly growing economy, monetary tightening may have little short-term effect on real economic activity, while, in an already weak economy or in combination with other negative shocks, a sharp monetary tightening may rapidly induce an economic downturn. If economic agents are highly sensitive to the risks of rising inflation, and if the central bank lacks credibility for its anti-inflation policy, a relatively minor action to ease monetary policy may stimulate a rapid and significant inflationary response. In contrast, if the monetary authority has established a high degree of credibility for its opposition to inflation, and if conditions in the economy are relatively slack, then even a substantial easing of monetary policy may take considerable time to generate significant inflationary results.

The interpretation of what constitutes a tightening or an easing of monetary policy also can be a complex and sensitive matter. An action to raise the Federal funds rate that would normally signify monetary tightening may not have this significance if increases in inflationary expectations or other pressures on market-determined interest rates are pushing rates up faster than the action of the monetary authority. Conversely, a sharp slowdown in money growth that would normally indicate monetary tightening (especially in a rapidly expanding economy) may not have quite the same significance if economic activity is falling in the initial stages of a recession. More generally, it should be recognized that changes in monetary growth rates and in the Federal funds rate reflect both policy actions of the Federal Reserve and endogenous responses to other developments in the economy.

With all these qualifications, it may be wondered whether it is possible to reach firm conclusions concerning the successes and failures of monetary policy during the 1980s. On the several important issues, I believe that reasonably clear answers can be given. Fortunately, these answers do not require precise estimates of the effects of monetary policy, and of the effects of all other fac-

tors, on the performance of the U.S. economy during the 1980s. Instead, it is a great advantage to assess the conduct of monetary policy qualitatively, by examining whether an alternative course of monetary policy would plausibly have improved the performance of the U.S. economy and whether the Federal Reserve ought reasonably to have had the sense and judgment to pursue such an alternative policy. Inevitably, of course, a significant degree of ambiguity will always remain in any such effort to assess fairly the complex and difficult task of conducting monetary policy in the U.S. economy.

2.2 Nurturing the Demon of Inflation

To analyze the most important issue in the conduct of monetary policy during the 1980s—the battle against and victory over high and volatile inflation—it is essential to review the development of the problem of inflation during the postwar era.

2.2.1 The Rise of Inflation

The inflation rate, measured by the annual rate of change in the Consumer Price Index (CPI), remained quite low from the early 1950s through the mid-1960s. Indeed, in 1956, the Federal Reserve became concerned when the inflation rate rose to 3 percent. The consequent tightening of monetary policy probably helped precipitate, deepen, or prolong the recession of 1957–58.

After remaining at or below 2 percent through 1965, the inflation rate rose to 3.4 percent during 1966. Concerned with possible overheating of the economy, the Federal Reserve tightened credit for about six months during 1966. There was a brief slowdown in economic growth in late 1966 and early 1967, but no recession. The inflation rate in 1967 leveled off at about 3 percent. However, with the resurgence of economic growth beginning in the second half of 1967 and the deepening U.S. military involvement in Vietnam, the inflation rate rose to 4.7 percent during 1968 and to 6.2 percent during 1969. Concern with high inflation brought a tightening of both monetary and fiscal policy beginning in late 1968—policy actions that surely contributed to the recession that started in late 1969. In contrast to the 1950s, however, the inflation rate reached 6 percent before effective policy measures began to operate against the inflationary menace.

Under the impact of rising unemployment and declining economic activity, the inflation rate (measured by the six-month annualized rate of change in the CPI) fell to 5.2 in late 1970 and continued down to about 3.5 percent during the first half of 1971. About six months into the recession, with evidence of no more than a partial victory over inflation, the Federal Reserve began to ease monetary policy fairly aggressively. Business activity began to expand in November 1970.

During the summer of 1971, monthly inflation rates began to edge upward. On 15 August, President Nixon imposed wage and price controls. For the next

year and a half, these controls helped partially suppress a further rise of the inflation rate, despite a relatively easy monetary policy. As controls were phased out, however, the inflation rate began to rise. With the increase in world oil prices after the Arab-Israeli War of October 1973, the twelve-month inflation rate was pushed to 8.7 percent for 1973 and to 12.3 percent for 1974—inflation rates well above the 6.2 percent rate at the end of the long economic expansion of the 1960s.

The Federal Reserve began to raise the Federal funds rate in response to rising inflation in late 1972, but growth rates of monetary aggregates remained relatively robust until more aggressive actions to tighten monetary policy were undertaken beginning in mid-1973. These actions, together with other effects of the rise in world energy prices, helped bring an end to the expansion of the early 1970s. The cyclical peak for this expansion is officially placed at November 1973. However, owing partially to a speculative buildup of inventories, the sharp phase of economic downturn did not start until the late summer of 1974.

As economic activity plummeted during the final quarter of 1974 and the first quarter of 1975, the inflation rate also dropped sharply. The nearly complete absorption of the price level effects of the increase in world energy prices by early 1975 was presumably another important contributor to the decline of inflation. In any event, the inflation rates for 1975 and 1976 were 6.9 and 4.9 percent, respectively. This drop in inflation was a significant accomplishment relative to the high inflation of 1973–74. However, it still left the inflation rate at the end of the deep 1974–75 recession above the rates at the ends of earlier recessions.

2.2.2 Targets for Monetary Growth

In the spring of 1975, at the behest of Congress and over objections from the Federal Reserve, the FOMC began to announce its intentions for monetary policy by specifying growth rates for monetary aggregates. At the beginning of each year, target ranges were specified over the subsequent four quarters for the growth rates of three monetary aggregates: (old) M1, consisting of currency and demand deposits at commercial banks; (old) M2, consisting of (old) M1 plus time deposits at commercial banks; and (old) M3, consisting of (old) M2 plus deposits at savings banks, savings and loan associations, and credit unions. As a shorter-term guide for monetary policy, the FOMC also determined target growth rates for these three monetary aggregates during the coming quarter.

The target growth rates for monetary aggregates were not the operational guide to the actual conduct of monetary policy. At each meeting of the FOMC, operational guidance for monetary policy is provided in the directive to the manager of the Open Market Desk at the Federal Reserve Bank of New York. Since the early 1970s, this directive had made reference to growth rates of monetary aggregates as one of the concerns of the FOMC that should be taken into account by the manager of the Open Market Desk. However, the directive

provided the critical guidance for the operational conduct of monetary policy by specifying a target range for the Federal funds rate.

The Federal funds rate is the interest rate on reserves lent between banks that are members of the Federal Reserve System and certain other participants in the market for "immediately available funds." The manager of the Open Market Desk at the Federal Reserve Bank of New York directly influences the Federal funds rates by open market operations that increase or reduce the supply of immediately available funds that may function as bank reserves. During the 1970s, the monetary policy directive from the FOMC usually instructed the manager of the Open Market Desk to maintain a specific value of the Federal funds rate provided that the monetary aggregates appeared to be growing within their desired short-term ranges. If the growth rates of monetary aggregates appeared likely to breach their desired short-term target ranges, the manager was usually authorized to make marginal adjustments to the Federal funds rate within a narrow tolerance range. This tolerance range was occasionally as wide as a percentage point, especially during 1975–76, but was usually limited to half a percentage point or less. Sometimes the language of the FOMC directive indicated a quite specific value for the Federal funds rate. At other times, the manager was instructed to use somewhat more discretion in adjusting the Federal funds rate in the light of economic developments.

The manager was generally instructed to seek further guidance from the FOMC if adjustments of the Federal funds rate outside its narrow tolerance band appeared necessary to contain monetary growth rates within their desired short-term target bands. In such situations, the FOMC might decide to alter (explicitly or implicitly) its monetary growth targets and avoid changes in the funds rate. Moreover, at any time, the FOMC could alter either its monetary growth targets or its prescription for the Federal funds rate if that appeared desirable in the light of information about the actual and prospective performance of the economy.

2.2.3 Recession and Recovery

During the recession of 1974–75, as the U.S. economy experienced sharp declines in both real output and inflation, the Federal funds rate was reduced rapidly from its peak of 13 percent in July 1974 to 5 percent in late May 1975. This decline in the funds rate both represented the normal monetary policy responses to developments in the economy and mirrored the substantial declines in other short-term interest rates. The sharp decline in market interest rates, in turn, reflected both the credit market effects of the drop in economic activity and the substantial decline in the actual and expected rate of inflation.

In the summer of 1975, as evidence of economic recovery accumulated, and as short-term interest rates moved modestly higher, the Federal funds rate was raised to 6.3 percent by late September.[2] Subsequently, as data indicated that

2. In this essay, the description of economic conditions that provided the context for decisions about monetary policy by the Federal Reserve is generally based on the official "Record of the

M1 and M2 were growing below the lower limits of their desired target ranges, the FOMC directed a series of reductions in the Federal funds rate down to 4.87 percent in January 1976. In May 1976, with indicators pointing to continued vigorous recovery, and with M1 and M2 now growing above their target ranges, the Federal funds rate was raised briefly to 5.5 percent and then held in the range between 5.25 and 5.5 percent through the summer months. During the autumn, amid signs of moderating real growth, with the monetary aggregates apparently growing within their short-term target ranges, the Federal funds rate was eased downward to 5 percent in early October and to 4.6 percent by late December. As the year ended, M1 was at the midpoint, and M2 and M3 were marginally above the upper limits, of the longer-term target ranges established a year earlier.

By the end of 1976, there was some evidence that inflation might be rising, while economic growth appeared sluggish. On balance, the evidence at this stage does not indicate that the Federal Reserve was knowingly fueling the resurgence of inflation. However, it may fairly be said that the Federal Reserve was not demonstrating much resolve to continue progress toward reducing inflation below the level that had led to the introduction of wage and price controls in August 1971.

2.2.4 Falling behind the Curve

During 1977, economic expansion proceeded rapidly, especially during the first half, while the twelve-month rate of consumer price inflation rose from 4.9 percent in December 1976 to 6.7 percent in December 1977. The Federal Reserve attempted to signal an effort to contain inflationary pressures by reducing, by half a percentage point, the upper and lower limits on the target growth ranges for monetary aggregates. The Federal funds rate was raised by three-quarters of a percentage point by mid-July and by an additional 1.25 percentage points by year's end.

The seriousness of these efforts to combat the rise of inflation during 1977, however, is open to question. The Carter administration's number one priority for economic policy was to maintain a vigorous expansion that would bring substantial reductions in the unemployment rate. The administration made clear that it did not favor a monetary policy that would interfere with this objective. On Capitol Hill, especially among Democrats, who dominated both

Policy Actions of the Federal Open Market Committee," which is published periodically in the *Federal Reserve Bulletin* and is reproduced each year in the *Annual Report* of the Board of Governors of the Federal Reserve System. Quite often, revised data provide a somewhat different picture of the performance of the economy than the Federal Reserve had at the time of its decisions. When this is a factor of substantial importance, it will usually be mentioned in the text. Where the issue is not important, revised data (rather than data available at the time) are sometimes used in this essay. The figures in this essay are all constructed with the most recent, revised data. It is important to recognize that the image presented by these figures does not always correspond to the information that the Federal Reserve had available at the time.

houses of Congress in the aftermath of Watergate, there was little sympathy for fighting inflation at the expense of progress in reducing unemployment.

In this political environment, the Federal Reserve authorized increases in the Federal funds rate only after evidence pointed to continued strong economic growth and only when the growth rates of monetary aggregates exceeded the shorter-term targets set by the FOMC. Despite a cumulative increase of 2 percentage points in the Federal funds rate, M1 grew by 7.8 percent from the fourth quarter of 1976 to the fourth quarter of 1977—2 percentage points higher than M1 growth for 1976 and 1 percentage above the upper limit of the target growth range for M1 for 1977. For M2 and M3, growth during 1977 was about 1 percentage point below growth during 1976, but at the upper limits of the target growth ranges for the aggregates.

In 1978, economic growth remained quite vigorous, while inflation worsened considerably. Specifically, real GNP rose by 6.3 percent on a fourth-quarter-to-fourth-quarter basis, while the twelve-month rate of consumer price inflation increased from 6.7 percent in December 1977 to 9.0 percent in December 1978. The target ranges for monetary growth in 1978 were set somewhat lower than for 1977, and the actual growth rates of M1, M2, and M3 were reduced from their 1977 growth rates. However, as in 1977, M1 grew above the upper limit of its target range, and M2 and M3 grew near the upper limits of their ranges.

On several occasions during 1978, the FOMC responded to the worsening inflation and to the rapid growth of monetary aggregates by raising the Federal funds rate, from around 6.5 percent in early January to 8.75 percent by late September, and ultimately to 10 percent by year's end. In April, the Carter administration signaled the increased priority that it assigned to curbing inflation when the president announced a variety of measures directed at that objective. At its meeting on 18 April 1978, the FOMC indicated the increased concern that it felt about rising inflation by reordering the official statement of its objectives in the directive to the manager of the Open Market Desk, placing "resisting inflationary pressures" ahead of "encouraging continued moderate economic expansion."

Despite the actions and statements of the administration and the Federal Reserve, by September 1978 it was clear that the efforts to combat rising inflation were not succeeding. At the end of the third quarter, virtually all measures of inflation were running significantly above their year-earlier levels. M1 was running well above the upper limit of its longer-term target range, and M2 and M3 were at the upper limits of their ranges. In October 1978, the U.S. dollar came under heavy downward pressure in foreign exchange markets, indicating a worldwide crisis of confidence in the ability and willingness of U.S. authorities to take effective action to control inflation.

2.2.5 A Failed Effort at Control

On 31 October and 1 November 1978, the administration and the Federal Reserve took action to deal with the crisis. The Treasury announced a variety

of measures to acquire substantial amounts of foreign currencies with which to intervene in support of the dollar in foreign exchange markets. The Federal Reserve Board raised the discount rate by a full percentage point to 9.5 percent and established a supplementary reserve requirement for time deposits of over $100,000. The tolerance range for the Federal funds rate was raised from between 8.75 and 9.25 percent to between 9.25 and 9.75 percent. During the final two months of 1978, the growth rates of the monetary aggregates slowed considerably but remained above or near the upper limits of their longer-term growth ranges. The FOMC directed a marginal increase in the Federal funds rate to 10 percent, partly to support the dollar in foreign exchange markets and partly to enhance the credibility of its efforts to combat inflation.

The statement of Federal Reserve objectives for monetary policy in 1979 made it clear that reducing inflation was the number one priority. The target growth ranges for (old) M2 and (old) M3 were set at 5–8 percent and 6–9 percent, respectively—a 1 percentage point reduction in the maximum desired growth rate and a 1.5 percentage point reduction in the minimum desired growth rate from the 1978 monetary growth targets. Anticipating that the introduction of automatic transfer service (ATS) accounts would reduce the growth of demand for (old) M1 by 3 percentage points because of shifts from demand deposits to savings deposits, the target range for (old) M1 was set at 1.5–4.5 percent.

During 1979, inflationary pressures generally rose, while real economic activity followed an erratic and perplexing course. The increase in world oil prices, subsequent to the overthrow of the shah of Iran, contributed significantly to the increase in inflation. Specifically, the energy component of the CPI showed a 37.4 percent increase during 1979, compared with an 8.0 percent increase during 1978, and this helped raise the overall inflation rate from 9.0 to 13.3 percent. Even excluding energy prices, however, the rate of increase in the CPI escalated significantly from 9.2 percent during 1978 to 11.1 percent during 1979. Other measures of inflation, such as the rate of increase in the GNP price index or in average hourly earnings, also showed significant increases for 1979 over 1978. Moreover, most measures of inflation (except average hourly earnings) tended to show higher inflation rates as the year progressed—a disturbing development that surely increased fears of future inflation.

After registering an unexpectedly strong advance at the end of 1978, economic activity was believed (at the time) to have turned quite sluggish in early 1979. Specifically, it was estimated that real GNP grew at a rate of less than 1 percent during the first quarter. Incoming evidence during the spring and summer pointed increasingly to an economic downturn. By the 11 July meeting of the FOMC, it was clear that economic activity had declined during the second quarter, and further declines were widely anticipated. Indeed, the record of that meeting indicates that "no member of the Committee expressed disagreement with the staff appraisal . . . [suggesting] a further contraction in economic ac-

tivity over the next few quarters."[3] Ultimately, revised data would show that economic activity was essentially flat during most of 1979, with moderate growth occurring during the summer quarter and again during the first quarter of 1980. However, as events unfolded during the course of 1979, it was generally believed, at the Federal Reserve and elsewhere, that a recession was either in progress or about to begin.

During the first half of 1979, monetary policy held the Federal funds rate nearly constant, in a narrow range between 10 and 10.5 percent. During the first quarter, (old) M1 declined, while (old) M2 and (old) M3 grew at rates below the lower limits of their target ranges. During the second quarter, growth of all the monetary aggregates picked up considerably, and, by early midsummer, each of these aggregates had reached or exceeded the upper bound of its target range. On 20 July, the Board of Governors raised the discount rate half a percentage point to 10 percent. On 27 July, the FOMC raised the upper limit of the Federal funds rate from 10.5 to 10.75 percent. On 14 August, the FOMC directed that the Federal funds rate be raised to an average of 11 percent and maintained within a band of 10.75–11.25 percent. On 16 September, the FOMC directed a "slight increase in the weekly average federal funds rate to about 11.5 percent."

This action raised the Federal funds rate in late September 1979 to 1.5 percentage points above the level it had reached just after the dollar stabilization crisis in November 1978. In the face of what was believed to be a very weak economy, most probably an economy already in recession, the FOMC believed that this was the appropriate degree of monetary tightening to combat clearly rising inflationary pressures.[4] The economy, however, was not as weak as was believed at the time. More important, while the Federal funds rate had been pushed up 1.5 percentage points during the ten months ending in September 1979, the inflation rate had risen by more than double that amount. Also, the monetary aggregates had risen from below the lower limits of their target ranges in March 1979 to or above the upper limits of those ranges by September. Once again, the Federal Reserve was falling behind the curve in its efforts to combat rising inflation. The foreign exchange market provided a further signal of this fact as the dollar once again came under severe downward pressure during the summer of 1979. Thus, eleven months after the administration and the Federal Reserve dramatically announced their new policies to curb inflation and strengthen the dollar, it was clear that those policies were not succeeding.

3. Unless otherwise indicated, most of the quotations in this essay are taken from the official "Record of the Policy Actions of the Federal Open Market Committee" (see no. 2 above). Several quotations, however, come from the semiannual "Monetary Policy Reports to Congress," which are also published in the *Federal Reserve Bulletin* and in the *Annual Report.*

4. A majority of the FOMC certainly may be said to have held this view. However, some members of the committee (especially Henry Wallich and, on one occasion, Paul Volcker) dissented and expressed their preference for a tighter monetary policy to combat inflation despite signs of economic weakness.

Of course, the acceleration of inflation during 1979 was partly the consequence of the second oil price shock that followed the overthrow of the shah of Iran. Had events developed differently, had the economy actually entered a recession in 1979, then perhaps the efforts to reduce inflation would have proved more successful. Moreover, it is understandable that the Federal Reserve was reluctant to take decisive action to tighten monetary policy when it faced the dreaded dilemma of rising inflation together with an economy that appeared to be in, or on the verge of, recession.

2.2.6 The Heritage of Rising Inflation

The dilemma that confronted the Federal Reserve in 1979 was not exclusively, or even primarily, the product of political upheaval in Iran and the second oil shock. In substantial measure, it was the consequence of failures to confront the rise of inflationary pressures more consistently and effectively at an earlier stage. Other countries, notably Switzerland and West Germany, that pursued more determined efforts to reduce inflation after the first oil shock in 1973 did not see their inflation rates rise as high in 1979 as in 1974–75. In contrast, the United States, which pursued a more laissez-faire policy toward inflation, confronted the second oil shock with inflation already rising through 9 percent and saw inflation jump to new peaks during 1979.

Moreover, the failure of U.S. monetary policy to curb the rise of inflation during the late 1970s cannot be explained away on the grounds that the Federal Reserve could not reasonably have understood the consequences of its actions. The failure is apparent not only in the persistent rise of inflation but also in the general tendency for monetary growth to exceed the targets set by the Federal Reserve. Specifically, as shown in figure 2.2, growth of M1 significantly exceeded the upper bound of its annual target range in 1977, 1978, and 1979. In 1975, M1 ended the year at the lower limit of its target range. This result, however, was largely the consequence of slow growth of M1 early in the year, attributable primarily to continued decline in economic activity and to the more rapid than anticipated decline in the rate of inflation. Only during 1976 was the growth of M1 close to the midpoint of the range set by the Federal Reserve.

For M2, as illustrated in figure 2.3, the story is worse. Only in 1978 was the growth of M2 close to the midpoint of its target range. In 1979, M2 growth was at the top of the target range, and, in 1975, 1976, and 1977, it was significantly above the upper limit of the target range. Moreover, for both M1 and M2, the Federal Reserve followed the practice of "rebasing" its monetary targets each year for the monetary growth that had actually occurred the preceding year. If the Federal Reserve had been effectively resisting the rise of inflation, this practice might have been defensible as a means of accounting for unanticipated shifts in money demand. In the circumstance of persistently rising inflation in the late 1970s, however, the practice of rebasing amounted to monetary accommodation of accelerating inflation.

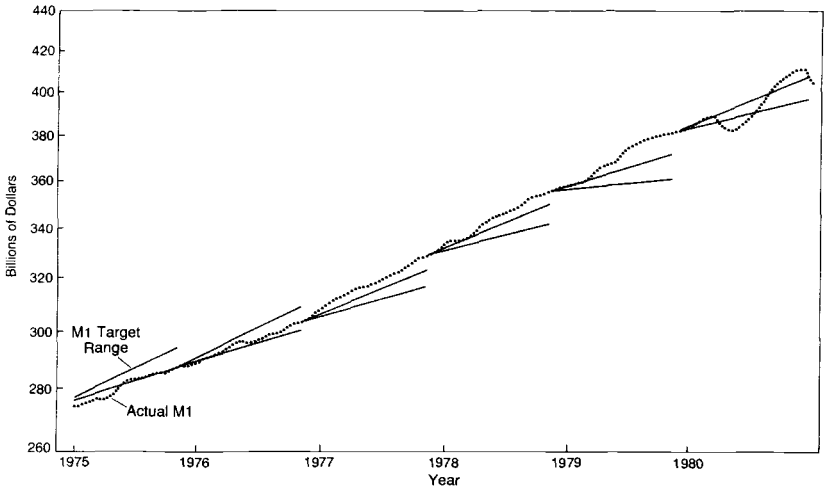

Fig. 2.2 M1 and growth target ranges, January 1975–December 1980
Note: The monetary targets are those established by the FOMC at the beginning of each year for annual growth rates.

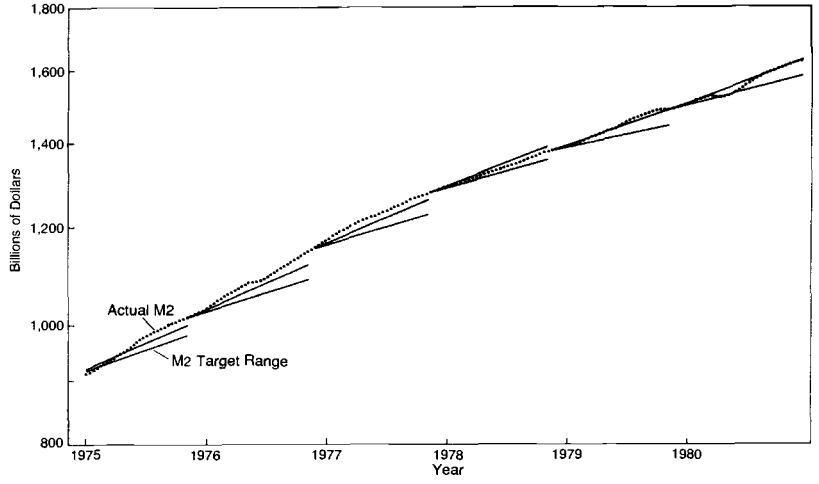

Fig 2.3 M2 and growth target ranges, January 1975–December 1980
Note: The monetary targets are those established by the FOMC at the beginning of each year for annual growth rates.

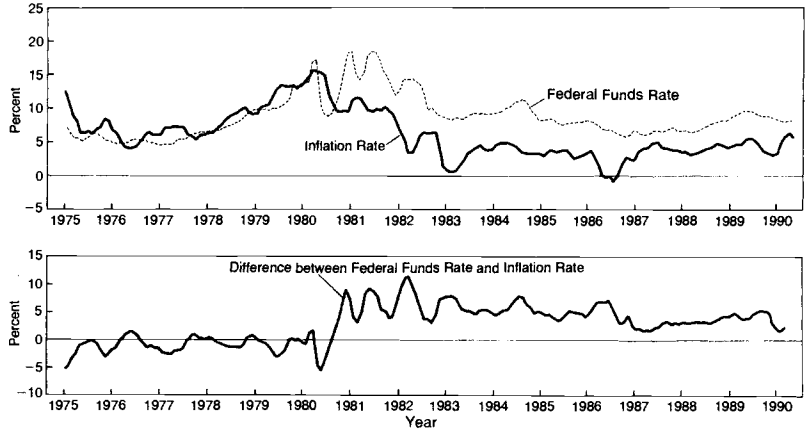

Fig. 2.4 Inflation rate and interest rate, January 1975–April 1990
Note: The inflation rate is a six-month moving average of the growth of the seasonally adjusted CPI, all items.

The inadequacy of the Federal Reserve's efforts to curb inflation during this period is also apparent in the behavior of the Federal funds rate, as illustrated in figure 2.4. The Federal funds rate was raised gradually from early 1977 through 1979. However, these increases in the Federal funds rate often lagged behind increases in the inflation rate, indicating fairly clearly that the Federal Reserve was "falling behind the curve" in its actions to combat rising inflation.

To observers outside the Federal Reserve, the developments of the late 1970s indicated that U.S. monetary policy was not deeply committed to resisting the rise of inflation. Most important, the actual inflation rate was rising persistently, even before the second oil price shock. Monetary growth was generally allowed to exceed announced targets. New targets were rebased to accommodate past inflation and past excessive monetary growth. Increases in the Federal funds rate often lagged behind increases in the inflation rate. Thus, while the Federal Reserve talked about a battle against the demon of inflation, it gave little evidence of much stomach for the fight.

2.3 The Demon Wins Another Round

Paul Volcker replaced G. William Miller as chairman of the Federal Reserve Board on 6 August 1979. For the preceding four years, Volcker had been president of the Federal Reserve Bank of New York and hence a member of the Federal Open Market Committee. Earlier, he had served in the Nixon administration as undersecretary of the Treasury for monetary affairs—traditionally a position of considerable responsibility for both domestic and international

financial policy in the U.S. administration. Paul Volcker was very well known and highly regarded in the financial community and exceptionally well qualified to take command of the Federal Reserve at a time of economic turmoil and crisis.

2.3.1 New Operating Procedures

The appropriate starting date for the assessment of U.S. monetary policy in the 1980s is not the day of Paul Volcker's accession to the chairmanship of the Federal Reserve, however, but rather two months later, 6 October 1979. On that Saturday, the Federal Reserve announced a new effort to discipline the demon of rising inflation. The discount rate was raised a full percentage point to a new record of 12 percent. New reserve requirements were imposed on certain liabilities of member banks. Most important, the FOMC adopted new operating procedures for the conduct of monetary policy.

Under the new operating procedures, the Open Market Desk would no longer be directed to keep the Federal funds rate at a specified level or within a narrow tolerance range but rather to supply a volume of bank reserves consistent with desired rates of growth of monetary aggregates prescribed by the FOMC. Technically, the desk would operate by estimating the total volume of bank reserves needed to support the short-term monetary growth targets set by the FOMC. The amount of borrowed reserves likely to be supplied through the Federal Reserve discount window would also be estimated. Through open market operations, the desk manager would then supply the implied amount of nonborrowed reserves appropriate to meet the target for total bank reserves.

It was recognized that, under these new operating procedures, the short-term variability of the Federal funds rate was likely to increase substantially. A very broad tolerance range would be specified for the Federal funds rate for the periods between scheduled meetings of the FOMC. On 6 October the tolerance range for the Federal funds rate was set at 11.5–15.5 percent. Since the Federal funds rate had been running at about 11.5 percent during September, the new broad tolerance range gave wide latitude to the manager of the Open Market Desk to tighten reserve availability in order to reduce the growth rates of monetary aggregates as prescribed by the FOMC.

The shift to the new operating procedures was motivated by tactical, psychological, and political considerations and not by a profound religious experience that suddenly converted most members of the FOMC to the doctrine of "monetarism." Under the old operating procedures, the FOMC could have directed a large increase in the Federal funds rate in order to restrain monetary growth and resist rising inflation. Tactically, however, the FOMC did not know how large an increase in the Federal funds rate might be needed, and it recognized the virtue of significantly greater flexibility in adjusting the Federal funds rate to deal with ongoing developments. Psychologically, in attacking inflationary expectations, there appeared to be a gain from publicly announcing a more "monetarist approach" to the general conduct of monetary policy rather than

just a change in the value of a particular policy instrument. Politically, the new operating procedures offered an important degree of cover for the highly unpopular action of sharply increasing interest rates and probably pushing the economy into recession. The necessary rise in interest rates would not be so visibly linked to Federal Reserve actions but could be blamed instead on market pressures arising from increased inflationary expectations and excess credit demands from the government and the private sector. The Federal Reserve could point to the generally agreed on need to resist inflation by restraining monetary growth as the essence of its policy.[5]

2.3.2 The Initial Assault on Inflation

The financial market response to the new Federal Reserve policy was immediate and dramatic. On the following Monday, the short-term interest rates leapt upward, and long-term bond prices tumbled. During the final two weeks of October, the Federal funds rate rose to 15.5 percent, before falling back to 13.5 percent in November and then edging up to 14 percent in late December. On average during the final quarter of 1979, short-term interest rates ran nearly 2 percentage points above late September levels, while long-term interest rates rose about a percentage point above their late September levels. During the final three months of 1979, growth of the monetary aggregates was slowed very substantially from the rapid pace of the preceding six months; M1, M2, and M3 recorded growth rates of 3, 7, and 6.25 percent, respectively.

Economic data reported during the first three months of 1980 indicated relatively sluggish real growth during the final quarter of 1979 but an apparent pickup of growth during January and February. Monetary growth remained subdued in January. In February, however, growth of the newly defined, narrow monetary aggregates, M1A and M1B, accelerated sufficiently to exceed the (relatively stingy) short-run target rates set by the FOMC. In response to this and other developments in the economy, the FOMC raised the upper limit of the tolerance range of the Federal funds rate (in a series of telephone conferences and at the regular meeting on 22 March) from 15.5 percent to 20 percent. The actual level of the funds rate jumped from 15 percent on 22 February to 19.4 percent by the end of March.

Despite the tightening of monetary policy, inflation continued to be very rapid during the final quarter of 1979 and accelerated further during the first quarter of 1980. Specifically, the (annualized) six-month inflation rate was recorded at 13.5, 13.3, and 13.4 percent in October, November, and December of 1979 and then at 14.2, 14.9, and 15.9 percent in January, February and March of 1980, respectively. Moreover, the remarkable surges in the prices of gold (to over $800 per ounce), silver (to over $50.00 per ounce), and other

5. William Greider (1987) provides a detailed (if not always sympathetic) discussion of the political and economic rationale underlying the shift in Federal Reserve operating procedures.

commodities by early February 1980 suggested growing hysteria about the possibility of runaway inflation.

In this environment, on 14 March 1980 President Carter acted to combat rising inflation. He announced a package of budget proposals to cut the projected federal deficit, and he authorized the imposition of controls on consumer credit by the Federal Reserve. The objective of these actions was to reduce pressures on interest rates arising from the federal deficit, to limit directly the growth of consumer credit that appeared to be fueling the inflationary process, and to attempt to break the psychological fear of uncontrolled inflation. As one high official of the Carter administration once explained it, "We decided to whack the donkey between the eyes with a two-by-four to make sure we had its attention."

2.3.3 Recession and Reversal

The budgetary proposals announced by President Carter were viewed with some disdain in financial markets and probably had little effect on the economy. The response to the credit controls, combined with the Fed's tight monetary policy, was virtually instantaneous—the economy nosedived into recession, with real GNP recording a spectacular 9 percent annualized rate of decline. Short-term interest rates tumbled, with the three-month Treasury-bill rate falling from 15.5 percent in March to 7 percent in June. The monthly inflation rate fell off somewhat in April, May, and June from the very high monthly rates in January, February, and March, but, on a six-month-average basis, the inflation rate remained very high.

After declining slightly in March, the narrow monetary aggregates, M1A and M1B, contracted sharply in April and then flattened out in May. The June rebounds in these aggregates largely offset the April declines but still left both M1A and M1B significantly below the lower limits of their longer-term target ranges. The broader aggregate M2 declined only modestly in April, and the strong rebound in June left it just above the lower limit of its target range. As evidence became available of the shortfall of monetary growth below the short-term targets set by the FOMC, and as other short-term interest rates dropped, the Federal funds rate plummeted to the 13 percent lower limit of its tolerance range by 6 May. The FOMC promptly reduced the lower limit of the tolerance range to 10.5 percent, and the actual funds rate fell almost to this limit by 14 May.

At the regularly scheduled FOMC meeting on 22 May, the desk manager was directed to provide reserves consistent with monetary growth rates "high enough to promote achievement of the Committee's objectives for monetary growth over the year, provided that in the period before the next regular meeting the weekly average federal funds rate remains within a range of 8.5 to 14 percent." Under this directive, the actual level of the Federal funds rate fell to 9.4 percent by the end of June. Thus, in three months, the Federal funds rate had been cut by 10 percentage points from its peak in late March. By this

measure of monetary policy, all the tightening between the dollar stabilization program announced on 1 November 1978 and the extraordinary measures of March 1980 was effectively reversed.

Given the behavior of the monetary aggregates, the sharp decline of the Federal funds rate during the spring of 1980 was a natural consequence of the monetary operating procedures of the Federal Reserve. However, the FOMC knew that it had a choice about whether to permit a decline of quite such speed and magnitude. It was not required by law or by deep religious conviction to seek extremely rapid correction of all deviations of monetary growth from previously specified targets. The manager of the Open Market Desk could have been instructed to tolerate substantial shortfalls of M1A and M1B below their previously announced target ranges. The FOMC could have retargeted monetary growth in the second half of 1980 at the previously announced rates, but starting from the base established in the second quarter. This would have been consistent with the "rebasing" of the growth targets in earlier years, when the monetary aggregates had often grown near or even above the upper limits of the preceding year's growth targets.

The turmoil and uncertainty in the economy and financial markets provided good reason for the Federal Reserve to be cautious in its conduct of monetary policy. The virtually complete lack of experience with the Federal Reserve's new operating procedures provided additional reason for caution. Such caution clearly did not justify an incredible, 10 percentage point drop in the Federal funds rate in an effort to offset one or two months of negative growth of monetary aggregates. There was no precedent for such action. Only two or three months into a recession that was widely regarded as the necessary consequence of successful efforts to curb inflation, there was no credible reason to believe that quite such a large and rapid drop in the Federal funds rate was necessary to forestall a repeat of the Great Depression. Moreover, as illustrated in figure 2.4, the Federal funds rate fell much more sharply than any reasonable estimate of what was happening to the rate of inflation. This alone should have raised the caution sign that the Federal Reserve was being too aggressive in allowing such a large and rapid decline in the Federal funds rate.

As suggested at the time by Governor Wallich, the Federal Reserve could have resisted declines in the Federal funds rate below 12 or 13 percent while awaiting more information about economic developments. This would still have meant a very dramatic 6 or 7 percentage point easing of the cost of Federal Reserve credit in response to the downturn in the economy and in the monetary aggregates. Moreover, the record of the 22 April FOMC meeting reports that the committee was clearly apprised of the dangers that "aggressive efforts to promote monetary growth might have to be reversed before long, perhaps leading to significant increases in interest rates," and that "vigorous efforts in the short run to bring monetary growth into line with the Committee's longer-run objectives could result in excessive creation of money."

2.3.4 Rebound and Resurgence

Judged by the behavior of monetary aggregates, during the summer and early fall of 1980 monetary policy was very expansionary. From well below the lower limits of their target ranges in May, the narrow monetary aggregates M1A and M1B shot upward during the next five months, with M1A rising to near the upper limit of its range, and M1B rising above the upper limit of its range in October. (For the path of M1B, which was subsequently redefined, and M1, see fig. 2.2 above.) Meanwhile, M2 (as illustrated in fig. 2.3 above) rose from slightly below the lower limit of its target range to moderately above the upper limit. The Federal Reserve did not forcefully resist these monetary developments by rapidly reversing the spring decline in the Federal funds rate. The funds rate fell briefly below 9 percent in July and early August, generally remained below 11 percent through mid-September, and was pushed as high as 13 percent in the week before the 4 November presidential election.

Of course, in normal times, a 4 percentage point increase in the Federal funds rate in four months would represent a dramatic tightening of monetary policy. However, nothing about economic events in 1980 was very normal, and the Federal Reserve had no rational basis for believing that its actions to raise the Federal funds rate during the summer and early autumn of 1980 were in any way symmetrical with its actions to cut the Federal funds rate during the spring. In the spring, recognizing that a recession would probably be the necessary consequence of successful efforts to reduce inflation, two months of shortfall of the monetary aggregates below their target ranges had justified a 10 percentage point decline in the Federal funds rate. In the summer and early fall, with no firm reason to believe that substantial permanent progress had been made in reducing the inflation rate below about the 10 percent level, five months of very rapid growth of the monetary aggregates led to only a 4 percentage point increase in the Federal funds rate. Moreover, as illustrated in figure 2.5, not only did the interest rate of three-month Treasury bills fall significantly less than the Federal funds rate from late April to mid-June, but the Treasury-bill rate also began to move upward fairly sharply two months before the Federal Reserve began to push the Federal funds rate upward.

The recession of 1980 was sharp but very brief. By the summer of 1980, economic activity began to recover. Retail sales began to rise in June after four months of decline. Industrial production began to rise in August, having fallen 8.5 percent during the preceding six months. Employment, measured by the household survey, began to recover in July, while nonfarm payroll employment, measured by the establishment survey, began rising in August. Private housing starts began recovering strongly in June. After falling sharply in the second quarter, real GNP posted a slight gain during the summer. It then rose at a vigorous 5 percent annual rate in the autumn and at a very rapid 9 percent annual rate during the first quarter of 1981.

For one month, in July 1980, the CPI was nearly unchanged. The monthly

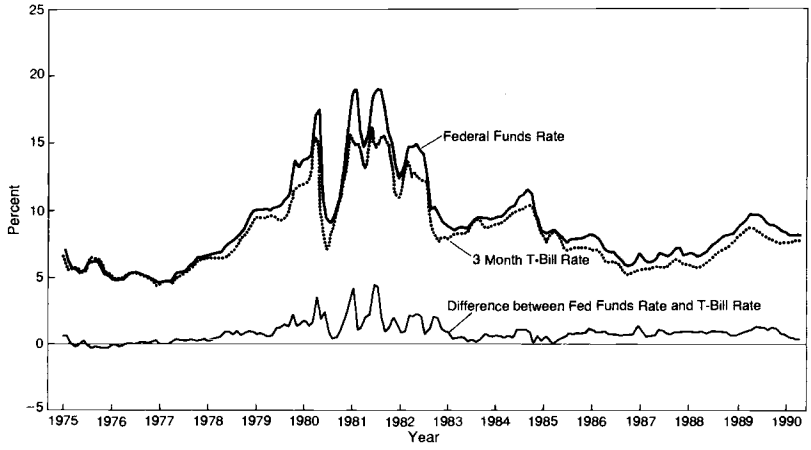

Fig. 2.5 Interest rates
Note: Federal funds rate and three-month Treasury-bill rate, January 1975–April 1990.

inflation rate, however, picked up to 8 percent in August and 12 percent in September. Even with the benefit of the July CPI result, the inflation rate for the last six months of 1980 was 9.7 percent. The December-to-December change in the CPI for 1980 was 12.4 percent, down only marginally from the 13.3 percent gain recorded for 1979. As measured by the GNP fixed-weight price index, there was no decline of inflation during the second half of 1980, and the inflation rate during all of 1980 was a percentage point higher than during 1979.

2.3.5 An Abortive Victory

In retrospect, especially knowing the price yet to be paid during the recession of 1981–82 to refight the battle against inflation, it is clear that the Federal Reserve accomplished only an abortive victory. Reducing inflation was the clearly stated, number one priority of monetary policy for 1980. The Federal Reserve clearly recognized that pursuit of this priority implied substantial short-term risks for business activity. It specifically pointed to the midpoints of its target ranges for monetary growth during 1980 as implying significant constraint on inflation. Early in the year, the Federal Reserve took decisive action to crush the bubble of inflationary hysteria. However, when the economy and the monetary aggregates turned sharply but briefly downward in the spring, and as the first glimmer of hope appeared in the long-proclaimed effort to reduce inflation, the Federal Reserve quickly and massively reversed the thrust of its policy. As year's end approached, the monetary aggregates were not at the midpoints of their target ranges but rather near or above the upper limits. Despite the pledges of forceful and persistent action to reduce inflation, and despite the recession of 1980, "inflation did not abate in 1980," as the

Federal Reserve conceded in its "Monetary Policy Report to Congress" in February 1981.

Of course, monetary policy is not made in retrospect. It is made in real time, without prescient knowledge of the future, and often without very accurate knowledge of what is currently happening. In this regard, 1980 certainly did not provide a congenial environment for the conduct of monetary policy. The economy shifted with unprecedented rapidity from inflation hysteria, to steep recession, and then back to expansion and accelerating inflation. There was little basis for assessing the impact on the economy of the imposition and subsequent removal of credit controls. Interest rates, usually a key indicator and instrument for the conduct of monetary policy, moved around with incredible volatility. The behavior of monetary aggregates was also extremely difficult to interpret and predict in the face of wide swings in interest rates and the deregulation of depository institutions.

Moreover, the Federal Reserve's new operating procedures seriously complicated the conduct of monetary policy during 1980. Partly, the problem was that neither the Federal Reserve nor the banking and financial system had any significant experience with the new operating procedures and certainly no experience relevant to the turbulent conditions of 1980. More important, many members of the FOMC apparently felt that it was important to demonstrate the seriousness and the symmetry of their commitment to the new operating procedures. The procedures served to justify the aggressive tightening of monetary policy in the autumn of 1979 and the extraordinary efforts to combat the inflationary hysteria of early 1980. When the economy tumbled into recession in the spring and the monetary aggregates fell well below their target ranges, symmetrical application of the new operating procedures demanded a very aggressive easing of monetary policy as measured by the Federal funds rate. Indeed, judged by the standard of achieving the monetary growth targets, the Federal Reserve failed to cut the funds sufficiently in the spring of 1980.

During 1980, the conduct of monetary policy was further complicated by the political environment of a presidential election. In the autumn of 1979 and the winter of 1980, despite the likely political costs of a recession, the Carter administration supported, or at least acquiesced in, the Federal Reserve's tight policy to combat rising inflation. When the economy fell steeply into recession, the administration approved the Federal Reserve's easing of monetary policy and surely would have been highly critical of the continuation of a very tight policy. It is unclear, however, that the administration actively sought quite the speed and extent of reductions in the Federal funds rate that occurred between late March and early June or that the administration could have effectively pressured a reluctant Federal Reserve to ease so dramatically.

During the summer and early autumn, as election day approached, administration officials understandably became increasingly unsympathetic toward any tightening of monetary policy. Nevertheless, the Federal Reserve began to nudge the Federal funds rate upward in September, and, on 25 September, the

Board of Governors authorized a full 1 percentage point increase in the discount rate—an unprecedented action so close to an election and one that elicited public criticism from President Carter. Despite this criticism, the Federal Reserve allowed or induced about a further 2 percentage point increase in the Federal funds rate before election day.

Market interest rates, however, began to move upward ten weeks in advance of upward movements in the Federal funds rate. In particular, the short-term Treasury-bill rate bottomed out by mid-June and had risen about 2 percentage points by mid-August—a fact that was known contemporaneously at the Federal Reserve. Also, an explosion of monetary growth began in June and continued through the summer and early autumn—developments that were known with only a brief delay at the Federal Reserve. Unquestionably, the Federal Reserve postponed actions to tighten monetary policy that were clearly called for by these developments under its own operating procedures. In all probability, political concerns about the consequences of a dramatic tightening of monetary policy shortly before a presidential election were an important reason for this delay.

It should be emphasized that the political concerns that influenced the Federal Reserve during the summer and early autumn of 1980 were not narrowly partisan—to aid in the reelection of President Carter. William Greider, who is not a great admirer of the Federal Reserve, makes this point in *Secrets of the Temple* (1987). He quotes Frederick Schultz, then vice chairman of the Federal Reserve Board, as expressing the views of many members of the FOMC: "Our attitude toward the election is that we'd like to dig a foxhole and crawl in until it's over." Greider's own conclusion is stated as follows:

> This disposition [to avoid political involvement] undoubtedly inhibited policy makers from executing sharp, stringent policy moves in the middle of a campaign if such decisions could be postponed. The majority of the FOMC, for instance, might have been more open to the arguments for tightening in the summer of 1980 if it had not been the season for presidential politics. Some governors, if pressed, would concede that during a campaign they would rather be easing than tightening if conditions permitted them to do so. Most of all, they wished for a smooth policy line that would avoid aggravating either political party. (p. 214)

These political difficulties, together with the other substantial problems of conducting monetary policy in the extraordinarily turbulent and uncertain environment of 1980, explain much of the erratic, seesaw course of monetary policy. They do not, however, entirely excuse the Federal Reserve's lack of persistence and determination in confronting the demon of inflation. To an important extent, the demon itself was the offspring both of the repeated failures to pursue sufficiently aggressive anti-inflation policies during the late 1970s and of the Federal Reserve's generally poor record of combating inflation since the mid-1960s. During the spring of 1980, the Federal Reserve was not compelled to ease as much as it chose to when the economy fell into

recession. As the record of its own meetings indicates, the FOMC was warned about the possible need to reverse that policy if the recession proved short and inflation resurged. It could and should have recognized the difficulties that would be faced if such a reversal became necessary in the midst of the presidential election campaign.

Given the information available at the time, the Federal Reserve did not have a particularly sound basis for engineering the entire precipitous drop of the Federal funds rate during the spring of 1980, other than the desire to adhere to its own new and untested operating procedures. If the Federal Reserve sought to adhere to these operating procedures, it should and could have acted more quickly and aggressively to restrain the resurgence of rapid monetary growth during the summer and early autumn of 1980. The dismal record of the Federal Reserve in nurturing and tolerating the rise of inflation during the preceding three years justified and necessitated sustained action to combat inflation. In 1980, having summoned the courage to stand eyeball to eyeball with the demon of inflation, the Federal Reserve should not have blinked.

2.4 Bloodshed and Victory

The second and ultimately successful effort to combat inflation during the 1980s really began, appropriately enough, on 4 November 1980—two years after the dollar stabilization crisis of 1978 and on the day that Ronald Wilson Reagan was elected president of the United States. For twenty-one months, until August 1982, the Federal Reserve would consistently pursue a very tight monetary policy. As a consequence of this effort, the inflation rate would be driven down from 12.4 percent during 1980 to 3.9 percent during 1982. The U.S. economy would also be pushed into a deep and prolonged recession during which real GNP would fall absolutely by 3.3 percent and the unemployment rate would rise to a postwar peak of 10.8 percent.

During the seven weeks following the presidential election, the Federal funds rate was driven up 6 percentage points, to nearly 20 percent by mid-December 1980. The growth rates of the monetary aggregates fell off sharply in November and December. By year's end, the November–December slowdown in money growth pushed M1A back toward the midpoint of its target range and drove M1B and M2 down toward the upper limits of their ranges. Alternatively, adjusting for the larger than expected increase in NOW and ATS deposits, it could be said that both M1A and M1B ended the year just below the upper limits of their target ranges, after having shot from being well below these ranges in late May to above their upper limits in October.

2.4.1 Twelve Months of Tight Money

The slowdown of monetary growth that began in November and December 1980 continued into January and February 1981, placing the narrow monetary aggregates M1A and M1B (adjusted for shifts of deposits because of the na-

tionwide introduction of NOW accounts) well below their target ranges. During this brief period in early 1981, M1A actually declined very sharply because interest-bearing checking accounts (not included in M1A) became widely available to individual households. In figure 2.6, which plots the six-month annualized growth rates of M1A and M1B, this development is reflected in the large negative growth rates of M1A during the first few months of 1981. For M1B, the six-month annualized growth rate declines sharply in late 1980 and early 1981 but does not become negative in early 1981. For M2, the six-month annualized growth rate, illustrated in figure 2.7, declines substantially from its relatively high level in the early autumn of 1980 but remains above the rate implied by the midpoint of the FOMC's target range for this aggregate.

As evidence of the substantial shortfall in the growth of the narrow monetary aggregates became available in late January and February 1981, the Federal funds rate fell from around 19 percent to the 15 percent lower limit of its tolerance range. This development probably reflected market anticipations of some easing by the Federal Reserve in pursuit of its monetary growth targets more than it did deliberate actions by the manager of the Open Market Desk. In any case, at its meeting on 2–3 February 1981, the FOMC decided that it would accept for some time a shortfall of the narrow aggregates below their short-term target ranges. Notably, at this juncture, the FOMC refused to authorize a further reduction in the lower tolerance limit for the funds rate.

At its meeting on the last day of March, the FOMC decided that, because of the confusion associated with shifts of deposits between the narrow aggregates, it would cease to make reference to M1A in its directive to the Open Market Desk. At this meeting, it also adjusted the tolerance range for the Federal funds rate to 13–18 percent. However, the funds rate fell below 15 percent only briefly during April, before preliminary data began to show more rapid growth of the monetary aggregates.

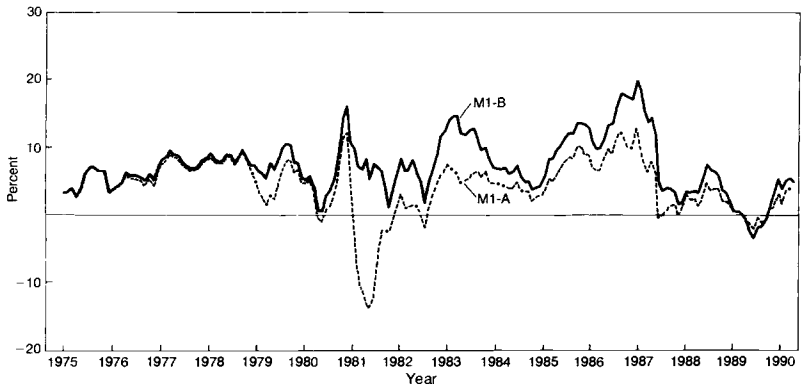

Fig. 2.6 M1 money supply growth, January 1975–April 1990
Note: The money growth rate is a six-month moving average of the respective M1 growth rate.

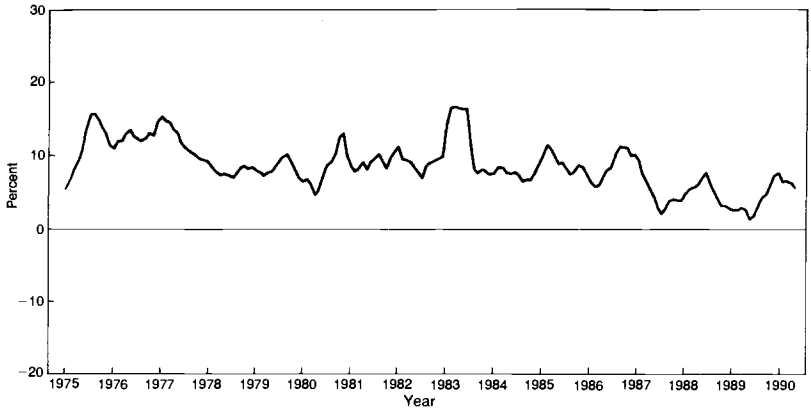

Fig. 2.7 M2 money supply growth, January 1975–April 1990
Note: The money growth rate is a six-month moving average of the M2 growth rate.

By early May 1981, monetary data showed M1B rising rapidly toward the midpoint of its target range and M2 growing above the upper limit of its target range. The Federal funds rate had already been pushed above the 18 percent upper limit of its tolerance range. In a telephone conference on 6 May, the FOMC authorized temporary excesses of the funds rate above this upper limit in order that "the reserve path should continue to be set on the basis of the short-run objectives for monetary growth." Two days earlier, the Board of Governors had raised the discount rate from 13 to 14 percent. At its regular meeting on 18 May, the FOMC formally raised the tolerance range for the funds rate to 16–22 percent. When these actions were taken, it was clear that economic activity had expanded rapidly during the first quarter—the final confirming echo of the rapid monetary growth of the summer and early autumn of 1980.

By the time of the FOMC meeting on 6–7 July 1981, it was apparent that economic activity had leveled out in the second quarter, following a revised estimate of a very strong growth during the first quarter. The large April increase in M1B had been reversed by sharp declines in May and June, and M1B (adjusted for deposit shifts into NOW accounts) was again well below the lower limit of its target range. M2 and M3 continued to grow above the upper limits of their ranges. Federal funds had generally been trading in the range of 18.5–19.5 percent during the preceding six weeks. The FOMC lowered the tolerance range for the funds rate to 15–21 percent in its directive of 7 July and maintained this range until its meeting on 5–6 October, when the range was reduced to 12–17 percent. Through mid-August, the actual level of the funds rate declined only marginally to about 18 percent. It then moved erratically downward, generally remaining above 15 percent through the end of October. From July through October, M1B grew very slowly and fell further be-

low the lower limit of its target range, while M2 continued to skirt the upper limit of its range.

In retrospect, it is clear that monetary policy was really very tight during the twelve months from November 1980 through October 1981. For almost this entire twelve months, the Federal funds rate was kept above 15 percent, half the time in the range of 18–20 percent. On only two previous occasions had the Federal funds rate ever reached or exceeded 15 percent: very briefly in late October 1979 and for about two months from late February to late April 1980. Moreover, measured in real terms, subtracting the six-month annualized rate of change in the CPI, the Federal funds rate was exceptionally high from November 1980 through October 1981—generally in the range of 4–9 percent.[6]

The monetary aggregates also indicated a very tight policy. As illustrated in figure 2.6 above, after spiking upward in late 1980, the six-month annualized growth rate of M1B fell continuously during 1981 and reached almost zero in October. M1A registered sharply negative growth for most of 1981. M2 grew at an 8.7 percent annual rate between October 1980 and October 1981 but failed to keep pace with the 10.2 percent rise in the consumer price index.[7]

After twelve months of very tight monetary policy, information received during November and December 1981 indicated sharply declining economic activity during the fourth quarter, after a small gain in the third quarter and a small decline in the second. A recession was now clearly under way, and it was expected to be at least as deep as the average recession since the Second World War. Data on consumer and producer prices were generally showing inflation rates much reduced from their levels earlier in 1981 and in 1980. Reflecting both an actual and an expected slump in activity and decline of inflation, short-term interest rates began to move sharply downward in very late September, with yields on three-month Treasury bills registering more than a 4 percentage

6. There are several possible ways to measure the "real level of the Federal funds rate," and they yield somewhat different numerical answers. However, using any consistent method of measurement, this measure of monetary tightness was exceptionally high, relative to previous experience, for a very long time during 1981, and it continued to be very high until the summer of 1982. Subsequently during the 1980s, the real level of the Federal funds rate would generally remain very high by the standards of the 1960s and 1970s. For the measure of the real level of the Federal funds rate illustrated in fig. 2.4 above, this may be partly explained by the possibility that the average anticipated rate of inflation during much of the 1980s ran somewhat above the six-month annualized rate of change in the CPI and by the likelihood that the sharp declines in this measure of inflation during late 1982 through early 1983 and again during 1986 did not correspond to similar declines of the anticipated inflation rate. However, an important part of the continued high real level of the Federal funds rate (and other interest rates) during the 1980s remains very difficult to explain. It follows that this indicator of the stance of monetary policy needs to be interpreted with care.

7. The real quantity of any monetary aggregate may be measured by dividing the nominal quantity by a measure of the price level. Using the CPI to measure the price level, between October 1980 and October 1981, the real quantity of M2 was falling. In the context of the behavior of all the other indicators of monetary policy, this decline in the real quantity of M2 should be interpreted as further evidence of a tight monetary policy.

point drop by year's end. Long-term bond yields also dropped substantially from their peaks in late September, with yields on Treasury bonds falling 1.5–2 percentage points by year's end.

2.4.2 Nine More Months of Tight Money

The Federal Reserve responded to these developments by making monetary policy only modestly less tight. The discount rate was cut from 14 to 13 percent on 30 October and cut again to 12 percent on 3 December. The tolerance range for the Federal funds rate was reduced to 11–15 percent at the FOMC meeting on 21 November and then to 10–14 percent at the FOMC meeting a month later. The actual level of the funds rate declined from 15 percent at the end of October to 13.25 percent in mid-November and fell as low as 12 percent in early December before turning upward. Growth rates of the monetary aggregates picked up somewhat in the final two months of 1981, with M1B rising toward (but not quite to) the lower limit of its target range and M2 rising a modest further amount above the upper limit of its range. The FOMC, however, was not disposed to repeat the (never officially conceded) mistakes of 1979 and 1980 by directing a rapid acceleration of monetary growth at the first signs of real weakness in the economy. The official record of the 17 November meeting of the FOMC notes (in the usual dry and understated tone of these documents):

> Many members thought that an aggressive effort to stimulate M1B growth over November and December at a pace sufficiently rapid to compensate for the shortfall in October would interfere with achievement of longer-term economic goals and would risk overly rapid expansion of money and credit in later months, particularly if the effort were accompanied by a precipitous decline in short-term interest rates to levels that might not be sustainable.

In 1982, the Federal Reserve stopped reporting and announcing growth targets for M1A and relabeled M1B more simply as M1.[8] In January, M1 grew at a very rapid 21 percent annual rate, after increasing at an 11 percent rate in December 1981. This placed M1 significantly above the target range for that aggregate established by the FOMC. M2 grew at a 13 percent rate in January 1982 (originally estimated as 11 percent), after rising at an 11 percent rate the preceding December (originally estimated as 8 percent). These developments placed M2 slightly above its target range by the time of the FOMC meeting on 1–2 February 1982.

It was known at the time that most of the large January gain in M1, as well as much of the increase in this aggregate in November and December 1980, came from other checkable deposits (OCD). OCD consists of interest-bearing checkable deposits in NOW and ATS accounts at all depository institutions

8. The definitions of M2 and M3 were also modified. Money market funds held by institutions were removed from M2 (and remained in M3), and retail repurchase agreements of less than $100,000 (already in M3) were added to M2.

and small amounts of demand deposits at thrift institutions and credit unions. OCD is the part of M1 (previously M1B) that is not in M1A, the old concept of M1 consisting of currency plus non-interest-bearing demand deposits at commercial banks. It is now known that OCD has a much lower transactions velocity than ordinary demand deposits, indicating very strongly that the January 1982 increase in OCD and correspondingly in M1 did not signal that monetary expansion was exceedingly rapid. Even at the time, there was good reason to suspect that this was true and to pay heed to continuing signals from M1A that monetary policy remained quite tight. The Federal Reserve, however, had removed M1A from any direct role in the short-run operation of monetary policy in March 1981 and was committed to abandoning this aggregate altogether in February 1982.

Knowing the Federal Reserve's operating procedures, financial markets focused on the short-run behavior of M1 (= M1B) and M2, for which estimates were announced weekly. If the Federal Reserve was believed to be serious about achieving its monetary growth targets (as apparently it was in late 1981 and early 1982), then market forces would automatically tend to force the Federal funds rate and other short-term interest rates upward once it was reported that growth of M1 (= M1B) was accelerating above its presumed target in late December 1981 and January 1982. In any event, whether as an automatic result of market forces or with some additional push from the Open Market Desk, the Federal funds rate did rise from 12.25 percent around 20 December to 14 percent at the end of January.

At the FOMC meeting on 1–2 February 1982, it was recognized that the January rise in M1 resulting from the rapid growth of OCD was probably a deviation that should not be corrected by an effort to drive M1 rapidly back toward its target range. On the other hand, the FOMC was not prepared to ignore entirely the January increase in M1 or to alter its previously announced target ranges, or to reintroduce M1A into the monetary control procedures. Instead, to move M1 back toward its target range for 1982, the FOMC directed that no further growth should occur in M1 in the period January–March, and it raised the tolerance range for the Federal funds rate to 12–16 percent. It is noteworthy that this decision was taken in the knowledge that M1 (= M1B) had undershot its 1981 target range and that the rapid January growth had placed this aggregate only slightly above the lower limit of the extension of the 1981 target range. It was also taken in the knowledge that real GNP was estimated to have fallen at a 5.25 percent annual rate in the final quarter of 1981, that preliminary indicators suggested a further decline in output during the first quarter of 1982, and that inflation was continuing the clear trend of moderation that had begun in 1981. Clearly, something had changed since the spring of 1980 in the Federal Reserve's approach to dealing with the risks of recession and inflation.

On balance, M1 grew very little between January and the end of June. M2 grew sufficiently slowly to fall just below the 9 percent upper limit of its target

growth range in March and subsequently ran essentially along this upper limit. After January, the Federal funds fluctuated generally between 14 and 15.5 percent and ended June at about 14.5 percent. Since the inflation rate (measured by the six-month annualized rate of change in the CPI) was running around 6 percent, the Federal funds rate in real terms generally exceeded 8 percent. Economic data during this period indicated, on balance, little change in output during the second quarter. Nonfarm payroll employment continued to decline, however, and the unemployment rate rose from 8.6 percent in January (already above the 7.8 percent peak reached during the brief 1980 recession) to 9.6 percent in June—at that point a record unemployment rate for the postwar era.

2.4.3 The Shift to Easier Money

By the end of June, the very slow growth of M1 for five months had erased the January bulge and brought this aggregate near to the upper limit of its 1982 target range. M2 continued to grow along the upper limit of its range. At this point, adherence to the monetary targets would have implied continuation of a tight monetary policy to bring both M1 and M2 toward the midpoints of their announced ranges. Some members of the FOMC (Governor Wallich and Reserve Bank Presidents Black and Ford) clearly favored this course. Alternatively, in view of the depressed level of business activity, the FOMC could have explicitly raised the targets for monetary growth. Governor Teeters, long a proponent of a somewhat less tight monetary policy, was an advocate of this latter option. The FOMC pursued neither of these courses. It did, however, raise the short-term growth targets for M1 and M2 by 2 and 1 percentage points, respectively, and it instructed the manager of the Open Market Desk that "somewhat more rapid growth would be acceptable."

With this decision, the FOMC effectively began fundamental change in the course of monetary policy in the direction of substantially greater ease. Initially, this change in policy was not apparent in the behavior of the monetary aggregates, as M1 declined slightly in July, while M2 growth increased modestly. In the face of a still deepening recession, however, the Federal funds rate dropped from 14.5 percent at the end of June to 15 percent by mid-July and to 11 percent by the end of July. The Federal Reserve Board cut the discount rate half a percentage point, to 11.5 percent on 19 July, by another half percentage point on 30 July, and by another half percentage point on 13 August. By late July, financial markets began to take the hint. The yield on three-month Treasury bills fell more than 4 percentage points between late July and the end of August, while longer-term bond yields declined more than 1.5 percentage points. Stock prices began what was to become the great bull market of the 1980s with a strong rally in August. The Federal funds rate fell to 10 percent by 18 August and to 9 percent just before the FOMC meeting on 24 August, at which time the tolerance range was reduced to 7–11 percent.

Monetary growth picked up considerably in August, with M1 and M2 rising at rates of 12 and 13 percent, respectively, and quite rapid monetary growth

generally continued to the end of 1982 and throughout 1983. The Federal funds rate fell to 9 percent by the end of 1982 and generally ran in the range of 8.5–9.5 percent during 1983. The discount rate was cut five more times between 17 August and 17 December, down to a level of 8.5 percent, where it was held throughout 1983.

Thus, the very tight monetary policy that the Federal Reserve embarked on in November 1980 began to be reversed in July–August 1982—a year after the officially recognized starting date of the 1981–82 recession. Economic activity continued to decline until November 1982, with the unemployment rate rising ultimately to a peak of 10.8 percent. The demon of inflation, however, had finally been tamed. During the twelve months of 1982, the CPI rose only 3.8 percent, and the annual inflation rate would remain generally in the neighborhood of 4 percent through the rest of the decade.

2.4.4 The Rationale for Tight Money

In retrospect, it is clear that the prolonged tightening of monetary policy from late 1980 to mid-1982 was the most important action taken by the Federal Reserve during the 1980s and perhaps the most important monetary policy action since the catastrophic failure of the Federal Reserve to resist the monetary collapse of the early 1930s. Four important points should be discussed concerning the rationale for this policy.

First, an extended period of very tight money that would push the economy into deep and prolonged recession was not exactly the publicly announced intention of the Federal Reserve. Federal Reserve officials, especially Chairman Volcker, did indicate the need for a sustained and determined effort to combat inflation, even at the expense of considerable pain to the economy. However, in its semiannual "Monetary Reports to the Congress," the Federal Reserve usually suggested a more gradual approach to restoring stability to the general level of prices—an approach that was officially endorsed by the Reagan administration. In this regard, a passage from the "Monetary Policy Report" of 25 February 1981 is noteworthy:

> It is essential that monetary policy exert continuing resistance to inflationary forces. The growth of money and credit will need to be slowed to a rate consistent with the long-range growth of the nation's capacity to produce at reasonably stable prices. Realistically, given the structure of the economy, with the rigidities of contractual relationships and the natural lags in the adjustment process, that rate will have to be approached over a period of years if severe contractionary pressures on output and employment are to be avoided.

Second, while the Federal Reserve clearly did not pursue a policy that avoided severe contractionary pressures on the economy, it is arguable that no such policy would have achieved a substantial and sustained reduction of inflation. To succeed in the effort to reduce inflation, millions of private actors

in the economy and in financial markets needed to be persuaded that inflation in the future would proceed at a substantially lower rate than in the past. Persuasion would be very difficult because, consistently for five years before 1981 and generally for the preceding ten years, people who had acted on the assumption that future inflation would be low turned out to be the economic losers whereas people who had acted on the assumption that future inflation would be high had been the economic winners.

Thus, to succeed in reducing inflation, the Federal Reserve had to establish its credibility as a consistent and effective warrior against the demon of inflation. Given the Federal Reserve's dismal record in restraining inflation since 1976, including the retreat of 1980, there was only one effective way for the Federal Reserve to demonstrate the anti-inflationary resolve of its monetary policy. The Federal Reserve had to show that, when faced with the painful choice between maintaining a tight monetary policy to fight inflation and easing monetary policy to combat recession, it would choose to fight inflation. In other words, to establish its credibility, the Federal Reserve had to demonstrate its willingness to spill blood, lots of blood, other people's blood.

Third, the Federal Reserve's tight monetary policy was partly the consequence of understandable and unavoidable miscalculation. The official record of the deliberations of the FOMC indicates that the likely depth and duration of the recession were consistently underestimated. To some extent, this tendency was probably a psychological correction for the FOMC's earlier errors in anticipating the 1979 recession that never quite materialized and in failing to appreciate the rapidity of the turnaround from recession to expansion in the summer of 1980. Outside the Federal Reserve, however, it was also widely believed that the 1981–82 recession would end five or six months sooner than it did—partly because of the expected expansionary effects of the Reagan administration's fiscal policy.

Moreover, judging the tightness or ease of monetary policy in the turbulent economic and financial conditions of 1981–82 was no easy task. There was a sharp downward shift in the velocities of circulation of various monetary aggregates that altered the significance of the growth rates of these aggregates as indicators of monetary policy. The occurrence and implications of substantial downward shifts in velocities were known and appreciated at the Federal Reserve. However, no one, including the Federal Reserve, had a firm basis for assessing precisely how much velocity shifted for different aggregates. In retrospect, knowing how much velocities did shift during 1981–82, the Federal Reserve's policy may now appear somewhat tighter than was reasonably understood or intended at the time. The Federal funds rate also became a less reliable indicator of monetary policy as market interest rates fluctuated with unprecedented volatility and as the anticipated inflation rate shifted downward to an extent that was extraordinarily difficult to evaluate. For understandable reasons, the Federal Reserve failed to appreciate how tight its policy really was,

in the context of a recession that turned out to be deeper and longer than originally anticipated.

Fourth, making due allowance for underestimates of the depth and duration of the recession and for the difficulties in assessing the actual tightness of monetary policy, it is nevertheless clear that the Federal Reserve knowingly persisted in a very tight monetary policy for many months after the economy had fallen into recession.[9] Indeed, as early as July 1981, with a year of tight monetary policy still in store, the forecasts presented to the FOMC pointed to a deep and prolonged recession even under the most expansionary options for monetary policy.[10] Having backed off from further monetary tightening during much of 1979, and having reversed policy so rapidly and ignominiously in 1980, most members of the FOMC recognized that this time they had to hold on to a tight policy until there was unmistakable evidence of real progress in reducing inflation. The financial markets particularly, and the economy more generally, were so sensitized by previous failures to control inflation that the Federal Reserve perceived little latitude to ease monetary policy before the summer of 1982.

2.4.5 An Excessively Tight Policy?

All things considered, it is still arguable that the Federal Reserve may have kept monetary policy too tight for too long during 1982. Taking account of the relatively high unemployment rate when the recession started and of the time before recovery restored the economy to near its longer-term growth path, the loss of output during the 1981–82 recession probably amounted to $200–$300 billion (in 1982 dollars), or possibly more.[11] As tends to be the case with long and deep recessions, many workers and businesses never recovered an important part of the ground lost during this downturn. Other longer-term problems of the recession and the period of very high interest rates—notably the

9. The disparity between the Federal Reserve's rhetoric suggesting a gradualist approach to combating inflation (discussed above) and its actual policy is not indicative of an effort to deceive the public or the Congress. People well understood that the Federal Reserve's policy was very tight, and it served the Federal Reserve's objectives to sustain this understanding. It was not polite or politically astute, however, to be too explicit about the casualties that might result from the Federal Reserve's policy or to contradict directly the administration's announced preference for a gradualist approach.

10. At each meeting of the FOMC, analyses of the performance and prospects for the economy are presented in the *Greenbook* and the *Bluebook*. The forecast presented to the FOMC at its July 1981 meeting is discussed explicitly in Karamousis and Lombra (1989). The most optimistic scenario presented for consideration by the FOMC envisioned an 8.3 percent average unemployment rate for 1982 and an 8.8 percent average unemployment rate for 1983.

11. The Hodrick-Prescott filter used to construct the smoothed trend path for real GNP in fig. 2.1 above indicates that real GNP barely fell below this trend during the recession of 1980 and was significantly above this trend in mid-1981. Using deviations from the Hodrick-Prescott trend to measure the output loss from the 1981–82 recession results in a comparatively small measured loss—about $200 billion. If the loss is measured relative to a trend passing through the actual level of real GNP during the second quarter of 1981, the loss is significantly larger—about $300 billion.

continuing problems of the savings and loan industry—are still of pressing importance in the United States. Other countries, particularly in Latin America, also felt and are still feeling the consequences of high interest rates and recession in the United States during the early 1980s. Moreover, given the fragile state of the U.S. financial system by the summer of 1982, avoidance of an even more serious economic downturn should be regarded as a fortunate outcome.

Of course, only a modest fraction of the cost of the recession of 1981–82 (and of associated economic problems) can be attributed to excessive and inappropriate tightness of monetary policy. Most of the cost is properly attributed to the necessity of combating the virulent inflation that was, in substantial measure, the consequence of previous laxity of monetary policy. Also, other factors such as the second oil price shock probably contributed in important ways to the length and depth of the recession. Nevertheless, if a somewhat less tight monetary policy during 1982 would have shortened the recession by even three or four months, without sacrificing a great deal of the progress in reducing inflation, it would have been a more desirable policy.

The difficulty is knowing at what point the Federal Reserve could have moved to a somewhat easier policy without provoking an adverse reaction by raising fears of future inflation. This problem clearly influenced the policy followed by the Federal Reserve, as expressed in the Federal Reserve's "Monetary Policy Report to the Congress" of 20 July 1982:

> Unfortunately, these stresses [of the recession] cannot be easily remedied through accelerated money growth. The immediate effect of encouraging faster growth in money might be lower interest rates, especially in short-term markets. In time, however, the attempt to drive interest rates lower through a substantial reacceleration of money growth would founder, for the result would be to embed inflation and expectations of inflation even more deeply into the nation's economic system. It would mean that this recession was another wasted painful episode instead of a transition to a sustained improvement in the economic environment.

Ironically, this statement is phrased as an expression of the Federal Reserve's future intentions rather than as a justification of its past actions. On the very day that this statement was released, the Federal Reserve cut the discount rate from 12 to 11.5 percent, signaling the beginning of what would become a four-and-a-half-year period of quite rapid monetary expansion. During this period, interest rates, both short and long term, would be driven significantly lower, and the U.S. economy would substantially recover from the devastation of both inflation and recession. By July 1982, enough blood had been spilled that the credibility of the Federal Reserve's anti-inflationary policy was established. Now, the economy generally, and the financial markets particularly, would sigh in relief or cheer in ecstasy, rather than shriek in terror, at the fact and prospect of a substantially easier monetary policy.

2.5 Savoring the Fruits of Victory

The victory over inflation and the obviously distressed state of the American economy were the key considerations leading to the Federal Reserve's shift to an easier monetary policy. Insofar as political considerations influenced the Federal Reserve's decision, these considerations all weighed in favor of the new policy. Concerned about the prolonged and deepening recession, many officials of the Reagan administration had been arguing for some time in favor of an easier monetary policy. On Capitol Hill, despite the upcoming congressional elections, monetary policy was not an issue of partisan dispute. Prominent legislators from both parties had been pressing for an easier policy since late 1981. Indeed, some Democrats were pushing legislation that would have limited the independence of the Federal Reserve and required the pursuit of an easier, lower-interest-rate monetary policy.[12]

As previously discussed, the Federal Reserve responded to criticism of its tight monetary policy by pointing to the necessity of maintaining a firm stance against the resurgence of inflation. In addition, Chairman Volcker and other members of the FOMC argued that the large and growing federal deficit was an important cause of high interest rates and that serious efforts to cut the deficit were essential to reduce interest rates without reigniting inflation. The evidence supporting this view was, and remains, somewhat ambiguous. Nevertheless, there is no doubt that the Federal Reserve's concern over the effect of the deficit on interest rates was genuine and that this concern was widely shared outside the Federal Reserve, especially in the financial community. The Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982, which sought to reduce the federal deficit by partially reversing the tax cuts of 1981, was passed by Congress in mid-August. There is no clear evidence, however, that the passage of TEFRA was instrumental in persuading the Federal Reserve to ease monetary policy or that it played a particularly important role in the subsequent decline of interest rates.

2.5.1 Problems in the Financial System

In addition to concerns about the general health of the economy, it does appear that the Federal Reserve's shift to an easier monetary policy was influenced by specific concerns about the stability of the banking and financial system. In late June 1982, Federal Reserve officials learned that the Penn Square National Bank of Oklahoma City was on the verge of failure. The failure of Penn Square, with its prospective losses to depositors, was publicly announced on 5 July. It sent tremors through the banking system—tremors to which the Federal Reserve was very sensitive—as other banks and their uninsured depositors and other uninsured creditors worried who might be next.

12. As on other issues concerning political influences on the Federal Reserve, an excellent discussion of the events of 1981–82 is provided in Greider (1987).

Of even greater importance, Federal Reserve officials were aware at least as early as June 1982 that the government of Mexico was experiencing considerable difficulties in arranging new financing for a large volume of commercial bank loans coming due during the summer. Many of the largest banks in the country were important creditors of the Mexican government, and Mexico was not the only country with large loans from U.S. banks that was in obvious economic difficulty. Default by the Mexican government would be a financial bombshell that could easily provoke a nationwide banking and financial crisis. On the thirteenth of August—appropriately a Friday—the Mexican finance minister Jesus Silva Herzog arrived at the U.S. Treasury and at the Federal Reserve with the sad news that the Mexican government's coffers were empty and that default would occur the following week. A large bailout package was arranged over the weekend, and default was avoided. However, the message remained clear—the banking system was in serious jeopardy unless something substantial was done soon to stimulate economic recovery.

2.5.2 Full Speed Ahead

As previously discussed, the Federal Reserve began to ease monetary policy in July 1982 and pushed hard in the direction of easing from August through December 1982. With the shift to a much easier monetary policy, M2 and M3 rose from somewhat below to somewhat above the upper limits of their target ranges. M1 began to grow at about twice the maximum targeted rate and rose well above the upper limit of its target range by year's end. Since interest rates fell dramatically during this period, and since M2 and M3 contain more interest sensitive elements than M1, the relative behavior of these aggregates was not surprising. Nevertheless, during the fall of 1982, the behavior of M1 was becoming an embarrassment to the Federal Reserve; it was indicating far too clearly that the Federal Reserve had given up on the monetary targets announced in February (and reaffirmed in July) in order to pursue a much easier policy.

At the FOMC meeting on 5 October 1982, this problem was solved by deciding that, "because the behavior of M1 over the balance of the year is subject to unusually great uncertainties," a short-term target for growth of M1 would no longer be used as an operational guide for the execution of monetary policy. Instead, a short-term growth target for M2 (and M3) in the range of around 8.5–9.5 percent at an annual rate from September to December was the officially stated guide for the manager of the Open Market Desk. The expiration of all savers certificates in October and the introduction of money market demand accounts (MMDAs) in December were discussed as reasons for especially great uncertainty about the behavior of M1. It is noteworthy, however, that, when M1 grew unusually rapidly during January 1982 because of growth in its OCD component, the FOMC did not choose to ignore M1. At that time, the FOMC wanted to continue a quite tight monetary policy, and the behavior of M1 provided a plausible rationale for continuing such a policy. In Octo-

ber, when the behavior of M1 was becoming an impediment to the FOMC's desire to ease monetary policy, M1 got dumped as an effective monetary target.

During the autumn of 1982, not only was M1 dumped as a target for monetary policy, but the whole procedure of using monetary growth targets as the operational guide for monetary policy instituted in October 1979 was effectively abandoned. The Federal Reserve returned to operating procedures similar to those employed in the 1950s and 1960s, when monetary policy indirectly targeted the level of the Federal funds rate. Under the procedures used from October 1982 until the late 1980s, the FOMC determined the "degree of restraint" or "degree of pressure" to apply to the reserve position of banks, as calibrated by the extent to which banks needed to come to the Federal Reserve's discount window to borrow reserves.

Given the level of the discount rate and the policies of the Federal Reserve that control borrowing at the discount window, there is a relatively precise relation between the amount of borrowing and the level of the Federal funds rate. In the official language of the directive, "maintaining the existing degree of restraint (or pressure) on bank reserves" means holding the Federal funds rate constant, "increasing the degree of pressure" means raising the Federal funds rate, and "reducing the degree of pressure" means reducing the Federal funds rate. However, since the relation between the "pressure on reserves" and the Federal funds rate is not exact and constant, there is more room for the funds rate to move around under indirect targeting than was the case under the direct targeting procedures used in the late 1970s. (Recently, since 1987, the operating procedures appear to have moved back toward direct targeting of the funds rate, but there has been no official announcement of such a change.)

During 1983, the FOMC observed what was going on in the economy: a vigorous recovery of business activity with no sign of increasing inflation. With good reason, it liked what it saw. When the year was over, real GNP had risen by 6.5 percent (fourth quarter to fourth quarter), the unemployment rate had fallen 2.5 percentage points, and the twelve-month gain in the CPI was only 3.8 percent. On fifteen occasions, the Board of Governors turned down requests from Reserve banks for changes in the discount rate and held the discount rate constant at 8.5 percent. Throughout the year, the FOMC directed only slight changes in the degree of restraint on bank reserves, and the Federal funds rate moved narrowly (by the standards of recently preceding years) within the range of 8.5–9.5 percent.

The behavior of the monetary aggregates was monitored and discussed by the FOMC during 1983, but that behavior exerted little apparent influence on decisions concerning the degree of pressure on bank reserves. The deemphasis of the M2 growth target early in the year was officially rationalized by the instabilities created by the introduction of MMDAs. Rapid growth of MMDAs accounted for much of the very rapid growth of M2 during the first quarter of 1983. Following its decision of October 1982, the FOMC also ignored the very

rapid growth of M1 throughout 1983, and it only "monitored" the behavior of this aggregate.

2.5.3 An Interval of Tightening

In January and February 1984, the Federal Reserve maintained the same policy stance that it had adopted in 1983. The degree of pressure on bank reserves kept the Federal funds rate close to 9.5 percent. In a telephone conference on 20 March 1984, the FOMC discussed recent increases in market interest rates and noted that "economic activity in most sectors was rising with considerable momentum, helping to generate strong demands for credit." The committee decided to relax informally the 10 percent upper limit of the tolerance range for the Federal funds rate. Subsequently, the tolerance range for the Federal funds rate was raised to 7.5–11.5 percent (at the FOMC meeting on 26–27 March) and to 8–12 percent (at the FOMC meeting on 16–17 July). The discount rate was raised from 8.5 to 9 percent on 6 April. The actual level of the funds rate was kept between 10 and 10.5 percent through June, then raised gradually to slightly over 11.5 percent in August, and then eased down to around 11 percent in late September.

The primary reason for the brief tightening of monetary policy from late March through September 1984 was the worry that continued rapid economic expansion was raising the risks of an acceleration of inflation. Estimates of real GNP growth indicated about a 9 percent real growth rate during the first quarter of 1984 and a still very rapid 7.5 percent rate of advance during the second quarter. When it became clear that the pace of expansion slowed considerably during the summer of 1984 and continued to be relatively sluggish during the fourth quarter, the Federal Reserve moved aggressively (but with some dissent within the FOMC) to reverse the monetary tightening of the period March–September. In October, the Federal funds rate was pushed down to 10 percent. In November, and again in December, the FOMC gave explicit directives to ease pressures on bank reserves, and the tolerance range for the Federal funds rate was reduced to 6–10 percent. The discount rate was cut to 8.5 percent on 21 November and then to 8 percent on 21 December. By year's end, the Federal funds rate had been pushed slightly below 8.5 percent.

In the official record of the FOMC's discussions of monetary policy during 1984, considerable attention is devoted to the behavior of monetary aggregates, with M1 being resurrected to a status of some importance. After a year and a half of rapid monetary growth and a full year of economic recovery, the Federal Reserve wished to maintain the hard-won credibility of its anti-inflation policy by indicating a more serious commitment to its monetary growth targets. When problems arose at the Continental Illinois National Bank during the spring and summer, the Federal Reserve sought to persuade financial markets that aid to Continental would not push the aggregates off target. Indeed, figures 2.2 and 2.3 above and figures 2.8 and 2.9 reveal that 1984 is the only year

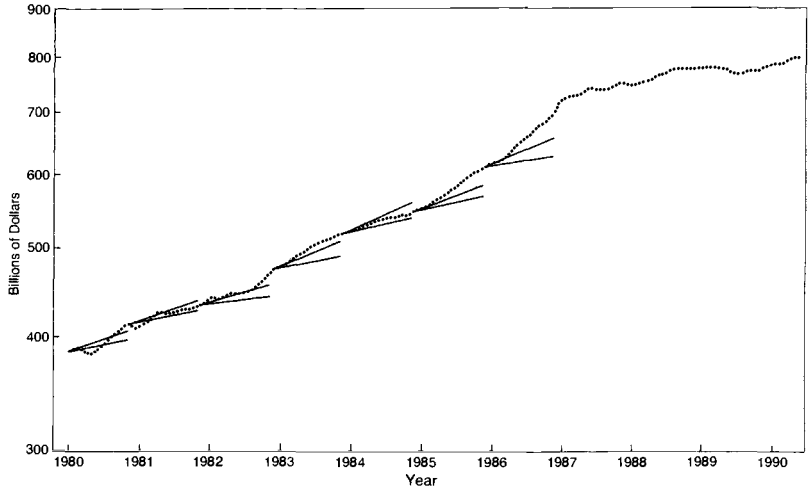

Fig. 2.8 M1 and growth target ranges, January 1980–April 1990
Note: The monetary targets are those established by the FOMC at the beginning of each year for annual growth rates.

in the entire history of monetary targeting by the Federal Reserve when both M1 and M2 ended the year near the midpoints of their respective target ranges.

During most of the 1980s, efforts to achieve the monetary growth targets, especially for M2, had some impact on the conduct of monetary policy. In fact, except for the aberration rationalized by introduction of MMDAs in early 1983, M2 ended each year of the 1980s within or very close to its announced target range. However, the target range was relatively broad, and the record indicates that achieving growth near to the midpoint of the range did not outweigh the actual and prospective performance of the economy as a dominant determinant of Federal Reserve policy.

Of course, 1984 was a presidential election year. Some in the administration were not particularly happy that the Federal Reserve embarked on a monetary tightening seven months before the election. Their concerns were more than narrowly political. Many monetarists believed that sharp changes in rates of growth of monetary aggregates were an important cause of economic instability. While they worried that the rapid money growth from October 1982 through 1983 might stimulate increased inflation, they also feared that too sharp a monetary slowdown might abort the economic recovery. Such concerns about changes in the rates of growth of monetary aggregates, however, were a bit too esoteric for most of the financial community and the press. By pursuing its announced monetary targets, the Federal Reserve probably helped insulate

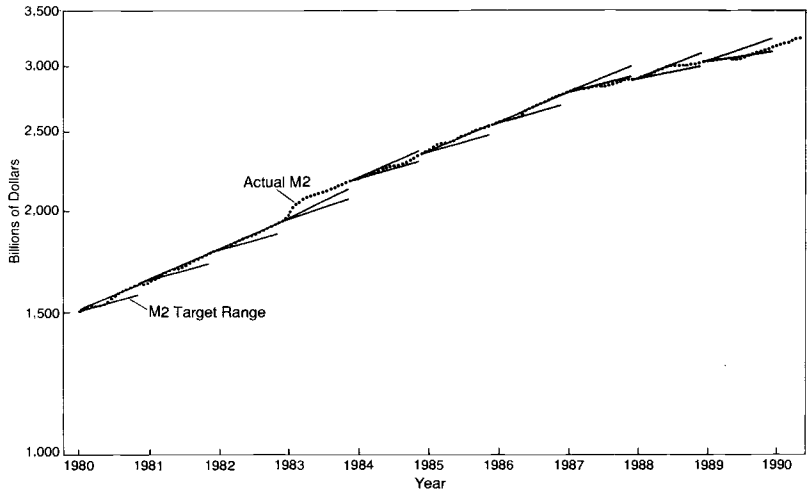

Fig. 2.9 M2 and growth target ranges, January 1980–April 1990
Note: The monetary targets are those established by the FOMC at the beginning of each year for annual growth rates.

itself from monetarist criticism. Thus, there was a marriage of convenience between the monetary tightening that the FOMC believed to be economically appropriate and the conscientious pursuit of its monetary growth targets.

In the latter part of 1984, an additional concern began to influence Federal Reserve policy: the extraordinary appreciation of the U.S. dollar against foreign currencies and the actual and prospective deterioration in the U.S. trade and current account balances. The dollar appreciated consistently, with only occasional small reversals, from the summer of 1980 until it reached its peak in early 1985. By late 1983, on a trade-weighted basis, adjusted for relative movements in national price levels, the real foreign exchange value of the dollar against other major currencies had risen about 45 percent from its low in the summer of 1980. At the Federal Reserve, and in the administration, most of this appreciation was regarded as a favorable development since a strong dollar helped reduce inflationary pressures. By the summer of 1984, the dollar had appreciated about another 10 percent in real terms, and it continued to appreciate in the autumn (rising a further 10 percent by the time of the peak in early 1985). At this point, the exceptionally strong dollar became a major concern in discussions about monetary policy, as indicated in the official record of the FOMC meeting on 21 December 1984:

> As they had at previous meetings, the members gave a good deal of attention to the effects of the continued strength of the dollar in foreign exchange markets. The related surge in imports was having a very negative impact on production in many domestic industries, while expansion of exports was be-

ing curbed by the appreciated value of the dollar as well as by relatively slow economic growth abroad.

The directive from this FOMC meeting specifically refers to "the continued strength of the dollar in foreign exchange markets" as a factor that should lead to further easing of monetary policy.

2.5.4 A Return to Easy Money

During 1985 and 1986, conditions in the economy, rather than the behavior of the monetary aggregates, continued to dominate Federal Reserve actions concerning the Federal funds rate and the discount rate. On balance, monetary policy was quite expansionary, in an environment of subdued inflation and moderate economic growth.

Specifically, in early 1985, concerns about the strong dollar and evidence that suggested a significant weakening of economic expansion (following a modest pickup in the fourth quarter of 1984) counterbalanced concerns about rapid expansion of the monetary aggregates. The Federal funds rate was kept in a relatively narrow range near 8.5 percent through the first four months of the year. As available evidence continued to indicate a very weak first quarter and a quite sluggish second quarter, the Federal funds rate was reduced to 8 percent in May and fell briefly to near 7 percent during June before returning to about 8 percent at the end of the month. The discount rate was cut from 8 to 7.5 percent on 17 May.

Nothing in the behavior of the monetary aggregates plausibly rationalized these adjustments. During the first half of 1985, M1 grew significantly above the upper limit of its target range, while M2 grew above and then along the upper limit of its target range. Moreover, revised data would ultimately show (years later) that economic growth had been considerably more vigorous during the first half of 1985, especially during the first quarter, than was believed at the time.

During the second half of 1985, the contemporaneously available evidence generally pointed to a moderate pace of economic expansion after a very slow first half. There were, however, mixed signals from different economic indicators, and there was some division among members of the FOMC concerning the prospects for future growth. Indicators of inflation generally showed the lowest rates of the 1980s, until modest upturns were reported in November and December. Despite persistent rapid growth of M1 above its target range and growth of M2 along the upper limit of its range, the FOMC decided not to increase the pressure on bank reserve positions from July through December and made one decision to ease slightly at its meeting in November. The Federal funds rate was maintained near 8 percent from July until December, when it rose briefly and marginally to about 8.25 percent.

International concern about the strong foreign exchange value of the dollar and its effects on payments imbalances and protectionist pressures led to the

Plaza Agreement of 22 September 1985. In this agreement, the finance ministers and central bank governors of the G-5 countries (France, Japan, the United Kingdom, the United States, and West Germany) announced their intention of seeking a somewhat lower foreign exchange value of the U.S. dollar and of pursuing other measures to reduce payments imbalances.

The Plaza Agreement, however, had little direct effect on U.S. monetary policy. In the months before the agreement, the FOMC had been concerned with the strong dollar, and this concern was one factor that probably contributed to decisions not to raise the degree of pressure on bank reserve positions despite rapid growth of the monetary aggregates (especially M1). After the Plaza, similar concerns contributed to similar decisions. On the other hand, throughout the period, the FOMC was alert to the danger that a precipitous drop in the dollar might contribute to inflationary pressures or erode the confidence of foreign investors whose capital was essential to finance the U.S. payments deficit. Especially late in 1985 and early in 1986, this concern provided a countervailing argument against efforts to ease the degree of pressure on bank reserves.

In early 1986, a division developed within the FOMC, and especially within the Board of Governors, concerning the advisability of further easing of monetary policy. Believing that the pace of expansion was becoming very sluggish and that dangers of a resurgence of inflation were remote, the four Reagan appointees to the Board of Governors favored some further easing. The three other governors, including Chairman Volcker, and most of the Federal Reserve bank presidents on the FOMC were unpersuaded of the need for further easing and feared the possible consequences for the dollar. On 24 February 1986, by a four-to-three vote, with Chairman Volcker in the minority, the Board of Governors approved the request of the Dallas Federal Reserve Bank to reduce its discount rate by half a percentage point.

At a meeting later the same day, this decision was rescinded by unanimous vote of the Board. The Board's *Annual Report* contains the following explanation of the shift: "Members who favored a reduction of the discount rate on domestic grounds decided that a delay of limited duration would be acceptable, given the outlook for easing actions by at least some other major central banks during the next couple of weeks, if not within the next few days." It should be added that a number of requests for discount rate cuts were made by Federal Reserve banks in January and February 1986 and were rejected by the Board of Governors. Acceptance of these requests would probably not have been enormously troubling to domestic or international financial markets. An open split of the Board of Governors that undercut the authority of the chairman, however, would have been quite a different matter.

The key economic event of 1986 was the dramatic drop in world oil prices and its impact on both inflation and economic activity. Reflecting the sharp decline in energy prices, the CPI fell in February, March, and April. For the twelve months of 1986, consumer prices rose only 1.1 percent, compared with

3.8 percent in 1985, 3.9 percent in 1984, and 3.8 percent in 1983. Economic activity in the energy-producing states was strongly negatively effected by the drop in oil prices. In addition, many U.S. manufacturing industries were continuing to feel the adverse impact of the strong dollar. As the data came in during the year, they indicated moderate real growth during the first quarter, a very sluggish second quarter, and then stronger but still relatively slow growth during the second half. Years later, revised estimates of real GNP would show a 6.6 percent growth rate for the first quarter, a −1.8 percent growth rate in the second quarter, a 0.8 percent growth rate in the third quarter, and a modest 2.3 percent growth rate in the fourth quarter. These figures, however, were not the estimates on which the Federal Reserve depended in deciding on monetary policy.

As evidence of the effects of the oil price decline became available, the Federal Reserve responded with actions to reduce interest rates. In coordination with other important central banks, the discount rate was cut half a percentage point to 7 percent on 6 March. Further half percentage point cuts were authorized on 18 April, 10 July, and 20 August, bringing the discount rate down ultimately to 5.5 percent—its lowest level for the decade. The FOMC directed or permitted substantial reductions in the Federal funds rate from slightly above 8 percent in January, to slightly below 7 percent in June, and then to 6 percent or slightly lower for July–November. Because of an extraordinary bulge of demand for transactions balances associated with provisions of the Tax Reform Act, the funds rate spiked up to nearly 9 percent for a few days in December but fell back to 6 percent in early January 1987.

In taking these actions, the Federal Reserve was often responding to developments in credit markets rather than leading market interest rates downward. In this regard, it is noteworthy that, between January and July, yields on longer-term Treasury bonds and notes fell more than either yields on three-month Treasury bills or the Federal funds rate. Except for the last downward step on 20 August, the reductions in the discount rate were clearly needed to catch up with developments that had already occurred in credit markets.

On the other hand, the Federal Reserve did not strongly resist declines in market interest rates during the first half of 1986 and did not act to push interest rates upward as the monetary growth accelerated in the second half. Specifically, except for a brief period early in the year, M1 consistently grew well above the upper limit of its target range, and it ended 1986 with more than double the maximum prescribed growth of 8 percent. M2 briefly fell slightly below the lower (6 percent) limit of its desired growth range during the first quarter but then accelerated to reach the (9 percent) upper limit of its range by year's end. M3 grew along the 9 percent upper limit of its desired range for essentially the entire year.

Judged either by growth rates of monetary aggregates or by the behavior of interest rates, monetary policy was quite expansionary during 1986—for the second year in a row. Thanks to the drop in oil prices, however, real economic

growth slowed temporarily during 1986 (with a sharp downturn in energy-producing states), and the overall inflation rate (including energy prices) declined to the lowest level since the early 1960s. Thus, at the end of 1986, the U.S. economy had enjoyed four years of business expansion and five years with the annual inflation rate remaining at or below 4 percent.

It should be added that economic activity expanded very vigorously during 1987 and that, despite the stock market crash of October 1987, expansion continued at a fairly rapid pace during 1988. With the slowing of the growth of real consumption spending and real government spending, improvements in net exports and in investment were the keys to continued overall growth. Specifically, in late 1986, U.S. real exports, which had shown no net growth since 1980, began to expand rapidly, recording a 50 percent rise during the next four years. The gain in exports also helped spark significant increases in real business investment in plant and equipment. The expansionary monetary policy of 1985–86, operating through the exchange rate as well as through interest rates, was an important contributing cause to these developments. This same expansionary monetary policy was probably also a key underlying cause of the increase of inflationary pressures during the late 1980s.

2.5.5 A Flexible and Credible Policy

For four and a half years, beginning in the summer of 1982, the monetary aggregates grew, on average, quite rapidly—at rates that in the late 1970s would have implied very rapid inflation. Clearly, there were important shifts during this period in the relations between the growth of monetary aggregates and the growth of nominal GNP. To some extent, these shifts could be understood as responses of demands for various monetary aggregates to changes in interest rates or to changes in interest elasticities of demands for these aggregates arising from banking regulations and the introduction of new forms of deposits. In any event, on the whole, the Federal Reserve made appropriate judgments about the nature and magnitude of these shifts. It provided monetary growth sufficiently rapid to support vigorous economic expansion without generating increased inflationary pressures—at least not pressures that became apparent before the end of 1986.

Moreover, the Federal Reserve was able to sustain quite rapid monetary growth over an extended period without generating intense fears it was fueling a resurgence of rapid inflation—fears that might have necessitated a monetary tightening that would have cut short the business expansion. Thus, in the bloodbath of the 1981–82 recession, and in the brief monetary tightening during 1984, the Federal Reserve had firmly established its credibility as an inflation fighter. It was then able to utilize this credibility to pursue a more flexible monetary policy to promote economic expansion from late 1982 through 1986.

2.6 Keeping the Demon at Bay

During the final three years of the 1980s, with one brief interlude, the general stance of monetary policy shifted from fueling economic expansion to resisting the rise of inflation. The move to tighten monetary policy began early in 1987 and continued until the stock market crash on 19 October. For the next five months, monetary policy was primarily directed at reducing instability in financial markets and avoiding recession. Beginning in late March 1988, amid signs of continued economic expansion and with some indications of rising inflationary pressures, monetary policy became progressively tighter until June 1989. Subsequently, while the growth of monetary aggregates remained quite sluggish, the Federal Reserve eased the Federal funds rate gradually downward. During this three-year period, as was the case earlier, developments in the economy, rather than the behavior of the monetary aggregates, exerted the decisive influence on Federal Reserve decisions about the Federal funds rate and the discount rate.

2.6.1 A Move toward Tightening

More specifically, during the winter of 1987, the Federal funds rate remained at essentially the same level as during the fall of 1986. With the Louvre Accord on 22 February, resistance to further significant depreciation of the dollar became an officially stated policy of the U.S. government. At its meeting on 31 March, the FOMC devoted "a good deal of attention . . . to the implications of the currently strong downward pressure on the dollar in foreign exchange markets." The committee agreed that "the conduct of open market operations needed to be especially sensitive to any tendency for the dollar to weaken significantly further." During April, the Federal funds rate was pushed up about fifty basis points, apparently to support internationally coordinated efforts to resist further dollar depreciation. At the regular meeting on 19 May 1987, the FOMC agreed that "open market operations . . . would be directed toward some degree of reserve pressure beyond that sought in recent weeks (but not necessarily greater than that prevailing recently)." This action was motivated both by concern about the recent increase in inflation (the CPI rose at a 5.9 percent annual rate between December and March) and by continuing worries about the dollar.

During the first six months of 1987, growth of all the monetary aggregates slowed considerably from the rapid pace set in 1985 and 1986. The slowdown in January and February reflected the collapse of the year-end bulge of demand for transactions balances generated by the Tax Reform Act, but the slow growth in later months suggested significant tightening of monetary policy. Specifically, by the end of June, M2 was well below the lower limit of the 5.5–8.5 percent growth range established by the FOMC, and M3 was near to the lower limit of its 5.5–8.5 percent desired growth range. For the first half of 1987, M1 grew at a 5.1 percent annual rate, nearly 11 percentage points below

its growth rate during 1986. For the FOMC, which had abandoned targets for M1 for 1987, this slowdown may have had little significance. However, for monetarists who focus on changes in the growth rates of monetary aggregates as a key indicator of shifts in the stance of monetary policy, it was important further evidence of a substantial tightening of monetary policy.

From June through mid-August, the dollar recovered slightly and then stabilized in foreign exchange markets, owing apparently to more favorable news about the U.S. trade balance. Available data showed that the U.S. economy was continuing to expand at a moderate pace. Recent price data showed that inflation had fallen off somewhat from the relatively high rates of the first quarter. Also, it became increasingly apparent that the federal deficit would register a large decline for the fiscal year ending on 30 September. Reflecting this good news on all fronts, stock prices continued to rise, with the Dow Jones industrial average recording a peak of 2,722 on 25 August. In this brief period of calm before the storm, on 11 August 1987, Alan Greenspan replaced Paul Volcker as chairman of the Federal Reserve Board.

2.6.2 The Crash

In late August, disappointing news about the U.S. trade balance, together with firming in foreign interest rates, brought the dollar under renewed downward pressure. Market interest rates in the United States moved up in sympathy with foreign interest rates and also (it appeared) in anticipation of tightening by the Federal Reserve. On 4 September, the Board of Governors raised the discount rate from 5.5 to 6 percent. Pressures on bank reserves were also increased at this time, and the Federal funds rate was pushed up about fifty basis points to slightly over 7 percent. At the FOMC meeting on 22 September, this increase in the funds rate was affirmed with a directive calling for maintenance of "the degree of pressure on reserve positions sought in recent weeks" and with an increase in the tolerance range for the Federal funds rate from 4–8 percent to 5–9 percent. These actions were taken with M2 substantially below the lower limit of its target range and with M3 slightly below the lower limit of its range. Available information indicated continued, moderately strong business expansion. There was no direct evidence of any significant acceleration of inflation, but recent declines in unemployment and increases in rates of capacity utilization raised worries that inflation might accelerate.

Short-term interest rates in Japan and West Germany moved further upward in late September and the first half of October. The Federal funds rate moved up to 7.26 percent for the week ending on Wednesday, 23 September, then up to 7.56 percent for the week ending on 30 September, then down to 7.43 percent for the week ending on 7 October, then up to 7.59 percent for the week ending on 14 October, and finally up to 7.76 percent on Thursday and Friday of that week. These increases in the Federal funds rate were not mandated by the FOMC directive of 22 September. The explanation given in the official record of the FOMC meeting of 3 November 1987 states that computer prob-

lems at a Reserve bank contributed to an exceptional increase in member bank borrowing (and hence in the funds rate) during the period from 22 September to 2 October. With respect to the behavior of the Federal funds for 5–16 October, the official record states, "Federal funds and other interest rates subsequently rose through mid-October as market participants appeared to anticipate monetary tightening in an environment of firmer policy abroad, concerns about the dollar, and pessimism about the prospects for domestic inflation."

Thus, the Federal Reserve claims to have done nothing explicit to tighten monetary policy further during the two weeks immediately before 19 October. Indisputably, however, the Federal Reserve allowed market participants "to anticipate monetary tightening" when it could surely have disabused them of such anticipations. Moreover, the actions of the Federal Reserve earlier in 1987 clearly made such anticipations of monetary tightening entirely rational.

The first paragraph of the lead story of the *Wall Street Journal* on Tuesday, 20 October 1987, succinctly and accurately describes the event of the preceding day: "The stock market crashed yesterday." Three months later, while serving as a member of the Council of Economic Advisers, I received a note from an able, intelligent, and normally sensible member of the White House staff suggesting that the word *crash,* which appeared many times in the description of the main macroeconomic events of 1987, be deleted entirely from the 1988 *Economic Report of the President.* Thus, while the Federal Reserve wished to deny (perhaps accurately) that it had done anything explicit to bring on the stock market crash, some in the administration wished to deny that the crash had occurred at all.

The apparent tightening of monetary policy in early October was surely one of several economic fundamentals that contributed to the 400-point slide in the Dow Jones Industrial Average during the two weeks before the crash, including the 108-point drop on Friday, 16 October. The 508-point drop in the Dow on Monday, 19 October, however, is not plausibly explained by economic fundamentals. It reflected pure panic.[13] Moreover, knowing now that the crash had a relatively benign outcome, it might even be argued that monetary tightening in the weeks before the crash helped restore a sense of reality to a stock market that had risen significantly beyond the level justified by economic fundamentals.

2.6.3 Aftermath

In any case, the response of monetary policy to the crash was massive, immediate, and appropriate. A terse public statement, released on the morning of Tuesday, 20 October, stated, "The Federal Reserve, consistent with its respon-

13. An opinion survey of financial market participants concerning the causes of the stock market crash was conducted for the Brady Commission. The results (summarized in the commission report) indicated that "economic fundamentals," including increases in interest rates, were key factors in generating the slide in stock prices during the two weeks before the crash. The crash itself, however, was attributed to panic in the marketplace.

sibilities as the nation's central bank, affirmed today its readiness to serve as a source of liquidity to support the economic and financial system." In the morning and early afternoon of 20 October, the Open Market Desk pumped $17 billion into the banking system—an amount equivalent to more than 25 percent of bank reserves and 7 percent of the monetary base. The Federal Reserve also let commercial banks know that it expected banks to continue to supply credit to other participants in the financial system, including loans to broker-dealers to carry their inventories of securities.

After a further, sickening decline on Tuesday morning, stock prices miraculously turned upward in the afternoon, and the Dow closed the day with a 102-point gain. Violent oscillations in stock prices continued through the week and, indeed, for the remainder of 1987. However, by Friday, 24 October, intense worry and nervousness replaced uncontrolled panic as the dominant mood in financial markets. As things calmed down and the crisis demand for liquidity subsided, the Federal Reserve withdrew most of the high-powered money that it had injected on 20 October. To avoid adding to turbulence in financial markets, it did so in a manner that kept the Federal funds rate very stable at about 6.75 percent—a drop of 1 percentage point from the level just before the crash.

The decline in stock market prices between August and late October reduced the value of marketable assets held by Americans by approximately $1 trillion. Since much of this wealth loss represented a reversal of gains made earlier during 1987 (and not yet fully incorporated in consumer spending), at the Council of Economic Advisers (CEA) we estimated that the direct negative effect of the decline in wealth on consumer demand would most probably be in the range of $25–$30 billion. The CEA projected that the effect on the economy would be about a 1 percent reduction of real GNP below the path that it would otherwise have followed during the next three or four quarters. With exports expected to contribute significantly to demand for U.S. products (the heritage of the decline in the dollar since early 1985), real GNP was officially forecast to rise by 2.4 percent during 1988. If achieved, such growth would be a not entirely unwelcome slowdown from the rapid pace of economic advance during 1987. However, at least at the CEA, two conditions were thought to be critical in order to achieve such a favorable outcome: avoidance of a further sharp drop in stock and bond prices and a monetary policy that was adequately supportive of economic expansion.

The FOMC anticipated that the lowering of pressures on bank reserves and the reduction in the Federal funds rate in the period immediately following the crash would lead to more rapid growth of the monetary aggregates. The operating procedures adopted by the Federal Reserve in the aftermath of the crash, however, placed little emphasis on achieving projected growth rates for monetary aggregates. Instead, they focused on maintaining stable conditions in money markets, which effectively amounted to pegging the Federal funds rate within a narrow range close to 6.75 percent.

In the event, the Federal Reserve's operating procedure delivered very slow

growth of the monetary aggregates during the ten weeks following the crash. M1 actually declined at about a 4 percent annual rate during November and December, while M2 and M3 grew at rates of about 1.5 and 3 percent, respectively. At least at the CEA, there was considerable concern that monetary policy was not doing enough to forestall the possible negative effects of the crash on economic activity. The concern on the other side (as expressed in the "Record" of the FOMC) was that any visible move to ease monetary policy further by lowering the Federal funds rate "would not be desirable currently, especially in the light of the dollar's weakness and the risks to domestic financial markets and the economy that a sharp further decline in the dollar would incur."

The decline in U.S. interest rates relative to interest rates in Japan and West Germany after the crash did contribute to a modest decline of the dollar in late October. Disappointing news about the U.S. trade balance and the U.S. government's apparent laissez-faire attitude toward the dollar contributed to a further 8 percent decline in the dollar by year's end. Clearly, the Federal Reserve's intent was not to resist these declines in the dollar. Rather it was to avoid the risk of instigating an international financial crisis by permitting a reduction in the Federal funds rate that might be interpreted as an explicit attempt to drive down the dollar.

Since the Federal Reserve did not reduce the Federal funds rate further to stimulate modestly stronger monetary growth, we do not know whether there was really any serious danger that such a move would generate an international financial crisis. On the other hand, since a modest increase in inflationary pressures, rather than recession, turned out to be the main macroeconomic development of 1988, it does not appear that more rapid monetary growth was really essential during the weeks following the stock market crash. In retrospect, therefore, the Federal Reserve appears to have acted wisely in not pushing the Federal funds rate further downward in order to achieve more rapid monetary growth at the end of 1987.

Economic data available from late October through mid-December indicated that the economy was continuing to expand at a moderate pace during the period before the crash but provided little information about postcrash developments. Data for the automobile industry, however, did show a sharp downturn in sales and a buildup in inventories. When estimates of fourth-quarter GNP did become available in January 1988, they indicated that real GNP had continued to grow at a moderate pace but that much of this growth was accounted for by inventory accumulation rather than by growth of final sales—a signal of future weakness in business activity. Meanwhile, the growth rates of monetary aggregates picked up considerably in January, while the dollar recovered somewhat in foreign exchange markets. The Federal Reserve reacted to these developments by reducing the pressure on bank reserves and easing the Federal funds rate downward by about twenty-five basis points to just over 6.5 percent. Subsequently, the dollar declined slightly against some foreign currencies, but this appeared to be more in response to poorer-than-expected trade figures rather than to the slight easing in the funds rate.

2.6.4 A Return to Tighter Money

By the FOMC meeting on 29 March, recent data showed that the economy was growing more strongly than previously anticipated. Concern was expressed about prospects for prices and wages, but "aggregate measures of prices and wages had not yet shown any sustained tendency to accelerate." Monetary growth (except for M1) had remained relatively robust since January. In this environment, the FOMC directed "a slight increase in the degree of pressure on reserve positions." It also decided to continue the shift (begun in January) of the operating procedures toward achieving the desired degree of pressure on bank reserves rather than placing special emphasis on maintaining stable conditions in the money markets.

The trend of monetary policy established at the FOMC meeting on 29 March continued through the remainder of 1988 and the first half of 1989. Economic data indicated that the expansion was continuing, although generally at a somewhat slower pace as time passed. On balance, data on prices and wages indicated a gradual, mild increase of inflationary pressures, with the (six-month) annualized rate of increase in the CPI rising to 5.7 percent in June 1989. Growth of the monetary aggregates slowed progressively. Specifically, for the six months ending in June 1988, the annualized rates of growth of M1, M2, and M3 were 7.7, 7.9, and 8.2 percent, respectively. For the six months ending in December, these monetary growth rates were reduced to 2.2, 3.1, and 4.8 percent, respectively. Then, for the six months ending in June 1989, these monetary growth rates fell to −3.5, 1.9, and 3.4 percent, respectively.

Meanwhile, the Federal funds rate was pushed up progressively and substantially from 6.6 percent in March 1988, to 7.5 percent in June, then to 8.75 percent in December, and subsequently to 9.8 percent in March, April, and May 1989, before declining somewhat to 9.5 percent in June 1989. The discount rate was raised half a percentage point to 6.5 percent in August 1988 and by another half a percentage point to 7 percent in February 1989. The increase in the Federal funds rate by about double the increase in the inflation rate, together with the very slow monetary growth during the first half of 1989, indicates a very tight monetary policy. The Federal Reserve was clearly indicating its determination not to "fall behind the curve" in the effort to resist rising inflation—as it had with such disastrous consequences during the 1970s.

The 1988 presidential election occurred in the midst of these actions to tighten monetary policy. The presidential contenders, however, happily avoided any serious discussion of monetary policy. Republicans were relieved that the economy survived the crash without a recession and wished to avoid any criticism of the Federal Reserve that would only stir up needless controversy. The Democrats also saw nothing to gain from criticizing the Federal Reserve and sought to credit it, rather than the administration, with the success in reducing inflation and managing recovery. Thus, the Federal Reserve was left to do its job without the political pressures often associated with a presidential election.

By mid-May 1989, the available data began to show significant slowing in the pace of economic advance, and this was confirmed by information received in subsequent weeks and months. Also, owing primarily to a partial reversal of earlier increases in energy prices, measures of inflation generally showed significant moderation during the summer and autumn of 1989. In this environment, the Federal Reserve shifted to a somewhat less tight monetary policy. For the Federal funds rate, the small decline in June was followed by a fifty-basis-point decline in July and by a further drop to 8.5 percent in November. Growth of M3 remained quite sluggish during the second half of 1989, and M3 slipped slightly below the lower limit of its target range. In contrast, growth of M2 rose to nearly an 8 percent annual rate in the second half, moving M2 from below the lower limit of its target range in May to just below the midpoint of this range by year's end. M1 shifted from significantly negative growth during the first half of 1989 to positive growth at about a 5 percent rate and was essentially unchanged for the year as a whole.

It is noteworthy that, as the Federal Reserve moved to tighten monetary policy in the spring of 1988, the dollar began to rise in foreign exchange markets. The upward movement generally continued until June 1989, and the dollar remained quite strong for some time after monetary policy began to ease during the summer of 1989. Initially, the strengthening of the dollar was regarded as desirable both in terms of reducing inflationary pressures in the United States and in reference to internationally coordinated efforts to enhance exchange rate stability. By late 1988, however, the appreciation of the dollar reached the point where the U.S. Treasury and foreign governments intervened actively, but generally not successfully, to resist further dollar appreciation. The worry (at least at the U.S. Treasury) was that a stronger dollar might seriously impede further reductions in the U.S. trade and current account deficits. The Federal Reserve carried out the foreign exchange interventions directed by the Treasury and, as is traditional, intervened on its own account in support of Treasury operations. However, the Federal Reserve did not alter its monetary policy in order to resist appreciation of the dollar. Monetary policy remained directed toward its primary objectives of fostering price stability and promoting sustainable economic growth.

2.6.5 Looking Forward into the 1990s

The scope of this discussion of monetary policy properly finishes with the end of 1989. However, it is appropriate to mention two developments during 1990 that are relevant for assessing monetary policy in the 1980s. First, inflation accelerated briefly in early 1990 owing primarily (but not exclusively) to an extraordinary 2 percent bulge of consumer prices in January. This raised the six-month annualized rate of change in the CPI to 6 percent for the first half of 1990, providing further evidence that the Federal Reserve was not merely tilting at windmills in its efforts to resist the acceleration of inflation during the late 1980s. Second, economic expansion was very sluggish during the first half of 1990, and recently revised GNP data also show very sluggish growth

during most of 1989. Specifically, for the five quarters starting with the spring of 1989, the most recent (July 1990) estimates of the annualized growth rates of real GNP are the following: 1.6, 1.7, 0.3, 1.7, and 1.2 percent, respectively. Preliminary evidence for the summer quarter of 1990, even before Saddam Hussein's invasion of Kuwait, indicates that, at best, economic expansion is continuing at a very slow pace.

No doubt, factors other than tight monetary policy contributed to this recent sluggishness in real economic growth. Nevertheless, it illustrates that determined efforts by the Federal Reserve to resist increases in inflation have a short-run cost in terms of the real growth of the economy. It also raises the question of whether the Federal Reserve was perhaps a little too forceful in its efforts to resist inflation during 1988–89 and a little tardy in its more recent actions to ease monetary policy. Any hope of providing a reasonably clean answer to that question, however, has probably become another victim of Saddam Hussein's aggression. If the U.S. economy falls into recession during the second half of 1990 or in early 1991, it will be extremely difficult to disentangle the effects of Federal Reserve policy before the 2 August invasion of Kuwait from the direct and indirect effects of the recent substantial rise in world oil prices. Moreover, the Federal Reserve now faces the delicate task of dealing both with negative output and employment effects of the rise in oil prices and with a short-term rise of inflationary pressures that is not the consequence of an excessively easy monetary policy.

2.7 Hail to the Chief

Since the Federal Reserve exercises very considerable independence in its conduct of monetary policy, this essay has focused primarily on the actions of the Federal Reserve. However, the Federal Reserve does not operate in a political vacuum, and its monetary policy must at least take some account of the economic policies of the administration and the Congress. In this regard, the key question for the 1980s is, What did Ronald Reagan do to win the great battle against inflation?

My answer may not be entirely unbiased. As a member of the Council of Economic Advisers for more than two years (from 1986 to 1988), it was part of my job to defend, as best as possible, the economic policies of the Reagan administration. However, I would identify the primary contributions of Ronald Reagan to the effort to reduce inflation as occurring much earlier in his administration.

2.7.1 Sending a Message

When the air traffic controllers went out on an illegal strike against the federal government in the spring of 1981, Ronald Reagan fired them. Beyond the federal workers who were directly affected, this action sent an important message that the climate of labor-management relations had changed. The general

public support for the firing of the air traffic controllers, together with the results of the 1980 election, indicated forcefully that the American people wanted something serious done about the problem of inflation and would support tough measures to accomplish the task. The import of this message was not lost at the Federal Reserve or among those who exercised more direct influence over the setting of prices and wages.

There is no reliable way to estimate the extent to which the changed climate of labor-management relations may have diminished inflationary pressures in the early 1980s. It is noteworthy, however, that studies based on the experience of the 1960s and the 1970s generally suggested that a prolonged period of very high unemployment might be required in order to make substantial progress in reducing rates of nominal wage growth.[14] In the recession of 1981–82, the unemployment rate did rise to a postwar peak, and it remained relatively high through the initial stages of recovery. However, even given these high rates of unemployment, the drop in the rate of wage inflation during the early 1980s was surprisingly rapid.

2.7.2 Cutting Taxes

Along more traditional lines, but for reasons that are not widely appreciated, the Reagan administration's fiscal policy may have aided the effort to reduce inflation, or at least ameliorated the recessionary consequences of the tight monetary policy that was the essential weapon in the battle against inflation. From the perspective of Keynesian open-economy macroeconomics, the classic policy prescription to minimize the unemployment costs of reducing inflation is a tight monetary policy combined with an easy fiscal policy. This prescription is based on the presumption that monetary policy has a comparative advantage in influencing the price level while fiscal policy has a comparative advantage in affecting the level of output and employment. Moreover, in an open economy operating under a floating exchange rate, the combination of a tight monetary policy and an easy fiscal policy tends to appreciate the foreign exchange value of domestic currency, which assists in reducing inflation.[15]

Of course, given its generally anti-Keynesian bias, the administration would

14. A classic analysis of this issue is provided in Tobin (1980). Many other analyses also suggested that a prolonged period of high unemployment would be necessary to make much progress in reducing the core rate of wage inflation.

15. Even if an expansionary fiscal policy was desirable for macroeconomics stabilization purposes during the early 1980s, it does not necessarily follow that the Reagan administration's fiscal policy was entirely appropriate. On the supply side, the effects of the tax cuts may not have been as large as their advocates supposed. On the demand side, perhaps the tax cuts legislated in 1981 (and partially reversed in 1982) were too much of a good thing. Moreover, if the Reagan administration's fiscal policy was helpful from a Keynesian macroeconomic perspective, this should probably be regarded as a fortunate accident. It should not be taken as a lesson that fiscal policy can often be used, in a flexible manner, for macroeconomic stabilization purposes. On the other hand, the practical and political barriers to the flexible use of fiscal policy, and the serious problem of getting the timing right, do not obliterate the favorable effect of an important fiscal policy action that fortuitously occurs at about the right time.

not usually advance such arguments. Instead, it would point to the favorable "supply-side" effects of the Reagan tax cuts both in encouraging increased output and employment and in reducing inflationary pressures. Probably both lines of argument contain some element of truth. In any case, the inflation rate did come down more rapidly than was widely expected, the dollar did appreciate strongly in foreign exchange markets, and the U.S. economy did recover very rapidly from the recession of the early 1980s—generally more rapidly than other industrial countries that pursued different combinations of monetary and fiscal policy.[16]

At the Federal Reserve, the administration's fiscal policy was generally regarded as more of a problem for the conduct of monetary policy than as a benefit. During 1982, it was anticipated that the phasing in of the tax cuts legislated in 1981 would help propel the economy out of recession. However, the dominant view expressed by the Federal Reserve was that the large actual and prospective federal deficits pushed interest rates higher, eroded confidence in the government's anti-inflation program, and impaired the Federal Reserve's policy to curb inflation without excessive costs in terms of output and employment. This complaint about the budget deficit was repeated, almost as a religious incantation, in virtually every public statement by the Federal Reserve. In particular, the "Monetary Policy Report to Congress" of 20 July 1982 (quoted earlier) puts the issue as follows:

> The policy of firm restraint on monetary growth has contributed importantly to recent progress toward reducing inflation. But when inflationary cost trends becomes entrenched, the process of slowing monetary growth can entail economic and financial stresses, especially when so much of the burden of dealing with inflation rests on monetary policy. . . .
>
> The present and prospective pressures on financial markets urgently need to be eased not by relaxing discipline on money growth, but by adopting policies that will ensure a lower and declining federal deficit.

Thus, monetary policy gets the credit for reducing inflation, while entrenched inflationary cost trends and the federal deficit get the blame for the recession and high interest rates. Ironically, as previously noted, on the very day that this "Monetary Policy Report" was issued, the Federal Reserve began precisely the relaxation of monetary policy that it argues against in this statement. During the next five months, interest rates tumbled downward under the

16. The administration's easy fiscal policy may also have interacted with the Federal Reserve's tight monetary policy through their combined impact on the foreign exchange value of the dollar, which, in turn, influenced both inflation and economic activity. Martin Feldstein has long been a leading proponent of this view, arguing that the actual and expected fiscal deficit was a leading cause of dollar appreciation during the early 1980s—a development that helped bring down the inflation rate (see, e.g., Feldstein 1986). Feldstein has also argued that the Federal Reserve's monetary policy determined primarily the course of nominal GNP. In the face of this monetary policy, the administration's expansionary fiscal policy contributed to greater growth of real GNP and to less of an increase in the price level.

impact of a much easier monetary policy, despite continued expansion of the federal deficit.

Of course, the administration's fiscal policy (and the large deficits to which it contributed) did not push interest rates lower. Qualitatively, the effect must have been in the other direction.[17] The problem for the Federal Reserve was that it tended to be blamed for high interest rates, and, with some justification, it wanted to shift part of the blame to the administration and the Congress. However, from the perspective of the overall conduct of macroeconomic policy, in the circumstances of the early 1980s, an expansionary fiscal policy that may have put some upward pressure on interest rates was not necessarily inappropriate. In contrast, late in the 1980s, the key task for macroeconomic policy was to resist a rise of inflation, with an economy functioning relatively near to full capacity and with substantial continuing deficits in the trade and current accounts. In this situation, it might have made sense to rely somewhat less on a tightening of monetary policy to resist rising inflation. Certainly, it would have been desirable to make somewhat greater progress in reducing the federal deficit.[18]

2.7.3 Staying the Course

Probably the most important contribution of President Reagan to the fight against inflation was not something that he did but something that he did not do. During the critical period of 1981–82, he did not pressure the Federal Reserve to back off of its tight monetary policy before a convincing victory had been won over the demon of inflation. Despite its much vaunted "political independence," the Federal Reserve could not persist in a tight monetary policy during a deep recession against the determined opposition of a popular president. Nicholas Biddle and the Second Bank of the United States were taught that lesson by Andrew Jackson, and, for eighty years thereafter, the United States had no central bank. More recently, one can imagine what Lyndon John-

17. There are many papers dealing with the effects of the government budget deficits on interest rates. They do not all reach the same conclusion. For one view, see Blanchard and Summers (1984). For an alternative view, see Barro and Sala-i-Martin (1990). My reading of the evidence is that it is difficult to make a convincing case that movements in the federal deficit (either actual or anticipated) were the dominant cause of movements in nominal or real interest rates—the timing is just not right. The enormous swings in interest rates from the summer of 1979 through early 1981 are not associated with dramatic movements in fiscal policy. The large drop in interest rates after the summer of 1982 does not correspond to news about exceptionally favorable developments for the deficit. The rise in interest rates during 1984 does not correspond to unforeseen adverse developments for the deficit. The decline in interest rates during 1985–86 is not generally associated with favorable news on the deficit. During 1987, the rise in interest rates before the stock market crash was associated with an unexpectedly large decline in the deficit. The rise of interest rates from early 1988 through the spring of 1989 corresponds to no significant development concerning the deficit. In all these episodes, it is far easier to see the influence of monetary policy than of fiscal policy on the behavior of interest rates.

18. As discussed in chap. 2 of *Economic Report of the President, 1987,* many of the arguments for reducing the federal deficit do not depend on whether the deficit has a dominant effect on the behavior of interest rates.

son or Richard Nixon would have done had their personal political popularity dropped substantially and their party faced significant midterm electoral losses because of an excessively tight monetary policy directed by a group of appointed officials at the Federal Reserve.

In this connection, it should be emphasized that, while the Federal Reserve enjoyed some support for its tight policy in the financial community, it was not popular with the home builders and construction workers, with the automakers and autoworkers, with the farmers and farm implement makers, and with the whole array of business and labor that felt the pain of tight money, high interest rates, and recession. Congress generally pays attention to the financial community on financial matters. However, Congress always pays close attention to expressions of pain and complaint from constituents back home. Hence, tight money is rarely popular on Capitol Hill. In 1981–82, many members of Congress and congressional leaders from both parties were highly critical of the Federal Reserve's tight monetary policy. Senator Robert Byrd, leader of the Democratic minority, circulated draft legislation commanding the Federal Reserve to reduce interest rates. Senator Baker, leader of the Republican minority, did not support this legislation but was deeply concerned about the Federal Reserve's tight policy and reportedly expressed those concerns directly and repeatedly to Chairman Volcker.

Senior administration officials, both in the White House and at the Treasury, generally shared the view that the Federal Reserve was keeping monetary policy too tight for too long. A consensus to force the Federal Reserve to relax its policy never developed either among senior officials in the administration or in the Congress. However, there can be little doubt that, had Ronald Reagan pulled on his cowboy boots and led a lynch mob from the south lawn of the White House down to Federal Reserve headquarters on Constitution Avenue, he would have been joined not only by the members of his administration but also by majorities from both parties in both houses of Congress, by the Washington representatives of a vast array of American businesses, and by a fair number of foreign diplomats, particularly from heavily indebted countries.

For whatever reasons, Ronald Reagan did not do that. Instead, he campaigned through the dark and difficult days of the recession of 1981–82 on the slogan "Stay the Course."

2.8 Lessons from Defeat and Victory

In the early 1930s, the Federal Reserve made the Great Mistake. It failed to resist, as actively and effectively as it could, the massive contraction of the money supply between late 1929 and early 1933, thereby contributing to the financial and economic devastation of the Great Depression and to all the horrors it helped engender. In the late 1960s and the 1970s, the Federal Reserve made smaller but still important errors in the other direction. After contributing to the rise of inflation through an inappropriately easy monetary policy in the

late 1960s, in the early 1970s, and again in the late 1970s, the Federal Reserve waited so long to take effective corrective action that the consequence was an unnecessarily deep and prolonged recession.

In particular, during 1977 and 1978, monetary policy helped fuel the resurgence of inflation. The initial efforts to combat rising inflation beginning in November 1978 were too timid. By the summer of 1979, in the face of the second oil price shock, it became clear that the timid initial efforts to combat rising inflation were ineffective and unpersuasive. Then, when the Federal Reserve finally did forcefully confront the inflationary demon in late 1979 and early 1980, it retreated at the first sign of significant casualties, before the battle had been won.

With its credibility badly damaged by its own past errors, the Federal Reserve rejoined the battle in November 1980 and, at the cost of a deep and prolonged recession, fought through to a convincing victory. Subsequently during the 1980s, the Federal Reserve successfully conducted a monetary policy that supported an exceptionally long and relatively vigorous economic expansion, without a substantial rise in the rate of inflation. Three important lessons can be learned, and apparently have been learned, from this experience.

2.8.1 Three Main Lessons

First, once the inflationary process has built substantial momentum and the credibility of the central bank has been impaired, it takes a determined tightening of monetary policy to reduce significantly the rate of inflation and restore confidence in a greater degree of future price stability. In principle, it might be hoped that a gradual, persistent tightening of monetary policy would control and ultimately diminish inflation without precipitating an economic downturn. However, experience indicates that a recession of significant depth and duration is the virtually inevitable consequence of a successful attack on deeply entrenched inflation. Efforts to avoid recession by stabilizing inflation once it has risen to a relatively high rate do not have a happy history. Under such a policy of monetary appeasement, the natural tendency is for the inflation rate to be ratcheted upward in a never-ending spiral toward hyperinflation.

Ultimately, there is no escape from the short-term economic damage of a determined effort to reduce inflation. The only option is postponement, which makes both the problem of inflation and the pain of its cure far worse. The Federal Reserve demonstrated that it learned this important lesson (perhaps too well) when it pursued a very tight policy for twenty-one months from November 1980 to August 1982. Implicitly, it accepted that a deep and prolonged recession was the necessary cost of gaining an important victory over the entrenched inflation that was largely the consequence of its own earlier policies.

Second, as a corollary of the first lesson, it is a serious mistake for monetary policy to allow the inflationary process to build substantial momentum before determined action is taken to curb the rise of inflation. Such action is likely to slow the pace of economic expansion and to raise the risk of recession. How-

ever, it is generally better to take moderate risks in this direction before inflationary pressures rise significantly than to delay action until a serious economic downturn becomes the likely consequence of necessary monetary tightening.

The Federal Reserve demonstrated its command of this lesson when it tightened monetary policy during 1984, during the first nine months of 1987, and again during most of 1988 and 1989. It remains, of course, an open issue whether the Federal Reserve went too far, or not quite far enough, in its recent tightening of monetary policy. Regardless of the outcome, however, it is apparent that the Federal Reserve is not disposed to repeat the same mistakes of the late 1960s and the 1970s.

Third, there is no *unique* quantitative guide to the monetary policy that best serves the generally agreed on and intrinsically related objectives of promoting maximum sustainable economic growth and assuring reasonable price stability. Instead, the central bank needs to examine a variety of indicators of the current and prospective performance of the economy and to assess several measures of the stance of its own monetary policy. This view—that the conduct of monetary policy requires judgment and discretion—has always governed the conduct of the Federal Reserve. Even during the period of relatively serious targeting of growth rates of monetary aggregates from October 1979 until the summer of 1982, the Federal Reserve was always looking at the performance of the economy and developments in financial markets in deciding on its policy.

The lesson of the late 1970s and the 1980s is that, in the turbulent and uncertain conditions likely to accompany a successful attack on entrenched inflation, there is no alternative to discretion in the conduct of monetary policy. There is also no escape from the responsibility to exercise that discretion wisely. On the basis of this experience, however, it remains an open question whether a more "rule-based" approach to the exercise of discretion in the conduct of monetary policy would more successfully avoid the problems of entrenched inflation or prolonged economic downturn.

2.8.2 The Meaning of Discretion

Economists have long disputed the virtues of "rules versus discretion" in the conduct of monetary policy—fundamentally a religious controversy, intrinsically related to the age-old dispute over free will versus predestination.[19] On

19. Following the work of Kydland and Prescott (1977) and of Robert Barro and David Gordon (1983), the recent academic literature has usually formulated the distinction between "rules and discretion" in terms of the ability of the monetary authority to precommit its policy in some specific and enforceable manner. In practice, it is questionable whether this distinction is very meaningful or useful. The economic variables that are really of interest to the public and their elected representatives (real economic growth, employment, and inflation) are not entirely under the control of monetary policy. The Federal Reserve could not realistically commit its policy to deliver specific outcomes for these variables. On the other hand, it is far from clear that the public would want specific commitments for those variables that the Federal Reserve can totally control if the outcome was unfortunate for the variables that really matter.

this issue, a highly relevant observation was made by Winston Churchill in his autobiography, *My Early Years*: "My conclusion upon Free Will and Predestination . . . , let the reader mark it, . . . they are identical."

Similarly, if there is a "rule" for monetary policy, then whoever writes it can revise it and whoever implements it must interpret it. Inevitably, some element of discretion infects every "monetary rule." Equally inevitably, the "discretionary" conduct of monetary policy is not whimsical and haphazard. The effort is always to achieve the desired outcome on the basis of what experience suggests to be the relation between actions taken and results achieved. Without some degree of consistency and regularity, there is no meaningful monetary policy. Thus, there is no sharp, clean distinction between "rules and discretion" but rather a muddy issue of the reliance to place on particular relations and indicators in guiding the actual conduct of monetary policy.

In this regard, the experience of the late 1970s and the 1980s powerfully illustrated the failure of interest rates to provide a continuously reliable guide for the conduct of monetary policy. From 1976 through 1979, the Federal funds rate was pushed up in a series of steps to levels that would have indicated a quite tight monetary policy in the context of the 1960s. However, during much of this period, the inflation rate was moving upward as fast as or faster than the Federal funds rate, and the Federal Reserve was falling behind the curve in its efforts to combat the rise of inflation. The level of the Federal funds rate, by itself, failed to provide a reliable indicator of the stance of monetary policy.

During the period of very tight monetary policy, from November 1980 until July 1982, the level of the Federal funds rate was generally very high both absolutely and in comparison with the rate of inflation. This fact, together with information about the performance of the economy and the slow growth of the narrow monetary aggregate M1A, correctly indicated a very tight monetary policy. However, for much of the period from the summer of 1982 through late 1986, the performance of the economy and the growth of the monetary aggregates indicated a relatively easy monetary policy. During this period, the Federal funds rate also generally remained well above the inflation rate. By the standards of the 1960s or 1970s, the level of the Federal funds rate, adjusted for inflation, would have suggested a very tight monetary policy. Thus, even in combination with the inflation rate, the Federal funds rate failed to provide a unique and completely reliable indicator of the stance of monetary policy.

On the basis of the experience of the late 1970s and the 1980s, similar con-

In the academic literature, there is also the notion that the problem with "discretion" is that the monetary authority cannot avoid the temptation to use it to surprise the public with greater than anticipated inflation in order to drive output and employment above their sustainable equilibrium levels. The practical relevance of this notion is also highly questionable. The Federal Reserve made mistakes in allowing inflation to build up momentum in the late 1960s and the 1970s. It was sometimes too timid in attacking inflation because of concern about the consequences for output and employment. However, there is little factual support for the accusation that the Federal Reserve actively sought to deceive the public by knowingly creating greater than anticipated inflation.

cerns apply to the use of monetary aggregates as the unique indicators of monetary policy. The key to the usefulness of monetary aggregates is a stable, highly predictable relation between the behavior of these aggregates and the behavior of economic variables of more fundamental interest, especially real GNP, the price level, and nominal GNP. As illustrated in figure 2.10, for the twenty years prior to 1980, the velocity of M1—the ratio of nominal GNP to M1—exhibited a relatively stable, 3 percent trend rate of growth. After 1980, this apparently stable relation between M1 (= M1B) and nominal GNP collapsed, with velocity declining sharply in the early 1980s and then remaining essentially flat, on balance, for the remainder of the decade. Clearly, a monetary policy that targeted the growth rate of M1 on the assumption of a 3 percent annual rate of increase in its velocity would have gone seriously, perhaps catastrophically, awry during the 1980s.

For M2, the trend behavior of velocity has remained essentially flat in the 1980s. However, there have been relatively large annual fluctuations in M2 velocity (i.e., fluctuations of 3 or 4 percent) that indicate that strict targeting of the growth rate of this aggregate would, on some occasions, have created serious difficulties.

Moreover, the usefulness of monetary aggregates as indicators of monetary policy is seriously impaired when the growth rates of these aggregates give disparate signals about the stance of monetary policy, as happened at several points during the 1980s. In particular, looking at the critical period of the battle against inflation from late 1980 through mid-1982, the growth rate of M2, illustrated in figure 2.6 above, does not by itself indicate a particularly tight monetary policy. Indeed, the growth rate of M2 during this period was marginally higher than the growth rate of M2 from early 1977 until October 1979, when, judged by the actual behavior of the price level, monetary policy was not firmly anti-inflationary. In comparison, the growth rates of M1 (= new

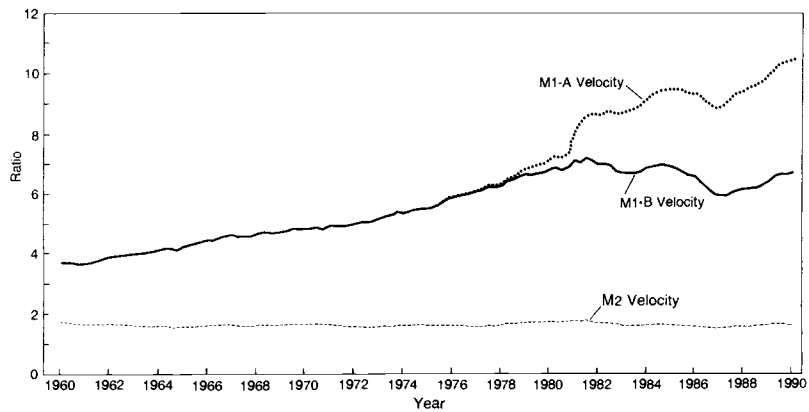

Fig 2.10 Velocity, various monetary aggregates, 1960:1–1990:1
Note: Velocity equals GNP divided by the respective monetary aggregate.

M1B) and especially of M1A (= old M1), both illustrated in figure 2.5 above, indicate a significantly tighter monetary policy from late 1980 to mid-1982 than during the late 1970s. Another example of significant disparity in growth rates of different monetary aggregates occurs in 1985 and 1986. The growth rate of M2 during this two-year period is only marginally higher than during the period of tight monetary policy from late 1980 to mid-1982. In contrast, M1 grows at an exceptionally rapid pace during 1985–86, both in comparison with the period of tight monetary policy during 1981–82 and in comparison with the period of rising inflation during the late 1970s.

Of course, monetarists would argue that much of the disparity in the growth rates, and many of the movements in velocities, of different aggregates during the 1980s can be explained by movements in interest rates and by shifts into and out of newly created classes of deposits. Granted that this is correct, it does not controvert the fundamental lesson that some degree of discretion is required in the conduct of monetary policy. The only way to remove discretion completely would be to specify a precise and invariant definition of the monetary aggregate to be targeted and a rate at which this aggregate should be made to grow, month in and month out, regardless of virtually any condition or circumstance short of thermonuclear war. The experience of the 1980s indicates that there are situations in which this sort of discretionless monetary rule would perform rather poorly.

2.8.3 The Role of Monetary Aggregates

Given the inevitability of some degree of discretion in the conduct of U.S. monetary policy, it remains relevant to ask what emphasis should be given to monetary growth rates in guiding the Federal Reserve's policy. On this issue, the lessons of the 1970s and the 1980s are somewhat ambiguous. As previously discussed, strict targeting of monetary aggregates would have encountered severe difficulties in the turbulent economic and financial environment of the early 1980s. On the other hand, it is clear that the Federal Reserve would have avoided most of the error of contributing to the buildup of inflationary pressures during the late 1970s if it had been more assiduous in achieving its own announced monetary growth targets. Under those circumstances, much of the economic and financial turbulence associated with the determined effort to reduce inflation during the early 1980s might have been avoided, and monetary targeting might have proved more successful throughout the period.

More generally, it may be argued that, in conducting a discretionary monetary policy, the Federal Reserve generally needs to pay considerable attention, in a careful and sophisticated way, to the behavior of monetary aggregates. Some prominent monetarists have suggested that an "adjusted monetary growth rule" would provide an especially valuable guide for monetary policy.[20] The adjustments would take the form of a moving average correction for

20. Allan Meltzer and Bennett McCallum are leading advocates of some form of adjustable monetary rule. Meltzer's views are presented in several papers (see, e.g., Meltzer 1987, 1991). For McCallum's arguments, see McCallum (1988).

changes in the relation between monetary growth and the rate of growth of nominal GNP. The virtue of such a "rule" is that it would help prevent the big errors of monetary policy: avoiding the persistent declines in the money supply that contributed to the Great Depression of the early 1930s and avoiding the excessive monetary growth that contributed to the rise of inflation in the 1960s and 1970s.

At least in my view, the usefulness of such a monetary rule is not as the sole guide to the operational conduct of monetary policy but rather as a medium-term indicator that policy may be deviating from the desired course. The "rule" provides a warning signal against the danger of too much emphasis on interest rates and on shorter-term economic developments and forecasts in governing the conduct of monetary policy.

To illustrate the possible virtue of giving somewhat greater emphasis to monetary growth rates in guiding the medium-term conduct of monetary policy, it is relevant to examine, retrospectively, whether this might have improved economic performance. Because demand for the narrow monetary aggregate M1A (= old M1) is less sensitive to movements in interest rates than the broader aggregates, it is convenient to focus attention on this narrow aggregate. As was recognized at the time, it is necessary to adjust for the downward shift in demand for M1A when interest-bearing transactions accounts (not included in M1A) became widely available to households in 1980 and 1981. With these adjustments, M1 appears to provide useful indications that might have guided improvements in monetary policy.

In the late 1970s, M1A was growing at rates that indicated a relatively easy monetary policy, especially in light of the normal upward trend (for the preceding twenty-five years) in the velocity of this aggregate. Giving a little more weight to the growth of M1A in determining monetary policy in the late 1970s would have suggested a somewhat earlier and more vigorous attack on inflation. The slowdown in the growth of M1A in the autumn of 1979 and the winter of 1980 provided an appropriate indication of the necessary tightening of monetary policy to combat the surge of inflation at that time. The sharp upturn of growth of M1A during that summer and early autumn of 1980 provided an accurate indication of the Federal Reserve's unfortunate retreat from the battle against the demon of inflation. Making appropriate allowance for the shift of households out of traditional demand deposits, the very tight monetary policy from November 1980 to July–August 1982 is also clearly indicated by the behavior of M1A. Had the Federal Reserve taken this indicator more seriously, it would not perhaps have pursued quite such a tight policy for quite so long, and the recession of 1981–82 might not have been quite as deep and quite as long.

The sharp increase in the growth rate of M1A in late summer and autumn 1982 dramatically illustrated the shift to a much easier monetary policy. The gradually declining, but still moderately high, rate of growth of M1A until the spring of 1984 points to the continuation of a relatively easy monetary policy,

while the sharp downturn in M1A growth later in the year indicates the brief period of monetary tightening. In retrospect, it seems that a modestly less easy monetary policy during late 1982 and 1983, which would have contributed somewhat less to the extraordinarily rapid pace of economic expansion from late 1982 to mid-1984, might have been appropriate. It might also have obviated the need for monetary tightening during 1984 that hit the economy at about the same time as the natural forces of economic recovery were abating.

During 1985 and especially 1986, the rapid growth of M1A indicated a substantial easing of monetary policy. Then, the sharp decline in the growth of M1A indicated an abrupt tightening of monetary policy during the first half of 1987, and the negative growth of M1A indicated further tightening just before the stock market crash. After a brief period of easing during the first few months of 1988, the growth rate of M1A indicated a very significant tightening of monetary policy from April 1988 through July 1989, followed by a modest degree of easing in the last quarter of 1989. Looking back at the very rapid real growth of the economy during 1987 (which is apparent especially in the revised data), it is relevant to ask whether a somewhat less expansionary monetary policy during 1986 might not have contributed to a more moderate pace of economic growth during 1987, thereby alleviating some of the need for monetary tightening in 1987 and conceivably in 1988–89. Again, taking more seriously the behavior of M1A as a guide for monetary policy might have contributed to a somewhat smoother, more sustainable course of economic expansion.

To avoid misunderstanding, it should be reemphasized that the issue is not whether the Federal Reserve should have set a specific target for the growth of M1A as the operational guide for monetary policy in the 1980s. Rather, the question is whether, at the margin, monetary policy might have been improved if somewhat more attention had been paid to the signals provided by the growth rate of M1A, within the context of the array of factors that guided Federal Reserve policy. Indeed, as previously discussed, rigid targeting of growth rates of monetary aggregates can lead to serious difficulties in the turbulent economic and financial environment of a determined assault on entrenched inflation. In these situations, the Federal Reserve faced tough decisions about how long to pursue a tight monetary policy in order to curb inflation, without highly reliable indicators of the actual tightness of its policy or of the likely future course of the economy. Careful judgment, rather than a mechanistic rule, was required to determine the most appropriate policy. Of course, with an appropriate monetary policy, difficult decisions about harsh actions to combat rising inflation should be an infrequent necessity. However, there is no guarantee, and no automatic rule, that assures that such decisions can always be avoided or that they will always be made wisely.

As the experience of the 1980s makes clear, real people and their elected representatives care a good deal about the growth of the economy, about the level of employment, about the rate of inflation, and about the level of interest

rates. Intrinsically, they care little about growth rates of monetary aggregates. The only occasion on which the monetary growth rates became a subject of significant public interest was during the early 1980s, when the Federal Reserve was believed to be paying significant attention to these growth rates in determining its policy with respect to interest rates. Once the Federal Reserve effectively abandoned operating procedures that attempted to achieve targeted growth rates for monetary aggregates, general public interest in monetary growth rates waned rapidly. The implication is that, so long as monetary policy contributes to acceptable behavior of the economic variables that really matter to real people, the Federal Reserve is unlikely to be held publicly accountable for deviations of monetary growth rates from specified targets. Rather, such technical issues regarding the conduct of monetary policy—important as they may be—will remain primarily the domain of specialists who analyze and assess the Federal Reserve's performance.

Ultimately, it is the performance of monetary policy with respect to its influence on growth, employment, inflation, and other economic variables of real importance for which the Federal Reserve can and should be held responsible. The task of assessing the Federal Reserve's performance, however, is not simple—primarily because the Federal Reserve's job is not simple. Monetary policy is far from the only important influence on economic activity or even on inflation. The Federal Reserve must conduct its policy without precise information about the ongoing behavior of the economy or, especially, about its likely future behavior. On some occasions through no fault of its own, and on some occasions because of past errors of its own policy, the Federal Reserve will confront choices with no happy outcomes. Moreover, even when monetary policy is tuned appropriately, a tension always exists between good arguments that the policy should be a little tighter and good arguments that it should be a little easier. Almost inevitably, the Federal Reserve will get somewhat more than its fair share of praise when the economy performs well and somewhat more than its fair share of blame when the economy performs badly. Fortunately for us all, for most of the decade of the 1980s, the Federal Reserve has been more deserving of thankful applause than of harsh criticism.

References

Barro, Robert, and Robert Gordon. 1983. Rules, discretion, and reputation in a model of monetary policy. *Journal of Monetary Economics* 12, no. 1 (July): 101–21.

Barro, Robert, and Xavier Sala-i-Martin. 1990. World real interest rates. *NBER Macroeconomics Annual,* 15–61.

Blanchard, Olivier, and Lawrence Summers. 1984. Perpsectives on high world real interest rates. *Brookings Papers on Economic Activity,* no. 2:273–324.

Feldstein, Martin. 1986. The budget deficit and the dollar. *NBER Macroeconomics Annual,* 355–92.

Greider, William. 1987. *Secrets of the temple.* New York: Simon & Schuster.

Karamousis, Nicholas, and Ramond Lombra. 1989. Federal Reserve policy making: An overview and analysis of the policy process. *Carnegie-Rochester Conference Series on Public Policy* 30 (Spring): 7–62.

Kydland, Finn, and Edward Prescott. 1977. Rules rather than discretion: The inconsistency of optimal plans. *Journal of Political Economy* 85, no. 3 (June): 473–91.

McCallum, Bennett. 1988. Robustness properties of a rule for monetary policy. *Carnegie-Rochester Conference Series on Public Policy* 29 (Autumn): 179–203.

Meltzer, Allan. 1987. Limits of short-run stabilization policy. *Economic Inquiry* 25 (January): 1–14.

———. 1991. The Fed at seventy-five. In *Monetary policy on the 75th anniversary of the Federal Reserve System*, ed. M. Belongia, 3–65. Boston: Kluwer.

Tobin, James. 1980. Stabilization policy: Ten years after. *Brookings Papers on Economic Activity*, no. 1: 19–71.

2. *Paul A. Volcker*

Martin Feldstein asked me to comment on some of the significant events in monetary policy during my tenure as chairman of the Federal Reserve. I think that there are five periods that deserve particular comment: the Federal Reserve's adoption of a more monetarist approach to policy-making in 1979; the credit controls and recession of 1980; the relaxation of monetary policy beginning in late 1982; the Plaza Accord in September 1985; and the Louvre meeting in February 1987.

Let me begin in late 1979, when I went to Washington. Michael Mussa's background paper accurately describes the setting for monetary policy at that time. Inflationary expectations seemed to be rising, as there was little confidence in the financial markets that the Federal Reserve would effectively restrain an increase in inflation. One part of the problem, I believe, was that banks had lost any fear that they might ever be unable to raise funds for lending. The interest rate limit for large certificates of deposit had been removed in June 1979, and the banks thought that there was no constraint on their ability to obtain credit. Although the cost of funds to banks was high, the inflationary environment meant that the banks did not let this high cost deter them from continued lending.

Ironically, despite these inflationary expectations, there was also an expectation that a recession was starting. For several months before the summer of 1979, the Federal Reserve staff had been projecting that a recession would begin shortly.

Then the Federal Reserve raised the discount rate twice between July and September 1979. Unfortunately, although these discount rate increases raised short-term interest rates somewhat, they had virtually no effect on the psychological environment. In fact, and much to my surprise, the second increase was actually counterproductive. That increase was adopted by a four-to-three vote, and of course the votes are announced. The market interpreted the close vote

as implying that the Federal Reserve was obviously not going to undertake any further tightening measures. Ordinarily, I might have been sensitive to that interpretation because one does like to have more of a consensus on shifts in policy. In this case, however, I was not concerned because I knew that I had three other votes if I wanted to tighten again. So it had not occurred to me in advance that the closeness of the vote would be a problem.

This event was one of the things that persuaded me that the Federal Reserve needed to pursue a strategy that would "shake up" the inflationary psychology and introduce some constructive uncertainty in financial markets. The strategy that we pursued—moving to a more monetarist approach to policy-making—had been the subject of endless analysis and debate at the Federal Reserve, and I had begun thinking about it earlier when I was still in New York. As I discussed the desirability of such a strategy as a means of dealing with expectations, there was enthusiastic support among both the Board members and the district bank presidents. I think that it is fair to say that the Carter administration was not enthusiastic. Members of the administration argued that the Federal Reserve should not launch this uncertain new approach, with unknown consequences, but should instead, if really necessary, tighten policy more severely in a more orthodox way.

Nevertheless, the change in policy was announced in early October 1979. I thought that there were two great advantages of the monetarist approach, which I had emphasized in some earlier speeches. First, it was a good way of disciplining ourselves. When we had announced that we were going to meet certain money supply targets, and not by manipulating interest rates but by working directly through the reserve base, we were committing a lot of prestige to that commitment, and it would have been very hard to rationalize a retreat. Second, it seemed to be a good device, given the spirit of the times, to convey what we were doing to the public. We said, in effect, that the United States was experiencing high inflation that needed to be dealt with and that inflation is a monetary phenomenon. Thus, we were not going to try to reduce inflation by manipulating interest rates but were instead going to go directly to the money supply. That seemed like a good way to explain what we were doing in a way that people could understand and support.

I did not expect at the time that interest rates would move as much as they did. Although we were working directly through reserves, we had established a wide band for the Federal funds rate and had agreed to reconsider our actions whenever the rate reached either end of this band. I thought that we should take this band seriously, but most members of the Open Market Committee were less conservative than I was on this point, and in the end the restriction was not very meaningful. Whenever the Federal funds rate reached the end of the band, there was a telephone meeting to ask whether the current policy should be continued, and the answer was always yes. As time passed, even less attention was paid to this band. So interest rates rose further and more rapidly than I had expected, and it was a disappointment that there were no favorable

expectational effects on long-term interest rates. While the money supply itself behaved reasonably in line with our targets over the rest of 1979, it experienced a great deal of volatility. Also, there was little visible effect at that stage on either economic activity or inflation, the earlier projections of recession notwithstanding.

The next significant period for monetary policy was early in 1980. Inflation had been running at a double-digit rate for several months, creating a true sense of inflationary crisis. President Carter then proposed a budget with a deficit that by today's standards was small but was considered outrageously inadequate to the anti-inflationary challenge at the time. The budget was, in a sense, withdrawn. The Federal Reserve took some tightening measures but delayed others because we wanted to have a coordinated program with the new budget.

At this time, the president decided that consumer credit controls should be imposed. He realized that some restraint on spending was necessary, and he wanted the restraint to come not just from higher interest rates but also from direct control over consumer credit. He became convinced that such a step would send the message to the public that he was serious about reducing inflation.

We at the Federal Reserve resisted the imposition of consumer credit controls, partly because of the usual problems associated with rationing and partly because consumer credit was not rising very fast and did not seem to be the source of the inflationary pressures. There was a law on the books, however, that said that the president could, in effect, give the Federal Reserve the authority to impose consumer credit controls. I thought that it would be awkward, to say the least, for the president to give us the authority to impose controls and then for us to say that we were not going to impose them anyway. In the end, I felt that we could not talk the president out of the credit controls, and we had to recognize that he was taking politically difficult steps to cut government spending and was willing to accept and even support further monetary tightening without complaint.

So we agreed to impose controls on consumer credit, although we made those controls as mild as we possibly could. We exempted anything to do with housing and automobiles, which are by far the most important elements of consumer credit. In effect, we put a tax on credit cards, a psychological gesture that we thought would not amount to much. We were completely wrong, however, as the idea of cutting back on consumer credit apparently touched a guilty nerve in the American public. The country went immediately into recession, with the economy declining at a faster rate than we first realized.

Businesses selling consumer goods that were usually sold on credit faced huge sales declines even when their products were not actually covered by the credit controls. I recall some recreational vehicle dealers who had a two-thirds decline in sales from one week to the next. The result was that the economy dropped precipitously, and I realized in retrospect that I had never seen anything like it.

We soon discovered that the money supply was dropping precipitously at the same time. We were providing reserves at a rate that normally would have sustained a 3 or 4 percent annual increase in the money supply, but in fact the money supply actually declined for a month or two at a high annual rate. Only later could we hypothesize not only that consumers were refusing to take on additional credit, but also that they were repaying their outstanding credit card balances because they felt that it was the patriotic thing to do. The repayment was accomplished by a reduction in bank account balances, which created a totally artificial decline in the money supply.

This decline in the money supply provoked a chorus of comments from economists—monetarists and Keynesians alike—to the effect that the Federal Reserve needed to provide additional reserves to the banking system. At the same time, of course, there was a very steep decline in economic activity for one quarter. So we took off the credit controls as soon as we could because I thought that they were inappropriate when the economy was in a recession.

I think that there was no sense during the summer of 1980 that the economy was recovering. I remember meeting at that time with a group of leading bankers who were in Washington for some other purpose. I was starting to think that the sinking spell in the economy was ending, although I had no sense of a strong recovery. I asked the bankers whether they thought that they might look back in October or November and say that by the end of September the economy was reviving. Not one of those bankers said that they thought that that was at all possible. In fact, while we were having the meeting, the economy had already been expanding for a month or two, and quite a lot of momentum soon developed.

The money supply also began to increase during the summer, although from a very low level. Initially, we did not move to restrain the rebound in the money supply because the level remained well below our targets. We did take some action beginning in August, but many people argue in retrospect that we did not act aggressively enough to restrain the growth of money in the latter part of 1980. The fact is that, for some months, neither we nor our subsequent critics realized that the economy was rebounding as fast as it was. All the staff projections of the money supply were for modest increases; in fact, we ended up with very large increases. This put us in the awkward position of having to tighten money in the face of a presidential election campaign. Jimmy Carter was complaining (although in a very limited way, to his credit) about "monetarism" and rising interest rates, while Ronald Reagan was complaining about the wild expansion of the money supply. We did increase the discount rate around the end of September, which is historically the closest to an election that the discount rate has ever been increased.

In retrospect, however, monetary policy seems too expansionary during this short period. The money supply rose rapidly until October or November, when we tightened more aggressively and were able to get it under control. It was in a way a mostly wasted year restoring credibility in the attack on inflation. The

main reason, it seems to me, was the complications introduced by the credit controls. This is a useful lesson. The unexpected psychological repercussions of that inherently mild action—the way the American public responded at that time to that gesture—were completely out of proportion to what we expected. We would not have had such a steep drop in the money supply or in the economy except for the controls.

The next interesting event was the easing of monetary policy in 1982. The recession had begun in mid-1981, but we did not adopt a strongly expansionary monetary policy until the summer of 1982. There were several reasons for our cautious stance in the first half of that year. First, there was a big jump in the money supply around the beginning of 1982 that carried it above our targets. Under the new approach and operating techniques, that development was not conducive to any aggressive moves to ease money. Second, although the economy was in a recession, inflation had not fallen very much by early 1982. Third, there were substantial expectations, generally shared within the Fed, that the economy would begin to expand in the second quarter of the year. I believe that the initial estimates of the second quarter did in fact show a small expansion, although that was later revised away. In studying the history of monetary policy, one must remember the difference between the revised figures available now and the unrevised figures available at the time. In the spring of 1982, we were operating in an environment in which we thought that the economy was probably beginning to recover, and the money supply remained somewhat above our targets.

However, this confidence in an imminent expansion became more and more questionable as the spring proceeded. The financial markets were under increasing pressure as well; this was an important background factor, although not the driving force, behind our eventual decision to ease. Sometime in July, as I recall, after the money supply had been stable for a long period, it finally fell back into our target ranges after its big jump at the beginning of the year. At this point, we decided that we could ease credibly, and we made some limited easing movements, the effects of which on interest rates were greatly amplified by market expectations, producing a solid decline. The stock market surged.

By the fall of 1982, the money supply began rising rapidly again. The money supply figures were clearly being distorted by the new money market accounts and other institutional changes, so this provided the occasion for an announcement that we were not going to follow M1 as religiously as we had been doing. In particular, we were not going to institute contractionary policy simply because the money supply figures were rising, and, in fact, we made another important easing move in the fall. By the end of the year, a strong recovery was under way.

Now let me turn to the Plaza Accord of 1985. This is an important event to discuss because the implications of the accord for monetary policy were the opposite of what is commonly thought to be the case.

The dollar had reached a peak in early 1985, and there was continuing debate both in the United States and overseas about exchange market intervention. Treasury Secretary James Baker and Deputy Secretary Richard Darman were more inclined to intervene than previous Treasury officials had been, and the meeting at the Plaza was largely at their initiative. I well understood the arguments for reducing the value of the dollar and had pleaded many times earlier for agreement on coordinated intervention. But I also held a good, traditional central banking view that countries deliberately depreciating their currencies often run afoul of inflation. I feared that the dollar decline might get out of hand, and I was simply not enthusiastic about an official doctrine that it is good to depreciate one's currency. So I wanted the decline in the dollar to be pursued without undue aggressiveness, and we had great arguments about how to do that. In the end, I think that my views about how to implement the intervention were largely accepted.

But the central question for today is, What were the implications of the accord for monetary policy? I read a lot of analysis that says that the Federal Reserve would have preferred to tighten policy for domestic purposes but was forced into a looser policy in order to help bring down the dollar. That is not true. By 1985, I was quite concerned that the U.S. economy was slowing down, and the Japanese and European economies were very sluggish as well. There was no doubt in my mind that it was not the right time to tighten policy. In fact, it was the absence of any need or desire to tighten that provided a "green light" for the Plaza Agreement. Indeed, there was substantial argument with the Fed in favor of loosened monetary policy for domestic purposes, but one reason that I opposed that action was because I did not want the dollar to fall in value too suddenly or confidence in our anti-inflationary resolve to be undercut. Thus, concern about the value of the dollar caused monetary policy to be shaded more on the tighter side during late 1985 than on the easier side, although that shading was evident in a refusal to ease rather than an actual tightening. I emphasize this point because it is just the opposite of what most commentators were saying at the time and have been saying more recently as well.

Finally, let me discuss the Louvre Accord of early 1987. During the summer of 1986, James Baker and I engaged in an ongoing public dialogue about the appropriate value of the dollar. He would say that he wanted the dollar to fall in value. My sense was that it had fallen enough, and I was afraid that it would be too weak, so I would testify the following day that I thought that its current value was just fine. We finally decided that he could say what he wanted and I could say what I wanted, and this was not particularly acrimonious because it had a favorable side effect—while the dollar continued to decline some, the contrasting approaches injected some uncertainty into the market, which prevented matters from getting out of hand. As the dollar remained weak, however, Treasury Department officials became more concerned about it. They arranged for the Louvre meeting, which was designed to reach an international consensus to stabilize exchange rates.

At neither the Louvre meeting nor the Plaza meeting was there any explicit discussion of monetary policy. This may be surprising from the standpoint of economic analysis, but it is not surprisingly bureaucratically or as a matter of international diplomacy. The central bankers had no desire to discuss monetary policy in that essentially political setting at the risk of tying their hands in the future. And the finance ministers felt that they could not press the point. The Germans in particular were very punctilious, with the people from the Finance Ministry believing that it was the Bundesbank's job to discuss monetary policy. The central bankers, quite naturally, preferred to discuss monetary policy issues "outside the room" and in other forums, but often they were not very explicit even then. In fact, big changes in monetary policy were not an issue at the Louvre. There was a lot of communication on a continuing basis afterward, but it was more in regard to intervention and exchange rates than to monetary policy per se. I think that everyone understood that the Plaza and Louvre agreements obviously had consequences for monetary policy, but that was all.

At both the Plaza meeting and the Louvre meeting, there were very explicit, painstakingly detailed discussions about who would intervene, in what amounts, and under what circumstances. Most of this discussion irritated me because I thought that it was very artificial—one cannot anticipate all the possible contingencies and determine who should do what in response. Nevertheless, there was a lot of discussion of that sort.

3. *James Tobin*

Speaking about Paul Volcker right after Paul Volcker, I am not in an enviable position. Imagine an academic critic following Douglas MacArthur in a retrospective discussion of the general's campaigns.

I shall discuss only briefly the three years from October 1979, the period of serious quantitative medium-run targets for monetary aggregates and of short-run operating targets for quantities of reserves. History will confirm the praise that Paul Volcker earned from his contemporaries for his resolute generalship of the war against the inflation of the late 1970s. The recessions did not reduce inflation to zero, but they did lower it to a comfortable rate, 4–5 percent, which proved to be stable during the subsequent cyclical expansion.

In 1979–80, many economists contended that the way monetary policymakers could bring about a relatively rapid and painless disinflation would be to announce strict monetarist targets and operating procedures and to commit themselves to stick with them regardless of what happened to business activity and employment. Thus, business managers and workers would be put on notice that their livelihoods and jobs depend on their own price and wage decisions—they must disinflate. This popular academic view may have influenced the cli-

mate of opinion in the Federal Reserve System and the financial markets. I gather that it was not as important in Volcker's own thinking as the need to obtain and display consensus in the system for a policy move appropriate to prevailing economic conditions.

If a "credible threat" was intended in the October 1979 revolution, it was attenuated by the policy roller coaster in 1980, severely criticized by Mike Mussa in his background paper and unapologetically reviewed by Paul in his remarks. Why Carter's credit controls were so powerful a restraint on aggregate demand and on money supplies remains a mystery. Evidently, their effects both on imposition and on removal greatly confused the Fed. Anyway, beginning in September 1980, a determined monetarist policy was followed for nearly two years. Did the policy make the disinflation faster and less painful than it would have been otherwise? The economic literature renders a mixed verdict. Certainly, it took substantial pain and suffering, not just threat, to get wage and price inflation rates down.

Was there any way to limit the cost? Some economists, myself included, had suggested combining the announcement of a firm disinflationary monetary policy with some variant of incomes policy, at least guideposts. There had been a stab at incomes policy in the Carter administration in 1979, but it was abandoned just at the crucial time. Rumor was that this decision was related to the contest for the Democratic presidential nomination, specifically to the position of organized labor. No incomes policy was conceivable in the new administration, although President Reagan's tough stand against the air traffic controllers in 1981 taught an exemplary lesson. One could say that the Fed itself was carrying out an incomes policy, albeit one that worked via actual pain and cost rather than by conjectural fears.

I hope that history will give Paul and his colleagues the praise that they deserve not only for fighting the war against inflation but also for knowing when to stop, when to declare victory. They reversed course in the summer of 1982, probably averting an accelerating contraction of economic activity in the United States and financial disasters worldwide. Many observers, knowing that the Fed takes seriously its responsibilities for financial stability, have assumed that the Mexican debt crisis and other financial threats were the main considerations in the Fed's decisions in 1982. According to Volcker, however, domestic nonfinancial business conditions were the main concern of the Federal Open Market Committee (FOMC).

I know that there are some hawks who thought then and think now that the anti-inflation crusade should have been pursued to the bitter end and that there are some who would resume now the push to zero inflation. I think that it was an act of genius, worth trillions of dollars of GNP—yes, real GNP—to have led the country to regard 5 percent inflation as zero, and I think that it is mischievous to rock the boat now.

The monetary management of the expansion of the last eight years—perhaps this record expansion has ended or is about to end—is my main topic.

For the management of aggregate demand, monetary policy has been the only game in town since 1981. The Reagan administration disabled fiscal policy as a tool of macroeconomic stabilization and dedicated it wholly to other goals, as discussed in other sessions of this conference. Structural budget deficits far beyond previous peacetime experience clouded the environment to which the Fed had to adapt. No doubt the economic and political implications of the federal budget complicated the Fed's decision problems. There were other new complexities and uncertainties: dramatically increasing international capital mobility; Latin American and other Third World debts; structural and regulatory changes in American banking and finance; insolvencies, threatened and actual, among American financial institutions.

Despite these handicaps, the Fed has been quite successful. Volcker and company, and then Greenspan and company, restored the reputation of fine-tuning and made it into a fine art. The proof is in the pudding. The economy grew steadily, if sometimes slowly, and eventually recovered the ground lost in the recessions. In 1988–89, unemployment was lowered well below what economists considered the lowest inflation-safe rates ten years earlier. Finally, after managing a "soft landing" at this new and lower nonaccelerating-inflation rate of unemployment (NAIRU), for the last two years the Fed has managed to steer the economy between the Scylla of price acceleration and the Charybdis of recession. I don't know how long that will be true, but it is true so far.

Demand management cannot take major credit for the improvement in the NAIRU, except that the previous deep recession may have helped discipline subsequent wage- and price-setting practices. Sharper foreign competition helped, a thin silver lining to the dark cloud of dollar appreciation. The decline in oil prices prior to August 1990 was a welcome contrast to the 1970s. Whatever cleared the path for expansion, the Fed does get credit for following the path into new territory, cautiously keeping the recovery going as long as inflation remained well behaved.

For the improved price performance of the 1980s, Mussa gives important weight to the new macroeconomic policy mix, loose fiscal policy and tight money. He echoes previous rationales for this combination. The argument is that the 1982–86 currency appreciation lowered the inflation rate associated with a given outcome in real output and employment. I am still skeptical. For the United States, the impact of appreciation on overall price indexes is small. Besides, it is temporary, essentially a loan from other countries that must be paid back. Later, the currency has to be depreciated, and the borrowed price reduction has to be reversed. Even in the short run, the gain from an appreciation is one shot; it lowers not the rate of inflation but the level of price indexes. The policy mix in question has serious costs in long-run growth and foreign indebtedness, costs that dwarf any small short-run macroeconomic advantages.

I have no inside information about how the Fed has done its fine-tuning. The interpretation that follows is simply inference from an outsider's observations.

The new Fed monetary regime, beginning in the fall of 1982, changed both medium-run targets of policy and operating procedures. Although target ranges for intermediate monetary aggregates are still voted on and announced, as required by law, they have lost importance, as the markets know very well (see Mussa's figs. 2.8 and 2.9).

The Federal Reserve recognized that intermediate monetary aggregates had lost whatever meaning they had because of regulatory and technological changes in the financial industries. Downgrading the monetary targets finessed at least one source of error in monetary policy, unexpected (or even systematic) changes in velocity. Mussa's figure 2.10 shows what happened to M1 and M2 velocities. Liberated from the Ms, the Fed is enabled to respond to shocks that change velocity but not the aggregates and is excused from responding to M changes that simply reflect velocity shocks. Tactically, in 1982, the changing and uncertain meanings of the Ms gave the Fed some cover for making changes in policy substance and operating procedure that Paul and his colleagues wanted to make anyway.

The Fed has aimed directly at observed and projected macroeconomic performance, as measured not by monetary aggregates but by variables that matter: real GNP growth; unemployment, excess capacity, and other indicators of slack; wage and price inflation. The weights on different measures of performance are not explicit; indeed, they doubtless differ among members of the Open Market Committee. The bottom line is likely to be some agreed on or compromise range for real GNP growth, higher or lower depending on the weights the committee is putting on the other variables.

Short-run operating instruments are no longer reserve quantities but, as in pre-1979 days, Federal funds rates. The differential between the funds rate and the discount rate reflects the pressure on the banks' reserve positions. Like most controllers, the Fed is a feedback mechanism, changing its instrument settings in response to discrepancies significant in size and duration between actual readings and projections of its target variables, on the one hand, and desired target paths, on the other.

Not surprisingly, Federal funds rates, and other interest rates as well, have been less volatile since 1982 than in the preceding monetarist regime. Paul admits that he was astounded by their volatility in 1980–82. Most of their recent volatility has been deliberate policy. When the Fed saw aggregate demand growing too slowly, the FOMC lowered the funds rate substantially (down 564 basis points in six months from July 1982). When demand was perceived to be growing too fast, the FOMC raised the rate (up 205 basis points in six months from February 1984). Likewise, the funds rate was lowered 163 points in the seven months from February 1986 and raised 210 points in the eight months from July 1988. Other interest rates moved in the same directions, longer rates of course by fewer points (see Mussa's fig. 2.4).

In retrospect, the tightening in 1984 looks excessive to me and too long maintained. The recovery was little more than a year old, and there was plenty

of slack left in the economy. At the time of the February 1984 "Monetary Policy Report," the Board believed that real GNP had grown 6 percent from 1982:4, then thought to have been the recession bottom, to 1983:4 and that growth had slowed to 4.5 percent in 1983:4. The Fed reported that 1983 growth was in considerable measure due to rebuilding of inventories. The unemployment rate was said to be down 2.5 points, but it was still about 8 percent. Wage and price inflation was still abating. Yet the Fed was aiming for only 4.5 percent growth in 1984, fourth quarter to fourth quarter—they got it, now revised to 5 percent. (This is the only time that I found so explicit a target in a "Monetary Policy Report to Congress." Generally, the growth target is unstated or is implicit in the FOMC members' projections. In his remarks, Paul warned us against reading any policy intentions into those projections.)

In most postwar recoveries, growth was 6 percent or better in the first year. I have never found convincing the "speed limit" theory, which argues that high growth rates are dangerously inflationary even in very slack economies. Demand management, I think, should aim for high growth at the beginnings of recovery and gradually reduce stimulus as the margin of economic slack declines. The Fed's foot was a bit heavy on the brake.

I mention this episode because it did unintended and unexpected long-lasting damage. The return of double-digit short interest rates in mid-1984, raising long-term bond rates above 13 percent again, ratcheted the dollar up another big notch (20 percent nominal, 19 percent real, in the multilateral trade-weighted index). I realize that, as Paul Krugman convincingly argued, there must have been significant speculative content in the appreciation of the dollar. But U.S. interest rates had a lot to do with it. The merchandise trade deficit grew from $21.7 billion in 1983:4 to $29.3 four quarters later, the current account deficit from $18.3 to $30.0. Reversal of the deterioration proved to be a slow and difficult process, even after the dollar's exchange value fell.

By 1980, economists inside and outside the Federal Reserve and the Treasury understood the qualitative role of exchange rates, capital movements, and trade imbalances in the transmission of monetary measures—and fiscal measures too—to the economy in a world of floating exchange rates and mobile financial funds. Qualitatively, things happened the way our theory said they would. But I guess that no one, even in the Fed's international shop, foresaw how large these effects could be, how long they could persist, and how difficult they might be to reverse.

The drag of the import surplus was one reason that the recovery of real GNP proceeded even more slowly in the two years after 1984, 3.6 percent in 1985 and 1.9 in 1986, while unemployment hovered around 7.0 percent. Only in 1987–88, after the cautious easing of 1986 finally took effect, was the recovery completed, five and a half years after it had begun.

Real interest rates averaged 400 or 500 basis points higher in the 1980s recovery than in previous postwar expansions. This is the proximate cause of several well-known adverse developments in the U.S. economy and the symp-

tom of others. Like most people in this room, I place most of the blame on federal fiscal policy. But the Fed could have lowered rates sooner and further in the period 1984–87.

I tell monetary policy skeptics like my friend Bob Eisner that we could have had—indeed, we would have had—the same recovery in the 1980s without the extraordinary fiscal stimulus, the same performance in GNP and employment without the negative by-products. I have based this claim on the generous interpretation of Fed policy that I have given above. Assuming that the Fed's targets for macroeconomic performance would have been the same had fiscal policy been pre-Reagan normal, I say that the Fed had plenty of room to lower interest rates in pursuit of those targets and would have used it. Maybe, in fact, sound fiscal policy would have made the Fed more expansionary. Maybe our central bankers held back at times in hopes of sending a message about fiscal policy to the president and Congress.

I am still saying these things, now to people who worry whether budget correction will cause recession. I hope I am right. The Fed might have to act faster, in larger steps, than they did in 1984–86. Twenty-five basis points every FOMC meeting would not be enough.

Sometimes, I am afraid, defense of the dollar has been given more weight than it deserves. I am not referring to the fall of 1979, when Paul tells us that the dollar's weakness and the complaints of major foreign central bankers simply reinforced the sufficient domestic reasons for a contractionary move. But supporting the dollar was a consideration in 1984 and again after the Group of Five agreed at the Louvre in early 1987 that the 1985–86 depreciation had gone far enough. (According to Paul, this was Treasury policy, not his preference. The idea that exchange rate policy is the province of the Treasury and that monetary policy is the province of the Federal Reserve seems dangerously anomalous, given that the two policies are essentially one and the same.) Interest rates to support the dollar contributed to the slowdown in 1987 and perhaps to the stock market crash in October. Following the crash, Greenspan and his colleagues eased decisively and let the dollar fall, with good macroeconomic results.

Dollar defense may be a consideration again now, when domestic demand expansions and tight monetary policies are raising interest rates in Japan and Europe. I see no good reason to oppose a depreciation of the dollar when lower interest rates are appropriate to domestic demand management, particularly when there is room in the economy for more net exports. How will we get the capital inflow that we need to "finance" our trade deficit if our interest rates are lower than those overseas? If it takes a dollar low enough to make investors around the world believe that it is going to rise, so be it.

As early as the spring of 1982, I suggested a tripartite accord—White House, Congress, and Fed—to shift the policy mix to tighter budget and easier money. It was a good idea then, and it has been a good idea ever since.

Summary of Discussion

Paul Volcker began the discussion by responding to several points made by Tobin. First, he addressed the extent to which the Federal Reserve worries about financial markets as well as about the economy. He thought that most people at the Fed focus on the economy, although in 1982 he had persuaded them to start thinking about the financial system as well. He and the president of the New York Federal Reserve Bank had worried more about the financial markets than other people had.

Next, Volcker agreed with Tobin that different members of the Federal Open Market Committee (FOMC) weigh various factors differently in choosing the appropriate monetary policy. This is why it is almost impossible to say what weights the Federal Reserve as a whole was giving to the money supply and to other indicators. Volcker thought that one reason that the FOMC keeps returning to interest rate targeting, which is what they seemed to be doing again, is simply that the rest of the committee never completely trusts the chairman. With a money supply target, some members of the FOMC might be suspicious that the chairman would use the small amount of leeway he has in week-to-week operations to produce a slightly different result than they want. With a Federal funds rate target, this problem does not exist.

Third, Volcker disagreed with Tobin's judgment about the degree to which there had been a problem with monetary policy in 1984. The general mind-set at the Federal Reserve had been that the Fed historically made the mistake of tightening monetary policy too late in an expansion and was then forced to tighten too abruptly. Perhaps that background contributed to the Fed sticking to a tighter policy in the summer of 1984 longer than it really intended or, in retrospect, than it should have. The lending market turned out to be tighter than expected because banks were reluctant to lend to each other as freely as they had in the past, and the result was double-digit interest rates. During July and August, there was much disagreement on the FOMC about how to respond, if at all, and it was not until September, when the economy began to look shakier, that monetary policy was finally relaxed.

Further, Volcker said that the Fed had paid attention to exchange rates in 1985 and 1986 and that he did not think that that had been a mistake. He added that Japan and Germany were growing even more slowly than the United States during that period and that he had felt that the burden was on them to expand in the interest of the world economy. So he had devoted considerable effort to encouraging them to expand so that the United States would not have to take inappropriately strong expansionary action itself.

Finally, Volcker remarked that he thought that there were signs that the Federal Reserve was going back to attempts to fine-tune the economy, deliberately or not.

Martin Feldstein asked whether the Federal Reserve expected a recession to occur in 1980 as a result of its change in monetary policy in late 1979.

Volcker responded that the Federal Reserve staff (like many others) had been projecting a recession for a long time but that it had not yet materialized. Thus, he thought that there was some risk of one occurring but that he was not at all certain, as the economy seemed to be expanding despite the expectations and people seemed to be willing to borrow and lend. Volcker said that he knew that a recession would occur sooner or later, regardless of the short-term stance of monetary policy, and that even now he is not sure whether the economy would have had a recession in March and April if credit controls had not been imposed. Volcker also noted that the White House had strongly urged (and authorized) the credit controls to make a political point as a supplement to the more traditional monetary restraint.

Feldstein questioned whether it was a natural thing that the economy had turned around so quickly after the very sharp downturn in 1980. As Volcker had described it, the credit controls induced a drop in money demand so that interest rates fell automatically without any explicit action by the Fed. In response to lower interest rates, money demand increased, and the economy recovered, with the Fed just a passive player. *Volcker* clarified that the Federal Reserve had taken the discretionary step of increasing nonborrowed reserves on several occasions.

Feldstein asked how effective the 1979 "regime shift" had been in convincing financial markets that the Federal Reserve was serious about reducing inflation.

Volcker believed that the outcome of the regime shift was not as favorable as he had expected or hoped. The Fed wanted to show banks that they did not have an inexhaustible supply of money, so they ought to take more care about the credit they were extending. This is the reason that the Fed put a special reserve requirement on time deposit accounts in October. Yet the policy was not as effective as hoped because of deep skepticism in the market. One indication was that people interpreted the fact that the Federal Reserve set monitoring ranges for the Federal funds rate as meaning that it was not really going to follow the new policy. Volcker added that this was why he was really not sure that there would have been a recession in March 1980 without the credit controls.

William Niskanen questioned the motivation of the Carter administration when it asked the Federal Reserve to impose credit controls in March 1980.

Charles Schultze replied that he had thought that the rationale for the policy was somewhat absurd. The Carter administration had been preparing an economic package that reduced the budget deficit by cutting social programs and encouraged the Fed to tighten monetary policy. But parts of the administration wanted a "liberal element" to combine with these conservative pieces, and the AFL-CIO was urging them to use credit controls to reduce the flow of credit without raising interest rates. So the Carter administration asked the Fed to impose the controls. Schultze added that no one had anticipated the public's response—people tore up their credit cards and mailed them back, and there

was a 40 percent drop in the monthly sales of big-ticket items. What was, objectively, a relatively mild penalty on consumer loans unexpectedly turned into a massive reduction in borrowing.

Paul Krugman noted that, in the discussion of budget policy, both Stockman and Schultze concluded that the standard budget policy in the United States is essentially an equilibrating one but that there were unusual events at the beginning of the 1980s that changed matters. For monetary policy, most people would conclude that it normally has an inflationary bias, where the Federal Reserve fights recessions earnestly and responds to inflations somewhat late. But, in the early 1980s, monetary policy, like fiscal policy, was completely out of character. Krugman wondered why this was possible. One explanation might be the great intellectual confusion that was reigning in 1980. There was the monetarist/rational expectations belief, for example, that, if you strongly announced your willingness to suffer pain, you would not actually have to suffer it. Monetarism also gave the Fed the ability to say that it was simply targeting monetary aggregates and not actually planning on a recession.

Krugman also asked whether it was simply a "stealth tactic" for the Fed to use the trappings of monetarism to pursue an essentially orthodox disinflationary policy.

Volcker replied that he thought that monetarist theory had been important in shaping the monetary policy of the early 1980s, as the theory had gained respect from both the public and professionals. He thought that rational expectations theory had been much less important. Most crucial to the shaping of monetary policy, however, was the fact that the general public was very upset when inflation rates were 14–15 percent, and they realized that it had something to do with money. So they were more willing to tolerate measures to reduce inflation by reducing money growth than when inflation did not seem so troublesome.

Volcker asserted strongly that applying monetarist theory had not been a stealth tactic. He believed that the Fed had used monetarism partly to discipline itself and partly to take advantage of the public support for such a policy. It was much easier to explain a monetarist policy to the public because he could point out that money is related to inflation, so that, in order to restrain inflation, the Fed needed to restrain the money supply. It seemed common sense that too much money meant too much inflation—people had learned this in school and had read it in the daily press. Volcker felt that it had been a very simple message, important to the explanation and support of policy.

James Tobin stressed Krugman's question about the extent to which the Federal Open Market Committee had been influenced by the rational expectations/monetarist doctrine in the late 1970s and afterward. The theory says that, by making a credible threat that there will be pain and suffering about which the Fed will do nothing, the Fed can accelerate disinflation without as much pain and suffering. Had this theory been significant in the shift in policy during the period 1979–82?

Volcker responded that there had been a hope that the theory would work in a general way, but certainly no faith in the more extreme formulations. There was a view that, if the Fed was credible enough, then short-term interest rates might go up, but long-term rates would remain stable or even go down because everyone had so much faith in the new, powerful anti-inflation program. In fact, however, long-term rates went up.

William Poole said that one of the puzzles from the period 1979–82 is why both long- and short-term interest rates were so volatile. One answer could be that the markets did not gain confidence in the Federal Reserve's conviction to stick with its policy until the economy had suffered a considerable way through the recession. But Poole did not believe that this explanation completely solves the puzzle about why long rates were so volatile and followed short rates so closely.

Schultze commented that perhaps Volcker sold himself a little short by denying the use of stealth in 1979. Schultze said that Volcker had been right, and that he and William Miller [chairman of the Federal Reserve Board, 1978–79] had been wrong, about the tactic to be used when radically changing the stance of monetary policy. For twenty-five years, the public had perceived the Fed as sitting around deciding what interest rates were going to be the next month, and the politicians saw the Fed as directly responsible for every quarter of a percent rise in rates. In 1979, the Fed had to make massive moves in interest rates, which would have been impossible had they tried to do it directly. Now that the Fed no longer has to move interest rates a lot, they can go back to targeting them.

Volcker responded that the Federal Open Market Committee really had no idea that interest rates were going to rise to 19 percent. It was not as though they decided that they wanted interest rates to go 19 percent and just announced the money supply figure that they knew was going to result in those rates. Volcker had known that interest rates were going to go up, but, had he known in advance that they would increase so much, he did not think that he would have been able to convince the committee, or perhaps himself, to implement the same policy. He emphasized this point because he did not think that the Federal Reserve can survive as an institution if people become convinced that things are done by stealth. He felt that it is very dangerous for any institution that depends on people's confidence to adopt policies on the basis that they will fool people. He regretted the confusion on this point that had been sown by later comments of some on the Open Market Committee itself.

Feldstein repeated Tobin's statement that at some point the Federal Reserve had stopped targeting the monetary aggregates and had made the true target nominal GNP and the operating target the Federal funds rate. He asked Volcker if this were true.

Volcker replied that, as the chairman, he had looked at both the economy and the money supply figures and, as he had mentioned earlier, also at the exchange rate and at financial markets when that seemed important. He

thought that the real shift in the operating target was in October 1982, when the Fed switched from total nonborrowed reserves to marginal borrowing. As time passed, there was a lot of debate in the Federal Open Market Committee (FOMC) between those who wanted to target interest rates directly and those who wanted to stick with borrowing. People may say that it amounts to the same thing because there is obviously a close relation, but it is not a perfect relation, and at times the two targets imply different operational approaches.

Volcker added that he had opposed returning to interest rate targeting because it induces a great reluctance to adjust policy, as Schultze said. When one is aiming directly at interest rates, it becomes a great decision to change them by a quarter of a percent, so, to avoid this inertia, Volcker did not want to target interest rates directly. Volcker said that it appears as though the Fed has gone back to targeting interest rates directly and that this has in fact created more inertia.

Volcker then addressed the issue of whether real GNP was the Fed's true target. He said that he was never confident that there was a close relation between Fed policy and nominal or real GNP over relevant time periods for operational decisions. So, even though he monitored the acceleration or deceleration of GNP, it was really very hard to target as a short-term operational matter. Volcker noted that the GNP numbers in the semiannual FOMC reports that Tobin mentioned were really projections, not targets.

Tobin pointed out that it seems logical to interpret those projections as implicit targets, given that they come from "the pilot of the boat." He went on to say that he did not mean to imply that the Fed was using real GNP as the target in any long-run sense but only that the Fed probably thinks of the economy in the old-fashioned terms of slack and catch-up in relation to normal full-employment growth. He noted that, although there are many economists in the world today who do not think of the economy in those terms, he thought that this is how the Fed was thinking of it during that period. So they based their real GNP goals on the implications for full employment as well as for inflation and the many other phenomena of concern.

Feldstein added that the Fed's nominal GNP projections seemed to be more or less consistent with traditional velocity relations and the Fed's monetary targets. Further, these nominal GNP projections were in line with the real GNP/inflation breakdowns forecast by the Fed. This suggests that, although the Fed may not literally have had nominal GNP targets, it did have a sense of the levels of nominal GNP, real GNP, and inflation that were consistent with its monetary policy. It seems as though the level of nominal GNP really was a central factor.

Volcker stated that the projections presented were not a set of forecasts that had been debated. They were the independent projections of nineteen voting and nonvoting members of the Federal Open Market Committee collected before the meetings, and the projections rarely changed after the meetings. Volcker added that people made projections of real GNP and of prices and

then added them up to get nominal GNP. Occasionally, these projections of nominal GNP implied unusual velocity behavior when combined with the monetary targets, but the implied velocity was never completely unrealistic.

Fred Bergsten responded that, despite Volcker's description of the FOMC meetings, people have found a closer correlation of monetary policy with nominal GNP than with anything else.

Geoffrey Carliner asked how important President Reagan's support had been to the Fed in its efforts to fight inflation in 1981 and early 1982. He also wondered whether the Fed would have received similar support from President Carter.

Volcker said that he thought that the Federal Reserve had received fairly good support from Carter. Despite the surge in interest rates, Carter mentioned monetary policy only once during the 1980 campaign. The Reagan administration was very monetarist and did not care about interest rates, and it encouraged the Fed to pursue tight money in early 1981. The economy continued to grow for a while despite the very high interest rates, but, when the recession finally occurred, the administration stopped encouraging the restraint on money, and a certain amount of sniping developed. Volcker said that he thought that there were probably many people in the White House and at the Treasury who tried to get President Reagan to criticize the Federal Reserve at that point but that Reagan would not say anything bad about an anti-inflationary policy, which was important.

Feldstein agreed that there were many people within the administration who were taking every opportunity to criticize the Fed in 1983 and 1984, especially as more and more private forecasters were predicting another recession. Nevertheless, President Reagan often took the opportunity at news conferences to say that he was supporting the Fed.

Volcker added that, in his view, the most important single action of the administration in helping the anti-inflation fight was defeating the air traffic controllers' strike. He thought that this action had had a rather profound, and, from his standpoint, constructive, effect on the climate of labor-management relations, even though it had not been a wage issue at the time.

Charls Walker asked the role of the presidents of the Federal Reserve Banks in making policy. He wondered in particular whether they had supported or hindered Volcker's efforts from 1980 to 1982.

Volcker said that there had been a very harmonious board during that period. People knew each other well and did not have very divergent views. Without question, however, the most monetarist people were some of the bank presidents. So Volcker said that he instinctively knew that many of the bank presidents would be enthusiastic over the new policy because they had at times in the past promoted something like that themselves.

Volcker also remarked that, although he received supportive comments on monetary policy from the administration, their statements emphasized a gradual approach. After 1979, Volcker realized that it was not realistic to decrease

the money supply gradually and expect that the economy would suffer no adverse effects. The Fed could not control the money supply that closely. Thus, Volcker tried to remove the word *gradual* from all statements after 1979.

Bergsten opened the subject of how external factors like the dollar had influenced Volcker's monetary policy. Although Tobin criticized Volcker for paying too much attention to the dollar, Bergsten thought that he had emphasized it much less than in the popular political view. In particular, Bergsten wondered about the role of external factors in Volcker's 1979 decision. The dollar had fallen sharply in late 1978 and remained precarious in 1979, and Volcker returned from the IMF meeting in Belgrade more quickly than had been scheduled. Had international events been, although not the cause of Volcker's decision, the trigger for deciding to move at that point?

Bergsten also asked about the role of external factors in 1982 when the Fed stopped targeting the monetary aggregates and went back to interest rate targeting. Some people suggested that the timing trigger had been the Mexico debt crisis because of its implications for the U.S. banking system.

Volcker said that the weakness of the dollar in 1979 had been just one factor in the whole inflationary expectations/lack of credibility picture. He had talked with some of his central banking colleagues at the Belgrade meeting to see how they would react to a strongly anti-inflationary monetary policy, and they had encouraged him. But he had returned from Belgrade not because of any great urgency caused by the meeting but because he felt that he should be back to work on this program. Even more important than the Belgrade meeting itself was a meeting with German Chancellor Helmut Schmidt during a stopover on the return flight. Schmidt had said that the U.S. economy was in trouble and that inflation was out of control. Shortly before that, Volcker had told Schultze and William Miller about the monetary policy he was considering, and the Schmidt visit may have been important in reinforcing the sense of urgency.

As for the change in policy in 1982, Volcker noted that the first signals of easing were in July, before the Mexican debt crisis erupted in the open. He did think that the precariousness of the international situation had been a factor but that domestic financial concerns had played a more important role.

On a related topic, *Poole* pointed out that the Plaza Agreement had committed the U.S. government to depreciate the exchange rate, requiring that interest rates be kept low. He felt that this had put a constraint on what the Federal Reserve could do. The market understood this constraint and took it as a signal that monetary policy was going to be biased in an easier direction than would otherwise have been the case.

Volcker recalled that he did discuss monetary policy with the secretary of the Treasury at the time of the Plaza Agreement but that, since he had thought that there was no reasonable prospect that the Fed would be tightening monetary policy for some months anyway, he had supported the agreement. Volcker said that, if he had thought that the Plaza Agreement would constrain the Fed's

decision making, his discussion with the secretary of Treasury would have been different.

Feldstein asked if similar concerns were raised around the time of the Louvre Agreement and the period thereafter. *Volcker* said that there must have been some discussion at the time but that he did not remember it, probably because it had not been a problem. It had not been discussed at the Louvre itself.

Feldstein then asked why the Treasury changed its policy regarding the exchange rate between 1985 and 1987. In 1985, the Treasury seemed eager to push the value of the dollar down, whereas, in 1987, it wanted to keep the dollar from declining any further. He wondered how much the decision to stop the dollar from declining was due to Volcker's concerns about an increase in inflation.

Volcker said that, under Secretary Don Regan, the Treasury Department had taken it as a badge of national honor that the value of the dollar was high. They did not want to intervene, no matter how high the dollar climbed. On the other hand, Treasury Secretary James Baker and Deputy Secretary Richard Darman seemed to dislike the large trade deficit, and they were particularly concerned about the increasing protectionist pressures in Congress. Volcker thought that this concern was really what had triggered the Plaza Agreement.

As for the decision to stop the decline of the dollar in 1987, Volcker said that the Treasury was certainly aware of his concerns about inflation and more pointedly than about the implications of a continuing fall in the dollar. He thought that the Treasury had already become somewhat concerned about the implications of further dollar decline. Also, the Treasury was concerned about international cooperation from Japan, which it wanted to undertake an expansionary fiscal policy.