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Reflections on Monetary Policy 25 Years After October 1979

Proceedings of a Special Conference of the Federal Reserve Bank of St. Louis

Origins of the Great Inflation
Allan H. Meltzer

The Reform of October 1979: How It Happened and Why
David E. Lindsey, Athanasios Orphanides, and Robert H. Rasche

The Monetary Policy Debate Since October 1979: Lessons for Theory and Practice
Marvin Goodfriend

The International Implications of October 1979: Toward a Long Boom on a Global Scale
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Panel Discussion I: What Have We Learned Since October 1979?
Ben S. Bernanke, Alan S. Blinder, and Bennett T. McCallum

Panel Discussion II: Safeguarding Good Policy Practice
Roger W. Ferguson Jr., Charles A.E. Goodhart, and William Poole

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Chairman's Remarks

Alan Greenspan

A defining moment may shape the direction of an institution for decades to come. In the modern history of the Federal Reserve, the action it took on October 6, 1979, stands out as such a milestone and arguably as a turning point in our nation's economic history. The policy change initiated under the leadership of Chairman Paul Volcker on that Saturday morning in Washington rescued our nation's economy from a dangerous path of ever-escalating inflation and instability. As I noted in congressional testimony before the Joint Economic Committee on November 5 of that year,

> We are here…to evaluate the moves of Chairman Volcker and his colleagues last month, implying that some alternate policies were feasible at that time. However, given the state of the world financial markets, had the Fed not opted to initiate a sharp interest rate increase in this country, the market would have done it for us.[1]

In a democratic society such as ours, the central bank is entrusted by the Congress, and ultimately by the citizenry, with the tremendous responsibility of guarding the purchasing power of money. It is now generally recognized that price stability is a prerequisite for the efficient allocation of resources in our economy and, indeed, for fulfilling our ultimate mandate to promote maximum sustainable employment over time. But the importance of price stability has sometimes been insufficiently appreciated in our central bank's history, and, as Allan Meltzer will soon point out, such episodes have had unfortunate consequences.

Far from being a bulwark of stability in the 1970s, the Federal Reserve conducted policies that, in the judgment of many analysts, inadvertently contributed to an environment of macroeconomic instability. We should strive to retain in the collective memory of our institution the ensuing lessons of that period. It may be the most fruitful and proper way to commemorate the events of October a quarter-century ago.

Tracing the roots of the 1970s inflation brings us to an earlier era. The Keynesian revolution of the 1930s and its subsequent empirical application led many economists to accept the view that through regulation, state intervention, and the macroeconomic management of aggregate demand, government policies (including those of our nation's central bank) could improve on earlier efforts to achieve and maintain "full employment." By the 1960s, policymakers seemed to concentrate their short-run objectives on maintaining a "high pressure" economy, in the belief that such a recipe could virtually thwart economic contractions at little or no risk to long-run stability and growth. If this high-pressure management inadvertently carried the economy beyond its productive potential, some costs in terms of inflation could be expected, but such costs appeared tolerable in light of the employment gains that came with them. Furthermore, policymakers hoped that additional tools at their disposal—so-called incomes policies enforced by "jawboning," guideposts, and price and wage controls—were ready to combat

[1] Alan Greenspan, "Statement," in *Domestic and International Implications of the Federal Reserves New Policy Actions*, Hearing before the Subcommittee on International Economics of the Joint Economic Committee, November 5, 1979, 96 Cong. 1 Sess. Washington, DC: Government Printing Office, 1980, p. 5.

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and control any resulting upcreep in inflation, with minimal macroeconomic cost. By the turn of the 1970s, the ugly reality of stagflation forced an overhaul of this policy framework. The corrosive influence of inflation on our nation's productive potential was beginning to take hold. Policymakers slowly came to recognize the adverse long-term consequences of compromising the purchasing power of our currency for economic well-being. Indeed, by the late 1970s, a consensus gradually emerged that inflation destroyed jobs rather than facilitated their creation. Unfortunately, a legacy of failed attempts during the decade, to restore stability with gradualist plans and with various incarnations of incomes policies, took its toll on business and household attitudes toward inflation and toward the prospects of our nation. By the end of the decade, an inflationary psychology had become well entrenched and complicated efforts to restore a sense of stability in the national psyche.

Little leeway for policy was left before the Federal Reserve took decisive action on October 6, 1979. In retrospect, the policy put in place on that day was the obvious and necessary solution to the nation's troubles. As events unfolded, however, the Federal Reserve did not escape criticism, and for a time it was not entirely obvious that the System could maintain the necessary public support to see its disinflationary efforts come to fruition. Though widely anticipated even before the actions of October, the recession and retrenchment in employment that followed those actions resulted in pressures on the Federal Reserve to reverse course. The 50th anniversary of the beginning of the Great Depression—the crash of 1929—was observed later during that same month, October 1979. I recall that this anniversary not only rekindled the question of whether such an event could recur but also inflamed sensitivities regarding the effects on unemployment that might stem from the new anti-inflationary action. Judging from the fate of earlier attempts during the 1970s to tame inflation in the face of a weakening economy, when short-run considerations appeared to trump policies oriented toward longer horizons, such fears of rising unemployment could have also derailed the reforms of October. In the event, they did not. We owe a tremendous debt of gratitude to Chairman Volcker and to the Federal Open Market Committee for their leadership and steadfastness on that important occasion and for restoring the public's faith in our nation's currency.

By the time that I arrived at the Federal Reserve, in 1987, the task of the Federal Open Market Committee had become easier precisely because of the perseverance and success of our predecessors in the turbulent years following October 1979. Maintaining an environment of stability is simpler than restoring the public's faith in the soundness of our currency. The task is easier still as we remind ourselves of the stark difference between the long-term prospects of our economy now, in our current environment of stability, and then, a quarter-century ago, before the reforms of that October.

In closing, I applaud President Poole and his colleagues for organizing this event to reflect on that critical episode in our nation's economic history. An appreciation of our history is, after all, an invaluable guide to sound policies for a better future.

Editors' Introduction

Athanasios Orphanides and Daniel L. Thornton

On October 6, 1979, the Federal Reserve implemented a monetary policy reform of profound significance for the U.S. economy, marking the beginning of the end of the inflationary malaise that permeated the economy at the time. Starting with its policy actions that Saturday afternoon, the Federal Reserve reaffirmed its responsibility to restore and maintain an environment of price stability in the economy, thereby restoring confidence and setting the stage for a period of lasting economic prosperity. This prosperity has been interrupted only by two mild and shallow recessions over the past two decades.

A conference held in St. Louis on October 7 and 8, 2004, provided the opportunity to reflect on the history of monetary policy in the United States 25 years after the events of that October. Over the two-day period, three papers were presented and discussed, followed by two panel discussions revisiting and distilling the policy lessons surrounding the events of October 1979 and those that can be drawn to safeguard good policy practice going forward. This conference volume is a compilation of the conference proceedings as well as personal reflections commemorating October 6, 1979.

With the passage of time, the significance of that moment for our nation's economic history and continuing prosperity will surely fade. Nonetheless, we hope that this conference volume will help preserve the lessons from the October 1979 episode. As Chairman Greenspan noted in his introductory remarks: "We should strive to retain in the collective memory of our institution the ensuing lessons of that period. It may be the most fruitful and proper way to commemorate the events of October a quarter-century ago."

ORIGINS OF THE GREAT INFLATION

In the first conference paper, Allan Meltzer offers a historical analysis of the economic and political forces that generated and sustained the Great Inflation of the 1960s and 1970s and necessitated the forceful disinflationary actions of October 1979. Various explanations have been advanced as possible causes of the policy errors of that period. Some are based on the political business cycle and dynamic consistency problems relating to the limited independence of the Federal Reserve at the time from the political process. Other explanations stress the role of misinformation or misinterpretation of economic theories, models, and/or data.

Meltzer reviews these explanations and discusses their limitations in providing a complete account of the historical experience. His analysis leads to his conclusion that not one but multiple elements must be identified as critical to understand the policy errors of the 1960s and 1970s. Meltzer stresses the role of leadership and beliefs of Federal Reserve policymakers, particularly the Chairman. According to Meltzer, during the 1960s, Chairman Martin placed excessive emphasis on reaching consensus among Federal Open Market Committee (FOMC) members before changing policy, a factor that contributed to unfortunate delays in taking prompt anti-inflationary action

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at the early stages of the Great Inflation, allowing it to gather momentum. Second, adherence to apparently flawed theories of inflation adversely influenced policy deliberations. Over many years, disregard of the fundamental long-run relationship between money growth and inflation steered analysis toward nonmonetary explanations of inflation. Meltzer argues that for many years Federal Reserve staff and policymakers denied that inflation had either begun or increased: They believed instead that inflation was the consequence of transitory factors that did not require a forceful policy response. Third, and perhaps most important, the presence of institutional arrangements that stressed policy coordination between fiscal and monetary policy compromised the independence of the Federal Reserve during the 1960s and 1970s. This, according to Meltzer, hindered the Federal Reserve from taking timely and effective disinflationary action throughout the period and is arguably the most significant factor in his analysis. Meltzer suggests that such political factors importantly influenced the thinking of both Chairmen Martin and Burns and argues that those two Chairmen held a rather restrictive view of Federal Reserve independence. Meltzer notes that bad luck, in the form of lower productivity growth starting in the mid-1960s, also contributed to the inflationary problem. Ultimately, however, Meltzer suggests that the inflationary problem could not have persisted in the absence of the other factors he identifies—importantly, the presence of flawed economic reasoning and the compromised independence of the Federal Reserve.

In her discussion of Meltzer's paper, Christina Romer agrees with many of the points in Meltzer's analysis but argues that his emphasis on the role of politics may be unwarranted. Instead, Romer argues, the Great Inflation occurred primarily because both fiscal and monetary policymakers were constrained by the misguided economic framework of the time. In her view, inflation persisted during that period because policymakers relied on flawed models of the economy. Romer stresses that views regarding the economy were not stagnant during this period but rather were changing. She provides an outline of the evolution of the dominant framework for policy analysis from the 1950s to the late 1970s, but argues that, during the Great Inflation, policymakers replaced one bad model with another, thus failing to recognize the actions needed to restore price stability. A major implication of Meltzer's emphasis on political constraints on Federal Reserve behavior, according to Romer, is that the Federal Reserve understood that the policy actions of the late 1960s and 1970s were inflationary. Citing forecast errors made by the Federal Reserve staff at the time, Romer argues that this may have not been the case. In her view, the policy change in October 1979 simply represented the triumph of better ideas over worse ones.

HOW AND WHY DID THE OCTOBER 1979 REFORM HAPPEN?

David Lindsey, Athanasios Orphanides, and Robert Rasche offer a historical review of the monetary policy reform, discuss the influences behind it, and gauge its significance. The authors lay out in detail the policy record from the start of 1979 through the spring of 1980, drawing extensively on the recently released transcripts of FOMC meetings during 1979, Federal Reserve staff analysis, and other contemporaneous sources. They then examine the reasons behind the Committee's decision to adopt the reform and the communications challenge presented to the Committee during this period.

The paper argues that the reform was adopted when the FOMC became convinced that its earlier gradualist strategy using finely tuned interest rate moves and aiming to avert economic slowdowns had proved inadequate for fighting inflation and reversing inflation expectations. Throughout 1979 and leading to the October reform, the FOMC faced a deteriorating inflationary outlook as well as a deteriorating economic outlook. During much of the year, Federal Reserve staff, private forecasters, and policymakers projected that recession was about to start. Within the gradualist framework in place, such concerns suggested caution against restrictive policy actions. As the year

progressed, the Committee increasingly realized that its inaction led to a deterioration of inflationary expectations and instability in financial markets. The Committee decided to embark on a tightening path as early as July 1979 within its existing operating framework. The Federal Reserve's move toward tightening was reaffirmed by President Carter's appointment of Paul Volcker as Chairman of the Federal Reserve. However, financial markets' reactions, especially following the FOMC meeting on September 18, 1979, suggested that the Federal Reserve's resolve to tighten policy sufficiently remained in question. This rift reinforced the new Chairman's beliefs that more drastic steps toward restoring confidence were needed, and such plans were prepared at his initiative. It was recognized that the new plan had to break dramatically with established practice, allow for the possibility of substantial increases in short-term interest rates, yet be politically acceptable and convince financial markets participants that it would be effective. The new operating procedures satisfied these conditions and were adopted for the pragmatic reason that they would likely succeed.

An element *not* suggested by the historical evidence as being important for the reform was monetarist ideology. According to Lindsey, Orphanides, and Rasche, the "monetarist experiment" of October 1979 was "not really monetarist!" Indeed, after examining various alternative frameworks, including monetarism; new, neo, and old-fashioned Keynesianism; and nominal income and inflation targeting, the authors conclude that the Committee's actions cannot be easily identified with any of them. Rather, they interpret the evidence as suggesting that in October 1979 the Committee simply accepted that, under prevailing circumstances, controlling monetary growth presented a robust approach to taming inflation and adopted the new operating procedures because of its determination to achieve that objective.

In his discussion, Stephen Axilrod suggests that the appointment of Paul Volcker as Chairman, specifically his unique contributions to the policy environment, deserves greater attention for understanding the events of October 1979. While inflation would surely have been tamed eventually, Axilrod stresses that the paradigm shift that took place following Paul Volcker's appointment in the summer of 1979 would not have taken place without him. Axilrod thought two characteristics not usually found in a leader were important. First, Volcker could think beyond the bounds of central bank practice of the day. Second, he was technically highly proficient and interested in the operating details of implementing central bank policies so that the Committee could have confidence in his leadership and ability to guide policy in a new complex environment.

Among the reasons for the policy change identified by Lindsey, Orphanides, and Rasche, Axilrod stresses three: first, how badly the Federal Reserve needed to regain its credibility as an inflation fighter; second, the need to minimize the cost of disinflation by convincing markets quickly that the new procedures would be effective; and third, the desire to make the necessary disinflationary policy actions more automatic and less dependent on the meeting-by-meeting policy decisions of the Committee. Axilrod agrees that making aggregate reserves the operating instrument and tying policy more closely to the money supply accomplished these aims.

THE POLICY DEBATE SINCE OCTOBER 1979

In his contribution, Marvin Goodfriend reviews the evolution of monetary policy theory and practice over the past 25 years and examines how both theory and policy have been shaped by the earlier experience of the Great Inflation and the reform of October 1979. A large part of this story, he writes, is that central bankers and academic economists learned from each other and both learned from the historical experience with inflation and disinflation.

Goodfriend points out that much of the macroeconomic theory developed before October 1979 remains at the core of policy models used today—including elements such as the discrediting of the notion of a permanent trade-off between inflation and unemployment and the importance of expectations for understanding inflation dynamics. He

notes, however, that there was much less consensus regarding some of these elements a quarter-century ago than there is today.

The experience of the 1970s, and the ensuing lessons, shaped importantly some of the policy choices, strategy, and tactics during and after the disinflation. As a result of the high and volatile inflation at the beginning of the disinflation in October 1979, Goodfriend suggests that the Federal Reserve experienced a "loss of room to maneuver"; that is, it lost the leeway to choose between stimulating employment and fighting inflation over the business cycle. In essence, the Federal Reserve was perceived by the public as having lost its resolve to combat inflation. As a consequence, inflation expectations were driven by recent experience, rather than being anchored by the Federal Reserve. Containing inflation in such an environment is much more difficult. Goodfriend cites the recurrence of "inflation scares" for several years following the October 1979 reform as evidence that regaining credibility was a gradual and costly process and identifies the successful practice of preemptive tightening as a means to combat such inflation scares as an important lesson from that experience. This success, Goodfriend argues, was the key to restoring the Federal Reserve's ability to stimulate employment during downturns without compromising price stability.

Indeed, perhaps the most important lesson from the experience of the past quarter-century identified by Goodfriend is that success in stabilizing inflation and in anchoring inflation expectations, with an explicit commitment by the central bank to pursue and maintain price stability, improves the stability of both inflation and output.

With regard to modern policy practice, Goodfriend identifies three developments as most important. First has been the rise of what he terms *implicit* inflation targeting as the core of the Federal Reserve's policy strategy. Second is the increase in policy transparency, specifically the Committee's practice of announcing its target federal funds rate immediately following each FOMC meeting. Third is the broader increase in transparency in communicating the Committee's concerns and providing information regarding its intentions for monetary policy. Goodfriend also identifies and briefly reviews some open questions relating to monetary policy practice, such as whether the Federal Reserve should adopt an inflation target and the extent to which FOMC communications could be further refined.

Goodfriend identifies the modern New Neoclassical Synthesis or New Keynesian model as the consensus model for monetary policy analysis at present; however, he identifies a number of continuing controversies regarding the consensus model that remain unresolved.

In discussing the paper, Laurence Ball expresses his agreement with parts of Goodfriend's discussion but also the view that the consensus model used to analyze monetary policy is flawed and not likely helpful for understanding the policy success of the Federal Reserve relative to other central banks over the past 25 years. Ball is particularly critical of the model's formulation of the Phillips curve and the emphasis on expectations in Goodfriend's analysis. Regarding the Phillips curve, Ball argues that some of the empirical implications of Goodfriend's consensus model are counterfactual and that the accelerationist Phillips curve, which lacks any explicit role for expectations, may provide a better characterization of the empirical evidence. Given his disagreement with the Goodfriend paper regarding the importance of gaining credibility and anchoring expectations, Ball also investigates alternative explanations for why U.S. monetary policy has been relatively successful in the past quarter-century.

LESSONS AND REFLECTIONS

In after-dinner remarks, John Taylor reviewed the international implications of the 1979 reform. In his view, the October 6 reform was a critical step in restoring stability not only in the United States but around the globe. Knowledge and key lessons from the U.S. experience spread around the world, leading to salutary shifts in monetary policy in numerous other countries that had experienced high inflation and instability during the 1970s. As a result of these improved policies, reductions in the variability of both inflation and

output have been noted in the United States and several other countries.

The conference concluded with two panel discussions. In the first, Ben Bernanke, Alan Blinder, and Bennett McCallum addressed the question "What Have We Learned Since October 1979?" In the second, Roger Ferguson, Charles Goodhart, and William Poole discussed the issue of "Safeguarding Good Policy Practice." Inevitably, the two panels overlapped somewhat and participants noted that identifying and safeguarding the salient characteristics of good policy practice depends sensitively on the lessons drawn from the improved policy environment of the past quarter-century over that prevailing before the reform of 1979. Perhaps the most frequently cited lesson was the recognition of the profound importance of low and stable inflation for maintaining economic prosperity and the central bank's unique responsibility to attain this goal. Panelists also stressed the importance of credibility in central banking and the benefits associated with well-anchored inflation expectations for enhancing a central bank's flexibility to stabilize real economic activity. An improved understanding of the macroeconomy, better ideas and models, an institutional environment favoring central bank independence, more systematic monetary policy with improved communications, and greater transparency were mentioned as factors conducive to good policy practice. The critical role of leadership for successful policymaking was also stressed.

Included in this volume are also ten personal reflections contributed after the conference, presenting different perspectives of the events of October 6, 1979. Anna Schwartz and Benjamin Friedman revisit the academic debate surrounding Paul Volcker's policy reform and assess the aftermath of the monetarist controversy that surrounded the reform.

Together with Charles Goodhart's comment, the essays by Charles Freedman, Otmar Issing, and Georg Rich offer a glimpse of the global climate during the period and as seen by officials at other central banks. Lastly, Robert Black, Philip Coldwell, and Frederick Schultz offer first-hand accounts of the policymaking environment during the turbulent period surrounding the reform; Edwin Truman and Joseph Coyne complement this insider view with their perspective from the Federal Reserve trenches.

Origins of the Great Inflation

Allan H. Meltzer

The Great Inflation from 1965 to 1984 is the climactic monetary event of the last part of the 20th century. This paper analyzes why it started and why it continued for many years. Like others, it attributes the start of inflation to analytic errors, particularly the widespread acceptance of the simple Keynesian model with its implication that monetary and fiscal policy should be coordinated. In practice, that meant that the Federal Reserve financed a large part of the fiscal deficit. This paper gives a large role to political decisionmaking. Continuation of inflation depended on political choices, analytic errors, and the entrenched belief that inflation would continue.

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The Great Inflation of 1965 to the mid-1980s was the central monetary event of the latter half of the 20th century. Its economic cost was large. It destroyed the Bretton Woods system of fixed exchange rates, bankrupted much of the thrift industry, heavily taxed the U.S. capital stock, and arbitrarily redistributed income and wealth.

It was also a political event, as are all major policy issues. This paper argues that the Great Inflation cannot be understood fully without its political dimension. Political pressure to coordinate policy reinforced widespread beliefs that coordination of fiscal and monetary policies was desirable.

Inflation started in an economy close to price stability. The annual reported rate of consumer price increase rose from 1.07 percent in January 1965 to 13.70 percent in March 1980 before declining in 1983. Measured inflation only reached its local trough of 1.12 percent in December 1986.[1] This method of measuring inflation, though widely used, is misleading. It mixes the effects of one-time price level changes (from currency devaluations, tariffs, and excises, but, in the 1970s, mainly supply shocks) with sustained rates of price change arising from the demand side. This is particularly important for the Great Inflation because the recorded peak rates of inflation reflect both the flawed or mistaken management of economic policies and the two large oil price shocks of the 1970s. Figure 1 shows the rise and fall of the reported inflation rate. Using a dummy variable to represent the oil price shock, we get the adjusted inflation series for 1979-80 shown in Figure 1.[2] This crude method attributes as much as half the reported peak inflation rate to a one-time price change. The adjustment suggests that the maintained rate of inflation never exceeded 8 to 10 percent.

An alternative measure, the rate of money wage growth, shows a maximum rate of increase

[1] Using the GNP/GDP deflator the quarterly dates are 1965:Q1, 1974:Q3, and 1986:Q1; the respective annualized quarterly data are 1.2 percent, 14.3 percent, and 0.7 percent.

[2] The dummy variable is included in a first-order autoregressive equation for consumer price index (CPI) inflation. The adjusted R^2 for the equation is 0.99, and the Durbin-Watson statistic is 1.59. The use of the dummy variable is a crude attempt to correct for the use of a fixed-weight price level following a large change in one of its components. Nominal wage growth does not show a comparable change.

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Figure 1

Year-on-Year Growth, Adjusted CPI, January 1965–July 1983

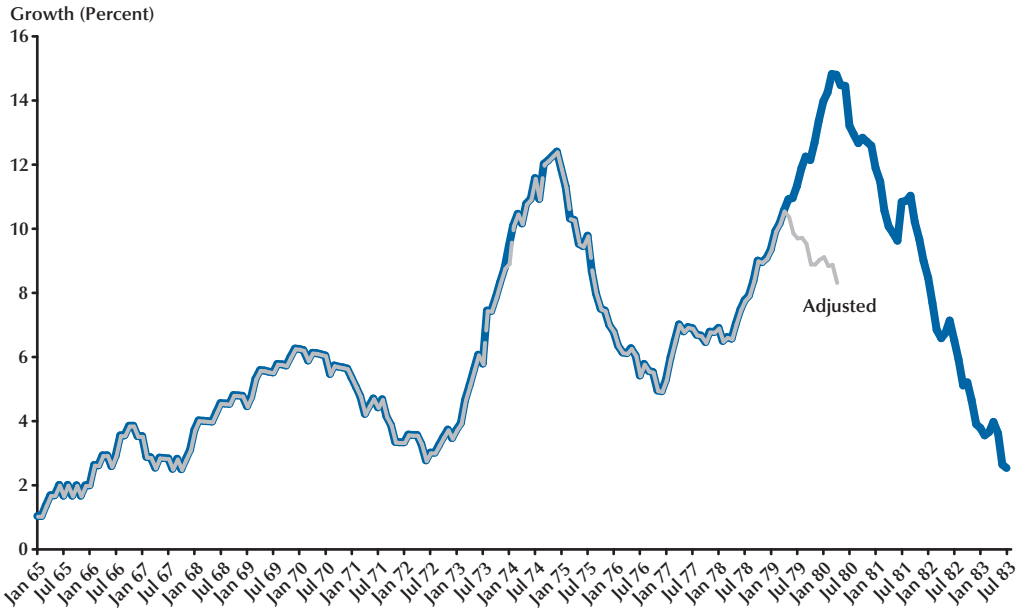
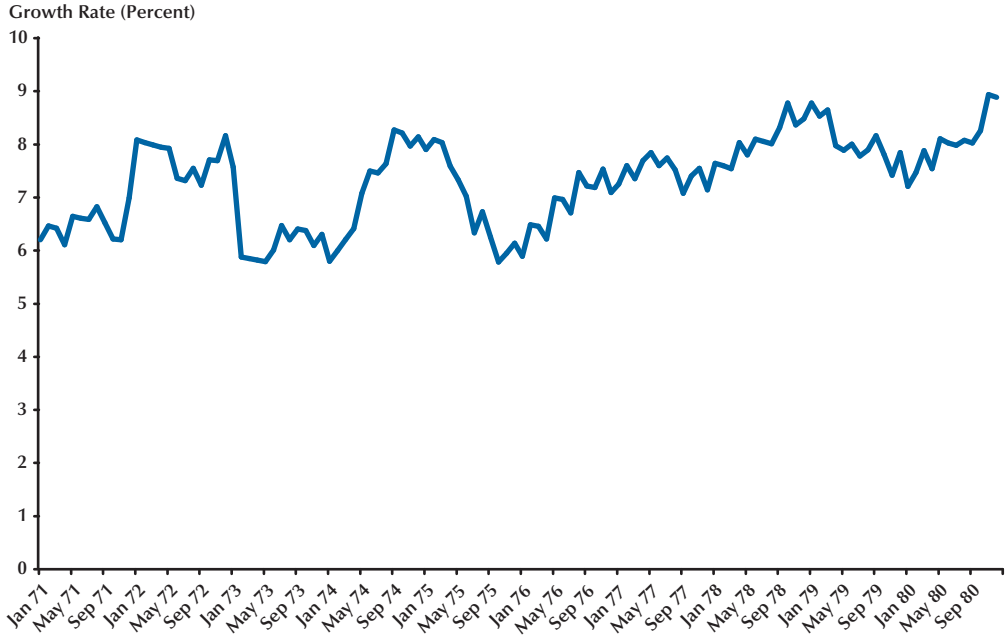


Figure 2

Average Annualized Hourly Earnings Growth, 12-Month Moving Average, 1971-80



of 9.3 percent in February 1981, when computed as a 12-month moving average of monthly data. This measure rises from 3.4 percent in early 1965 and does not return to this range until early in 1984. Figure 2 shows the wage data. They have a less-exaggerated response to the oil shocks of the 1970s and show considerable persistence.

The Great Inflation raises three main questions. Why did the inflation start? Why did it continue for nearly 20 years? Why did it end when it did rather than earlier or later? This paper answers the first, partially answers the second, and mainly neglects the third. A simple answer to the third question has a political dimension also: Policymakers stopped believing in and taking the policy actions that sustained inflation, and a new President supported and encouraged anti-inflation monetary policy. Making that case requires more attention to the details of policy actions in the 1980s than space permits. My research to date has not completed work on the 1970s and 1980s, so the evidence about persistence of inflation on which I rely must be extended to the late 1970s. Until that is done, my answer to the second question remains incomplete.[3]

During the inflation, I criticized policymakers for their errors, for failing to prevent inflation and failing to end it. Along with Karl Brunner and others on the Shadow Open Market Committee, I proposed alternative policy actions. This paper criticizes the policies also. It is important to note that I believe that much of what policymakers did, or failed to do, was close to the consensus of mainstream economists. And it was close also to popular beliefs about the importance of inflation as expressed in surveys and opinion polls taken at the time. That does not relieve policymakers of responsibility, but it puts their errors in the context in which they made them.

The Gallup organization repeatedly asked respondents to state what they regarded as the most important problem facing the country. Data from the beginning of 1970, when annual CPI inflation reached 6 percent, show that only 14 percent named inflation or "the high cost of living" as one of the most important problems. The percentage rose and fell with reported inflation in the 1970s. It did not remain persistently above 50 percent and as high as 70 percent until 1980-81.

Politicians and policymakers are usually reluctant to take actions that are socially costly or unpopular. The Federal Reserve is an independent agency, not directly subject to control by the administration in office. The paper shows why the Federal Reserve hesitated to act, ultimately failed to prevent inflation from starting, and allowed it to continue. By the 1980s, the public and policymakers had learned that inflation was costly. Voters elected a President committed to reducing it, and the Federal Reserve had a Chairman who changed procedures and, most importantly, remained resolute in the commitment to reduce inflation.

PREVIOUS EXPLANATIONS

A large and growing literature addresses the causes of the Great Inflation. Both economists and political scientists have considered the issue. This section does not attempt a comprehensive survey, but it briefly summarizes some representative contributions and explains what I find supported by data or internal records.

Tufte (1978) offers a political interpretation. Based on work such as Kramer (1971) and many later studies, his work shows that election outcomes depend positively on employment, real disposable income, or similar variables and negatively on inflation. Quoting Nordhaus (1975, p. 185), Tufte argues that "politically determined policy choice will have lower unemployment and higher inflation than is optimal." Barro and Gordon (1983) reached a similar conclusion in a different model.

One problem with these models is that they explain policy outcomes for a period restricted to the Great Inflation. They explain neither the period before nor the period after the Great Inflation. To explain observed changes in the inflation rate, the models require improbably large changes in the so-called natural rate of unemployment. They suggest why it can be politically costly

[3] Much of the material comes from the second volume of my study *A History of the Federal Reserve* (Meltzer, forthcoming), which is now in process.

to reduce an inflation that has started, but they do not adequately explain either why inflation ended or why, once ended, it did not return. Second, the political models explain what politicians prefer, but they avoid an explanation of why an ostensibly independent Federal Reserve cooperated.

Economists' explanations fall into three groups. The first cites theoretical errors: Policymakers used the wrong model to choose actions or interpret data. The second cites misinformation: Policymakers believed that their actions would reduce or prevent inflation, but the data misled them. The third is that officials in the 1960s neglected or dismissed money growth as important for inflation. This is a special case of the first explanation that merits separate consideration. I discuss each in turn.

Theoretical Errors

There is little reason to doubt and abundant evidence to support the conclusion that in the late 1960s the Council of Economic Advisers under Gardner Ackley and the Board's staff under Daniel Brill relied heavily on a simple Keynesian model with a nonvertical, long-run Phillips curve. Romer and Romer (2002) develop this reasoning.[4] Combining this model with a belief that, in James Tobin's familiar phrase—it takes many Harberger triangles to fill an Okun gap—we get a rationalization or defense of inflationary policies.[5]

Another explanation of this kind points to the misinterpretation of interest rates or neglect of the distinction between real and nominal interest rates. This was a long-standing Federal Reserve problem (Meltzer, 2003). According to Taylor (1999), Clarida, Galí, and Gertler (2000), and others, until 1981, the Federal Reserve did not increase the market interest rate enough in response to inflation to offset the negative effect of inflation on (ex post) real interest rates and on expected future interest rates. Orphanides (2003) shows that, at the margin, the Federal Reserve's response was sufficient to compensate for inflation. It remains true, however, that ex post real short-term interest rates remained negative during much of the 1970s.[6]

Suppose we accept Taylor's interpretation and conclude that the Federal Reserve did not raise nominal interest rates enough. We are left with two questions. First, didn't the market recognize the error and raise (the more relevant) long-term interest rates and other asset prices? Second, then as now, the Federal Open Market Committee (FOMC) looked at many different series. They knew that inflation continued and rose at times to new levels. How could they fail to see (or learn) that their actions were inadequate to slow or stop inflation? The data in Figure 1, or similar data for the period, were available at every meeting.

I do not question the claim that the simple Keynesian model, such as is found in Ackley (1961), with a nonvertical long-run Phillips curve, misled policymakers in the 1960s by overstating the role of fiscal policy, especially temporary changes; understating the role of money growth; failing to distinguish between anticipated and unanticipated inflation and between the effects of temporary and permanent tax rate changes; and neglecting the role of inflationary anticipations on interest rates, wages, and prices. However, the Nixon administration economists did not share many of these beliefs. They accepted that the long-run Phillips curve was vertical, and they emphasized the importance of money growth for inflation. Nevertheless, under their guidance, inflation increased before the oil-price shock of 1973 and continued through their term in office.

[4] Hargrove and Morley (1984) have interviews with Council chairmen in which they state their interpretations. Okun (1970) explains that he regarded Friedman's (1968) explanation of the vertical long-run Phillips curve of little practical relevance.

[5] The argument is flawed. Tobin compares the one-time loss from unemployment (Okun gap) to the loss from nonindexed inflation (Harberger triangle). Losses from inflation continue as long as inflation continues. Fischer (1981) shows many ways inflation is costly that are not captured in the Harberger or Bailey triangle. See also Feldstein (1982) for effects on capital.

[6] Recent papers compare two explanations of negative real short-term rates. One attributes the result to chance, principally unfavorable shocks (oil); the other cites policy errors (see Collard and Dellas, 2004, and Velde, 2004). These are not alternatives. Both could be and probably were relevant. One problem is that the bad luck mainly affected the price level, not the maintained inflation rate. A market that recognized temporary and permanent changes would have different responses of short- and long-term interest rates to such changes, hence different responses of economic activity. Between the end of December 1972 and December 1973, 3-month Treasury bill rates rose from 5.13 to 7.50 percent; 10-year constant maturity Treasury bonds rose only from 6.40 to 6.87 percent. This is one illustration of the difference between the two definitions of inflation.

Despite their beliefs about money and inflation, they urged faster money growth in 1970-72 and at other times.

At most, reliance on the simple Keynesian model is part of an explanation of the start of the inflation. There has to be more to the story, because it is the Federal Reserve, not the Council of Economic Advisers, that makes monetary policy. William McChesney Martin Jr. was Chairman of the Board of Governors at the start of the inflation and until 1970. Martin did not rely on explicit economic models, Keynesian or other.[7] He said many times that he did not find economic models useful, and he gave most attention to market data and market participants, not economists. Martin made many speeches opposing inflation and pointing out its costs. As I note below, he did not welcome what happened during the last years of his management of the Federal Reserve, from 1965 to early 1970.

Gordon (1977, p. 276) concluded that his model based on a Phillips curve failed "to explain the increased variance of inflation during 1971-76 as compared to the pre-1971 period." The model did better at explaining the cumulative change. Gordon concluded that the Phillips curve became steeper after 1971, but he offered no explanation of the change. The change in the estimated coefficients of his equations from estimates for earlier periods suggests that the underlying structure had changed. The likely reason was that the public had learned to expect inflation.[8] A common finding at the time was that the trade-off between inflation and unemployment became steeper (imposing a more inflationary cost of reducing unemployment) as time passed.

Misinformation

In a series of papers, Orphanides showed that the information available to policymakers from 1987 to 1992 differed, at times substantially, from the data published subsequently for output and inflation. One of his papers (Orphanides, 2001, Figure 2) shows that the output gap, as measured at the time, was generally larger than the output gap based on data recorded in the revised national accounts. The difference was often sufficient to mislead policymakers adjusting policy in response to the output gap and inflation. Orphanides (2004) shows that the principal sources of error were two misperceptions: (i) Through much of the 1970s, policymakers assumed that full employment meant an unemployment rate of about 4 percent; they were slow to recognize that the so-called natural rate of unemployment had increased. (ii) Productivity growth slowed in the late 1960s or early 1970s, but policymakers continued to expect a return to the higher productivity growth of earlier postwar years.

Orphanides's explanation has considerable verisimilitude, as he shows. I would add that policymakers erred in treating the output loss following the 1973 and 1979 oil shocks as evidence of recession, instead of a one-time transfer to the oil producers that permanently reduced the level of output. This contributed to the mismeasurement of the output gap and the desire to raise output by monetary expansion. This is an example of the pervasive problem created by failing to distinguish between one-time changes and maintained rates of change. The problem remains currently in discussions of inflation targeting. At the time, Germany, Switzerland, and Japan did not make this error and experienced less inflation despite greater dependence on imported oil. This shows that alternatives were known. Fortunately, the Federal Reserve did not repeat the error in 2004.

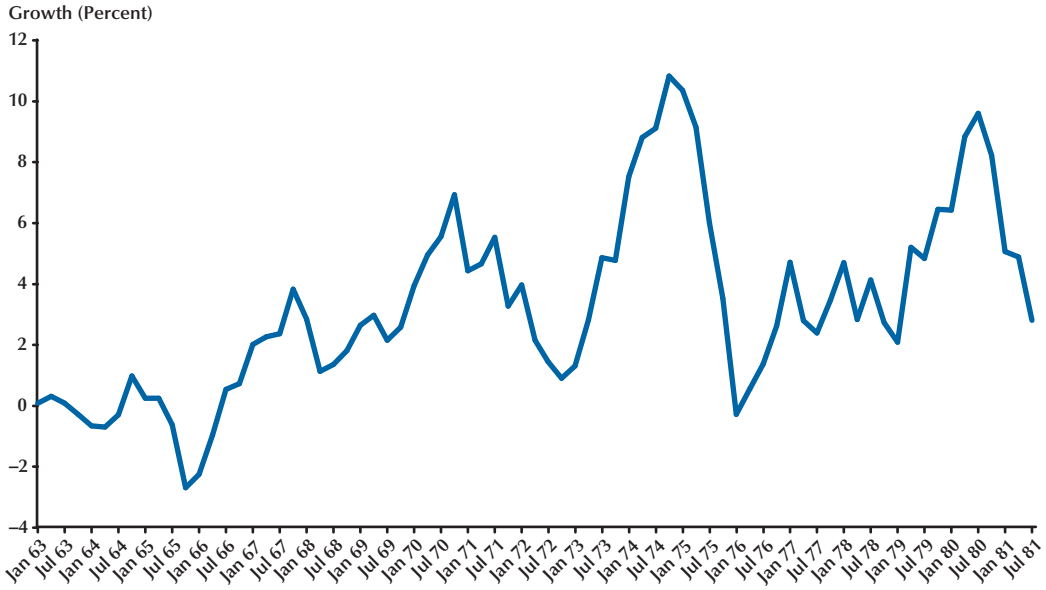
The more general point based on Orphanides's work is that the Federal Reserve underestimated inflation throughout the Great Inflation. The persistence of the error raises a question: Why did the FOMC members not recognize the error after a few years and adjust their procedures?

[7] Of course, anyone who makes repeated decisions, and does not act haphazardly, can be described as having a framework in mind. This is far different from saying that Martin had an economic model relating interest rates or free reserves to output and prices. As he often said, he thought of policy as a river that had to be controlled enough to irrigate the fields without flooding them. After reading Martin's statements in Board and FOMC meetings, in White House conferences, and in the question-and-answer sessions in Congress (as opposed to statements that his staff wrote for him), I cannot find an economic model. In 1963-64, as a temporary member of the House Banking Committee staff, I interviewed Chairman Martin and asked him to explain how he thought monetary policy worked. He explained about rivers irrigating fields.

[8] Sargent (1999) develops an explanation that depends on the belief that there was a permanent (or long-run) trade-off between inflation and unemployment. Sargent (2002, pp. 80-85) supplements that explanation by pointing to several additional errors.

Figure 3

Year-Over-Year Monetary Base Growth Minus Year-Over-Year Real GDP Growth, 1963:Q1–1981:Q3



The Role of Money Growth

A noticeable change occurred in the 1960s. By 1960-61, policy had driven the CPI inflation rate from an annual rate of 3.5 percent in 1958 to 1 percent or less in 1959-61. Under the influence of Winfield W. Riefler, secretary of the FOMC and an influential adviser, Chairman Martin at times testified about keeping the average rate of monetary growth close to the average rate of output growth.

After Riefler retired at the end of 1958, this model of inflation disappeared from the Board and its staff. Malcolm Bryan of the Richmond Reserve Bank and D.C. Johns and Darryl Francis of the St. Louis Bank brought this analysis to the FOMC in the 1960s, without much impact on decisions. Martin at this stage dismissed money growth, claiming that he did not understand the money supply. Governor Sherman Maisel, at the Board from 1965 to 1972, is an exception. He often urged a policy of controlling money growth. He was not, however, willing to control inflation if it required more than a modest increase in the unemployment rate.

Figure 3 suggests that, in addition to its error in measuring growth of real output, neglect of money growth—here, growth of the monetary base—contributed to the policy error.[9] Comparing Figures 1 and 3 shows that growth of the base in excess of output growth leads the inflation rate throughout the period. Excess growth of the base would have been a useful statistic for future inflation. The Federal Reserve Board staff gave it little or no weight.

Economists in the Nixon administration did not neglect money growth. Neglect of money growth contributes to an understanding of the start of the inflation in 1965-66, but neglect cannot explain why inflation continued after 1969. Economists in the Nixon administration watched reported money growth closely and overemphasized the effect of short-term changes. Their larger error was that most often they wanted to increase money growth to reduce the unemployment rate.

[9] Base growth is from Anderson and Rasche (1999), so it adjusts for changes in reserve requirement ratios.

A Remaining Puzzle

The references to Orphanides, Sargent, Taylor, and Romer and Romer offer explanations of the Great Inflation compatible with the more general statement that policymakers ignored economic theories that were available. Indeed, the monetarist critique at the time emphasized these differences, as Franco Modigliani (1977) later acknowledged.

The remaining large puzzle is to explain why this happened. Why did the Federal Reserve dismiss for years the long-run vertical Phillips curve and the effect of inflation on nominal interest rates, wages, and anticipations more generally? Propositions that attribute the Great Inflation to analytical errors of one kind or another ought to be supplemented by an explanation of why the error persisted for 15 years before policy changed. As is well known, policymakers began anti-inflation policies as early as 1966 and several times after—1969, 1973, 1978-79, and 1980. They were aware of the Great Inflation but, until 1979-82, they did not persist in policies to end it.

My main objection to explanations based on persistent policy errors is that they are incomplete. Federal Reserve officials could observe inflation rates. They knew that their policies had not ended inflation. Most often inflation was above their forecast. Yet, they did not change course. Arthur F. Burns, who became Chairman of the Board of Governors in 1970, was a distinguished economist, influenced more by data and induction than by deductive theories. Yet, he also failed to stop the inflation and, at times, saw it rise to rates never before experienced in U.S. peacetime history. Most of the FOMC members were not ideologues or slavish adherents to a particular theory. Most regarded themselves as practical men, meaning they were not attached to any particular theory and were willing to discard analyses that did not work. Martin especially was both dismissive of economic theories and strongly in favor of price stability and the fixed exchange rate system. Yet, he left the chairmanship with CPI inflation at a 6 percent annual rate and the fixed exchange rate system on the edge of collapse.

While I accept the importance of analytic errors, I do not believe that either the start of inflation or the 15 years that followed can be explained fully as a consequence of errors in the economic theory that the FOMC applied. In the rest of the paper, the members of the FOMC and the administrations explain their reasoning.

One additional caveat is that the Federal Reserve is not a monolith. Members of the FOMC have independent views. Particularly in the 1960s, they were mostly noneconomists. They had considerable difficulty agreeing on how to implement actions, as Maisel (*Diary*, 1973) documents fully. The staff, or part of it, had a model, but insiders who have written about the 1960s and 1970s often emphasize inconsistency in the choices made by the FOMC (see Lombra and Moran, 1980, Pierce, 1980, and Maisel, *Diary*, various years).

The international character of the Great Inflation is sometimes advanced as support for explanations based on errors in economic theory. The claim is that many countries made the same errors, particularly denial of the natural rate hypothesis. All experienced inflation. Once policymakers everywhere accepted the natural rate hypothesis, time inconsistency theory, understanding of the need for credibility, and rational expectations, inflation declined.

Appealing as this argument is to economists, it fails to separate the start of inflation and its continuance. The start of inflation occurred under the Bretton Woods system of fixed exchange rates. Surplus countries experienced inflation because they would not appreciate their currencies to stop the inflation, and those that did appreciate made at most modest increases in their exchange rate until 1971. They were fully aware of the problem; they did not want a solution that reduced their exports or slowed the growth of output and employment.[10] They opposed dollar depreciation. Once the fixed exchange rate system ended, Japan, Germany, Switzerland, and Austria reduced their inflation rates. Others permitted inflation to continue or increase.

The United Kingdom was the principal deficit country, aside from the United States. It comes closest to supporting the policy errors (or preferences) explanation. Policymakers in both U.K.

[10] Think of China, Taiwan, and Korea, currently.

parties accepted and used a simple Keynesian model. The long delay of sterling devaluation from 1964 to 1967 and the policy measures chosen are evidence of the reluctance to slow growth (Nelson, 2003).

WHY INFLATION STARTED

The Great Inflation started while William McChesney Martin Jr. was Chairman of the Board of Governors. Martin was not a wild radical eager to confiscate the wealth in outstanding bonds and fixed nominal values. He was not a radical of any kind. On the contrary, he was a symbol of conservative fiscal policy and "sound" finance. His contemporaries often portrayed him in caricature wearing a high starched collar and looking like a refugee from the 19th century. He gave many speeches denouncing unbalanced federal budgets, balance of payments deficits, and fiscal profligacy.

Martin seems a most unlikely person to preside over monetary policy at the start of the Great Inflation. Yet, until January 1970, he was in a position to stop it. He failed to do so. When he left office, broad-based measures of prices had increased 5 to 6 percent in the previous year, an unusually high rate of inflation for a relatively peaceful period.

Inflation was not new in 1965, and it was not new to Martin. He had successfully ended the inflation that followed the Korean War. By late 1952, average annual increases in consumer prices reached 1 to 2 percent and continued to fall after price controls ended. By 1954-55, inflation was modestly negative. Again, in 1959-60, average annual CPI fell to 0 to 2 percent from 3 to 4 percent in 1957-58.

The start of the Great Inflation—the sustained increase in the price level—was a monetary event. Monetary policy could have mitigated or prevented the inflation but failed to do so. This section discusses two questions: Why did the Federal Reserve permit inflation to return in 1965? Why did it not repeat the actions that had ended inflation twice in the 1950s?

The detail in the chapter of my history (Meltzer, forthcoming) from which this material is drawn suggests not one answer but several. Three seem most important. First is Martin's leadership and beliefs. Second, neither Martin, nor his colleagues in the FOMC, nor the staff had a valid theory of inflation or much of a theory at all. Nor did they have a common set of beliefs about how the economy worked. And some of their main ideas were wrong, as the literature cited earlier points out. Third, institutional arrangements hindered or prevented the taking of timely effective action and, thus, increased inflation. Beliefs and arrangements worked together to allow inflation to start and to continue. One of the most important arrangements was the Employment Act. The prevalent belief was that the Act required coordination of fiscal and monetary policy to achieve an unemployment rate of 4 percent or less. This became a national objective.

Martin's Leadership and Beliefs

Martin was a highly respected Chairman. He believed passionately in the independence of the Federal Reserve, and he had the courage to insist on its independence when pressured by President Johnson or by presidential staff and officials. In his oral history, he described fully and at length the pressure from the President to rescind the discount rate increase in 1965 and his resistance to presidential pressure at other times.

However, at times, Martin responded to administration pressure by hesitating or delaying action. Although he made a widely reported speech about the dangers of inflation at Columbia University in June 1965, the Federal Reserve did not raise interest rates until December. He urged delay in October 1965. His reason was coordination. He told the FOMC that "he had the responsibility for maintaining System relations within the Government…and he had made that one of his principal concerns during the fourteen years he had held his present office" (FOMC, Minutes, October 12, 1965, pp. 68-69).

He was not confrontational, dogmatic, or unwilling to change his mind. He admitted mistakes and respected Board members who disagreed with him. If a majority did not agree with him about a policy change, he would, if necessary, wait months until a majority formed.

In the System's early years, the Federal Reserve was independent of government, although at times restricted by gold-standard rules. The government rarely intervened in Federal Reserve decisions, despite having two members on the Board; the Federal Reserve operated independently and divulged little information.

By the 1950s, standards had changed. Central banks controlled one part of the policy "mix" that affected the level of employment, output, and prices. Although no longer represented on the Board, successive administrations recognized that the public expected government to maintain high employment rates and avoid inflation. The Employment Act of 1946 codified this practice.

The prevailing interpretation of the Employment Act changed the meaning of central bank independence and with it the goal of monetary policy. In an oft-quoted remark, Martin defined independence indirectly by saying that the Federal Reserve had to take away the punch bowl while the party was still on. His more formal statement described the Federal Reserve as independent within the government, not independent of the government. To those like Martin, that statement went beyond recognizing that the Federal Reserve was the agent of Congress—it also recognized that Congress had delegated and could withdraw its constitutional responsibility to coin money and regulate its value.

The March 1951 Accord freed the Federal Reserve from Treasury control of interest rate levels but retained its co-equal responsibility for debt management. The Treasury had to price its issues in light of current market interest rates. The Federal Reserve's role was to prevent the market from failing to accept a Treasury issue at the announced price; in practice that meant the Federal Reserve supplied enough reserves to keep interest rates from rising around the time the Treasury sold its offering.

Martin explained many times that Congress voted the budget and approved deficit finance. The Federal Reserve was not empowered to prevent the deficit or refuse to finance it. Central bank independence stopped well short of that. Therefore, he complained often about the size and frequency of budget deficits, but the Federal Reserve provided the reserves to finance them. And it rarely felt able to remove the additional reserves after it supported the Treasury's offering. That would have meant higher interest rates and a refusal to finance the deficits that Congress voted. It also implied temporarily higher unemployment.

The problem arose because the Federal Reserve contributed to debt management by adopting an even-keel policy. The Treasury announced the interest rate on its note and bond issues, and it considered an issue to have failed if there was large attrition. Under the even-keel policy, the Federal Reserve kept interest rates from changing before, during, and for a few weeks after the issue was sold. If the issue failed, the System bought it, supplying reserves.

Failures were rare. More often the System supplied enough reserves at the fixed interest rate to permit banks to buy unsold issues. These reserves generally remained with the banks; the Federal Reserve rarely withdrew them subsequently.

Auctioning notes and bonds would have avoided the problem. Both the Federal Reserve and the Treasury opposed securities auctions (except for bills) when the issue arose in the 1950s and 1960s. Finally, in the early 1970s, the Treasury began to auction debt, and the even-keel policy ended. Even-keel is only important for the start and early years of inflation.

The Federal Reserve reduced inflation from 3.5 percent to about zero at the end of the 1950s. The Eisenhower administration shifted from a budget deficit to a surplus between fiscal 1959 and 1960, so debt management played a small role and there was no large increment of debt to finance. The Federal Reserve could end inflation with a maximum federal funds rate below 4 percent. This was not the case in the early years of the Great Inflation, 1965 to 1968. The Johnson administration maintained its spending for Vietnam and the Great Society. Congress delayed approving the surtax. The budget deficit reached $25 billion current dollars, 3 percent of gross national product (GNP). The Federal Reserve had to invoke even-keel frequently. Monetary base growth remained at 5 to 6 percent, compared with

1 to 4 percent from 1961 to 1964. And growth slowed, so the excess of base growth over output growth rose, as shown in Figure 3.

In the early 1960s, Martin regarded unemployment as structural, not responsive to expansive monetary and fiscal policies. Kennedy administration economists blamed restrictive fiscal and monetary policies, including "fiscal drag," the tendency of the budget to reach balance before the economy reached full employment. They wanted permanent tax reduction supported by an expansive monetary policy to finance the deficit. In their analysis, policy coordination meant that the government used fiscal actions to adjust the economy. The Federal Reserve was supposed to support the policy by preventing an increase in market interest rates. Martin did not agree with the analysis or the policy, and he later decided that he had been wrong. But he agreed that the Federal Reserve should assist in financing the deficit because Congress approved it. Thus, he accepted "coordination."[11] Later, when deficits increased in size and Treasury offerings became larger and more frequent, the Federal Reserve had fewer days on which it could increase interest rates and more debt issues to help manage.

Martin often said that monetary policy *alone* could not prevent inflation or achieve balance in international payments. Given his belief that the Federal Reserve shared responsibility for successful deficit finance, his statement became true if it required excessive money growth (see Figure 3).

Some of his successors showed that inflation could be reduced *even* in a period with large deficits. In the 1980s, the federal government ran large, persistent deficits. The Federal Reserve had an independent policy, did not assist in deficit finance, and did not coordinate policy. The important operating changes were the end of the Federal Reserve's even-keel policy of holding interest rates constant when the Treasury sold notes or bonds and the end of policy coordination as practiced in the 1960s. By the 1980s, the Treasury auctioned its securities and let the market price them instead of having the Treasury set a price that the Federal Reserve felt bound to support.

The Role of Economics

Martin often began a conversation by saying, "I am not an economist." He had little interest in economic explanations of inflation, claimed not to "understand" the money stock, and did not have much confidence in the accuracy of economic data. He saw, correctly, that short-term changes were unreliable and were often revised substantially.

Martin did not articulate a coherent theory or explanation of the relation of Federal Reserve policy to economic activity and prices. When pressed, he fell back on his analogy to a river. Other members of the FOMC held a wide range of views about monetary policy. Several presidents and Board members were practical men without much interest in theoretical explanations of inflation or economic activity. Bryan (Atlanta Fed) and Johns and later Francis (St. Louis Fed) emphasized money growth and at times proposed procedures for adjusting policy to control money growth, but they never received majority support. A few members of the FOMC, and a growing number of senior staff members, relied on some version of Keynesian theory. To the extent that there was a dominant view, in the early 1960s, the members favored making judgments for the next three weeks based on observable data. If it seemed appropriate, the decision could be revised at the next meeting. This meant that there was no consensus to act against inflation or unemployment until it occurred and was well established. That Chairman Martin was the leading member of this group contributed to its dominance. We know now that this procedure is not optimal.

A by-product of this atheoretical approach was the vague instruction given to the account manager, who was responsible for implementing FOMC policy action. Unable to agree on how their actions affected their longer-term goals, the members could not decide how best to implement policy actions. The Manager of the System Open Market Account had considerable discretion and, the minutes show, members frequently differed

[11] The Quadriad became a principal means of coordination. The Chairman joined the Secretary of the Treasury, Director of the Budget, and Chairman of the Council of Economic Advisers in meetings with the President. The Quadriad started in the Eisenhower administration, but it became a principal means of influencing Martin during the Kennedy and Johnson administrations.

over whether the Manager had followed instructions. The Manager's focus was the money market, so his decisions gave much more weight to current technical details than to longer-range objectives such as inflation. For example, after 1970, the Manager rarely paid attention to the FOMC's proviso clause, instructing him to change money market conditions whenever growth of reserves (or some aggregate) became excessive or deficient.

Instructions in the 1960s, to maintain the "tone and feel of the market," achieve moderate ease, or err on the side of restraint, gave little direction even when the members agreed on objectives. Often the instructions in the directive and the stated consensus were so imprecise that one member would criticize the Manager's actions as inconsistent with his instructions and another would follow with praise for the Manager's performance.

The use of free reserves as a policy target added to the dissatisfaction that some members expressed. Free reserves rose when member bank borrowing fell, and conversely. Borrowing rose and fell cyclically, so free reserves moved procyclically. Eventually some members noticed the procyclicality. Also, free reserves often moved opposite to or independently of total reserves, the money stock, or bank credit.

In November 1960, James Knipe, consultant to the Chairman, wrote a memo criticizing the instructions that the FOMC sent to the Desk: "The directives are cast as such pious expressions of intent that they convey…almost no meaning… One gets very little sense of progress from one meeting to the next, and not much of an account of what has just been accomplished or what the Committee believes ought to be accomplished during the next three weeks" (Knipe, November 14, 1960, p. 6). The memo suggested "some use of numbers" (p. 6).

A few weeks later, Malcolm Bryan (Atlanta Fed) wrote to a senior staff member, Woodlief Thomas: "We can defend the actual policy; what I am afraid we can't do is to explain what we mean by the instructions we give" (Bryan, January 14, 1961). Bryan continued his effort to improve procedures. In April 1961, he urged the FOMC to "manage the reserve position…with a great deal more precision, and with a steadier hand" (FOMC, Minutes, April 18, 1961, p. 22). Bryan argued that total reserves should grow at a 3 percent trend rate based on growth of population and transactions. The figure he presented at the meeting showed that the growth rate fell below trend before each of the postwar recessions and rose above trend during the late stages of economic expansions. Bryan concluded that "we have tended to overstay our position of tightness and to be too tight, and then to overstay our position of ease and to be too easy" (p. 22).

Governor King supported Bryan and welcomed his analysis, but Governor Robertson wanted more expansion than 3 percent growth. He argued that the demand for money changed over time, so he opposed using any "historical trend line as a strategic objective of policy" (FOMC, Minutes, May 9, 1961, p. 42). Bryan's proposal attracted support from one or two presidents, but both Martin and Hayes disliked "mechanical rules" and preferred to rely on judgments made at the time.

The directive to the Manager usually changed when policy changed. Although the members discussed changes in the directive vigorously, they rarely referred to the directive when commenting on policy operations. The directive became public when the Board published its annual report, from 3 to 15 months after the FOMC's decisions. The directive's principal role was to show that the FOMC responded promptly to changes in the economy. It did not fully succeed.

A more substantive problem was the lack of continuity and the weak influence of long-term objectives. Each meeting considered and responded to the most recent data. The members did not have a framework to relate current changes to longer-term developments. Many of the changes to which they responded were transitory, often random movements. Martin (and others) recognized that their policy "must be tailored to fit the shape of a future visible only in dim outline" (Martin, July 11, 1961, p. 68). They lacked a formal or common means of doing so. Martin always remained skeptical about economic models and model-based forecasts, but he did not propose a general guideline as a substitute.

Members recognized the omission of explicit policy guides and the weak connection between actions and long-term goals. In 1961, Vice Chairman Canby Balderston made a long statement about the lack of procedures for achieving long-term objectives. He recognized that discussion loosely related to a long-term objective was sub-optimal and used the growth rate of total reserves to illustrate his points.

> The guiding philosophy that I favor for the Committee's decision-making is to proceed steadily, week by week, toward whatever goal seems appropriate.
>
> [Recently] the Committee may have changed its objective from a 5 percent growth rate to a 3 percent growth rate [of total reserves] without full realization as to what had happened, and since the last meeting the implementation of Committee policy has resulted in a radical departure even from the lower growth rate. (FOMC, Minutes, August 22, 1961, pp. 47-48)

Early in 1961, the FOMC considered a memo suggesting changes in the directive. The memo started a discussion that continued through the year. It showed considerable awareness of the need for change. The discussion had two objectives: improving control and public relations. Several members wanted to publish reports of their actions more frequently.

As a consequence, the FOMC made the current instruction to the Manager slightly more explicit by adding a paragraph to the directive. Members of the FOMC, at this time, used different measures or variables to describe the current policy target. Martin did not attempt to reconcile these differences, so the Manager (or whoever guided the Manager) retained control of policy action. The FOMC did not adopt some of the more explicit instructions suggested by the staff (Ralph Young, September 6, 1961). George Clay (Kansas City Fed) gave the reason: "lack of agreement among the Committee members" (Clay, November 13, 1961, p. 2).

Alfred Hayes (New York Fed) favored a proposal by Watrous Irons (Dallas Fed) that would allow FOMC members to comment on a "statement of the general economic policy position of the Committee as it developed out of the discussion" (Hayes, November 3, 1961, p. 3). The Secretary of the FOMC and the Manager would prepare the statement immediately after the meeting. Following a review by the Chairman, members would review, approve, dissent, or propose changes. The statement would appear with the policy directive in the record for the meeting. Hayes emphasized that the policy statement would be short, no more than "three or four sentences to express the main points integral to current policy" (p. 3). The objective was to give greater emphasis to goals such as price stability that could be realized only over time.

Eliot Swan (San Francisco Fed) wrote the following: "We need some economic analysis of policy on a fairly current basis, done within the System, and presented regularly to the public." This would give the public a sense "of what the System is trying to do, how it tried to do it, and what seems to have been accomplished" (Swan, November 10, 1961, p. 3). Swan undercut his proposal by adding that this statement would not be an official statement endorsed by the FOMC.

George Clay (Kansas City Fed) recognized one problem with proposals like Swan's or any attempt to make the directive more explicit. There was a "lack of agreement among the Committee members…[E]fforts to be completely explicit may make it more difficult to arrive at a consensus. But a lack of specific directions shifts the responsibility of interpretation to the Trading Desk… Attempts to be specific also are hampered by the fact that individual members of the Committee differ in the measures through which they express their choices—using free reserves, interest rates, credit expansion, and other terms that cannot be interchanged" (Clay, November 13, 1961, p. 2).

A remaining problem was to agree on the purpose served by the directive and statement of procedure. Public relations, a public record, and directions to the Manager received different weights from each of the members. The more astute members recognized that any substantive statement restricted future actions. Several agreed that procedural rules, such as dealing in bills only

or not supporting bond prices, "are unnecessary and can prove to be administratively embarrassing at times" (Deming, November 24, 1961, p. 1). The problem in writing explicit rules was that "they may be limiting at times and thus force hard-to-explain deviations; if they are written so broadly as to escape these difficulties, they become almost meaningless" (pp. 1-2). Frederick Deming (Minneapolis Fed) opposed an explicit target because the FOMC would have to explain why it deviated. He insisted that the directive

> could not be couched in terms of a guide or guides such as free reserves, money supply, total reserves, federal funds or bill rates…I simply do not believe that any one indicator is…good enough to use all of the time and I fear that should we attempt to use one (or more) in the directive itself, we will spend a great deal of time subsequently trying to explain why we did not get quite the precise results that these apparently precise indicators would imply we sought. I also feel that an attempt to write directives in specifics would push uncomfortably close to mechanistic policymaking. (p. 3)

The letters show clearly that one major purpose that the old flexible and imprecise directive served was covering up disagreements within the FOMC. Bryan and Hayes did not agree about a quantitative target for total reserves, but both agreed with Irons that the FOMC should maintain procedural rules. Bryan differed with several of his colleagues by recognizing the problem that a vague directive posed. Unlike the majority, he believed the FOMC would be well served if it adopted a quantitative target, but he understood that his proposal did not attract much support.

The discussion at this meeting, many subsequent discussions, and failure to adopt a quantitative objective suggest that a majority did not favor precise instructions and explicit objectives. One reason is that ambiguity provided opportunities for Martin, Hayes, or the Manager to change directions. Unambiguous policy objectives and operating procedures to achieve the objectives required a commitment to rule-like behavior that many on the FOMC were not willing to make.[12] Martin usually made no comment on more explicit statements of direction, perhaps because he recognized that agreement was unlikely.

Once inflation started, the issues changed. Some members believed that inflation could permanently lower the unemployment rate. Others were more concerned about the temporary increase in the unemployment rate resulting from actions to slow inflation. Several accepted that little could be done as long as the federal government ran budget deficits. Since there was no generally accepted framework relating unemployment, inflation, budget deficits, balance of payments, and Federal Reserve actions, there was no agreement about a long-term strategy.

The members recognized that they did not have a common framework. After Sherman Maisel became a Federal Reserve Governor, in 1965, he tried to make policymaking more coherent and systematic (Maisel, 1973). He soon recognized that there was no basis for agreement; members told him that they were unlikely to find a common framework.

The minutes have an occasional remark about anticipations of inflation. There is little evidence of a general understanding at the time that anticipated inflation raised interest rates. The FOMC did not distinguish between real and nominal rates until much later. At the start of the inflation, and for a long time after, members using nominal interest rates overestimated the degree of restraint. Misinterpretation added to the pressures from President Johnson to keep interest rates from rising. They also overestimated the expected growth of output after productivity growth slowed in the mid-1960s.

One way to avoid responsibility for inflation was to find some other cause. Much public and policy discussion blamed labor union demands for starting inflation, treating these wage demands as autonomous events and not as a response to actual and anticipated inflation. Many at the Federal Reserve and in the administration shared this view. This led to the use of guideposts for

[12] Cukierman and Meltzer (1986) later showed the advantages of ambiguous policy directives for policymakers who wanted to change objectives.

wage and price increases. The universal failure of guideposts and guidelines to prevent inflation did not quickly change these views. And it did not remind the proponents that noninflationary policies would prevent large relative price changes from affecting the general price level. Lucas (1972) and Laidler and Parkin (1975) showed that relative price changes would not cause a sustained inflation in the absence of actual or anticipated expansionary policy.

Martin explicitly rejected the idea that policy could reduce unemployment now and respond to inflation later, the Phillips curve reasoning favored by Walter Heller and other members of the 1964-65 Council of Economic Advisers. The Kennedy-Johnson tax cut brought this issue to the front because the Johnson administration argued that the deficit created by the tax cut was both desirable and temporary. By approving the tax cut, Congress knew that the resulting deficit was not an accident. So did Martin and the Federal Reserve. Martin believed he had a responsibility to finance it without a large increase in interest rates, but he did not accept the analytic argument. It wasn't that the Phillips curve was vertical; it was whether there was a reliable trade-off.

> Over the years, we have seen counterpoised full employment or price stability, social objectives or financial objectives, and stagnation or inflation. In the last case there was even a serious discussion of the number of percentage points of inflation we might trade off for a percentage point increase in our growth rate. The underlying fallacy of this approach is that it assumes we can concentrate on one major goal without considering collateral, and perhaps deleterious, side effects on other objectives. But we cannot. If we were to neglect international financial equilibrium, or price stability, or financial soundness in our understandable zeal to promote faster domestic growth, full employment, or socially desirable programs, we would be confronted with general failure. (Martin, February 1, 1963, pp. 10-11)

That statement showed that Martin was aware of the inflationary (and balance of payments) consequences of financing the deficit. But he was under pressure from his own beliefs about the meaning of independence, from the Council's belief in policy coordination, and from President Johnson's opposition to higher interest rates.

The Council used its *Economic Report of the President* to instruct the Federal Reserve about proper actions: "It would be self-defeating to cancel the stimulus of tax reduction by tightening money" (Council of Economic Advisers, 1964, p. 11). Martin recognized the political pressure to avoid increasing interest rates before the 1964 election. His early meetings with President Johnson reinforced his beliefs that Johnson was a populist who supported his populist views with the policy coordination arguments he learned from Heller and others.[13]

In December 1964, the Federal Reserve raised the federal funds rate by 0.5 points to 4 percent. Monetary base growth remained at a 5 to 6 percent annual rate. By May 1965, annual CPI inflation rose to 1.75 to 2 percent, the highest sustained rate since 1958.

The year 1965 was the transition from one of the best four-year periods in U.S. experience to years of inflation and slow growth. It was the last year of strong productivity growth and the first year of rising inflation. The four-quarter average rate of increase in the GNP deflator rose from 1.5 to 3 percent. The CPI began the year rising at a 1 percent annual rate. It ended at 2 percent; a 12-month moving average of the CPI rate of increase did not fall below 2 percent in any month for the next 20 years. The unemployment rate fell from 5 percent at the start of the year to 4 percent at the end.

To administration economists, with their faith in the Phillips curve, the increase in inflation was the price paid for lower unemployment. They were willing to pay the price, reluctant to tighten policy. Martin and several of his colleagues on

[13] In case Martin forgot, Heller reminded him and urged President Johnson to do the same. For example, on March 2, Heller sent a memo to Johnson stating, "Martin's fears of prospective inflation seem to be mounting to a fever pitch" (Heller, March 2, 1964). He urged Johnson to hold a meeting of the Quadriad to increase pressure on Martin. Arthur Okun quoted Johnson's comment on interest rates: "It's hard for a boy from Texas ever to see high interest rates as a lesser evil than anything else" (Hargrove and Morley, 1984, p. 274).

the FOMC held a very different view. They were more concerned about inflation and the balance of payments.

Until 1965, the U.S. balance of payments had improved, and not just because of the visible capital controls and military purchases at home. Relative prices shifted to increase U.S. competitive advantage. The beginning of domestic inflation reduced this advantage, leading to a decline in the current account surplus.

The administration made the first of several errors. Early in 1965 the President's economic report and his other messages announced the need for further expansion and proposed a reduction in excise taxes and a "budget that will once again contribute expansionary force rather than restrictive pressure" (Council of Economic Advisers [CEA], 1965, p. 9). This was part of an ambitious program to achieve "the Great Society" by increasing funds for poverty programs, welfare, and training. Monetary policy could contribute by continuing to twist the yield curve by holding up short-term interest rates to stem a capital outflow, while lowering long-term rates to encourage domestic expansion (pp. 105-06). The President also asked for repeal of the 25 percent gold reserve requirement against deposit liabilities of Reserve Banks (p. 12).

The administration's concern for fiscal stimulus came despite a decline in unemployment to 4.8 percent in January 1965 and a reported 7.5 percent annual rate of increase in industrial production in 1964, a year with a major automobile strike. These and other signs of strength should have suggested that additional stimulus was unnecessary, but administration economists did not interpret them that way. Reports of a large increase in the payments deficit at the end of 1964 gave evidence that the interest equalization tax had shifted a large part of foreign borrowing to banking markets not subject to the tax. The first quarter increase in the deflator, 4.9 percent at an annual rate, gave a second warning: This was the largest quarterly increase in eight years. The gold outflow in January gave an additional warning: At $263 million, it was twice the amount of gold sales for all of 1964. Outflows continued in February and March, reaching a record $832 million for the first quarter and $1.664 billion for the calendar year.[14] About half the outflow went to France.

If the push for additional stimulus was the first mistake made that year, it was not the last. More consequential were the efforts in mid-summer to hide the increase in military spending to support the Vietnam War and, late in the year, public pressure on the Federal Reserve to prevent any increase in interest rates. The Federal Reserve chafed under administration pressure, but it permitted annual growth of the monetary base to reach 5.9 percent by December, the highest 12-month growth rate since early 1952.

The Federal Reserve did very little during the first half of 1965. Treasury borrowing required even-keel operations much of the time. That alone cannot explain the cautious, hesitant response. Four reasons stand out.

First, Martin wanted the FOMC to reach a consensus before it acted. He often waited, thinking that discussion, events, and perhaps collegiality would help form the consensus. But Governors Mitchell and Robertson persistently opposed tighter policy. On April 30, Sherman Maisel, an economics professor from the University of California at Berkeley, joined the Board, replacing a banker, Abbot Mills. Maisel usually voted with Mitchell and Robertson. Later, after the President appointed Andrew Brimmer to replace Canby Balderston, Martin was never certain when he would have a majority of the seven Board members. He hesitated to act with a majority of the FOMC if it did not include a majority of the Board.

Second, and most important, Martin believed he had a duty to prevent inflation and maintain the dollar's value. This belief clashed with his firm belief that the Federal Reserve was independent within government. If an elected administration proposed and Congress approved budget deficits, the Federal Reserve had to help finance part of them. He could complain internally, and even externally, but he did not choose to undermine decisions of elected officials and legislators.

[14] The gold outflow included an additional subscription to the International Monetary Fund.

Third, "policy coordination" added greatly to the problem. Independence "within the government" suggested that monetary, fiscal, and other administration policies should seek the same objectives and attach similar weights to employment, price stability, and the payments deficit. This did not happen. Martin did not accept the mistaken idea that policymakers could maintain a welfare-maximizing inflation rate that lowered unemployment to the socially desirable minimum. He expressed much greater concern about inflation and the balance-of-payments deficit than President Johnson or his advisers. When Douglas Dillon left the administration, Martin lost a powerful ally inside. He had earlier lost a President who paid attention to his warnings and acquired one with entrenched populist views who hated "high" interest rates (Bernstein, 1996, p. 364).

Policy coordination ensnared Martin in administration policy. He willingly sacrificed part of the Federal Reserve's independence for the opportunity to be part of the economic "team," make his views known to the President, and coordinate policy actions.[15] Inevitably he compromised by surrendering some independence of action to coordinate policies. His offer to resign in February 1965 possibly reflected recognition that coordination with President Johnson and his advisers would be costly to Federal Reserve independence and to the country. Although he warned the country about inflation many times, he accepted reappointment in 1967 and remained until his term ended in 1970, without implementing the policy actions that he favored to achieve price stability and protect the gold stock.

President Johnson's main argument in 1965 was that coordination required Martin to wait until he announced the 1967 budget estimates in January 1966, but he refused to give accurate estimates. In November 1965, the working estimate called for $105 billion of total spending in fiscal 1967. By mid-January, estimated spending had increased to $106.4 billion for fiscal 1966 and $112.8 for 1967, but the 1967 estimate assumed that ordinary spending for the Vietnam War ended in December 1966. That held defense spending to $57 billion. Actual spending was $114.8 and $137.0 billion in fiscal 1966 and 1967, respectively, and defense spending reached $58 and $71 billion in the two years, respectively (Johnson, December 20, 1965).

Fourth, and of lesser importance, the Federal Reserve staff and several of the members denied for several years that inflation had either begun or increased. They did not deny the numbers they saw. Like Gardner Ackley, they gave special explanations—a relative price theory of the general price level—in effect claiming that the rise in the price level resulted from one-time, transitory changes that they did not expect to repeat. Later, they added other explanations, especially that the cause of inflation had changed from the classic "demand pull" to the new "cost push." This reasoning exempted the Federal Reserve (and other central banks) from responsibility and suggested that the problem was not monetary. Governor Sherman Maisel (1973, p. 284) presented the main idea:

> In a period of general stability, a strong union or a monopolistic or oligopolistic group of companies may try to increase their income. If they have enough power, they can do so even though unemployment exists elsewhere. It is theoretically possible that other prices would fall as they raise their prices, but this is unlikely in most modern economies, where wages and prices are too rigid to react to minor increases in unemployment. In fact, the opposite occurs. Workers in industries with somewhat lower demand will strive for higher wages also…[S]ince profits are generally not that large, over time any increase in wages must show up in higher prices.

The economy had not acted that way in 1961-64. But, even if modern economies acted as Maisel described, his discussion explains why the price level would be higher. It does not explain why prices would continue to increase or increase

[15] During the 1964 expansion with low inflation, Martin told Heller that he had been wrong to think that the tax cut "would quickly fire up, not to say overheat the economy." He offered to "cooperate with the CEA—he always has…but he was particularly warm and insistent about it" (Heller, July 17, 1964).

at a rising rate. This distinction, between a change in price or wage level and a maintained rate of change, hindered clear thinking about inflation. Sometimes the word meant any price level increase. Elsewhere it meant a sustained rate of increase. Since one-time price level increases often took place over time, it was easy, but misleading, to mix the two.

The sustained rate of price increase could not continue without an increase in money or its rate of use (velocity). Maisel recognized that without an increase in money, cost-push price increases were limited. He wrote that the principal reason prices continued to increase was "the unwillingness, for valid economic and political reasons, to allow the economy to suffer the necessary recession or depression which would accompany a policy of not expanding money because incomes are being pushed up from the cost side" (p. 25). Then he added a critical sentence: "The level of unemployment required to stabilize prices…is higher than that which the economy finds acceptable" (p. 25).

This popular explanation worked with other features of the Federal Reserve's approach, such as coordination, support for deficit finance, and failure to distinguish between real and nominal rates. No single person may have held all of these views. The ideas worked together to start inflation—sustained rates of price increase—and permit it to continue.

The most likely alternative explanation was not advanced at the time. Once the public learned that policymakers would act to prevent a rise in unemployment, they anticipated, correctly as it turned out, that anti-inflation policy would cease soon after unemployment started to increase. This is not to be confused with the vertical, long-run Phillips curve. It does not invoke a vertical Phillips curve; it is not inconsistent with that proposition, but it emphasizes the shifting policy analyzed in Cukierman and Meltzer (1986) and the anticipations induced by the policy.

The FOMC met eight times during the first half of 1965. It voted twice for "slightly firmer" policy, on February 2 and March 23. Governors Mitchell and Robertson opposed both changes, joined by President Clay (Kansas City Fed) in March. Free reserves responded to the changes, but interest rates declined during the first half of the year. In May, four members of the FOMC dissented; they wanted a tighter policy. Martin did not support them.

At almost every meeting, there are references to expanding activity, rising prices, rapid credit expansion, or an increasing payments deficit. Difficulties in separating persistent and temporary changes, such as anticipation of rising prices or inventory building in anticipation of a steel strike, reduced the impact of the observations. The administration put on additional controls to reduce the foreign payment outflow, supporting those who wished to put responsibility for the gold loss on the administration and away from monetary policy.

The FOMC remained divided during the spring. The May 25 meeting minutes summarized Chairman Martin's policy view:

> His own thinking probably tended in the direction of the group favoring firming, although no one could be sure about the appropriate timing. He was becoming increasingly worried about both the balance of payments and the possibility of domestic inflation. His views were not firm on either point. (FOMC, Minutes, May 25, 1965, p. 62)

His colleagues must have been surprised when he spoke at the Columbia University commencement a week later. His speech compared the economic situation in 1965 with that of 1928-29. He pointed to similarities and differences. He did not claim that the country faced a serious inflation threat. His concerns were financial weakness and speculation. The press and stock market speculators emphasized the alleged similarities with 1929, not the differences. Industrial stock prices fell 5.4 percent in the next five weeks and did not pass their previous peak for four months.

In the spring, the Treasury was concerned about a possible slowdown of economic growth. During the summer, a new problem slowly emerged. Beginning in July 1965, President Johnson expanded the resource and financial commitment to the Vietnam War by announcing

that additional troops would be sent to Vietnam. The President did not let the members of the Council or Treasury officials know the actual size of planned spending increases. Martin learned from Senator Richard Russell, as early as July, that the budget deficit would be much larger than Johnson admitted to the Treasury, the Council, or the Quadriad. "I had better information than the Treasury had…I went to the President, oh, I'd say four or five times and laid them out to him" (Martin, May 8, 1987a, pp. 1-2).

Johnson did not want to reduce spending, raise tax rates, or have the Federal Reserve raise interest rates. Martin described the conversation.

> He [President Johnson] didn't want any increase in rates and he wanted me to assure him that there wouldn't be. I couldn't do that, of course. I had already made up my mind that we needed an increase in rates. So I did my best to break this to him as gently as possible but wasn't so very successful in that he was absolutely convinced that I was trying to raise the rate and pull the rug out from under him. I said "Mr. President you know that I wouldn't do that to you even if I could." He said, "Well I'm afraid you can." And I said, "Well, I want to tell you right now that if I can [raise the rate] I will, because I think you're just on the wrong course. I've been perfectly fair with you. I was over here early this year." (Martin, May 8, 1987b, p. 9)

Despite increases in long-term rates in August and September, no action followed for several months. In July, Ellis (Boston Fed) dissented because he wanted a firmer policy. In late August, Trieber (New York Fed) did the same. Martin "was in complete agreement with the consensus…for no change in policy" (FOMC, Minutes, August 31, 1965, p. 68). Hayes argued for a tighter policy in September, including a discount rate increase. Balderston, Shephardson, and Ellis (Boston Fed) favored a discount rate increase after the Treasury completed its financing. Martin did not think the timing was right. The vote was nine to three for no change. Maisel, Mitchell, and Robertson dissented because interest rates had increased despite a policy of no change. They wanted policy to ease to roll back the increase.

At a Quadriad meeting early in October, Ackley and Treasury Secretary Henry Fowler urged Martin to delay any increase in interest rates until the evidence was clearer. Ackley proposed waiting until January, when the new budget data became available. Fowler argued that "risks of tightening are greater than the risks of overstaying present policies." He called the danger of overheating "tenuous," and he wanted the administration to oppose changes in the prime rate (Fowler, October 6, 1965, pp. 1-2).

Martin's memo for the Quadriad meeting tried to shift discussion from interest rates to credit growth. He noted that Regulation Q ceiling rates caused credit to flow outside the banking system, and he warned of "rising expectations, evidenced in financial markets and real investment." A slight increase in interest rates would help to extend the expansion and improve the balance of payments (Martin, October 6, 1965).

Martin's views did not prevail. A week later at the FOMC, he read his memo to the President. FOMC members split. Some agreed with Martin but wanted to wait for the Treasury to complete its financing. Others opposed because they saw no sign of inflation. Faced with a divided Committee and administration opposition, Martin not only did not insist, but voted against an increase. After warning the Committee about the danger of waiting too long, he explained why the FOMC should not change policy.

> As Chairman, he had the responsibility for maintaining System relations within the Government—for getting the thinking of the President and members of the Administration, and for apprising them of the thinking within the Committee—and he had made that one of his principal concerns during the fourteen years he had held his present office. Last week he had given the President a paper expressing his personal views…[H]e had talked with the Chairman of the Council of Economic Advisers, with Treasury officials, and with the President. They had all expressed the

> view that it would be unwise to change monetary policy now. The President had not taken a rigid position on the matter—he had not suggested that the Committee should abdicate its responsibility for formulating monetary policy…At the moment, however, the Administration was strongly opposed to a change in policy.… With a divided Committee and in the face of strong Administration opposition he did not believe it would be appropriate for him to lend his support to those who favored a change in policy now. (FOMC, Minutes, October 12, 1965, pp. 68-69)

The President was not much concerned about Martin's warnings about spending and the deficit. He spent much of the fall of 1965 pushing enactment of new spending programs for education and the environment (Califano, 2000, pp. 70, 81). Apparently, policy coordination worked only in one direction.

In September, Martin had agreed to let the Federal Reserve staff participate in a joint effort with the staffs of the other Quadriad members to study where the economy was headed. The report in November concluded that the Federal Reserve "should not tighten for the remainder of the year" and should reconsider action when the budget and GNP estimate for 1966 became known[16] (Okun, p. 24). Monetary tightening should wait for GNP to reach $720 billion, a 5 percent increase from 1965 and almost 2 percentage points above the standard forecast (p. 24).

Martin knew that the budget estimates understated the increase in defense spending and that Johnson had suppressed the planned increase. He knew also that contrary to standard practice, the Budget Bureau would not discuss the budgetary projections with him or his staff. Martin distrusted President Johnson and was inclined to give more attention to markets than to economists' forecasts. Government bond yields began to rise in August and had increased 20 basis points by mid-November to the highest level since 1960. This was a large increase by the standards of the time.

On November 4, the Treasury's issue of 18-month 4.25 percent notes was not well received, allegedly because of concerns about increased spending for Vietnam. Between August 1 and December 1, yields on 3- to 5-year Treasury issues rose 42 basis points to 4.52 percent (Board of Governors [BOG], 1965, p. 190). In the month of November, the System bought $5.5 billion of 1- to 5-year securities, mainly the new note issues, and sold Treasury bills or let them run off.

The market had signaled that interest rates should rise. With a few brief exceptions, the federal funds rate had remained above the discount rate since March. Data available at the time showed rapid growth in the monetary aggregates.

Martin had another source warning about inflation: the Federal Advisory Council (FAC), 12 bankers with statutory responsibility for advising the Board. Members explained the strength of investment spending as an attempt to substitute capital for rising labor costs (BOG, Minutes, September 21, 1965, p. 3). In November, the FAC repeated its September warning: "The Council is concerned with increasing evidence of the development of inflationary pressures, the continued strong demand for bank loans…Consequently, we believe the Board should be prepared to move in the direction of further restraint, including a tightening of reserves and an increase in the discount rate" (BOG, Minutes, November 16, 1965, p. 22).

Martin was, finally, ready to accept the challenge despite continued opposition from the administration. His reason was to show independence, not to reduce growth of credit and money. At the FOMC meeting on November 23, the staff proposed that if the FOMC tightened policy, it should reduce reserve growth and keep Regulation Q ceiling rates unchanged. This would force a reduction in CDs and bank credit. Hayes proposed the opposite, an increase in ceiling rates and the discount rate (Maisel, *Diary*, December 3, 1965, pp. 3-4). Nine of the twelve presidents either opposed a discount rate increase or wanted to wait. Martin said the market's "expectations were just as much that the President would not allow any interest rate changes as to the contrary" (FOMC, Minutes, November 23, 1965, p. 84). "He

[16] Martin did not share the report with Board members. We could not find a copy in the Board's archives.

wanted to raise the discount rate in order to free the interest rates from domination by the President and he was more interested in this than he was in tightening the amount of money" (Maisel, *Diary*, December 3, 1965, p. 15). He opposed an increase in reserve requirement ratios because he did not want to reduce availability. His aim was to show that the System had not yielded to the administration (Maisel, *Diary*, January 18, 1966, pp. 2-3).

Maisel warned Ackley that the discount rate would increase. Martin had already told him. The President was at his ranch in Texas recovering from a gall bladder operation. On November 29, the President's assistant relayed an urgent telegram from Ackley to the President in Texas warning that Martin intended to approve a discount rate increase the following week. The telegram quoted Maisel as urging the President to tell Governor Daane to oppose any increase until January (Califano, November 29, 1965). A few days later, Ackley followed with a memo claiming that he had failed to distinguish between real and nominal interest rates, but he argued that the voluntary restraint program on bank lending to foreigners was an effective substitute for higher interest rates in reducing the capital outflow. The President responded by inviting the Quadriad to his ranch the following Monday.

Martin decided to act before the Texas meeting. On December 3, the Board voted four to three to raise the discount rate at New York and Chicago. In the next ten days, all Reserve banks adopted the 4.5 percent rate. Robertson, Mitchell, and Maisel dissented. Dewey Daane cast the swing vote supporting the increase. Following the vote, the Board voted to increase Regulation Q ceiling rates to 5.5 percent.

The opponents used a number of arguments. Robertson said that inflation was not inevitable. Higher rates might bring on recession and would raise the cost to the Treasury of marketing its debt in January (BOG, Minutes, December 3, 1965, p. 2). Robertson proposed instead to (i) slow the issue of (unregulated) bank promissory notes by making them subject to Regulation Q ceiling rates and (ii) allow banks to borrow reserves to cover the loss of time deposits because Regulation Q ceiling rates were below market rates. Reminiscent of the Riefler-Burgess doctrine, he explained that increased member bank borrowing "should serve to moderate somewhat the rate of advance in bank credit" (BOG, Minutes, December 3, 1965, p. 3). He also opposed increasing Regulation Q ceiling rates.

Mitchell did not agree. He opposed the increase in the discount rate on political grounds. The Federal Reserve "appeared to be on a collision course with the administration" (p. 7). He preferred to negotiate a 0.25-percentage-point increase with the administration, but he favored an increase in ceiling rates and would support a 5.5 percent ceiling rate on all maturities over 15 days (p. 9).

The recovery was Maisel's main concern, but he also believed they should wait for the President's budget in mid-January. He favored incomes policy to control prices and wages. "A discount rate increase…could be interpreted only as a vote of no-confidence by this Board in the national goal of growth at full employment" (p. 16). Neglecting 2 percent inflation, he warned the Board that the discount rate at New York had not been as high as 4.5 percent since November 1929 (p. 17). He dismissed current concerns about inflation. If inflation rose, the Board could act later.

The winning coalition was in place. Dewey Daane made the case for higher rates, based on persistent price pressures, the risk of more general price increases, and the prospect that an investment boom had started. He mentioned a 10 percent increase in business fixed investment as especially troublesome. He added that he worried about "deterioration in our balance of payments not entirely papered over by changing definitions and some strenuous Governmental efforts to achieve postponement of some scheduled outflows into next year's statistics" (p. 11). Then he added that higher interest rates "will contribute to the relative price stability essential to the eventual resolution of our balance of payments problem" (p. 11).

Martin spoke last. He warned about the risk to the System's independence if it acted against the President's wishes. "There is a question whether the Federal Reserve is to be run by the administration in office" (p. 28).

The Board's announcement emphasized that it wanted to slow excessive demands for credit and maintain price stability. A news story describing the action said, "The Federal Reserve has no intention of imposing a severe 'tight money' policy that would render bank loans difficult to get" (*New York Times*, December 6, 1965, p. 6). Nevertheless, President Johnson criticized the decision, publicly expressing his view that it would hurt consumers and state and local governments and complaining that "the decision on interest rates should be a coordinated policy decision in January" (p. 31). *The New York Times* editorial supported the President on coordination while recognizing that inflationary pressures had increased and the administration had restricted its efforts to pressuring industries and firms not to raise prices (p. 36).

Gardner Ackley, the Council's chairman, used more pointed language (Ackley, p. 3). But Ackley's concern was as much about the breakdown of policy coordination as about the increase in interest rates.

> The members of the Council were not entirely unsympathetic with Martin's position. We agreed that some kind of restraint was necessary. We would have much preferred a tax increase rather than tighter money. We not only clearly predicted to the President that monetary policy would tighten considerably farther, but I suppose in a sense we also had a certain amount of sympathy with what the Fed was doing, although we didn't always express that sympathy strongly or clearly in the President's presence. (p. 4)

Later, Ackley described policy development under the pressure of war finance as he saw it. Johnson opposed any reduction in spending on his Great Society programs. He disliked higher interest rates. That left a tax increase to pay for rising costs of war and the Great Society programs. By October, Ackley claimed that the Council knew about spending increases.

> It is frequently assumed that at this period the Council of Economic Advisers and perhaps other people were misinformed about some of the facts…about the size of prospective government expenditures… [W]e had all the evidence we needed to conclude without any question, certainly by November or early December, that a tax increase was absolutely necessary if we were going to avoid substantial inflation in 1966. So the proposal for a tax increase was well formulated and strongly supported by Treasury, Council, and Budget Bureau in the late fall and throughout this period. (Hargrove and Morley, 1984, pp. 247-48)[17]

Some of the President's advisers claimed that if Martin had not raised the discount rate, the President might have asked for a tax increase early in 1966 (Okun, p. 25). Dewey Daane explained, however, that Martin knew Wilbur Mills (Chairman of the House Ways and Means Committee) well and "never had any sense that there was the slightest possibility of a tax increase from LBJ" (Hargrove and Morley, 1984, p. 252). Johnson (1971, pp. 444-45) confirms this. For Martin, coordination had become a one-way street; the Federal Reserve supported administration policies but had no support for its own concerns.[18] The President had refused to confirm what Martin knew about the budget. Inflation had started to increase, and the market people, whose judgments Martin relied on more than economists' forecasts, saw this in the large increase in lending to finance war production. He took a temporary respite from coordinated policy.

The discount rate increase raised criticisms of Martin and the Federal Reserve out of proportion to the steps they had taken. Congressman

[17] Ackley's memos in the Johnson library do not support his claim or his recollection about timing. His recommendation appears in a December 17 memo, two weeks after the rate increase.

[18] It was not just the President. Ackley claimed that he liked Martin, but he did not respect him or his opinions. "Martin was absolutely zero as an economist. He had no real understanding of economics" (Ackley, p. 6). Heller, who continued to advise Johnson after he left the Council, regarded coordination as a way of influencing, possibly controlling, the Federal Reserve's actions. Ackley did not believe the Federal Reserve should be independent: "I would do everything I could to reduce or eliminate the independence of the Federal Reserve" (p. 6). This attitude, whether or not expressed openly, was unlikely to make Martin believe that the relation was one of equals coordinating their actions.

Wright Patman called for Congress to end Martin's power. Senator Paul Douglas (Illinois) called the action "as brutal as it was impolite," and Senator William Proxmire (Wisconsin) said it was a blunder and demanded hearings (*New York Times*, December 7, 1965, pp. 1, 74).

The press report of the meeting at the ranch suggested that Johnson and Martin had a difference of opinion, but the "atmosphere [at the press conference] was suffused with sweetness" (p. 1). Martin's account of the meeting was entirely different. Johnson accused him of taking advantage of his illness and harming his presidency. "He was very disagreeable" (Martin, 1987b, p. 14). But Martin did not yield, even when Johnson swore at him. Martin's account explains why his efforts to coordinate delayed action, despite his June speech and his many warnings about inflation.

The rate increases remained in effect. Under intense pressure, Martin courageously maintained the Federal Reserve's right to independent action, but the action did not stop inflation or slow growth of the monetary base. The monetary base and M1 continued to increase rapidly as the Federal Reserve attempted to moderate the impact on market rates.

Martin had not raised the discount rate to reduce money growth. At the first FOMC meeting after the discount rate increase, his concern was the shock to the market from the increases in discount and Regulation Q ceiling rates. The FOMC agreed. Part of the market's uncertainty probably came from growing recognition that inflation had returned (Maisel, *Diary*, Summary, February 9, 1967).[19] The directive called for moderating the market's turbulence.

Instead of a restrictive policy to stop inflation, "credit was supplied between December and the end of June at record-breaking rates. The rate of increase in total reserves from December through June was at a 6.3 percent annual rate. This was four times as large as the June-November 1965 period. All other aggregate measures showed similar rates of increase" (p. 1).

Those who voted for the discount rate increase argued for minor restriction of credit; those who voted against the increase recognized that the administration had left the problem to the Federal Reserve. Although they believed that fiscal restraint was the preferred policy, they saw that it was not about to happen. They argued for more monetary restriction, citing the growth of the aggregates as evidence of the need for restraint (p. 3). Martin and other proponents of moderation relied instead on the decline in free reserves and the rise in the federal funds rate and other short-term rates. They believed that policy tightened.[20]

By March, long-term Treasury yields reached 4.7 percent, a 0.35-percentage-point increase after the discount rate increase, and the federal funds rate reached 4.63 percent, a 0.5-percentage-point increase. Member bank borrowing increased, and free reserves reached –$255 million in March (from $8 million in December). As on many other occasions, free reserves and interest rates misled the majority of the FOMC.

Governor Maisel (1973) drew a similar conclusion. "Federal Reserve doctrine was based on a money market strategy. The Fed used money market conditions simultaneously as a target, or measure, of monetary policy and as a guide for the manager" (p. 78). Referring to his introduction to FOMC procedures, Maisel wrote, "Nowhere did I find an account of how monetary policy was made or how it operated…Arguments had been strong and quite clear [in 1965] because they were based primarily on ideological views…Frequently, members of the FOMC argued over the merits of policy without ever having arrived at a meeting of the minds as to what monetary policy was and how it worked" (pp. 77-78).

The absence of a relevant, coherent framework proved costly. By March 1966, the 12-month rate of increase in the CPI reached 2.8 percent, the highest rate in eight years. The Great Inflation had started.

Arthur F. Burns became Chairman of the Board of Governors in February 1970. He was the first economist to hold that position. A close

[19] Maisel did not start keeping a diary at each meeting, although he took notes. The February 9, 1967, summary covers some meetings from December 1965 to October 1966. The text is based on notes made at the meetings. I am extremely grateful to Sherman Maisel for making his diary available to me.

[20] Maisel (1973, pp. 83-85) gives a full account of the arguments at the February 1966 meeting. He documents the misleading interpretation of a decline in free reserves as evidence that policy had become more restrictive despite the large increase in total reserves.

associate of President Nixon, he served as an adviser on many nonmonetary issues during his term as Chairman, and he infuriated the President in 1970-71 by calling publicly and frequently for a wage-price review board to control inflation.

At first, Burns agreed to the administration's gradualist approach to slowly lower inflation with very little increase in unemployment. By the time he became Chairman, however, the economy was in recession, with the unemployment rate well above the acceptable 4.5 percent that the gradualist policy hoped to keep as a maximum. Burns persuaded the FOMC to adopt a more expansive policy despite the 6 percent CPI inflation rate. For the second time, the Federal Reserve retreated from an anti-inflation policy. This reinforced the expectation that inflation would not decline over time.

Using reasoning different from that of Ackley, Okun, or Martin, Burns reached the same policy conclusion. There is much more to the monetary history of the 1970s than this paper can present. Burns's decision to ease policy at his very first meeting tells us much about the ordering of his priorities. Burns's Per Jacobsson lecture explains his reasoning, his interpretation of the vague guideline in the 1946 Employment Act, and the weights he applied to inflation and unemployment.

> "Maximum" or "full" employment, after all, had become the nation's major economic goal—not stability of the price level… Even conservative politicians and businessmen began echoing Keynesian teachings. It therefore seemed only natural to federal officials charged with economic responsibilities to respond quickly to any slackening of economic activity…but to proceed very slowly and cautiously in responding to evidence of increasing pressure on the nation's resources of labor and capital. Fear of immediate unemployment—rather than fear of current or eventual inflation—thus came to dominate economic policymaking. (Burns, 1987, p. 691)

Missing from Burns's statement and from the rest of his lecture is any reference to the independence of the central bank. Policy coordination and central bank independence were in conflict. As many central banks learned from the 1970s experience, the conflict arose from the difference in the weights they must assign to inflation and employment if their countries are to realize both high employment and low inflation. Politicians elected for four- or five-year terms put much more weight on employment—jobs, jobs, jobs—than on a future inflation. Central bankers are given longer terms and operational independence to increase the weight they place on longer-term consequences of policy actions; the Federal Reserve failed to do so. Inflation fell after the Federal Reserve abandoned coordination and accepted its responsibility to maintain the value of money. Once the public became convinced that the Federal Reserve would persist despite unemployment rates above 10 percent and short-term interest rates near 20 percent, anticipations changed. That took until 1984-85, the year when 10-year Treasury bonds reached a peak (13.8 percent). The economy had recovered with annual CPI inflation at 4 percent or less.

This outcome, in broad outline, would not have surprised Arthur Burns. He recognized that

> [v]iewed in the abstract, the Federal Reserve System had the power to abort the inflation at its incipient stage fifteen years ago [1964] or at any later point, and it has the power to end it today [1979]. At any time within that period, it could have restricted the money supply and created sufficient strains in financial and industrial markets to terminate inflation with little delay. It did not do so because the Federal Reserve was itself caught up in the *philosophic and political* currents that were transforming American life and culture. (Burns, 1987, p. 692; emphasis added)

Burns does not appeal to mistakes, bad luck, or misinformation. He appeals to philosophical and political beliefs.[21] Unlike Martin, who had

[21] Burns recognizes "errors of economic or financial judgment," calls them significant, and cites the consensus view in the 1960s and early 1970s that "an unemployment rate of about 4 percent corresponded to a practical condition of full employment" (Burns, 1987, p. 693).

more limited understanding of what had to be done, Burns knew "in the abstract" what was required. He was unwilling, or believed the Federal Reserve would be unable, to carry through an anti-inflation program that imposed heavy costs. He dismissed gradualism that spread the costs over five years or more as unlikely to succeed.

> [T]he very caution that leads politically to a policy of gradualism may well lead also to its premature suspension or abandonment in actual practice…That has happened in the past, and it may happen again. (p. 697)

Lacking a political consensus, Burns allowed inflation to continue and increase. And he erred in treating the 1973-74 oil shocks as a recession that called for more stimulus. That error, too, brought higher inflation.

CONCLUSION

Martin's beliefs, the absence of a relevant theory, errors, and institutional arrangements explain why inflation started. The first two eventually changed, but inflation continued, so the reasons inflation continued are separate from the reasons it started. Two main institutional arrangements contributed to inflation in the 1960s.

First, even-keel policy caused the Federal Reserve to delay taking appropriate policy action, sometimes for months. During even-keel periods, usually lasting for two to four weeks, the Federal Reserve often permitted large increases in reserve growth that it did not subsequently remove. It is, of course, true that the System could have prevented the inflationary impact. The Treasury failed to do so because the cost of reducing reserves (or reserve growth) always seemed large. It could have eliminated even-keel policy by auctioning securities, as it eventually did.

Years later, Chairman Arthur Burns accepted the importance of even-keel policies for the beginning and continuation of inflation.

> While the Federal Reserve always would accommodate the Treasury up to a point, the charge could be made—and was being made—that the System had accommodated the Treasury to an excessive degree. Although he was not a monetarist, he found a basic and inescapable truth in the monetarist position that inflation could not have persisted over a long period of time without a highly accommodative monetary policy. (FOMC, Minutes, March 19, 1974, pp. 111-12)

Second, Martin's acceptance of policy coordination with the administration prevented the Federal Reserve from taking timely actions and contributed to more expansive policies than were consistent with price stability. The System delayed acting in 1965 despite Martin's early warnings about inflation, and it eased policy in 1968 to coordinate with fiscal restriction. Despite well-known arguments from the permanent-income hypothesis, Arthur Okun and the Board's staff expressed concern about fiscal overkill. Martin had promised President Johnson that passage of the temporary tax surcharge would lower interest rates. The Board moved to ease policy by encouraging reductions in the discount rate against the wishes of most of the Reserve Bank presidents. Output continued to rise and unemployment to fall. By December, the annual rate of CPI increase was 4.6 percent, 1.8 percentage points higher than a year earlier. The unemployment rate was 3.4 percent, the lowest since 1951-53. Monetary base growth for the year reached 7.15 percent. Martin said: "[T]he horse of inflation not only was out of the barn, but was already well down the road" (FOMC, Minutes, December 12, 1967, p. 98).

Martin acknowledged the error in easing policy. Reversing the error proved costly. As Okun eventually recognized, we could not "get back to where we were in 1965, the good old days…That's exactly what we thought would happen. That's exactly what didn't happen" (Hargrove and Morley, 1984, p. 308).

The Nixon administration had a different analytic framework. It accepted the vertical long-run Phillips curve and paid attention to money growth. It chose a gradualist policy and, in its internal memos, was willing to tolerate an unemployment rate as high as 4.5 percent. By the end of the 1969-70 recession, the unemployment rate

reached 6 percent, with annual CPI inflation of 5.4 percent.

Administration economists urged faster money growth to reduce unemployment. Arthur Burns, the new Chairman of the Board of Governors, convinced himself that inflation could not be reduced at a politically acceptable unemployment rate. He told President Nixon that "Wage and price decisions are now being made on the assumption that governmental policy will move promptly to check a sluggish economy" (Burns, June 22, 1971, p. 2). He also blamed cost-push factors, the power of labor unions, and welfare programs, along with expectations that inflation would persist. He favored controls or guideposts to break expectations. As the 1972 election approached, President Nixon accepted that advice. The administration chose political benefit over economic fundamentals.

Inflation continued because of the unwillingness of policymakers to persist in a political and socially costly policy of disinflation. During the 1960s and after, there was little political support for an anti-inflation policy in Congress and none in the administration if it required unemployment much above 4 percent. Polling data show that inflation was not named by many people as "the most important problem facing the country." The number of respondents who considered inflation to be the most important problem never went above 14 percent. And during the 1970s, that percentage was always lower. Often, inflation came fourth or fifth on the list of most important problems.[22] Without political support, the Federal Reserve was back in a position similar to that of 1946-50. It had greater independence on paper; it had not committed to maintain interest rates at or below a fixed ceiling as in 1942-50. The unemployment rate functioned in much the same way, however. It limited the extent to which the System could persist in a policy to end inflation or reduce it permanently. Soon after unemployment rose, the administration and the Federal Reserve shifted their operations and goal from lowering inflation to avoiding or ending recession and restoring full employment.

Andrew Brimmer, a Board member from 1966 to 1974, explained that employment was the principal goal: "Fighting inflation, checking inflation was the second priority" (Brimmer, 2002, p. 22). No one ever took an explicit vote to order these priorities, but the decisions taken at critical times support Brimmer's interpretation.

Reversals had lasting effects. Inflation fell quickly in 1966-67, without a recession but with major disruption of the housing market and strident opposition from the politically powerful thrift industry. The public learned from this attempt to reduce inflation that anti-inflation actions did not last once unemployment (or other costs) started to rise. The policy focus then shifted, reinforcing the public's growing belief that inflation would continue and even increase. These beliefs made it harder for the Federal Reserve to persuade the public that it would persist with anti-inflation actions the next time it tried.

The next time was 1969-70. A new administration was in power. The principal economic policymakers did not subscribe to the idea of a permanent trade-off between unemployment and inflation. They accepted the logic of Milton Friedman's (1968) analysis showing that any reduction in unemployment achieved by increasing inflation was temporary. It persisted only as long as the inflation was unanticipated. But, the public and Congress were unwilling to accept the temporary increase in unemployment that would substantially lower or end inflation. Officials learned subsequently that, by refusing to pay the costs of transition to lower inflation, they increased the costs they would face subsequently by reinforcing beliefs that the public held.[23] They called this mixture of inflation and unemployment "stagflation" and found it puzzling and mysterious because they ignored the anticipations that the policy actions fostered.

[22] I am greatly indebted to Karlyn Bowman of the American Enterprise Institute for retrieving the Gallup data.

[23] I suspect that at least some of them would have paid these costs if they would not go on too long. By the time they generally recognized that their policy was working very slowly, the presidential election was less than two years away. President Nixon was not inclined to sacrifice his second term to end inflation and probably not convinced that his advisers and the Federal Reserve could deliver. He believed that he lost the 1960 election because of rising unemployment and had no interest in repeating the experience.

Once inflation became entrenched, it required a more persistent commitment to end it. Martin, the Federal Reserve, and administration economists were aware of the cost paid to end a modest inflation after 1958. After four years of stable prices, why did they let inflation continue after it returned?

Bad luck contributed. Growth of output slowed after 1966, just as the money growth rate increased. Many officials continued to believe that higher growth would return. Other beliefs played a larger role. Some of the same factors that contributed to the start also contributed to persistence. Until the Treasury began to auction notes and bonds after 1970, even-keel operations contributed to inflation and made disinflation difficult.[24] George Mitchell, a member of the Board from 1961 to 1976, told Congress that if the Treasury sold short-term debt to the banking system "we have to supply reserves to the banking system…The success of this operation depends on how much pressure the banking system is under. If it is not under much pressure, it would continue to hold the securities and therefore the money supply would rise" (Joint Economic Committee, 1968b, p. 134). He did not say that if banks were under pressure they would sell the securities and make loans.

At the same hearing, Senators tried to get the Federal Reserve to control money growth within a range of 2 to 5 percent. Mitchell denied that money growth was excessive.

> **Senator [Jack] Miller**. I have heard criticisms of the Federal Reserve Board for being responsible for the inflation, as a result of the excessive expansion of the money supply…
>
> **Mr. Mitchell**…Our conviction is that we have not overused this tool.
>
> **Senator Miller**. If you have not overused the tool, then where does the inflation come from?…
>
> **Mr. Mitchell**. I think it really comes from the government deficit. (p. 135)

Later in the same hearing, Senator William Proxmire questioned Mitchell about the procyclical behavior of the money stock, citing declines in four postwar recessions. Mitchell would not accept the conclusion (p. 140). Martin, like Mitchell and many others, claimed that budget deficits were the principal cause of inflation. At times, the statement of this belief suggests that the inflationary effect of the deficit depends only on the size of the deficit and is independent of deficit finance and money growth. Experience in the 1960s and 1980s can be looked on as an experiment that tests this proposition in a simple, direct way. The much smaller budget deficits of the 1960s occurred with rising inflation rates, and the larger deficits of the 1980s accompanied falling inflation rates. A major difference was that the Federal Reserve did not believe it was obliged to finance the 1980s deficits, and it did not do so. Neglecting or ignoring the effects of policy actions on money growth and inflation was a major error in the 1960s and 1970s.

Federal Reserve decisions in the Martin era were made every three weeks. Much time was spent on what had happened or what might happen before the next meeting. There is no evidence that the Board or the FOMC had an organized way of thinking about the more distant future, as senior staff recognized (Axilrod, 1970; Pierce, 1980; and Lombra and Moran, 1980). Until 1965-66, Chairman Martin followed the Riefler rule that prohibited forecasts. When forecasts began, they often had large errors, discrediting them. Also, the members of the Board and the FOMC did not have a common framework or way of thinking about monetary policy. Neither Martin nor Burns made any effort to develop an agreed-upon way of thinking about how their actions influenced prices, employment, and the balance of payments. Sherman Maisel argued frequently for a more systematic approach, without much success. The members did not agree on elementary propositions.

Even if these problems had been resolved and a common framework developed, as Burns (1987) notes, the absence of political and popular support would likely have prevented the System from continuing decisive action. A more appro-

[24] Brimmer (2002, pp. 25-26) did not recall any discussion about changing even-keel policy.

priate, common framework would have avoided the error in 1968, when the Federal Reserve eased policy and increased the inflation rate, because it accepted the Keynesian claim that the temporary surtax was "fiscal overkill." But it is also true that the Johnson administration and the Federal Reserve were willing to undertake anti-inflation monetary policy only after the 1968 election.

Martin believed he could maintain Federal Reserve independence while coordinating policy actions with the administration. Although he warned about inflation in 1965, he encouraged no action against it until late in the year because he hoped that President Johnson would raise tax rates instead. Three years later, he eased policy to offset the surtax, a step that he later recognized as an error. Some of his senior staff agreed.[25]

Martin was not alone in these errors. He had the support of most of his Board and much of the academic profession. He made little effort to lead the Federal Reserve away from the coordinated policy. And there is no evidence of coordination working in the opposite direction—administration policy adjusting to support the Federal Reserve's responsibility for inflation.[26]

Policy coordination was not the only error in 1968. Administration and Federal Reserve forecasts attributed a powerful effect to the $10 billion temporary tax surcharge. They could have known better. Economic analysis had established that the main effect of a temporary surcharge would be on saving. Franco Modigliani testified to that effect a month before the surcharge passed.

> If the people know that taxes are going to be put up for just 3 or 6 months, chances are that there would be little change in their consumption because they would look forward to being able to recoup later. Therefore, I think attention should be given to finding measures that have the right incentives. (Modigliani, 1968, p. 63)

Partly as a consequence of policy coordination, but also in response to political and public pressure, the Federal Reserve accepted responsibility for housing and income distribution. Although it could not do much about the latter except to reduce reserve requirements for small banks, it moderated its actions to prevent sharp reductions in homebuilding. Adding homebuilding to a list of objectives that included sustained growth, full employment, low inflation, and international balance almost ensured failure to meet most or all of the objectives.

When Burns replaced Martin, President Nixon recognized the independence of the Federal Reserve and then added, "I respect his independence. However, I hope that independently he will conclude that my views are the ones he should follow" (Wells, 1994, p. 41).

This was a forecast of the pressure the President and his advisers kept up. Burns, like Marriner Eccles before him, wanted to be a key presidential adviser while he was Chairman. Possibly to satisfy the President's pressures for lower unemployment or because he shared the President's priority, Burns maintained relatively high money growth and in 1970-71 frequently and forcefully argued for a wage-price board to slow inflation by exhortation. More likely, as he claimed repeatedly, he believed that monetary policy could not reduce inflation. His Per Jacobsson lecture (Burns, 1987), from which I quoted, shows that he recognized that the inflation was the result of overly expansive monetary policy but there was little support in the administration, Congress, or the general public for the consequences of the policy that would be required.

Burns resented White House interference and pressure, but he did not often resist it. He took over a Board most of whose members had been appointed by Presidents Kennedy and Johnson. To varying degrees, a majority preferred to continue inflation rather than increase unemployment. If inflation could be reduced at an unemployment rate of 4.25 or 4.50 percent, they would accept it.

[25] "Question: Do you think it was a mistake for the Fed to be that closely involved in administration policy? Answer: Yes, because you become less objective" (Axilrod, 1997, pp. 17-18).

[26] The House Banking Committee asked economists and policy officials for their opinions on mandating policy coordination, a policy rule, or the present regime. Replies came from 69 respondents. Most (42) favored a coordinated program; 13 favored a monetary rule of some kind; 14 favored no change. I interpret that to mean that the group members did not oppose coordination but did not want it made mandatory. Chairman Okun of the Council of Economic Advisers voted for mandatory coordination. Chairman Martin and Secretary Fowler voted for the status quo (Joint Economic Committee, 1968a, p. 8).

But they did not want any higher unemployment rate. There was a minority that wanted more restrictive policy and more action against inflation. The few consistent anti-inflationists, such as Hayes, Brimmer, and Francis, were exceptions. They gained support when inflation rose, but only until unemployment rose above the level the majority would accept. Brimmer (2002, p. 23) explained at the time that if fiscal policy was the way it was, you would have to tighten monetary policy to the point of inducing a recession. He added that the Federal Reserve "didn't promise a tradeoff [of easier monetary policy]…if you get a tax bill but we came pretty close to it" (p. 23).

Many other reasons have been used to explain the persistence of inflation: The use of money market targets, failure to distinguish between real and nominal interest rates, and neglect of monetary aggregates (Mayer, 1999; Bordo and Schwartz, 1999; McCallum, 1999; and Hetzel, 2003). Nelson (2003) summarizes this literature and documents the importance of neglecting money—the monetary policy neglect hypothesis—both in Britain and the United States.

Analytic errors contributed to inflationary policy. Bad analysis and flawed theoretical understanding can lead to major policy mistakes, as in the Great Depression. The Federal Reserve made no effort to achieve analytic clarity on such basic issues as the causes of inflation. Several of its members doubted that it was worth the effort. They did not respond to Darryl Francis's efforts to explain that (i) in the long run, inflation was caused by money growth in excess of real growth and (ii) Federal Reserve policy produced excess money growth because it did not permit interest rates to increase enough. Similarly, they did not respond positively to Maisel's efforts to adopt a consistent policy framework.

Three morals: You cannot end inflation (i) if you don't agree on how to do it, (ii) if you and the public think it is less costly to let it continue, and (iii) if you are overly influenced by politics. The Federal Reserve was better able to control inflation when the President was named Eisenhower or Reagan instead of Johnson, Carter, or Nixon.

REFERENCES

Ackley, Gardner. *Macroeconomic Theory*. New York: Macmillan, 1961.

Ackley, Gardner. Oral History II, Johnson Papers, LBJ Library. Austin, TX.

Anderson, Richard G. and Rasche, Robert H. "Eighty Years of Observations on the Adjusted Monetary Base." Federal Reserve Bank of St. Louis *Review*, January/February 1999, *81*(1), pp. 3-22.

Axilrod, Stephen H. "The FOMC Directive as Structured in the Late 1960s: Theory and Appraisal." Unpublished manuscript, Board of Governors of the Federal Reserve System, January 28, 1970, pp. 1-63.

Axilrod, Stephen H. Interview with the author. June 26, 1997.

Barro, Robert J. and Gordon, David B. "A Positive Theory of Monetary Policy in a Natural Rate Model." *Journal of Political Economy*, August 1983, *91*(4), pp. 589-610.

Bernstein, Irving. *Guns or Butter: The Presidency of Lyndon Johnson*. New York: Oxford University Press, 1996.

Board of Governors of the Federal Reserve System. Minutes. Washington, DC: various dates.

Board of Governors of the Federal Reserve System. *Annual Report, 1965*. Washington, DC: 1965.

Bordo, Michael D. and Schwartz, Anna J. "Monetary Policy Regimes and Economic Performance: The Historical Record," in John B. Taylor and Michael Woodford, eds,. *Handbook of Macroeconomics*. Amsterdam: North Holland, 1999.

Brimmer, Andrew F. Interview with the author. February 26, 2002.

Bryan, Malcolm. Letter to Woodlief Thomas. Records. Washington, DC: Board of Governors of the Federal Reserve System, January 14, 1961.

Burns, Arthur F. Letter to President Lyndon B. Johnson. Burns papers, Box B-B90. Gerald R. Ford Library, June 22, 1971.

Burns, Arthur F. "The Anguish of Central Banking." *Federal Reserve Bulletin*, September 1979, pp. 687-98; reprinted September 1987, *73*(9), pp. 689-98.

Califano, Joseph A. Jr. Telegram to President Lyndon B. Johnson. White House Central File, Box 50. LBJ Library. Austin, TX: November 29, 1965.

Califano, Joseph A. Jr. *The Triumph and Tragedy of Lyndon Johnson*. College Station, TX: Texas A&M University Press, 2000.

Clarida, Richard; Galí, Jordi and Gertler, Mark. "Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory." *Quarterly Journal of Economics*, February 2000, *115*(1), pp. 147-80.

Clay, George. Letter to Ralph Young. Records. Washington, DC: Board of Governors of the Federal Reserve System, November 13, 1961.

Collard, Fabrice and Dellas, Harris. "The Great Inflation of the 1970s." Working Paper 336, European Central Bank, April 2004.

Council of Economic Advisers. *Annual Report*. Washington, DC: Government Printing Office, 1964.

Council of Economic Advisers. *Annual Report*. Washington, DC: Government Printing Office, 1965.

Cukierman, Alex and Meltzer, Allan H. "A Theory of Ambiguity, Credibility, and Inflation under Discretion and Asymmetric Information." *Econometrica*, September 1986, *54*(5), pp. 1099-28.

Deming, Frederick L. Letter to Ralph Young. Records. Washington, DC: Board of Governors of the Federal Reserve System, November 24, 1961.

Feldstein, Martin. "Inflation, Tax Rules, and Investment: Some Econometric Evidence." *Econometrica*, July 1982, *50*(4), pp. 825-62.

Fischer, Stanley. "Towards an Understanding of the Costs of Inflation: II." *Carnegie-Rochester Conference Series on Public Policy*, Autumn 1981, *15*, pp. 5-41.

Federal Open Market Committee. Minutes. Washington, DC: Board of Governors of the Federal Reserve System, various dates.

Fowler, Henry. Memo to President Lyndon B. Johnson. Confidential Files, Box 41. LBJ Library. Austin, TX: October 6, 1965.

Friedman, Milton. "The Role of Monetary Policy." *American Economic Review*, March 1968, *58*(1), pp. 1-17.

Gordon, Robert J. "Can the Inflation of the 1970s Be Explained?" *Brookings Papers on Economic Activity*, 1977, *1*, pp. 253-77.

Hargrove, Erwin C. and Morley, Samuel A., eds. *The President and the Council of Economic Advisers*. Boulder, CO: Westview Press, 1984.

Hayes, Alfred. Letter to Ralph Young. Records. Washington, DC: Board of Governors of the Federal Reserve System, November 3, 1961.

Heller, Walter. "Monetary Policy." Papers. JFK Library. Boston, MA: March 2, 1964.

Heller, Walter. Memo to President Lyndon B. Johnson. White House Central Files, Box 282. LBJ Library. Austin, TX: July 17, 1964.

Hetzel, Robert L. "Arthur Burns and Inflation." Federal Reserve Bank of Richmond *Economic Quarterly*, Winter 1998, *84*(1), pp. 21-44.

Hetzel, Robert L. *The Monetary Policy of the Federal Reserve System: Analytics and History*. Unpublished manuscript, Federal Reserve Bank of Richmond. 2003.

Johnson, Lyndon B. Recording of Telephone Conversation with Robert McNamara. Citation No. 9326, White House Series. LBJ Library. Austin, TX: December 20, 1965.

Johnson, Lyndon B. *The Vantage Point*. New York: Holt, Rinehart and Winston, 1971.

Joint Economic Committee. *Compendium on Monetary Policy Guidelines and Federal Reserve Structure*. Washington, DC: Government Printing Office, December 1968a.

Joint Economic Committee. *Standards for Guiding Monetary Action*. Washington DC: Government Printing Office, May 8-16, 1968b.

Knipe, James. Memo to William McChesney Martin Jr. Records. Washington, DC: Board of Governors of the Federal Reserve System, November 14, 1960.

Kramer, Gerald H. "Short-Term Fluctuations in U.S. Voting Behavior, 1896-1964." *American Political Science Review*, March 1971, *65*, pp. 131-43.

Laidler, David and Parkin, Michael. "Inflation: A Survey." *The Economic Journal*, December 1975, *85*(340), pp. 741-809.

Lombra, Raymond and Moran, Michael. "Policy Advice and Policymaking at the Federal Reserve." *Carnegie-Rochester Conference Series on Public Policy*, Autumn 1980, *13*, pp. 9-68.

Lucas, Robert E. Jr. "Expectations and the Neutrality of Money." *Journal of Economic Theory*, April 1972, *4*(2), pp. 103-24.

Maisel, Sherman J. *Sherman J. Maisel's Diary*. Washington, DC: Board of Governors of the Federal Reserve System, various years.

Maisel, Sherman J. *Managing the Dollar*. New York: Norton, 1973.

Martin, William McChesney Jr. Letter to Wright Patman, in Federal Open Market Committee, Minutes. Washington, DC: Board of Governors of the Federal Reserve System, July 11, 1961.

Martin, William McChesney Jr. Testimony, Joint Economic Committee, in Records. Washington, DC: Board of Governors of the Federal Reserve System, February 1, 1963.

Martin, William McChesney Jr. Memo to President Lyndon B. Johnson. Confidential Files, Box 41, LBJ Library. Austin, TX: October 6, 1965.

Martin, William McChesney Jr. "Martin papers," as cited by the Missouri Historical Society. St. Louis: May 8, 1987a.

Martin, William McChesney Jr. Oral History. Missouri Historical Society. St. Louis: May 8, 1987b.

Mayer, Thomas. *Monetary Policy and the Great Inflation in the United States: The Federal Reserve and the Failure of Macroeconomic Policy, 1965-79*. Cheltenham, UK: Edward Elgar, 1999.

McCallum, Bennett T. "Recent Developments in Monetary Policy Analysis: The Role of Theory and Evidence." *Journal of Economic Methodology*, July 1999, *6*(2), pp. 171-98.

Meltzer, Allan H. *A History of the Federal Reserve*. Volume 1, 1913-51. Chicago: University of Chicago Press, 2003.

Meltzer, Allan H. *A History of the Federal Reserve*. Volume 2. Chicago: University of Chicago Press (forthcoming).

Modigliani, Franco. Testimony. U.S. Congress, Joint Economic Committee. Washington, DC: Government Printing Office, May 8, 1968, p. 63.

Modigliani, Franco. "The Monetarist Controversy, or Should We Forsake Stabilization Policies?" *American Economic Review*, March 1977, *67*(2), pp. 1-19.

Nelson, Edward. "The Great Inflation of the Seventies: What Really Happened?" Unpublished manuscript, Federal Reserve Bank of St. Louis, 2003.

New York Times. December 6, 1965, p. 6.

New York Times. December 7, 1965, pp. 1, 74.

Nordhaus, William D. "The Political Business Cycle." *Review of Economic Studies*, April 1975, *42*(2), pp. 169-90.

Okun, Arthur M. *The Political Economy of Prosperity*. Washington, DC: Brookings Institution Press, 1970.

Okun, Arthur M. Oral History I, Johnson Papers, LBJ Library. Austin, TX.

Orphanides, Athanasios. "Monetary Policy Rules Based on Real-Time Data." *American Economic Review*, September 2001, *91*(4), pp. 964-85.

Orphanides, Athanasios. "The Quest for Prosperity Without Inflation." *Journal of Monetary Economics*, April 2003, *50*(3), pp. 633-63.

Orphanides, Athanasios. "Monetary Policy Rules, Macroeconomic Stability, and Inflation: A View from the Trenches." *Journal of Money, Credit, and Banking*, April 2004, *36*(2), pp. 151-75.

Pierce, James L. "Comments on the Lombra-Moran Paper." *Carnegie-Rochester Conference Series on Public Policy*, Autumn 1980, *13*, pp. 79-85.

Romer, Christina D. and Romer, David H. "The Evolution of Economic Understanding and Postwar Stabilization Policy," in *Rethinking Stabilization Policy*. Kansas City, MO: Federal Reserve Bank of Kansas City, 2002, pp. 11-78.

Sargent, Thomas J. *The Conquest of American Inflation*. Princeton, NJ: Princeton University Press, 1999.

Sargent, Thomas J. "Commentary: The Evolution of Economic Understanding and Postwar Stabilization Policy," in *Rethinking Stabilization Policy*. Kansas City, MO: Federal Reserve Bank of Kansas City, 2002, pp. 79-94.

Swan, Eliot. Letter to Ralph Young. Records. Washington, DC: Board of Governors of the Federal Reserve System, November 10, 1961.

Taylor, John B. "An Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules*. Chicago: University of Chicago Press, 1999.

Tufte, Edward R. *Political Control of the Economy*. Princeton, NJ: Princeton University Press, 1978.

Velde, Francois R. "Poor Hand or Poor Play? The Rise and Fall of Inflation in the U.S." Federal Reserve Bank of Chicago *Economic Perspectives*, First Quarter 2004, *28*(1), pp. 34-51.

Wells, Wyatt C. *Economist in an Uncertain World: Arthur F. Burns and the Federal Reserve*. New York: Columbia, 1994.

Young, Ralph to FOMC, Attachment II. Records. Washington, DC: Board of Governors of the Federal Reserve System, September 6, 1961.

Commentary

Christina D. Romer

The Great Inflation of the late 1960s and 1970s was surely one of the defining moments of postwar economic history. After more than a decade of stable prices and relatively steady real growth, the United States, and indeed the world economy, embarked on a path of steadily rising inflation. By the end of the 1970s, inflation had reached levels unheard of in peacetime. Understanding the origins of the Great Inflation is a crucial task for modern economists and policymakers. Only by understanding how we went so far astray in the 1960s and 1970s can we be confident of avoiding the same fate in the future.

In his paper, Allan Meltzer provides his usual mix of probing insight and detailed narrative history. Meltzer makes several arguments about the factors giving rise to the Great Inflation. Some of them I agree with; some of them I do not. But, as is always true of his work, I learned a great deal.

Meltzer's key theme is that politics were crucial. The Great Inflation began and continued largely because monetary policymakers felt constrained to accommodate expansionary fiscal actions. More generally, monetary policymakers felt they needed to support the administration's and Congress's desire for low unemployment above all else. Added to this main idea, Meltzer stresses the impact of operating procedures. The need to maintain an "even-keel" during debt issues and an excessively short-run focus in monetary policymaking made concerted anti-inflation policy difficult.

There is surely truth in Meltzer's politics hypothesis, especially for the late 1960s. But overall, I feel that Meltzer's analysis is too narrow. I believe that his painstaking analysis of the day-to-day details of policymaking has caused him to fail to stress the more fundamental determinants of policy mistakes in this era. In the 1960s and 1970s, it was not that the Federal Reserve was narrowly constrained by fiscal policy. Rather, both monetary and fiscal policymakers were constrained or driven by the misguided economic framework of the time.

IN DEFENSE OF THE IDEAS HYPOTHESIS

The view that economic ideas were the key source of the Great Inflation, and indeed most of the policy failures and successes of the postwar era, is one that my coauthor, David Romer, and I documented in a series of papers (see Romer and Romer, 2002a, 2002b, 2004). It is, as Meltzer notes, a view with many proponents, especially for the Great Inflation. Taylor (1997, 1999), Sargent (1999), De Long (1997), Mayer (1998), Orphanides (2003), Nelson (2004a,b), and Nelson and Nikolov (2004) have all provided evidence on the central role of economic beliefs. Since Meltzer argues that beliefs were only a small part of the story, I thought it would be useful to discuss the evidence for this alternative briefly and to answer some of Meltzer's challenges. I will then go on to discuss what parts of Meltzer's politics hypothesis I think are persuasive and what parts I feel are not.

In our papers, David Romer and I use much the same sources and techniques as Meltzer. We show the crucial role of ideas by reading the narrative record. We find that monetary and fiscal policymakers' economic views evolved drastically over time and that these views played a crucial role in the actions they took. In our analysis, the

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Table 1

Characteristics of Policymakers' Economic Framework in Different Eras

1950s	Inflation (π) caused by output above capacity. Normal unemployment (u) moderate. No permanent π-u trade-off.
1960s	Normal u low. Permanent π-u trade-off.
Early 1970s	Natural rate framework with low natural rate of unemployment ($\bar{u}$). π insensitive to slack.
Mid-1970s	Natural rate framework with moderate $\bar{u}$. π responds somewhat to slack.
Late 1970s	Natural rate framework with low $\bar{u}$. π insensitive to slack.

Great Inflation resulted from the replacement of the remarkably sensible economic framework of the 1950s with the fundamentally misguided framework of the 1960s. The inflation persisted throughout the 1970s because policymakers replaced one bad model of the economy with another.

Let me give a brief sense of the evolution of economic beliefs. (Table 1 summarizes this evolution.) In contrast to Meltzer, who views 1950s policymakers as largely rudderless, we find that policymakers in this decade had a basically sound, if relatively unsophisticated, view of how the economy functioned. They believed that inflation resulted when output went above a quite reasonable view of capacity or full employment. They also believed that, while expansionary policy could reduce unemployment below normal in the short run, the resulting inflation would certainly not lower unemployment permanently and might possibly raise it. For example, Federal Reserve Chairman William McChesney Martin said in 1958: "If inflation should begin to develop again, it might be that the number of unemployed would be temporarily reduced…but there would be a larger amount of unemployment for a long time to come" (Federal Open Market Committee [FOMC], Minutes, August 19, 1958, p. 57). Because of these views, both monetary and fiscal policy were carefully tempered in the 1950s. On a number of occasions the Federal Reserve responded to rising inflation by orchestrating serious contraction.

In the 1960s, policymakers clearly adopted a different model. Estimates of a "reasonable and prudent" goal for normal unemployment were substantially reduced by the Kennedy and Johnson administrations and by the Federal Reserve (Council of Economic Advisers, 1962, p. 46). And, as has been stressed by a number of scholars, a belief in a permanent trade-off between inflation and unemployment briefly held sway. These views led to highly expansionary monetary and fiscal policies, and inflation and booming real growth resulted.

Around 1970, policymakers adopted a natural rate framework, but with an overly optimistic estimate of the natural rate. This view led to a half-hearted attempt at disinflation in 1969 and 1970. The result was that inflation was temporarily slowed, but not squelched.

Early in his tenure as Federal Reserve Chairman, Arthur Burns added the idea that inflation was relatively insensitive to slack. He concluded that "monetary policy could do very little to arrest an inflation that rested so heavily on wage-cost pressures. In his judgment a much higher rate of unemployment produced by monetary policy would not moderate such pressures appreciably" (FOMC, Minutes, June 8, 1971, p. 51). If tight monetary policy and the resulting unemployment were ineffective against inflation, there was no reason to pursue it. Because of this view, the Federal Reserve and the Nixon administration ran expansionary macroeconomic policy and advocated dealing with inflation through wage and price controls.

Economic views became substantially more sensible in the mid-1970s and, again, disinflation was attempted. Inflation fell substantially after the 1973-75 recession. However, with the election of Jimmy Carter and the appointment of G. William Miller as Federal Reserve Chairman, estimates of the natural rate were lowered and Burns's view that inflation was insensitive to slack returned with a vengeance. The first Carter *Economic Report of the President* stated: "Recent experience has

demonstrated that the inflation we have inherited from the past cannot be cured by policies that slow growth and keep unemployment high" (Council of Economic Advisers, 1978, p. 17). The result was fiscal expansion and monetary policy inaction in the face of high and rising inflation.

This brief description of the "ideas view" of the Great Inflation points out a number of important elements. One is the notion of change. A crucial part of any explanation of the Great Inflation must be to show what changed in the 1960s that led the price stability of the 1950s to be replaced by persistent inflation. Our research, along with that of a number of other scholars, clearly shows that the economic framework took a radical turn.

This same notion of change explains why the policy mistakes were so persistent. Meltzer gives as one reason that he rejects the central role of ideas that it is implausible that bad ideas would have lasted 15 years in the face of the obvious continued rise in inflation. But, as we show, policymakers did learn. The Samuelson-Solow permanent trade-off view was rejected at the start of the Nixon administration. However, it was replaced by another flawed model: first by a natural rate framework with a very low natural rate, then by a natural rate framework with an extreme insensitivity of inflation to slack. It was this succession of misguided models that gave rise to repeated policy mistakes and persistent inflation in this period.

Here I should mention the very nice recent paper by Georgio Primiceri. Primiceri (2004) develops and estimates a model of learning for the 1960s on. He finds that this evolution of ideas that we think was crucial could have resulted from policymakers updating their framework along plausible dimensions in response to the macroeconomic developments in this period. For example, Primiceri finds that Burns's conclusion that inflation was insensitive to slack was a plausible way to revise the natural rate model given policymakers' priors and the inflation news of the time.

A second important element is the key role of ideas for both monetary and fiscal policy. The economic beliefs of policymakers in different parts of the government show close correlation over the entire postwar era. That both monetary and fiscal policy were expansionary in the late 1960s and 1970s does not mean that the Federal Reserve felt forced to accommodate fiscal policy. Rather, the two types of policymakers shared similar views about the sustainable level of unemployment and the ability of aggregate demand restriction to cure inflation.

The description also suggests how some other recent research fits into the ideas story. Athanasios Orphanides (2003) emphasizes errors in the measurement of the output gap as a source of policy mistakes in the 1960s and 1970s. But, misestimates of the output gap are not random or due to technical difficulties. They are fundamentally due to a flawed model of the economy. The belief in a permanent trade-off, along with data from the low-inflation environment of earlier decades, led policymakers in the 1960s to choose 4 percent as their goal for unemployment. A belief that inflation had become insensitive to slack allowed them to maintain this flawed view in the early and late 1970s despite rapidly rising inflation.

Edward Nelson (2004a,b, and Nelson and Nikolov, 2004) emphasizes what he calls the monetary neglect hypothesis as the source of the Great Inflation. This hypothesis holds that policymakers attributed inflation to supply-side factors and did not believe that monetary restraint could cure the resulting inflation. In our view, the emphasis on special factors was a symptom of policymakers' other misguided beliefs, such as an overly optimistic estimate of the natural rate: They had to invoke other factors because they did not believe demand was excessive. Moreover, the belief that monetary contraction was useless was the fundamental part of the neglect hypothesis. Even if the inflation had been caused by special factors, without the pessimism about the usefulness of slack, the obvious response would have been monetary contraction. We agree strongly with Nelson that this pessimism was the crucial source of policy inaction at key points in the 1970s.

STRENGTHS AND WEAKNESSES OF THE POLITICS HYPOTHESIS

Now that I have shamefully digressed and given my own view of where the Great Inflation

came from, let me return to Meltzer's alternative view that politics were crucial. It is a view that I believe has some strengths, but also some important weaknesses.

Perhaps its most fundamental weakness is that it is too narrowly focused on the Federal Reserve. Suppose that Meltzer is completely right that the Federal Reserve felt constrained to support various administrations' expansionary fiscal policies. This story only pushes the mystery of the Great Inflation back a step. One is left to ask, Where did the drive for expansionary fiscal policy come from? Here, I believe, even Meltzer would assign a large role to ideas. Herbert Stein's classic book *The Fiscal Revolution in America* (1969) details the crucial role of economic beliefs in breaking down the traditional support for a balanced budget. And, as I have described, the changing beliefs among policymakers about the sustainable level of unemployment and the efficacy of recession for controlling inflation can explain why policymakers genuinely concerned about inflation could nevertheless have advocated fiscal expansion.

In terms of his description of Federal Reserve behavior, I feel Meltzer has provided crucial information about the late 1960s. As I have described, Chairman Martin had fundamentally sensible views about where inflation came from and the sustainable level of unemployment. And he did not change those views during his tenure. Nevertheless, he failed to act to stem the rising inflation of the second half of the 1960s. Meltzer has provided compelling evidence of Martin's quite limited support for true Federal Reserve independence and his deference to the White House.

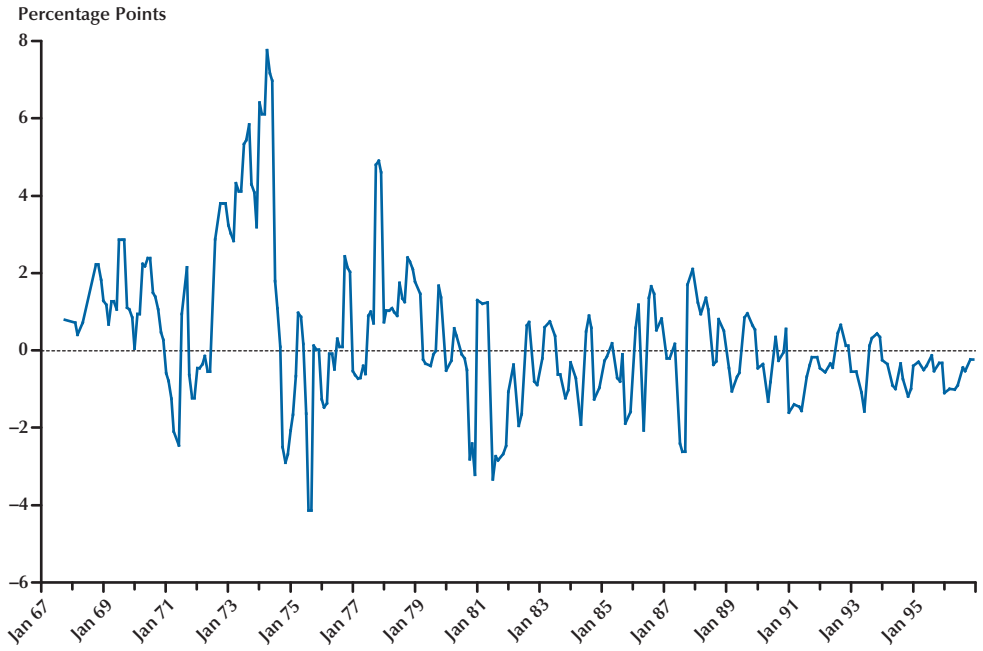
However, my reading of the narrative record puts less emphasis on the narrow issue of the Federal Reserve supporting the various administrations' fiscal policies and more on supporting the administrations' economic frameworks and macroeconomic goals. In the 1950s, the economic framework of the Eisenhower administration largely matched that of Martin and the majority of the FOMC. In this environment, Martin had no difficulty standing up to Congress. He said in 1958: "If the System should lose its independence in the process of fighting for sound money, that would indeed be a great feather in its cap and ultimately its success would be great" (FOMC, Minutes, September 9, 1958, p. 53). But the Kennedy and Johnson administrations had thoroughly accepted the New Economics, as had a number of members of the FOMC and the Board staff. Martin, I believe, felt it was not appropriate to push his own views when so many around him believed otherwise. It is interesting that the minutes of the FOMC for the 1960s contain numerous discussions of the Council of Economic Advisers' beliefs and forecasts (see, for example, February 13, 1962, p. 5, and March 1, 1966, p. 44).

I would also put much less weight than Meltzer does on operating procedures as a source of Martin's policy mistakes in the late 1960s. Short-term emphasis in policymaking, lack of focus on monetary aggregates, and a commitment to maintaining interest rates during a Treasury debt issue were all factors that had been present in the 1950s. Yet, as Meltzer notes, the Federal Reserve had no trouble undertaking aggressive and successful disinflations after the Korean War and in 1958-59. Furthermore, Meltzer's argument that larger budget deficits in the 1960s made "even-keel" constraints more important seems to me implausible. The deficit-to-GDP ratio in 1959 was as large or larger than in most years of the late 1960s and early 1970s. The important change between the 1950s and the 1960s was the change in economic beliefs among fiscal and some monetary policymakers, which, for the reasons Meltzer discusses, Martin chose not to challenge.

While a slightly revised version of Meltzer's politics story can explain why Martin did not act to restrain the rising inflation of the late 1960s, this, of course, only brings us to 1970. That the moderate inflation of the late 1960s continued and accelerated for ten more years is in many ways the more important feature of the Great Inflation. I do not believe that the politics hypothesis is correct for most of this decade. I certainly do not feel that it is correct for Arthur Burns in the early 1970s. Meltzer quotes Burns's 1979 Per Jacobson lecture as evidence that Burns knew that monetary policy could have stopped the inflation of the 1970s, but felt unable to do so because of political constraints. I can't help but believe that there is

Figure 1

Greenbook Forecast Errors for Inflation



a substantial amount of wishful revisionism in Burns's ex post account. The minutes of the FOMC for the early 1970s show no sign of a struggle between Burns's desires and the policies he advocated. Burns argued forcefully for expansionary policy, citing his belief that monetary contraction was useless. This was, importantly, an idea he had expressed many times before becoming Federal Reserve Chairman.

It is possible that political concerns were more important late in Burns's tenure. By the mid-1970s, Burns's economic framework seemed much more standard, and he testified that "we will need to rely principally on sound management of aggregate demand through general monetary and fiscal policies" to bring about a gradual return to price stability (Board of Governors, February 1974, p. 105). Nevertheless, after tightening during the 1974 recession and returning the inflation rate to an almost acceptable level, Burns led a rapid monetary expansion in 1977. The minutes give remarkably little justification for this action. I hope that Meltzer will turn his prodigious talents to explaining Burns's puzzling last hurrah.

In the case of G. William Miller, whom Meltzer does not discuss, I think there can be little doubt that he was acting as he saw fit. Miller genuinely believed that it was possible to "pursue a monetary policy that aims at a reduction of inflationary pressures while encouraging continued economic growth and high levels of employment" (Board of Governors, December 1978, p. 943). Miller, like Burns, acted in a way that supported the administration in office because he shared the same economic framework as the administration.

One way to try to get some empirical evidence on the issues that Meltzer raises is to look at the Federal Reserve's internal forecasts. Meltzer's political story implies that the Federal Reserve knew better—they understood that their actions in the late 1960s and early 1970s were inflationary (or at least not contractionary enough to curb inflation), but took them for political reasons. If this were true, one would expect their internal

Table 2

Natural Rate of Unemployment Implicit in Greenbook Forecasts

Era	Mean
Martin (1967:10–1970:01)	2.5%
Burns (1970:02–1975:06)	3.1%
(1975:07–1978:02)	8.2%
Miller (1978:03–1979:07)	4.6%
Volcker (1979:08–1987:07)	8.0%
Greenspan (1987:08–1996:12)	6.7%

forecast errors for inflation to be reasonably small and unbiased. This is most definitely not the case.

Figure 1 shows the forecast errors for the Greenbook forecast of inflation two quarters ahead. (I am using the Greenbook forecast for the GNP/GDP deflator and therefore use as the comparison series a real-time measure of the deflator. See Romer and Romer, 2002b, for more details on the comparison series and procedures.) The forecast errors during the Great Inflation were very large and nearly all positive. Federal Reserve forecasts, on average, underpredicted inflation just two quarters ahead by 1.2 percentage points. And, during the early Burns era, forecast errors of 4 percentage points or larger were common. Such large errors are more consistent with the notion that the Federal Reserve failed to curb inflation because its model of the economy was severely flawed, than that the Federal Reserve was constrained by fiscal policy or other political concerns. It is interesting to note that, even during the late Martin era, the inflation forecasts are severely overly optimistic, which is perhaps indicative of the idea that, while Martin may have had reasonable beliefs, many at the Federal Reserve (including the staff) had adopted the New Economics. This may help to explain why Martin found it hard to follow his personal compass.

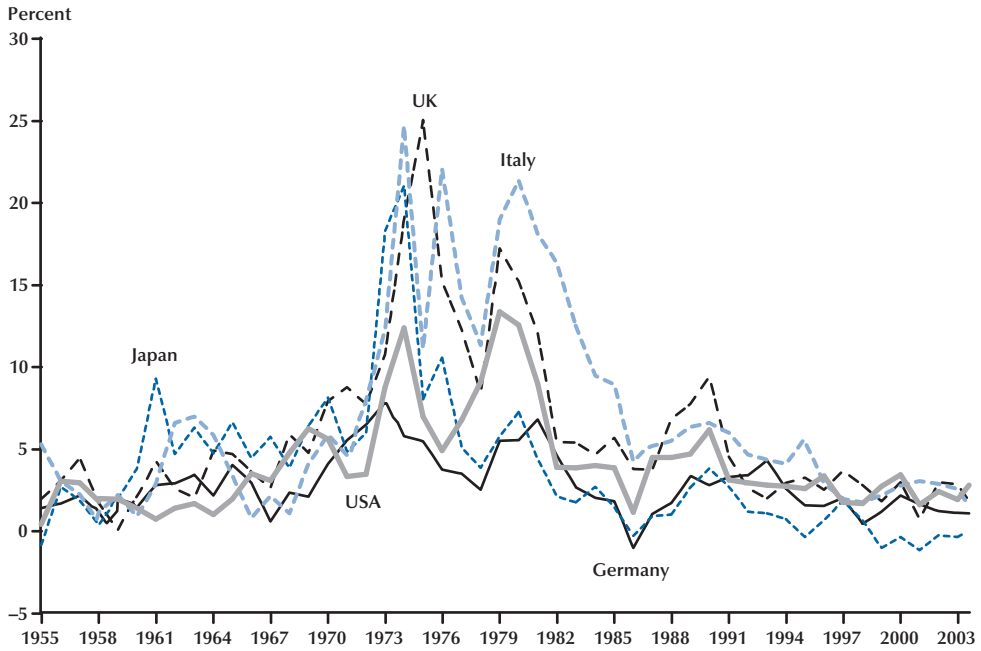
Another exercise one can do with the Greenbook forecasts is to infer the implicit estimate of the natural rate of unemployment. To do this, one has to make the somewhat heroic assumption that all forecasted movements in inflation result from forecasted deviations of unemployment from the natural rate. Thus, the estimates will inevitably be somewhat noisy and rough. (Again, see Romer and Romer, 2002b, for more details on this exercise.) The results, however, are striking and are given in Table 2. The implicit estimate of the natural rate averaged around 3 percent during the late Martin and early Burns periods. It rose substantially in the last three years of Burns's tenure, a time when his stated economic views also became more reasonable. These implicit estimates of the natural rate then fell to around 4.5 percent during the Miller era. These estimates (except for those late in the Burns era) are dramatically lower than almost any modern estimates of the natural rate for this period (see Staiger, Stock, and Watson, 1997) and lower than the implicit estimates in the Greenbook forecasts for the Volcker and Greenspan eras. That the Federal Reserve's internal estimates of the natural rate were so overly optimistic during the late 1960s and much of the 1970s makes it unlikely that they were chomping at the bit to tighten but were prevented from doing so by political concerns. Rather, the Federal Reserve was doing what it thought was right, given the beliefs that it held at the time.

A final consideration that forces me to question Meltzer's explanation of the Great Inflation in the United States is the fact that the inflation of the late 1960s and 1970s was worldwide. As Figure 2 makes clear, though the inflation may have started sooner in the United States, by 1970 it had enveloped all of the major industrial countries. (The data are from Global Financial Data and show the annual percentage change in the consumer price index for each country.) A story that focuses on the delicate relationship between the Federal Reserve and the executive and legislative branches or on the particulars of Federal Reserve operating procedures just seems too small. One inherently wants an explanation that crosses borders.

Now, Meltzer is surely right that some of the worldwide inflation was simply American inflation exported to other countries by the Bretton Woods system. Countries such as Japan and Germany were strongly committed to fixed

Figure 2

Inflation in Five Countries



exchange rates. As a result, when American inflation caused large trade surpluses for those countries, they responded, in part, by allowing inflation to rise (see, for example, Cargill, Hutchison, and Ito, 1997, and Johnson, 1998). It is also surely the case that Meltzer's politics story is right for some countries. For example, Fratianni and Spinelli's (1997) analysis of Italian monetary history stresses fiscal dominance and structural rises in the budget deficit as the key sources of Italy's unusually severe inflation in the 1970s. And, in a number of countries, there was surely at least some of the pressure toward cooperation with fiscal authorities that Meltzer thinks was important for the United States in the late 1960s.

But, for most of the key industrial countries, ideas played a more central role. Ideas, such as a belief that very low unemployment was sustainable or that inflation caused by supply factors won't respond to contractionary monetary policy, can easily spread across countries. And there is a growing body of research that suggests that such ideas fueled the inflation of the late 1960s and 1970s in a number of countries. Nelson (2004a,b), for example, has shown that policymakers in the United Kingdom, New Zealand, Australia, and Canada all subscribed to the belief that aggregate demand contraction could do little to cure inflation and so refused to adopt anti-inflationary monetary or fiscal policy. Johnson (1998) shows that the tenets of optimistic Keynesianism led German fiscal authorities to adopt quite expansionary policies between 1969 and 1973 (see also Kloten, Ketterer, and Vollmer, 1985, and Allen, 1989). And, as Meltzer notes, Germany and Japan resisted revaluation when the Bretton Woods system began to falter in the early 1970s because they feared the output consequences. What, other than a flawed model of the economy, would have led these two countries to believe that the overheated conditions could have endured and not given way to rising inflation?

Perhaps the strongest evidence that the Great Inflation in the United States and elsewhere was

the result of ideas is the fact that ideas ended it. Countries with vastly different institutions, operating procedures, and fiscal situations successfully undertook painful disinflations and have maintained low inflation in the face of numerous shocks for almost two decades. One need only attend a meeting of central bankers to see that what is consistent across countries is the economic framework—nearly everyone subscribes to the fundamental beliefs that inflation is costly, capacity is limited, and inflation can be controlled by aggregate demand policy. It is these beliefs that fueled the Volcker disinflation in the United States and that broke the back of inflation worldwide. Like all good revolutions, the Volcker revolution was the triumph of better ideas over worse ones.

REFERENCES

Allen, Christopher S. "The Underdevelopment of Keynesianism in the Federal Republic of Germany," in Peter A. Hall, ed., *The Political Power of Economic Ideas: Keynesianism across Nations*. Princeton, NJ: Princeton University Press, 1989, pp. 263-90.

Board of Governors of the Federal Reserve System. *Federal Reserve Bulletin*. Washington, DC: various dates.

Cargill, Thomas F.; Hutchinson, Michael M. and Ito, Takatoshi. *The Political Economy of Japanese Monetary Policy*. Cambridge, MA: MIT Press, 1997.

Council of Economic Advisers. *Economic Report of the President*. Washington, DC: Government Printing Office, 1962, 1978.

De Long, J. Bradford. "America's Peacetime Inflation: The 1970s," in Christina D. Romer and David H. Romer, eds., *Reducing Inflation: Motivation and Strategy*. Chicago: University of Chicago Press for NBER, 1997, pp. 247-76.

Federal Open Market Committee. Minutes. Washington, DC: Board of Governors of the Federal Reserve System, various dates.

Fratianni, Michele and Spinelli, Franco. *A Monetary History of Italy*. Cambridge: Cambridge University Press, 1997.

Johnson, Peter A. *The Government of Money: Monetarism in Germany and the United States*. Ithaca, NY: Cornell University Press, 1998.

Kloten, Norbert; Ketterer, Karl-Heinz and Vollmer, Rainer. "West Germany's Stabilization Performance," in Leon N. Lindberg and Charles S. Maier, eds., *The Politics of Inflation and Economic Stagnation*. Washington, DC: Brookings Institution, 1985, pp. 353-402.

Mayer, Thomas. *Monetary Policy and the Great Inflation in the United States: The Federal Reserve and the Failure of Macroeconomic Policy, 1965-79*. Cheltenham, UK: Edward Elgar, 1998.

Nelson, Edward. "The Great Inflation of the Seventies: What Really Happened?" Working Paper No. 2004-001, Federal Reserve Bank of St. Louis, January 2004a.

Nelson, Edward. "Monetary Policy Neglect and the Great Inflation in Canada, Australia, and New Zealand." Working Paper No. 2004-008, Federal Reserve Bank of St. Louis, April 2004b.

Nelson, Edward and Nikolov, Kalin. "Monetary Policy and Stagflation in the UK." *Journal of Money, Credit, and Banking*, June 2004, *36*(3), pp. 293-318.

Orphanides, Athanasios."The Quest for Prosperity without Inflation." *Journal of Monetary Economics*, April 2003, *50*(3), pp. 633-63.

Primiceri, Georgio E. "Why Inflation Rose and Fell: Policymakers' Beliefs and U.S. Postwar Stabilization Policy." Working paper, Princeton University, May 2004.

Romer, Christina D. and Romer, David H. "A Rehabilitation of Monetary Policy in the 1950s." *American Economic Review*, May 2002a, *92*(2), pp. 121-27.

Romer, Christina D. and Romer, David H. "The Evolution of Economic Understanding and Postwar Stabilization Policy," in *Rethinking Stabilization*

Policy. Kansas City, MO: Federal Reserve Bank of Kansas City, 2002b, pp. 11-78.

Romer, Christina D. and Romer, David H. "Choosing the Federal Reserve Chair: Lessons from History." *Journal of Economic Perspectives*, Winter 2004, *18*(1), pp. 129-62.

Sargent, Thomas J. *The Conquest of American Inflation*. Princeton, NJ: Princeton University Press, 1999.

Staiger, Douglas; Stock, James H. and Watson, Mark W. "How Precise Are Estimates of the Natural Rate of Unemployment?" in Christina D. Romer and David H. Romer, eds., *Reducing Inflation: Motivation and Strategy*. Chicago: University of Chicago Press for NBER, 1997, pp. 195-242.

Stein, Herbert. *The Fiscal Revolution in America*. Chicago: University of Chicago Press, 1969.

Taylor, John B. "Comment," in Christina D. Romer and David H. Romer, eds., *Reducing Inflation: Motivation and Strategy*. Chicago: University of Chicago Press for NBER, 1997, pp. 276-80.

Taylor, John B. "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules*. Chicago: University of Chicago Press for NBER, 1999, pp. 319-41.

The Reform of October 1979: How It Happened and Why

David E. Lindsey, Athanasios Orphanides, and Robert H. Rasche

This study offers a historical review of the monetary policy reform of October 6, 1979, and discusses the influences behind it and its significance. We lay out the record from the start of 1979 through the spring of 1980, relying almost exclusively on contemporaneous sources, including the recently released transcripts of Federal Open Market Committee (FOMC) meetings during 1979. We then present and discuss in detail the reasons for the FOMC's adoption of the reform and the communications challenge presented to the Committee during this period. Further, we examine whether the essential characteristics of the reform were consistent with monetarism; new, neo, or old-fashioned Keynesianism; nominal income targeting; and inflation targeting. The record suggests that the reform was adopted when the FOMC became convinced that its earlier gradualist strategy using finely tuned interest rate moves had proved inadequate for fighting inflation and reversing inflation expectations. The new plan had to break dramatically with established practice, allow for the possibility of substantial increases in short-term interest rates yet be politically acceptable, and convince financial market participants that it would be effective. The new operating procedures were also adopted for the pragmatic reason that they would likely succeed.

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> Do we have the wit and the wisdom to restore an environment of *price* stability without impairing *economic* stability? Should we fail, I fear the distortions and uncertainty generated by inflation itself will greatly extend and exaggerate the sense of malaise and caution... Should we succeed, I believe the stage will have been set for a new long period of prosperity.[1]
>
> —Paul Volcker

A quarter-century after Paul Volcker's monetary policy reform in October 1979, the profound significance of restoring price stability for the nation's prosperity is widely recognized. Taming the inflation problem of the 1970s did set the stage for a long period of prosperity, as Volcker and many others had hoped. Over the past two decades, the nation has enjoyed greater price stability together with greater economic stability. Expansions have been uncommonly long and recessions relatively brief and shallow (Figure 1).

The centerpiece of the reform was the abandonment of federal funds rate targeting in favor of nonborrowed reserves targeting as the operating procedure for controlling the nation's money supply. This resulted in the unwelcome higher volatility of the federal funds rate (Figure 1) during a few years following the reform. In the prevailing environment of high and increasingly unstable inflation, however, small adjustments in the fed-

[1] Volcker (1978, p. 61).

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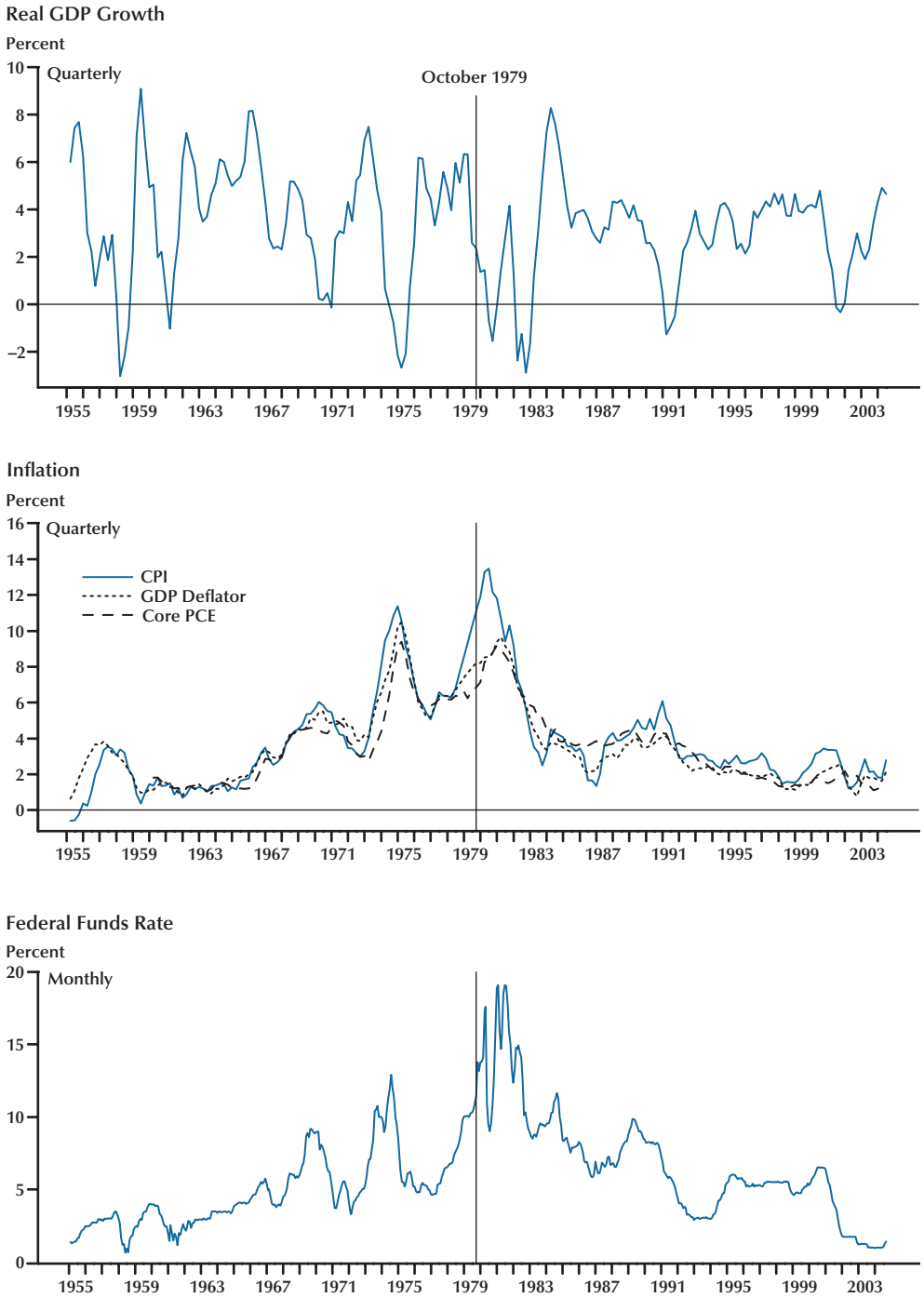
Figure 1

Real GDP Growth, Inflation, and the Federal Funds Rate



eral funds rate had proven woefully inadequate for reining in monetary growth.

The reforms of October run much deeper than the technical details that a mere switch in operating procedures would suggest.[2] By the end of the 1970s, the policy framework of the Federal Reserve had inadvertently contributed to macroeconomic instability. The break in operating procedures facilitated a salutary reorientation of policy strategy, one focusing on the critical role of price stability for achieving and maintaining the System's objectives. This study offers a historical review of the monetary policy reform of October 6, 1979, and examines the reasons for and lessons from that experience in this broader context of the Federal Reserve's policy strategy.

The paper is organized in five sections. The first section, *How It Happened*, lays out the historical record from the start of 1979 through the spring of 1980, relying almost exclusively upon contemporaneous sources and with deliberately minimal editorial comment. An important new source for this historical description is the transcripts of Federal Open Market Committee (FOMC) meetings during 1979. These transcripts, which only recently became publicly available, prove especially valuable for assessing the reasoning behind FOMC actions. The second section, *Why?*, presents and discusses 12 reasons for the FOMC's adoption of the reform, approximately in order of increasing subtlety. The third section looks at the communications challenge presented to the Committee during this period, and asks whether "*What We Have Here Is a Failure to Communicate!*" *Or Not!* The fourth section asks *Was Chairman Volcker… A Monetarist? A Nominal Income Targeter? A New, Neo, or Old-Fashioned Keynesian? An Inflation Targeter?* or *A Great Communicator?* The final section concludes.

HOW IT HAPPENED

In the first half of 1979, the Board of Governors of the Federal Reserve System (BOG) under Chairman G. William Miller was short-handed and inexperienced, while the FOMC was deeply divided over the economic outlook, its primary policy objective, and its appropriate tactics. At the beginning of the year there were two vacancies on the Board, as Governor Jackson had resigned on November 17, 1978, and two days later Vice Chairman Gardner died. The two vacancies remained until one was filled by the appointment of Governor Rice on June 20, 1979.

Of the five members of the Board on January 31, 1979, Governor Wallich, who had taken office in March 1974, had the longest tenure. Two governors, Chairman Miller, and Governor Teeters, each had less than a year of service. The average tenure on that date was about 2.7 years, which was among the shortest on record (see Figure 2).[3]

At the year's first FOMC meeting in February, the Board staff indicated in the Greenbook that they expected real growth to slow, unemployment to rise, and, as a consequence of the increasing labor-market slack, the inflation rate to decline (BOG, 1979b, p. I-5). (Figure 3 shows the Greenbook forecasts through September and the staff's forecast prepared right after the October 6 reform.) Through May, the staff forecast for real growth and unemployment stayed essentially unchanged, but the inflation outlook deteriorated appreciably.[4]

Board members and Reserve Bank presidents initially were about evenly split on the outlook for continued real growth versus recession, but on balance they became increasingly pessimistic as time passed. At the February 1979 meeting at least six individuals indicated that they felt a recession during that year was possible. At the same meeting at least nine other individuals indicated that they agreed with the staff forecast of no recession, or thought that the outlook was for strong growth, or thought the most pressing issue was the inflation rate (FOMC, Transcript, 2/6/1979, pp. 10, 12, 22-23). But by the March meeting, the sentiment among the governors and presidents for continuing growth was already souring; by then

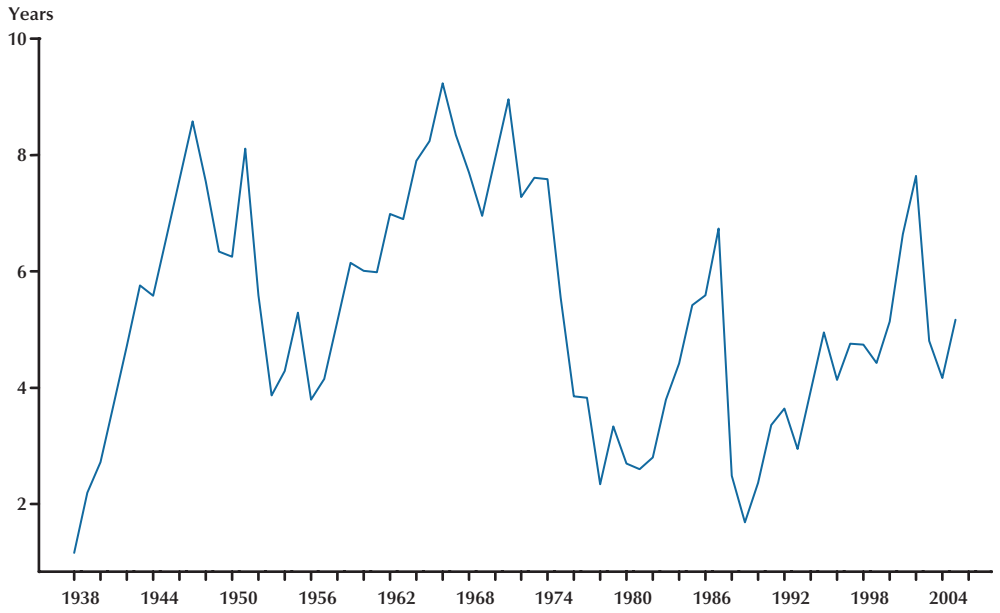
[2] For a description of the operating procedures prior to the reforms, see Wallich and Keir (1979). See Axilrod (1981) and Lindsey (1986) for descriptions of the new operating procedures.

[3] Governor Partee served on the senior staff of the Board of Governors for many years before his appointment to the Board, which began January 5, 1976. The terms of members of the Board expire on January 31 of even-numbered years.

[4] See Kichline (1979a,b,c).

Figure 2

Average Tenure of Federal Reserve Board Members
(as of January 31 of Year Shown)



at least nine individuals predicted a recession before the end of the year. By the May meeting, at least eight individuals felt that the economy either already was in recession or close to a cyclical peak.

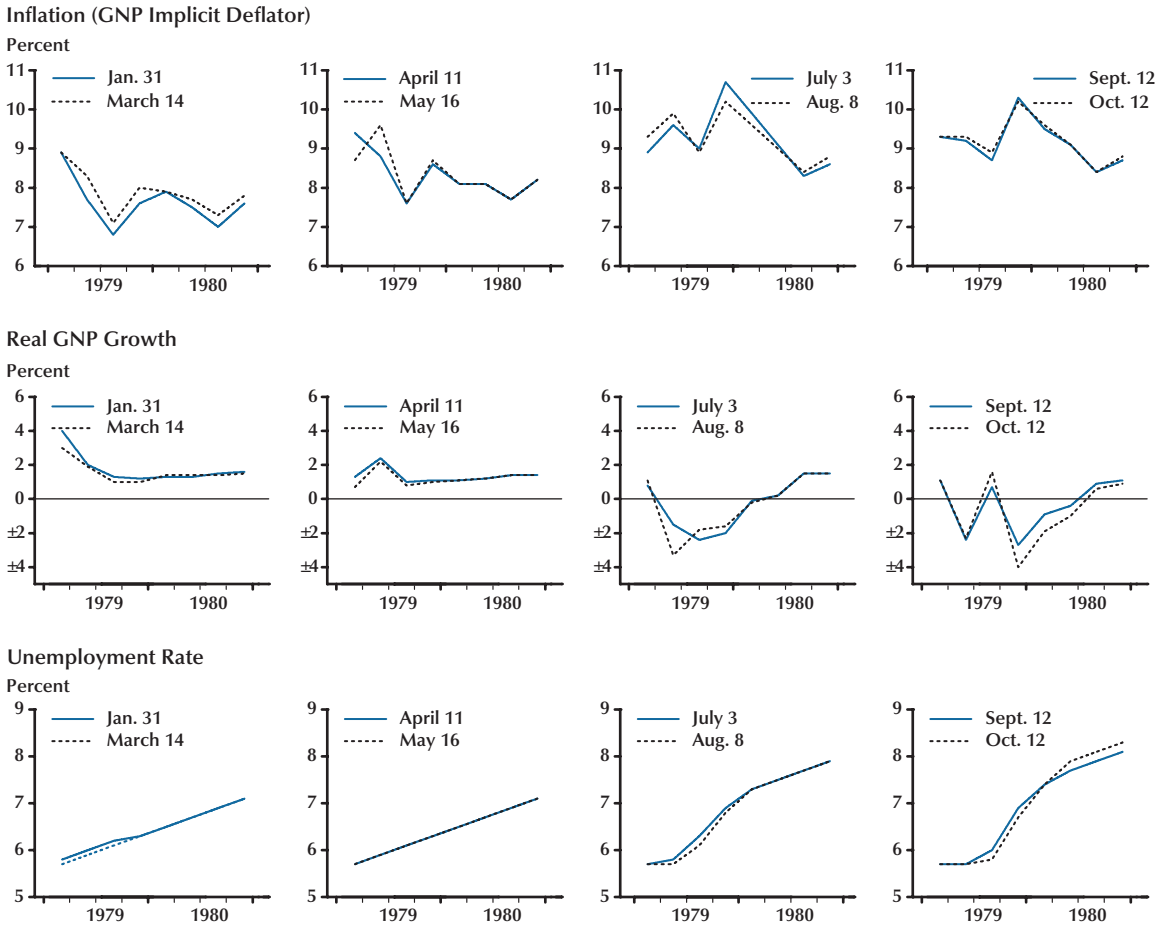
In early July, the Greenbook assessed that a recession had already started by the second quarter, and it was projected to persist to the end of the year. The Board apparently held a similar view, as the July 17 Monetary Policy Report indicated that the projection of Board members for real gross national product (GNP) growth over 1979 was –2 to –1/2 percent (BOG, 1979a, p. 76). All the while, inflation was worsening further, in part due to the rapid increase in energy prices. Private forecasts of economic activity were no less pessimistic. Indeed, the Blue Chip consensus forecast pointed to a recession even before the staff did, starting in May. Such forecasts of recession accompanied by increasingly virulent inflation remained a recurrent theme both in the Greenbook and in the Blue Chip consensus forecasts for the remainder of the year.

The deteriorating inflation situation and the increasing pessimism about prospective real growth produced different opinions at the FOMC table as to the appropriate focus of policy. One group was quite vocal that priority had to be assigned to addressing inflation; a second group was equally vociferous that priority instead should be given to mitigating the risk of economic weakness. The conflict posed a difficult situation for Chairman Miller, who appears to have viewed his role as that of discovering a consensus among the FOMC principals. His mode of operation was to collect statements on the wording of a directive (in terms of growth rates of M1 and M2 and a range for the federal funds rate) and then to float a "trial balloon" to see how much support it garnered (FOMC, Transcript, 3/20/1979, pp. 31-32). At some meetings Chairman Miller did not even state his own view of the economic outlook or an appropriate wording for the directive.

Dissents from the directive were common, even numerous, at some of the meetings in the first half of 1979. Four members dissented at the March

Figure 3

Evolution of Greenbook Forecasts During 1979



meeting because they favored tighter policy—after only one dissent, also in that direction, at the February meeting (BOG, 1979a, pp. 142-43). Three dissents from the directive occurred in April, all toward tighter policy, and three dissents again were recorded in May—two for easier and one for tighter policy (BOG, 1979a, pp. 156, 165). The conference calls on June 15 and July 27 elicited one dissent each, the first in favor of a tighter policy stance and the second in favor of an easier one (BOG, 1979a, pp. 166, 178). Only at the July meeting was the directive adopted unanimously (BOG, 1979a, p. 178). Based on his comments, Chairman Miller seemed frustrated by the dissents.

An ongoing issue during the first half of 1979 was whether the FOMC should frame the operating paragraph of the directive to the Manager for Domestic Operations, System Open Market Account, in terms of a "monetary aggregates" or a "money markets" objective. This nuance was a significant issue in the minds of many FOMC participants. Surprisingly, considering the extent of the internal discussion devoted to this issue, the only explicit definition or explanation of the terminology that we have been able to find is in the staff recommendations for alternative wording of the directive that appear in the 1979 Bluebooks. For example, in the Bluebook for the February

1979 FOMC meeting the staff suggested both a "monetary aggregates emphasis" and a "money market emphasis" as alternative wording for the directive. The difference seems to be only a single phrase. The suggested wording with the monetary aggregates emphasis was this:

> If, with approximately equal weight given to M1 and M2, their growth rates appear to be *significantly above or below the midpoints* of the indicated ranges, the objective for the funds rate is to be raised or lowered in an orderly fashion within its range. (BOG, 1979c, p. 20)

The suggested wording for the money market emphasis was this:

> If, with approximately equal weight given to M1 and M2, their growth rates appear to be *close to or beyond the upper or lower limits* of the indicated ranges, the objective for the funds rate is to be raised or lowered in an orderly fashion within its range. (BOG, 1979c, p. 20)

The distinction seemed to have hinged on whether the Manager was to react to growth of the aggregates within the specified ranges or only when the growth of the aggregates approached or went outside the stated ranges. But, in practice, the federal funds rate fluctuated within rather narrow ranges under either directive. On the basis of this distinction, all of the directives from the February through September 1979 FOMC meetings, except for that adopted at the March FOMC meeting, were "money market directives."

As to the actual policy stance, Chairman Miller's tenure in 1979 included only minor tightenings—gauged by the FOMC's funds rate objective. Two occurred on conference calls and without formal FOMC votes. They were in line with directive instructions to make small funds rate adjustments up (or down) within a specified range to resist emerging faster- (or slower-) than-specified growth in the monetary aggregates. The first took place on April 27, when the funds rate objective went from a range of 10 to $10^{1}/_{8}$ percent to $10^{1}/_{4}$ percent, and the second on July 19, when the FOMC raised the target to $10^{1}/_{2}$ percent. On the next day, the Board unanimously voted to hike the discount rate $^{1}/_{2}$ percentage point to 10 percent. Miller's departure to the Treasury was announced on July 19 and took place when Chairman Volcker was sworn in on August 6. When Miller went to the Treasury, the Trading Desk, acting between Committee meetings in accord with directive instructions from the FOMC, was pursuing an increased federal funds rate objective of $10^{5}/_{8}$ percent or a shade higher, compared with 10 percent or slightly higher as the year began.

Vice Chairman Volcker's impression of emerging macroeconomic problems remained remarkably constant during G. William Miller's chairmanship in 1979. Such a conclusion can be drawn from Volcker's comments at the February, March, April, and May meetings of the FOMC.

> **Vice Chairman Volcker**…I continue to feel that we could have a recession, but it's by no means certain. I wouldn't rule one out, by any means, in the second half of the year. But in terms of the recession outlook itself, I think the number one problem continues to be the concern about the price level. The greatest risk to the economy, as well as [to actual] inflation, is people having the feeling that prices are getting out of control. (FOMC, Transcript, 2/6/1979, p. 10)

> **Vice Chairman Volcker**…I think the odds are better than 50/50 that we're going to run into a recession by [year-end], and I've thought that for some time...Essentially, I think we're in retreat on the inflation side; if there's not a complete rout, it's close to it. And in my view that poses the major danger to the stability of the economy as we proceed. (FOMC, Transcript, 3/20/1979, pp. 9-10)

> **Vice Chairman Volcker**...And [inflation] clearly remains our problem. In any longer-range or indeed shorter-range perspective, the inflationary momentum has been increasing. In terms of economic stability in the future that is what is likely to give us the most problems and create the biggest recession. And the difficulty in getting out of a recession, if we succeed, is that it conveys an impression that we are not dealing with inflation. I'm afraid that is the impression that we are conveying. We talk about gradually decelerating the rate of inflation over a series of years. In fact, it has been accelerating over a series of years and hasn't yet shown any signs of reversing. (FOMC, Transcript, 4/17/1979, p. 16)

> **Vice Chairman Volcker**...I'm impressed by the degree that inflation is now built into thinking in terms of the business outlook. I'm also impressed—the supporting factor—by the degree with which capacity problems and backlogs exist...Frank Morris said that we can't casually assume the recession will be mild. I suppose we can't casually assume it, although it looks that way to me now—if we're going to have one. But we can't always be looking at the worst. If we're going to balance these risks of inflation and recession we have to run not too scared that the recession is going to be worse than we expect. So it is a question of bringing about a balance. (FOMC, Transcript, 5/22/1979, p. 22)

While vice chairman, Volcker expressed skepticism about the ability of economists to make accurate forecasts.

> **Vice Chairman Volcker**...When I look at the outlook for real GNP, it does seem to me that the staff forecast of six quarters of approximately 1 percent growth in GNP per quarter is inherently improbable. I don't think that has ever happened.
>
> **Chairman Miller**. Plus or minus 3 percent.
>
> **Vice Chairman Volcker**. That is precisely the difficulty. The reason they have come up with this forecast is that one doesn't know whether the 3 percent error will in fact be plus or minus. I must say in talking about projection errors that I am much more concerned about the persistent errors in the projections of the inflation rate than I am about the recent errors in the projections of the monetary aggregates. The inflation projections have been consistently on the low side. And I'm not just talking about the staff's projections; I think that has been true of most forecasters. (FOMC, Transcript, 4/17/1979, pp. 15-16)
>
> **Vice Chairman Volcker**...I'm not inclined to raise the question of whether the staff have overestimated the rate of price increase; I doubt that that's the case. (FOMC, Transcript, 7/11/1979, p. 7)

Given his view of the outlook for inflation, despite more hopeful forecasts by others, Volcker advocated monetary policy tightening in the first part of the year before the policy move in that direction in late April. In February he first voted in a straw poll against standing pat before grudgingly switching his vote in the end. However, he dissented from that policy stance at both the March and April meetings.

> **Vice Chairman Volcker**...I think we are at a critical point in the inflation program, with the tide against us. If we don't show any response at all, we are giving an unfortunate signal in my judgment. I believe those concerned about inflation would find no response during this period almost inexplicable in terms of what we say regarding our worries about inflation...I do think we need to make some move in recognition of what has been happening on the inflation front. And I think its good for the stability of the economy in the long run. (FOMC, Transcript, 3/20/1979, pp. 10, 28)
>
> **Vice Chairman Volcker**...We may be one month closer to a recession than we were last month and I think we are late [in tightening], but I still am of the view that some greater degree of restriction would be more appropriate than the reverse [and] more appropriate than standing still. (FOMC, Transcript, 4/17/1979, p. 16)

His hawkish perspective at the March and April meetings did not, however, stem mainly from recent rapid money growth—which at that time in fact was running far below expectations.[5]

> **Vice Chairman Volcker**...I don't think that {money} target itself, though written in our records, is written in heaven, given all the uncertainties that we had when we set it... {T}he exact level of the aggregates isn't quite as important to me as the movement on the funds rate. I'd like to make some gesture there immediately. (FOMC, Transcript, 3/20/1979, pp. 28-29)
>
> **Vice Chairman Volcker**...I sit here listening to all this about the aggregates and it seems to me that the only reasonable conclusion is not to put much weight on the aggregates. We see

[5] Light editing that actually appears in the official transcripts is shown here with brackets, [ ]. Further editing we have done for this paper is shown with braces, { }.

> relationships that go way out of the range of historical experience. We haven't any idea of the validity of the forecast [for the monetary aggregates], I'm afraid, and the combination of those two events does not make me want to linger over the aggregates. (FOMC, Transcript, 4/17/1979, p. 15)

By the time of the May meeting, though, money growth had become more normal, and he was ready to upgrade the role of the aggregates in policymaking.

> **Vice Chairman Volcker**...As I thought about what to do, I arrived at the same conclusion that Steve did up to a point—that maybe for lack of anything better we should go back and look at the aggregates a bit...I was thinking of widening the range mostly in the downward direction rather than widening it on the up side. But I do think that's a reasonable approach as we watch both the aggregates and the business news in the next six weeks. (FOMC, Transcript, 5/11/1979, p. 22)

Volcker's hawkish views were well known outside the Federal Reserve as well as inside at the time President Carter interviewed him for Federal Reserve Chairman in July. In Volcker's recollection of the interview, "I told him the Federal Reserve was going to have to be tighter and that it was very important that its independence be maintained." Although Volcker thought that these views might preclude his nomination as Chairman, the President proved him wrong despite the opposition of some of his advisers (Treaster, 2004, pp. 61-62). President Carter's nomination of Paul Volcker to replace G. William Miller as chairman of the Federal Reserve Board was announced on July 25. The exchange value of the dollar steadied on this news, but in a July 27 conference call that was not transcribed, the FOMC voted to raise not the actual funds rate target but rather the upper limit of its allowable range to $10^3/_4$ percent, making a new range of $10^1/_2$ to $10^3/_4$ percent, owing to strong growth in the aggregates (FOMC, 1979b, pp. 1-2).

Volcker's nomination enjoyed wide support across the political spectrum, and his confirmation hearing on July 30 was relatively uneventful. At the hearing Volcker reiterated his well-publicized views in favor of curbing inflation and stressed that "if we're going to have price stability" it was "indispensable" to bring down the growth of monetary aggregates (U.S. Senate, 1979, p. 12). Volcker took the oath of office on August 6, and he presided over the August 14 FOMC meeting. At that meeting, the FOMC continued its recent turn toward firming. With two dissents—one in favor of a smaller, and one in favor of a larger, move—the FOMC raised the funds rate objective from $10^5/_8$ percent or a shade higher to 11 percent. Chairman Volcker's thinking can be gleaned from a selection of his comments.

> **Chairman Volcker**...It looks as though we're in a recession; I suppose we have to consider that the recession could be worse than the staff's projections suggest at this time...When we look at the other side, I don't have to talk much about the inflation numbers...And when I look ahead, nobody is very optimistic about the inflation picture...When I look at the past year or two I am impressed myself by an intangible: the degree to which inflationary psychology has really changed...{I}t would be very nice if in some sense we could restore our own credentials and [the credibility] of economic policy in general on the inflation issue. (FOMC, Transcript, 8/14/1979, pp. 20-22)

He proposed "some gesture" at that meeting, though the time did not seem ripe for a major move or any procedural change.

> **Chairman Volcker**...{W}e don't have a lot of room for maneuver and I don't think we want to use up all our ammunition right now in a really dramatic action; I don't see that the exchange market or anything else really requires that at the moment. Certainly dramatic action would not be understood without more of a crisis atmosphere than there is at the moment. Ordinarily I tend to think we ought to keep our ammunition reserved as much as possible for more of a crisis situation where we have a rather clear public backing for whatever drastic action we take. (FOMC, Transcript, 8/14/1979, pp. 22-23)

On August 16, the Board voted unanimously to increase the discount rate $^1/_2$ percentage point

to 10 1/2 percent. In response to continued strong aggregates growth and dollar weakness, the Desk subsequently raised the funds rate objective in two steps (in accordance with directive instructions) to 11 3/8 percent by the end of August, an operating objective that lasted until the September 18 FOMC meeting. The Board considered additional requests to raise the discount rate in late August and early September but appeared deeply divided on the need for such increases. In late August, the Board voted against such raises. Then, in early September it tabled multiple requests for additional action, effectively postponing a decision until after the FOMC meeting scheduled for September 18 (BOG, Minutes, 9/7/1979, p. 4; 9/14/1979, p. 3).

Early in the September 18 meeting, President Roos of the Federal Reserve Bank of St. Louis raised the question of whether the FOMC's operating procedures should be reexamined. Chairman Volcker indicated that the Committee's decision that day should be within the traditional approach but that the question should be reassessed soon by the Committee.

> **Mr. Roos**...[Given] your statements, which I think are great, that we're never going to accomplish our ultimate goal until we achieve some discipline in terms of monetary growth, couldn't we discuss these issues again? Maybe I am out of order to raise this now, but couldn't there be a discussion again of whether or not our traditional policy of targeting on interest rates, in spite of the possible adverse consequences in terms of money growth, [is appropriate]? Shouldn't this be given another look in view of everything you've said and in view of the less than happy experience that the FOMC has had over the past years in achieving its goals of stability in terms of the inflation problem? Shouldn't we take a look at this in some way?
>
> **Chairman Volcker**. My feeling would be that you're not out of order in raising that question, Mr. Roos. We would be out of order in having an extended discussion of it today, because I don't think we're going to resolve it. I presume that today, for better or worse, we have to couch our policy in what has become the traditional framework. But I think it is a very relevant question, which has come up from time to time, and I think we should be exploring it again in the relatively near future. And I would plan to do so. (FOMC, Transcript, 9/18/1979, pp. 13-14)

Later at that FOMC meeting, Chairman Volcker, in laying out the policy choice, again noted both horns of the existing dilemma.

> **Chairman Volcker**...There is a very strong possibility of recession on the one side. We've had that possibility for almost six months now and we still have the unemployment rate at a level that some consider to be the natural rate. I don't know whether it is or it isn't, but we had a lot of discussion earlier, which may be reflected in some of the comments about labor markets still being fairly tight. And, obviously, we have inflation as strong as ever. We have a difficult timing problem. Difficult or not we have a timing problem if the business outlook develops more or less as projected, in that we don't have a lot of flexibility—at least flexibility in a tightening direction—in terms of what we can do in the midst of a real downturn...But we are in a rather crucial period in terms of how much the probably deteriorating inflationary expectations now get built into the wage structure...I also share the view that has been quite widely expressed that we have to show some resistance to the growth in money. (FOMC, Transcript, 9/18/1979, pp. 33-34)

He recommended only limited further tightening.

> **Chairman Volcker**...As I listened, among the voting members of the Committee at least, I think there was a majority desire—but clearly not unanimous—to make a little move on the federal funds rate. So I would propose 11-1/2 percent on that at this point. I am not particularly eager to make a major move now or in the foreseeable future, so I would suggest that we put a band around that of 11-1/4 to 11-3/4 percent, which ought to [result in a] reconsideration before a very major step on the funds rate. (FOMC, Transcript, 9/18/1979, p. 35)

The vote elicited eight assents but four dissents; the dissents included Governor Rice on the

dovish side, but three of them came from hawks—Presidents Balles and Black and Governor Coldwell—who were disappointed at the lack of sufficiently forceful action. After the conclusion of the FOMC meeting, the Board met to consider the pending requests for raising the discount rate. The Board continued to be divided on the desirability of such action. Members supporting the increase pointed to the virulence of inflation and inflationary expectations, while members opposing the action emphasized the weakening in economic activity and the lagged effects of monetary policy. In the end, the Board split nearly evenly in approving a 1/2-percentage-point discount rate hike to 11 percent: The vote was four to three, with the dissenting votes all on the dovish side—Governors Partee, Rice, and Teeters.

As usual, the vote on the discount rate, with the three dissents toward more dovish policy, became known right away after the announcement of the discount rate change. By contrast, neither the FOMC's tightening action that morning nor the hawkish sentiment reflected in the three dissents in favor of further tightening was released immediately. Without this information, the dovish dissents on the discount rate had a dramatic and arguably misleading effect on perceptions regarding the policy intentions of the FOMC. The Board action engendered the perception that the Federal Reserve's resistance to inflationary forces would be insufficient and discomfited financial markets. The press interpreted the vote thusly:

> Many money market analysts have been expecting the FOMC to seek to tighten credit again in an effort to slow down sharp increases in the money supply...However, the split vote, with its clear signal that from the Fed's own point of view interest rates are at or close to their peak for this business cycle, might forestall any more increases in market interest rates. (Berry, 1979, A1)

> This division indicates that Mr. Volcker's drive for a restrictive monetary policy may encounter increasing opposition within the seven-member board. (*Wall Street Journal* [*WSJ*], 1979b, p. 2)

> [T]he vote left uncertain whether Paul A. Volcker, who became Federal Reserve chairman early in August, could continue to command a majority for his high-rate policies. The split was seen as indicating a fundamental division within the board over whether inflation remains a more pressing problem than recession...
>
> "A 4-3 split is significant because it means Volcker will have to sit harder on the liberal governors," Jeffrey A. Nichols, vice president and chief economist of the Argus Research Corporation, said. "The Chairman will have to be tough to keep the other members under control."...
>
> One banker said she thought the failure of the board yesterday to cite inflation or the growth of the money supply, but merely to note technical factors, could indicate a compromise with governors who were becoming more concerned about recession than inflation. "It might mean we have the beginnings of a dovish voting group," she added. (Bennett, 1979, p. A1)

> Some dealers reasoned that the Federal Reserve Board's 4-to-3 split vote on the discount rate increase meant the central bank would have difficulty in making further moves to restrict the growth of money and credit...
>
> "The Reserve Board vote," one municipal bond dealer said, "makes me think that this is as much of a push toward higher rates as we're going to get for a while. I [don't] think that 4-to-3 vote sat very well with a lot of traders today." (Allen, 1979, p. D9)

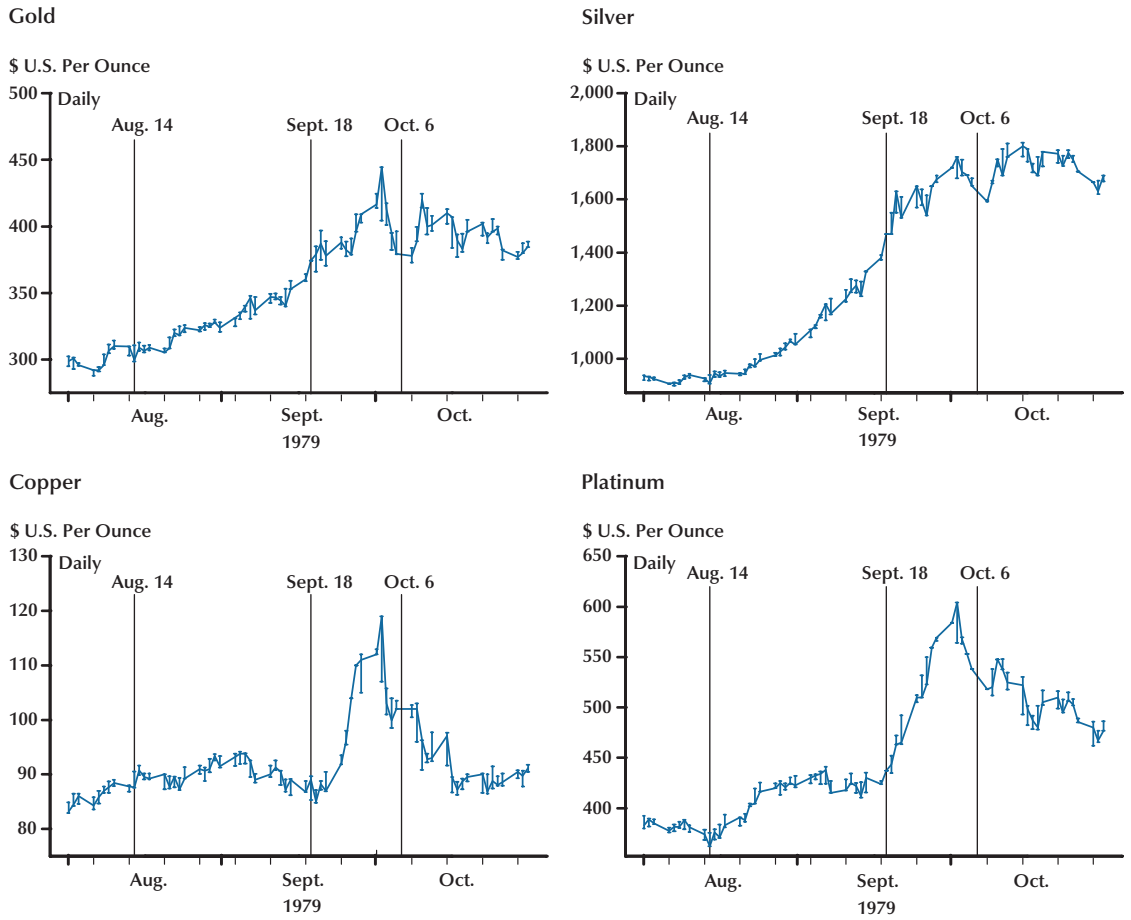
> The 4-to-3 split gave rise to speculation that the Federal Reserve was unlikely to drive interest rates still higher. (Cowan, 1979, p. 1)

> The relatively small increase in the funds target reflects "a growing split within the Fed's policy-making circle," according to David Jones, an economist for Aubrey G. Lanston & Co. He reasoned that with the economy losing steam some Fed officials want a pause in credit tightening while others contend that further moves are necessary to battle inflation. (*WSJ*, 1979e, p. 5)

The events of September 18 had a swift destabilizing effect on markets that set the tone for developments over the following three weeks. Commodity markets, in particular, became

Figure 4

Commodity Futures Prices



NOTE: For each day, the graphs show the opening price and high/low trading range during the day. Vertical lines denote FOMC meetings.

extremely volatile, alarming policymakers. Developments in commodity markets during this period are illustrated in Figure 4, which shows the daily futures prices of the December 1979 contracts for gold, silver, and copper and the January 1980 contract for platinum. The vertical lines in each panel indicate the dates of FOMC meetings. The continuous line designates the opening price each day, while the high-low lines denote the intraday range of price fluctuation. Gold and silver futures prices rose steadily between the August and September FOMC meeting dates, but with the exception of a few days, the intraday volatility was little changed from earlier in the summer. Copper futures were stable during this period, and, though platinum prices rose, they merely returned to mid-year levels.

The behavior of prices in these markets changed dramatically in the days after the discount-rate announcement. Gold and silver prices continued moving up, and intraday volatility increased substantially. Copper and platinum futures prices rose rapidly, also with substantial intraday volatility. Prices on all four futures contracts reached a peak on October 2 and retreated sharply for the next several days.

The price developments in these markets were

noted regularly in the press. A sample of this commentary, which uniformly interpreted these developments as evidence of hedging against inflation, follows.

> For gold's rise, analysts had been citing the metal's traditional allure during times of inflation and general global unease. (*WSJ*, 1979a, p. 3)

> With a leap that would have been dismissed before as inconceivable, the price of gold soared a record $24 an ounce in London, to another high of $375.75, and then jumped an additional $6.25 in later dealings in New York.
>
> Although he [a Treasury official] said he didn't believe gold's surge was "directed particularly against the dollar," he said the jump was "disturbing" and could cause a "widespread psychological reaction...a lack of confidence in our ability to turn inflation around." (*WSJ*, 1979c, p. 8)

> Mr. Miller told the National Conference of State Legislatures that there has been a "speculative trend" in the gold market as people bought gold as an inflationary hedge...
>
> Another Treasury official called the current gold rush "a symptom of growing concern about world-wide inflation." Lisle Widman, the Treasury's deputy assistant secretary for international monetary affairs added that "the message we would draw is that governments around the globe need to redouble efforts to curb inflation."(*WSJ*, 1979d, p. 2)

> In the commodity markets, nervous speculators sent futures prices through wild gyrations. At first, prices rose sharply as the recent bout of gold and silver fever spread to markets for other raw materials. Gold, silver, copper, platinum and sugar all rose to new highs in early dealings, presumably because inflation-wary speculators continued to dump dollars in favor of commodities...
>
> But then came the rumors that the U.S. might be planning a major new dollar-support program. On the theory that fighting inflation to save the dollar might depress commodity prices, speculators began selling, and many futures prices skidded the maximum permitted in a single day of trading. By the end of the day, however, most prices recovered somewhat when the rumors hadn't been substantiated, and many traders admitted to considerable confusion about the day's developments. (*WSJ*, 1979f, p. 1)

A few days after the discount-rate vote, Governor Partee spoke to the Money Marketeers in New York. Their harsh questions converted him on the spot from a dove to a hawk (Greider, 1987, p. 85).

As September drew to a close, the crisis that Chairman Volcker spoke of at the August FOMC meeting evidently had arrived, and the need for a dramatic monetary policy announcement had become compelling. The Chairman became increasingly convinced that such action should include a change in operating procedures deemphasizing the federal funds rate in favor of reserves as an operating instrument. He asked Stephen Axilrod, Economist for the FOMC, and Peter Sternlight, Manager for Domestic Operations, System Open Market Account, to prepare a background memorandum for the FOMC outlining the general features of such a proposed new approach. He also discussed changing the operating procedures with the other members of the Board to garner their support early on (Greider, 1987, pp. 105-118; Volcker and Gyohten, 1992, pp. 167; Treaster, 2004, p. 150; FOMC, Transcript, 10/5/1979, p. 1).

In his discussions with the Board members, Fred Schultz, the Board's vice chairman, lined up foursquare behind the Chairman, as would usually be the case in decisions to come, in this instance in his support for the Chairman's call for dramatic monetary-policy action. The three Board members who had voted against the discount rate hike, Teeters, Rice, and Partee, also supported the change. As will be discussed in more detail below, they liked the automaticity of the reserves-based technique in that the FOMC did not choose, and thus could not be identified as having chosen, the specific level of the funds rate. The two hawks, Wallich and Coldwell, were philosophically opposed to money and reserve targeting as unreliable and as removing too much central bank judgment from the monetary policy process, but they were willing to go along with it

if necessary to get FOMC support for a substantially tighter policy stance. According to Greider,

> Wallich did not argue much. "I was not sure people would do it my way," he said. "It was probably wise to use a method that produced a consensus for tightening." (Greider, 1987, p. 113)

On September 29, Chairman Volcker left for the annual International Monetary Fund (IMF) meeting, which was in Belgrade that year.[6] On the plane flight to Europe, the Chairman took the opportunity to brief two top administration officials, G. William Miller, who was now Secretary of the Treasury, and Charles Schultze, chairman of the Council of Economic Advisors. They were not enthusiastic about the idea of new procedures, and in coming days they made their solidifying views known to Volcker. Moreover, in their subsequent conversations with President Jimmy Carter, the President may have voiced similar concerns to them. But Chairman Volcker considered it significant that the President never directly expressed this disapproval to him in person or otherwise (Volcker and Gyohten, 1992, pp. 168-69).

On his trip abroad, Chairman Volcker also sought the counsel of various trusted foreign leaders and central bankers, including Germany's Helmut Schmidt and Otmar Emminger. Their comments only reinforced his intention to move ahead. When his participation was no longer required at the IMF meetings, he returned early to the United States (Volcker and Gyohten, 1992, p. 168).

Chairman Volcker arrived in Washington on Tuesday, October 2, with his ears still resonating with strongly stated European recommendations for stern action to stem severe dollar weakness on exchange markets. His unexpectedly early return fueled market rumors that action dealing with the crisis might be imminent. This had a stabilizing effect on commodities markets, with futures markets opening lower on October 3, retracing some of their sharp increases of the previous several days (Figure 4).

The next regularly scheduled meeting of the FOMC was to take place on October 16, 1979, two weeks after Volcker's return from Europe. However, likely in light of the urgency of the situation after September 18, the Chairman instead decided to convene a special FOMC meeting earlier in the month. The special meeting, scheduled in secret and on very short notice, was to take place on Saturday, October 6, in Washington.

Few new governmental data were released in the three weeks after September 18 that could have provoked a sense of urgency about significant policy action. Table 1, reproduced from the Greenbook from October 12, 1979, shows the dating of various statistical releases tracked by the staff between September 18 and October 5. The only data published after that starting date but before Volcker left for Belgrade were for the consumer price index (CPI) and housing starts in August. To be sure, the annualized one-month core CPI inflation rate in August exceeded 12 percent, up substantially from the 8.7 percent July core CPI inflation rate available at the September FOMC meeting. But this information, while unpleasant, did not seem to be the source of the alarm, as will be seen from Chairman Volcker's interpretation of these figures on October 6.

On the morning of Thursday, October 4, two days before the planned Saturday meeting, the Board met in its Special Library to discuss the possible monetary policy actions under consideration. According to the Minutes of the meeting:

> [O]ne member of the Board referred to the outburst of speculative activity in the gold market, which appeared to be spilling over into other commodity markets as well, and to the very sensitive conditions in domestic financial and dollar exchange markets. He also noted that inflationary sentiment appeared to be intensifying as data on price increases continued to worsen. Against this background, the staff had been directed to prepare memoranda on a package of possible actions designed to show convincingly the Federal Reserve's resolve to contain monetary and credit expansion in the U.S., to help curb emerging speculative excesses, and thereby to dampen inflationary

[6] In addition to Chairman Volcker, the three previous Federal Reserve Chairmen were at the Belgrade meeting. Chairman Miller was attending as Treasury secretary. And Chairman Martin was to introduce Chairman Burns who was giving the Per Jacobsson lecture that year. Burns took the occasion to deliver his remarkable "The Anguish of Central Banking," which we return to later on.

Table 1

October 12, 1979

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SELECTED DOMESTIC NONFINANCIAL DATA
AVAILABLE SINCE PRECEDING GREENBOOK
(Seasonally adjusted)

	Latest Data			Percent Change from		
	Period	Release Date	Data	Preceding Period	Three Periods Earlier	Year earlier
					(At annual rate)	
Civilian labor force	Sept.	10-5-79	103.5	5.2	3.8	2.5
Unemployment rate (%) 1/	Sept.	10-5-79	5.8	6.0	5.6	5.9
Insured unemployment rate (%) 1/	Sept.	10-5-79	3.0	3.1	2.8	3.4
Nonfarm employment, payroll (mil.)	Sept.	10-5-79	89.9	1.8	1.0	3.2
Manufacturing	Sept.	10-5-79	21.0	1.4	-1.5	2.3
Nonmanufacturing	Sept.	10-5-79	68.9	1.9	1.8	3.5
Private nonfarm:						
Average weekly hours (hr.) 1/	Sept.	10-5-79	35.6	35.6	35.6	35.8
Hourly earnings ($) 1/	Sept.	10-5-79	6.25	6.22	6.13	5.78
Manufacturing:						
Average weekly hours (hr.) 1/	Sept.	10-5-79	40.0	40.1	40.1	40.5
Unit labor cost (1967=100)	Aug.	9-28-79	176.5	8.9	7.4	8.2
Industrial production (1967=100)	Aug.	9-14-79	150.9	-13.4	-3.9	2.0
Consumer goods	Aug.	9-14-79	147.7	-25.4	-11.3	-1.9
Business equipment	Aug.	9-14-79	170.3	-9.1	-2.6	4.2
Defense & space equipment	Aug.	9-14-79	92.9	6.5	1.7	5.7
Materials	Aug.	9-14-79	155.3	-12.2	-1.0	3.4
Consumer prices all items (1967=100)	Aug.	9-25-79	220.7	12.6	12.1	11.7
All items, excluding food & energy	Aug.	9-25-79	209.4	12.2	10.4	9.9
Food	Aug.	9-25-79	235.0	.0	1.2	9.5
Producer prices: (1967=100)						
Finished goods	Sept.	10-4-79	221.0	17.1	14.8	11.8
Intermediate materials, nonfood	Sept.	10-4-79	251.5	18.4	18.5	14.8
Crude foodstuffs & feedstuffs	Sept.	10-4-79	249.9	17.5	13.2	13.8
Personal income ($ bil.) 2/	Aug.	9-18-79	1938.1	5.2	9.8	11.3
					(Not at annual rates)	
Mfrs. new orders dur. goods ($ bil.)	Aug.	10-3-79	74.6	2.9	-3.2	5.6
Capital goods industries	Aug.	10-3-79	24.5	8.6	-.4	13.5
Nondefense	Aug.	10-3-79	21.5	6.1	2.4	16.9
Defense	Aug.	10-3-79	3.0	30.8	-16.7	-6.3
Inventories to sales ratio: 1/						
Manufacturing and trade, total	July	10-3-79	1.44	1.43	1.44	1.44
Manufacturing	Aug.	10-3-79	1.54	1.54	1.48	1.51
Trade	July	10-3-79	1.34	1.33	1.33	1.33
Ratio: Mfrs.' durable goods inventories to unfilled orders 1/	Aug.	10-3-79	.563	.557	.546	.600
Retail sales, total ($ bil.)	Aug.	9-10-79	72.8	.7	1.2	8.1
GAF 3/	Aug.	9-10-79	16.1	.7	2.7	9.0
Auto sales, total (mil. units.) 2/	Sept.	10-3-79	10.7	-2.4	12.3	.9
Domestic models	Sept.	10-3-79	8.5	-2.6	19.2	-1.9
Foreign models	Sept.	10-3-79	2.2	-1.7	-8.3	13.7
Housing starts, private (thous.) 2/	Aug.	9-19-79	1,783	-.4	-2.8	-11.0
Leading indicators (1967=100)	Aug.	9-28-79	139.1	.0	-.5	-2.0

1/ Actual data used in lieu of percent changes for earlier periods.
2/ At annual rate.
3/ Excludes mail order houses.

> forces and lend support to the dollar in foreign exchange markets. Such a package might include actions on reserve requirements and the discount rate; in addition, the staff had been asked to analyze the implications of a possible shift in Federal Open Market Committee procedures, whereby the Desk, in its day-to-day operations, would operate more directly on a bank reserves, rather than a Federal funds rate, target. (BOG, Minutes, 10/4/1979, pp. 1-2)

The Minutes indicate that "Board members agreed on the seriousness of the situation and on the need for action" but postponed taking decisions on reserve requirements and the discount rate until Saturday, when the special FOMC meeting was to be held (BOG, Minutes, 10/4/1979, pp. 2-4).

That same day, the background memorandum on the proposed new operating procedures that Stephen Axilrod and Peter Sternlight were preparing at Chairman Volcker's request was finalized and sent electronically to the FOMC. The Axilrod and Sternlight memorandum envisioned that the FOMC would specify desired short-run growth rates for M1 and other monetary aggregates. The staff would then construct the associated paths for total reserves and the monetary base. The memorandum also suggested another point at which an FOMC decision would be a crucial aspect of the newly structured operations.

> A method for setting the level of nonborrowed reserves would be to take the average level of borrowing in recent weeks and subtract them from total reserves. Or the Committee could take a different level of borrowing—either higher or lower—depending in part on whether it wishes to tilt money market conditions toward tightness or ease in the period ahead. Whether money market interest rates would tend to rise, or rise more than they otherwise would, then depends on whether the demand for the total monetary base or total reserves were strong relative to the FOMC's path. If strong, the funds rate and the level of member banks borrowing would tend to rise as the Desk adhered to the initial path level {of} nonborrowed reserves. Conversely, if demands were weak, the funds rate, and the level of member bank borrowing, would tend to decline. (Axilrod and Sternlight, 1979, p. 7)

The FOMC held a last-minute information-sharing conference call on October 5.

> **Chairman Volcker**...You will have very shortly, if you don't already, a memorandum that Steve Axilrod and Peter Sternlight prepared describing a possible approach that involves leaning more heavily on the aggregates in the period immediately ahead. And the complement of that is leaning less heavily on the federal funds rate in terms of immediate policy objectives. We have had some considerable discussion of that over the past couple of weeks here and that memorandum attempts to distill some of the thinking. I want to discuss tomorrow whether to adopt that approach, not as a permanent [decision] at this stage, but as an approach for between now and the end of the year, roughly, in any event. (FOMC, Transcript, 10/5/1979, p. 1)

He also referred to the unstable conditions in commodities markets.

> **Chairman Volcker**. The discussions abroad were very difficult in a number of respects. The feeling of confidence is not high, I should say, in a number of directions and that increases the difficulty of restoring a sense of stability. One of the alarming things earlier, to me at least, was the sensitivity and responsiveness of some of the commodity markets outside of gold and silver to what was going on. There were some very sharp increases in prices of copper and other metals at the end of last week and at the beginning of this week, a development that has since subsided somewhat with the improvement in the gold market and the exchange market. But, quite clearly, we are in a very sensitive period. (FOMC, Transcript, 10/5/1979, p. 4)

The momentous special meeting convened at 10:10 am on Saturday. Chairman Volcker framed the issues.

> **Chairman Volcker**...We wouldn't be here today if we didn't have a problem with the state of the markets, whether international or domestic. They were pretty feverish last week—or beginning in the previous week, really. Beginning

about 2 weeks ago and carrying over into the early part of what is still this week, the foreign exchange market was in a situation that was clearly not amenable for very long to such techniques as intervention. The markets have turned around some in the past few days, as you know. I think that is almost entirely explicable by the fact that at about the time I returned from Belgrade Treasury officials and others were making some statements that left hanging the possibility of some kind of a package, so the foreign exchange dealers have retreated to the sidelines...

In terms of the economy...my own concerns about the risks of the economy falling off the table, though they have not evaporated, have diminished a bit...On the price front, expectations have certainly gotten worse rather than better...I certainly conclude from all this that we can't walk away today without a program that is strong in fact and perceived as strong in terms of dealing with the situation...{W}e are not dealing with a stable psychological or stable expectational situation by any means. And on the inflation front we're probably losing ground. In an expectational sense, I think we certainly are, and that is being reflected in extremely volatile financial markets...{Regarding} the commodities issue{, b}eginning a little more than a week ago, late in the previous week when the gold market was gyrating, there was some very clear evidence that this psychology was getting into the metals markets in particular in a very forceful way and maybe in the grains markets very temporarily...The psychology in the foreign markets is the same as the psychology at home; it is reflected in the metals markets. It is the inflationary psychology or whatever. (FOMC, Transcript, 10/6/1979, pp. 4-6, 12, 15)

Chairman Volcker argued, however, that overall inflation data were not alarming as yet.

Chairman Volcker...Even though the price news is bad, it does not in my judgment as yet reflect a spreading of the whole inflationary force into areas outside of energy. We had a fluctuation in food [prices] last month, but that [component of the price index] goes up and down. If we look at the wage trend, so far as we know—with the exception of the General Motors settlement—we haven't had a real breakout yet. But we're dealing with a situation where that's an imminent danger on the one side as is the possibility of a recession on the other side. (FOMC, Transcript, 10/6/1979, p. 5)

Chairman Volcker then laid out the specific options.

Chairman Volcker...Now, when it comes to our action here, I think there are broadly two possibilities. One is taking measures of what might be thought of as the traditional type. That would include a discount rate move on the one side and so far as this Committee is concerned a significant increase in the federal funds rate—putting those moves together. The Board will be considering some reserve requirement changes later today. Let's assume that the package would include that...

The other possibility is a change in the emphasis of our operations as outlined in the memorandum that was distributed, which I hope you've all had a chance to read. That involves managing Desk operations from week to week essentially, with a greater effort to bring about a reserve path that will in turn achieve a money supply target—which we have to discuss—recognizing that that would require a wider range for the federal funds rate and would involve a more active management of the discount rate. And of course the question of reserve requirements and the discount rate change at this point are relevant in that context too. (FOMC, Transcript, 10/6/1979, pp. 7-8)

In presenting the pros and cons of each option, Chairman Volcker first mentioned that changing operating procedures had occurred to him some time ago.

Chairman Volcker...I must say that the thought of changing our method of operations germinated—in my mind at least—before the market psychology or nervousness reached the extreme stage it reached over the past week or so. My feeling was that putting even more emphasis on meeting the money supply targets and changing operating techniques [in order to do so] and thereby changing psychology a bit, we might actually get more bang for the buck...I overstate

> it, but the traditional method of making small moves has in some sense, though not completely, run out of psychological gas. (FOMC, Transcript, 10/6/1979, p. 8)

He made it clear that the choice of the initial borrowing assumption, in principle, should be based on the same predicted level of the federal funds rate (converted to a spread over the discount rate) that was associated with the projection of near-term M1 growth matching the FOMC's target path for that aggregate.

> **Chairman Volcker**...Suppose we happen to put a lot of weight on the current projection of the money supply and pick figures that would closely coincide with that. We would then provide, making some assumption on the level of borrowing that seemed to be consistent with the level of interest rates that presumably laid behind the projection of the money supply in the first place—we can't avoid interest rate assumptions the way these things are done—nonborrowed reserves along that path. If the money supply actually grew faster, borrowings would go up and presumably interest rates would go up; if the reverse happened, borrowings would go down and interest rates would go down. (FOMC, Transcript, 10/6/1979, p. 25)

(Instead, the procedure for giving the FOMC alternative initial borrowing assumptions that was put forth in the aforementioned Axilrod-Sternlight memorandum was in fact followed in practice for a little longer than a year.)

Chairman Volcker said that he could live with either option but again stated that in his mind a decision to adopt the second one would be only temporary.

> **Chairman Volcker**...I am prepared, within the broad parameters, to go with whichever way the consensus wants to go so long as the program is strong, and if we adopt the new approach so long as we are not locked into it indefinitely. If we adopt the new approach, I'd consider it something that we adopted that seems particularly suitable to the situation at this time. (FOMC, Transcript, 10/6/1979, p. 10)

The Committee discussed whether a change in procedures would lock it in for a considerable period.

> **Mr. Eastburn**...There's a credibility problem if we launch this and stop and go with it. So I really think we are committed to this if we go [forward].
>
> **Chairman Volcker**. Well, I don't want to accept that. I don't think we can make that decision now. If we [change our operating technique], I do accept the fact that to some degree we have prejudiced the discussion we will have at the end of the year. We will have to have a reason then to move back to the traditional method. But I don't think we can really make that decision now, nor should we. Nor do I think this commits us that fully, though it prejudices to some degree what we would do next year. (FOMC, Transcript, 10/6/1979, p. 15)
>
> **Chairman Volcker**...There's an immediate advantage in the publicity {regarding the change in technique}; there is a disadvantage not very far down the road if people read this as a commitment and in fact we are not going to be able to live up to that commitment. (FOMC, Transcript, 10/6/1979, p. 27)

He later noted he preferred that such a decision be reconsidered around year-end, which arose from his sense that money demand historically had been plagued by institutional innovation and hence instability.

> **Chairman Volcker**...That's the [reason] I'm not willing to make a judgment at this point as to the long-run desirability of this technique through thick and thin and in all possible circumstances.
>
> So, I would remind you that because of the particular circumstances I am thinking of using this technique for the [coming] 3- or 4-month period. This is a time when it may be particularly important to our credibility and to the economy and to psychology and everything else that we provide ourselves with greater assurance that we will get a handle on the money supply. (FOMC, Transcript, 10/6/1979, p. 28)

In the course of Committee deliberation, President Roos of the Federal Reserve Bank of St. Louis presented only a limited statement.

> **Mr. Roos**. Well, Mr. Chairman, I assume that my credibility with you and my colleagues would

> be severely jeopardized if I came out flatly in opposition to this proposal! [Laughter] I also was told by my father to keep my mouth shut when things are going well. So all I'll say is briefly: God bless you for doing this! [Laughter] (FOMC, Transcript, 10/6/1979, p. 24)

After Committee discussion, a straw poll was conducted of all the governors and presidents. Staying with the traditional method was preferred by five of those present (FOMC Transcript, 10/6/1979, p. 50). However, a majority preferred switching to the new technique, and the final official vote was unanimous.

Immediately following the FOMC meeting, at 1:30 pm, the Board met to consider discount rate and reserve requirement actions. The Board unanimously approved a 1-percentage-point increase in the basic discount rate, a comparable rise in subsidiary rates, and an 8 percent marginal reserve requirement on managed liabilities (BOG, Minutes, 10/6/1979, pp. 1-7).

The Board authorized a press release describing all of these actions. The press release stated prominently that the Committee's and the Board's respective votes on the actions taken were unanimous. In characterizing the essence of the new technique, the release noted its temporary rationale.

> Actions taken are:...3. A change in the method used to conduct monetary policy to support the objective of containing growth in the monetary aggregates over the remainder of this year within the ranges previously adopted by the Federal Reserve. These ranges are consistent with moderate growth in the aggregates over the months ahead. This action involves placing greater emphasis in day-to-day operations on the supply of bank reserves and less emphasis on confining short-term fluctuations in the federal funds rate. (BOG, 1979d, p. 1)

Then a press conference was scheduled for 6:00 p.m.

> **Mr. Volcker**. I think in general you know the background of these actions; the inflation rate has been moving at an excessive rate and the fact that inflation and the anticipations of inflation have been unsettling to markets both at home and abroad. That unsettlement in itself and its reflection in some commodity markets is, I think, contrary to the basic objective of an orderly development of economic activity. (BOG, 1979e, p. 1)

He indicated that the purpose of the new procedures was to hit the money growth ranges for the current year, but any sense that the FOMC had adopted the techniques only provisionally was lost on everyone:

> **Mr. Volcker**. I would emphasize that the broad thrust is to bring monetary expansion and credit expansion within the ranges that were established by the Federal Reserve a year ago. (BOG, 1979e, p. 2)

Finally, Chairman Volcker was asked about the real-side impact of the new initiatives.

> *Question*. But in immediate terms does it have an effect that will tend to slow down economic growth that is already too wishy-washy in this country?
>
> **Mr. Volcker**. Well, you get varying opinions about that. I don't think it will have important effects in that connection. I would be optimistic in the results of these actions. But we're in an area dealing with economic events that are not fully predictable. I think the main thing to say about the economy right now is that it is somewhat stronger than anticipated. The outlook continues to be, in a general way, that some inventory adjustment may be in prospect. I think the best indications that I have now in an uncertain world is that it can be accomplished reasonably smoothly. (BOG, 1979e, p. 8)

At a White House press conference the same day, Jody Powell read the following official Presidential statement:

> The administration believes that the actions decided upon today by the Federal Reserve Board will help reduce inflationary expectations, contribute to a stronger U.S. dollar abroad, and curb unhealthy speculations in commodity markets.
>
> Recent high rates of inflation, led by surging oil prices, other economic data, as well as developments in commodity and foreign

> exchange markets, have reinforced the administration's conviction that fighting inflation remains the Nation's number one economic priority.
>
> The administration will continue to emphasize a policy of budgetary restraint. Enactment of effective national energy legislation to reduce dependence on foreign oil is vital to long-term success in this effort.
>
> The administration believes that success in reducing inflationary pressures will lead in due course both to lower rates of price increases and to lower interest rates. (Carter, 1980, p. 1835)

After the initial events on October 6, Chairman Volcker made several additional public appearances to explain the various actions. In a speech to the American Bankers Association (ABA) on the morning of Tuesday, October 9, he provided an overview.

> Those measures were specifically designed to provide added assurance that the money supply and bank credit expansion would be kept under firm control. There will be one seemingly technical, but potentially significant, change in procedure in conducting open market operations. More emphasis will be placed on limiting the provision of reserves to the banking system—which ultimately limits the supply of deposits and money—to keep monetary growth within our established targets for this year. We have raised the discount rate—and will manage it more flexibly—so that restraint on bank reserves will not be offset by excessive borrowing from the Federal Reserve Banks. We have placed a special marginal reserve requirement of 8 percent on increases in "managed liabilities" of larger banks (including U.S. agencies and branches of foreign banks) because that source of funds has financed much of the recent buildup in credit expansion. That requirement, admittedly cumbersome by its nature, will be maintained so long as credit expansion is excessive...
>
> As the rate of increase in energy prices subsides—as it should in coming months—the inflation rate as a whole should also decline appreciably. Looked at another way, the immediate challenge is to avoid imbedding the current rate of inflation in expectations and wage and pricing decisions, before the current bulge in prices subsides. That is not an unrealistic objective, but it is one that will require discipline over the months ahead. (Volcker, 1979a, pp. 3, 8)

In that speech, he added,

> Attempts to pin all blame for inflation on factors outside our control would only doom our efforts to futility. (Volcker, 1979a, p. 8)

That Tuesday morning as well, the *WSJ* ran a story that included this paragraph:

> Among those who are skeptical that the Fed will really stick to an aggregate target is Alan Greenspan, president of Townsend-Greenspan & Co., a New York economics consultant. Mr. Greenspan, who served as chief economic advisor to Presidents Nixon and Ford, questions whether, if unemployment begins to climb significantly, monetary authorities will have the fortitude to "stick to the new policy."[7] (*WSJ*, 1979g, pp. 1, 6)

The *WSJ* published a story the following day, Wednesday, October 10, that included more information: Additional meetings had been held on October 9.

> Officials of the Federal Reserve Bank of New York held separate meetings yesterday with reporters and securities dealers in an effort to clear up some of the confusion surrounding details of the Federal Reserve's anti-inflation techniques announced Saturday.
>
> Peter D. Sternlight, Senior Vice President of the New York Fed, said he doesn't know all of the answers yet. "We're in the midst of a

[7] While he expressed some doubt as to whether the Federal Reserve would follow through with the program, Greenspan was certainly supportive. Indeed, in congressional testimony on November 5, 1979, he strongly defended the Federal Reserve: "I thus conclude that for the United States there is little leeway for policy maneuvering in the monetary area and that the focus, as it should have been all along, must be on defusing underlying inflationary pressures... 1980 is likely to be a recession year and high interest rates are unquestionably going to exaggerate and prolong any recession. It would be a mistake, however, to attribute the interest rate increases to the Federal Reserve. Its options are limited. The problems reflect earlier inflationary policies. Unless and until we can reverse them, a restoration of balance in our economy will remain illusive" (U.S. Congress Joint Economic Committee, 1980, pp. 7-8).

> learning process ourselves," he said. "We have some objectives but don't have procedures at this stage..."
>
> Mr. Sternlight also said the Fed doesn't plan to be "rigid or mechanistic" in pursuit of bank-reserve targets. "This may cause some die-hard monetarists to subdue their elation at our change in approach and recall their congratulatory messages," he said...
>
> When a reporter asked what rates the public should watch for clues to Fed thinking, Mr. Sternlight replied: "I'm not sure I have a ready substitute to proffer at this point." He emphasized that "we're still very much experimental" at this stage.
>
> Mr. Sternlight said one key figure the Fed would pay attention to is "nonborrowed reserves." But he emphasized that the Fed won't rely exclusively on this and plans to remain flexible in its approach. (*WSJ*, 1979h, p. 3)

Besides not reassuring the dealers (Melton, 1985, p. 49), this briefing content was received with a certain displeasure at the Board in Washington, as it seemed to undermine both the Federal Reserve's commitment to the new approach and the care with which the new procedures had been thought-through in advance (David Lindsey's recollection).

On Wednesday, the day that the story above was published, "a Fed official," perhaps Chairman Volcker, spoke to the *WSJ*, which published the following story:

> As markets gyrated in the uncertainty following the Federal Reserve Board's weekend policy switch, a Fed official warned that the central bank will continue to be unpredictable.
>
> "Anybody looking for a rule of thumb is going to be frustrated," the official said in an interview that sketched a picture of a more flexible—and probably tougher—Fed.
>
> "There are still going to have to be policy judgments made," the official said, indicating the central bank "isn't going to trap itself by following any rule." He said the Fed will try to steer between the "two extremes" of its old practice of inching the federal funds rate up and down and "letting the funds rate go anyplace forever..."
>
> The Reserve Board official observed that the markets were "scrambling" for clues to get a "more definite" picture of the Reserve Board's future behavior. But he added "There isn't any sense in scrambling. It doesn't exist. We changed the procedure. What the limits are going to be aren't clear yet." (Conderacci, 1979, p. 3)

The *WSJ* reported that reactions among monetarists varied widely. Some were jubilant.

> Overcast skies here yesterday did little to dampen the spirits of Laurence K. Roos...
>
> Although the bank was closed because of Columbus Day, Mr. Roos was in his office in downtown St. Louis, and he was beaming. "Except for the unfortunate coincidence of the holiday, champagne and beer would be flowing in the aisles here," he says with a broad smile. (Garino, 1979, p. 6)

But feelings of euphoria did not extend to monetarists in academia.

> As more details of the Fed's program emerge from talks with Fed officials, some financial experts believe the Fed will continue to encounter difficulties trying to rein in the growth of the money supply...
>
> Nevertheless, Fed officials say they believe they can enforce and execute their program announced Saturday evening. They acknowledge, though, that some aspects are so new that they don't have all the details worked out yet...
>
> Separately, some economists were disheartened by remarks made by Peter D. Sternlight... that "we don't plan to be rigid or mechanistic" in pursuit of bank reserve targets and will continue looking at many other factors.
>
> That worries Allan H. Meltzer, an economics professor at Carnegie-Mellon University. He says that the Fed may try to fine-tune more items than it has the power to do and that the money supply may get out of control. He urges the Fed to focus on the "monetary base"..."I didn't send them a congratulatory telegram," he says. "I'm going to hold my breath and hope they don't screw it up." (Herman, 1979, p. 6)

Another story continued in the same vein.

> Together with Allan H. Meltzer...Professor [Karl] Brunner six years ago set up the Shadow

> Open Market Committee, a group...that meets twice a year to appraise the work of the Fed's key policymaking group. The verdict more often than not has been unfavorable.
>
> Prof. Brunner up to now sees no reason to change...
>
> Politics aside, monetarists question whether the Federal Reserve has chosen the best operating technique...
>
> According to the Federal Reserve plan, estimates for nonborrowed reserves will largely determine what the Fed does as it tries to hit its desired monetary growth rate. Prof. Brunner wonders why the system does not simplify its task by focusing solely on the monetary base. Statistical studies, he says, have shown that the relationship between the base and the gross national product has been smooth and predictable since World War II. Prof. Brunner is quick to admit that Mr. Volcker sounds much better than some of his immediate predecessors. The new chairman has been much more willing to concede that the Fed deserves much of the blame for the existing inflation. He stresses that the important need now is not just to articulate a new policy but to stick with it...
>
> But monetarists have been burned so often that for now they will withhold their cheers. Securities markets seem similarly skeptical that the Fed finally is determined to stop inflation... (Clark, 1979, p. 22)

To further explain the FOMC's actions, Chairman Volcker appeared on the *MacNeil-Lehrer News Hour* on October 10. His first comment reacted to the earlier view of experts that, as a newly appointed Federal Reserve Chairman, he wouldn't make any radical changes.

> **Paul Volcker**. Well, I don't know that these are radical changes in Federal Reserve policy in a very fundamental sense. We want to deal with this problem of inflation, and I think that intention was perhaps reinforced in the public mind by the actions we took on Saturday; but in a very basic sense the policy has been there and we intend to carry it out. (*MacNeil-Lehrer News Hour*, 1979, p. 1)

Commenting on the market reaction, he went on to underscore the point that the Federal Reserve was determined to bring down both actual and expected inflation.

> **Paul Volcker**. I think the point may be that we captured their attention...and I think that's constructive in a sense, because there've been a lot of doubts, a lot of anxiety that this inflation was going to get out of control. And it's not going to get out control if we do our job...[A] lot of people were skeptical whether we could deal with it. I hope they're less skeptical now than they were before... (*MacNeil-Lehrer News Hour*, 1979, p. 2)

He stressed the long-run rather than the short-run effect on real economic activity.

> **Paul Volcker**. And this is the kind of circumstance which leads to concern about recession; and I share that concern. But...[i]f inflation got out of hand, it's quite clear that that would be the greatest threat to the continuing growth of the economy, to the productivity of the economy, to the investment environment, and ultimately to employment...Now, I'm not saying that unemployment will not rise. I am saying the greater threat over a period of time would come from failing to deal with inflation rather than efforts to deal with it. (*MacNeil-Lehrer News Hour*, 1979, p. 6-7)

In a subsequent appearance on *Issues and Answers* on October 29, he spoke further.

> **Mr. Volcker**. We are in a very difficult economic situation, but I would not, in terms of a possible recession, which has been discussed for months, trace that to our particular actions. The situation we had was rising inflation, speculation, a weak dollar. (*ABC News' Issues and Answers*, 1979, p. 2)

On October 17, before the Joint Economic Committee, Chairman Volcker dealt in more detail with the effect on public attitudes of the "serious inflationary environment we are now facing."

> An entire generation of young adults has grown up since the mid-1960s knowing only inflation, indeed an inflation that has seemed to accelerate inexorably. In the circumstances, it is hardly surprising that many citizens have

> begun to wonder whether it is realistic to anticipate a return to general price stability, and have begun to change their behavior accordingly. Inflation feeds in part on itself. So part of the job of returning to a more stable and more productive economy must be to break the grip of inflationary expectations.
>
> We have recently seen clear evidence of the pervasive influence of inflationary expectations on the orderly functioning of financial and commodity markets, and on the value of the dollar internationally. Over a longer period of time, the uncertainties and distortions inherent in inflation have a debilitating influence on investment, productivity and growth. In the circumstances, the overwhelming feeling in the nation—that we must come to grips with the problem—reflects the common sense of the American people. At the same time, we have to recognize that, after more than four years of expansion, there are widespread anticipations of inventory adjustments and a downturn in economic activity. The challenge is to deal with this troublesome situation in a manner that promises, over a period of time, to restore a solid base for sustained growth and stability... Above all, the new measures should make abundantly clear our unwillingness to finance a continuing inflationary process. (Volcker, 1979b, pp. 1-2, 4)

Before the National Press Club early in 1980, he underlined these monetary sources of sustained inflation.

> Our policy, taken in a longer perspective, rests on a simple premise—one documented by centuries of experience—that the inflationary process is ultimately related to excessive growth in money and credit. I do not mean to suggest that the relationship is so close, or that economic reality is so simple, that we can simply set a monetary dial and relax...But, with all the complications, I do believe that moderate, non-inflationary growth in money and credit, sustained over a period of time, is an absolute prerequisite for dealing with the inflation that has ravaged the dollar, undermined our economic performance and prospects, and disturbed our society itself. (Volcker, 1980a, pp. 3-4)

Chairman Volcker contended on January 15, 1980, that poor forecasts can undermine anti-inflationary policy.

> [I]t's a dangerous game to change basic policies on the basis of short-term forecasts at any particular point in time. Forecasts of the short-run outlook are so often fallible that they're almost as apt to be wrong as right.
>
> In the past, in shaping our nation's policies, I think we've had an insidious tendency to anticipate the worst in terms of unemployment in particular; and we always anticipate the worst and act on those anticipations over time. That's a recipe for too much expansionary action and ultimately for inflation. Today our margins for error in that connection are less than they have ever been and I think that we should not make that mistake again. (Volcker, 1980e, p. 42)

Then, before the Joint Economic Committee on February 1, he noted

> the almost universal failure of forecasts made at this time last year, and throughout most of the year, to predict accurately the continued expansion of economic activity in 1979. Despite the shocks from very large oil price hikes, fuel shortages, and major strikes, as well as the imposition of restraining macroeconomic policies, the economy proved to be remarkably resilient. Growth in real economic activity did slow in 1979 from the unsustainable 5 percent rate posted in the preceding year, but real GNP still advanced 1 percent over the four quarters of 1979; the much-heralded recession never appeared.
>
> The 1979 experience underscores how limited our ability is to project future developments. It reinforces the wisdom of holding firmly to monetary and other economic policies directed toward the evident continuing problems of the economy—of which inflation ranks first—rather than reacting to possibly transitory and misleading movements in the latest statistics or relying too heavily on uncertain economic and financial forecasts. In retrospect, recharting policy to respond to tentative signs of a faltering economy last year would have proven extremely costly to our anti-inflation effort. (Volcker, 1980b, p. 76)

In his first Humphrey-Hawkins testimony on February 19, 1980, Chairman Volcker amplified his critique of approaching monetary policy in such a way.

> In the past, at critical junctures for economic stabilization policy, we have usually been more preoccupied with the possibility of near-term weakness in economic activity or other objectives than with the implications of our actions for future inflation. To some degree, that has been true even during the long period of expansion since 1975. As a consequence, fiscal and monetary policies alike too often have been prematurely or excessively simulative or insufficiently restrictive. The result has been our now chronic inflationary problem, with a growing conviction on the part of many that this process is likely to continue. Anticipations of higher prices themselves help speed the inflationary process...
>
> The broad objective of policy must be to break that ominous pattern. That is why dealing with inflation has properly been elevated to a position of high national priority. Success will require that policy be consistently and persistently oriented to that end. Vacillation and procrastination, out of fears of recession or otherwise, would run grave risks. Amid the present uncertainties, stimulative policies could well be misdirected in the short run. More importantly, far from assuring more growth over time, by aggravating the inflationary process and psychology, they would threaten more instability and unemployment. (Volcker, 1980d, pp. 2-3)

The reception given to the new operating procedures at the February Humphrey-Hawkins hearings by the House and Senate banking committees was generally, though not universally, welcoming. The House Committee on Banking, Finance, and Urban Affairs was chaired by Representative Henry Reuss, a Democrat from Wisconsin. Despite his support, the tone of the other representatives was mixed. Even so, the congressional committee's monetary-policy report, published in April, approved of "a cautious moderation of monetary growth in 1980 and into the future for some years to come." The report called the new operating procedures "a change we applaud" and even recommended contemporaneous reserve requirements! (U.S. House of Representatives, 1980c, pp. 2-4). William Proxmire, a Democrat from Wisconsin, although an independent maverick, was chairman of the Senate Committee on Banking, Housing, and Urban Affairs. He approved of the "aggressive" policy under Chairman Volcker. He even noted "continuing doubts that the Federal Reserve will continue to pursue a tight monetary policy in a Presidential election year." The only other senator to address the issue, Jake Garn, a Utah Republican, also took an anti-inflationary position (U.S. Senate, 1980, pp. 1-3).

On a more technical level, an official summary of the operational details of the new procedures, dated January 30, 1980, appeared as an appendix to both testimonies by Chairman Volcker, on February 1 and February 19, as well as to another of his testimonies on February 4, 1980 (Volcker, 1980c). This document identified and described in detail eight separate steps constituting the procedures. It also discussed

> how the linkage between reserves and money involved in the procedures is influenced by the existing institutional framework and other factors...The exact relationship depends on the behavior of other factors besides money that absorb or release reserves, and consideration must also be given to timing problems in connection with lagged reserve accounting. (U.S. House of Representatives, 1980a, p. 1)

This document was released only after the Committee discussed on January 8, 1980, whether to continue with the new procedures. Chairman Volcker began the discussion; it cannot be said that the Committee's decision turned into a suspenseful cliffhanger:

> **Chairman Volcker**...I just want to be explicit about whether we want to continue this general type of procedure. Obviously, we're on it and it has worked; on the surface, anyway, it has worked. The results are more or less in line with what was intended. And I think it continues to have some of the advantages that were foreseen originally. While we still worry about

> what the federal funds rate is doing, when it doesn't go according to our preconception, we at least avoid making a concrete decision...
>
> {A}s a broad thrust, I think the question is whether or not to continue basically what we've been doing.
>
> **Mr. Partee**. Shifting back from a very successful experiment certainly would be hard to explain.
>
> **Chairman Volcker**. There's no question.
>
> **Mr. Morris**. The reaction would be devastating.
>
> **Mr. Partee**. It surely would.
>
> **Mr. Balles**. Unthinkable. (FOMC, Transcript, 1/8-9/1980, pp. 13-14)

Despite the technical description, some confusion about the new procedures persisted. Governor Wallich expressed the point a month after the description was first released as follows:

> The new procedures of the Federal Reserve have given rise to some understandable misconceptions that suggest that the Federal Reserve has not been fully effective in making itself understood. (Wallich, 1980, p. 9)

WHY?

Looked at from a deeper perspective than mere historical narrative, the question can be asked as to the reasons for the FOMC's adoption of the new operating procedures—that is, why? Listed roughly in order of decreasing obviousness, the reasons are as follows:

1. restoring more certain public confidence in the Federal Reserve
2. by allowing more certain restraint over long-term inflation,
3. by more clearly abandoning a policy strategy of "gradualism" and
4. by gaining more certain control over intermediate-term money growth,
5. by clearly switching from the federal funds rate on the money-demand side to nonborrowed reserves on the money-supply side as the short-run operating target,
6. thereby permitting the federal funds rate more certain short-run flexibility to attain the needed level in terms both of monetary and inflationary developments,
7. thereby more clearly distancing the FOMC from the particular day-to-day level of the federal funds rate and
8. thereby clearly moving away from a deliberative smooth adjustment of the funds rate and
9. thereby clearly avoiding any reliance on uncertain FOMC estimates of potential output or the Non-Accelerating Inflation Rate of Unemployment (NAIRU) and
10. thereby clearly avoiding any reliance on uncertain FOMC forecasts of output, employment, and inflation and
11. thereby clearly assuming full central bank responsibility for the attainment of long-term price stability, but also
12. thereby more clearly avoiding difficult questions of overt responsibility for intermediate-term real-side developments.

Point One

The historical narrative in the last section helped to demonstrate that the media commentary and commodity market reaction to the revelation on September 18 of the Board's four-to-three discount-rate vote—without the disclosure of the FOMC's tightening and the accompanying three dissents for even tighter policy—worked together to pound a fatal stake into the credibility of the FOMC as the country's bulwark against inflation. Had the public and the markets received the full picture, then the reaction would very likely have been more subdued. Restoring the public's trust in the System became a paramount end for any actions that the FOMC would contemplate.

Point Two

According to the narrative history in the previous section, by October 6, 1979, the FOMC evidently had come to view rampant inflation and inflationary expectations as the nation's most serious problem. Judged by actual events, the

time had come for dramatic action by the Federal Reserve to counter the inflationary threat to the nation's economy. This action would need to be sustained long enough to reduce inflation substantially as well as strengthen public attitudes about the central bank's resolve to do so, because intense inflationary forces and unhinged inflationary expectations were seen to be detrimental to real-side activity. In the strength of its view, upon which it was willing to act decisively, the FOMC was far ahead of its time. Indeed, as the 1970s began, quite the opposite opinion prevailed—to wit, that some inflation was needed to "grease the wheels" of the market system. Only after the long economic expansions of the last seven years of the 1980s and the last eight years of the 1990s did the damaging effects of inflation rates and expected rates of inflation above low single digits on saving, investment, and productivity become demonstrable.

Point Three

A strategy of "gradualism" had characterized the FOMC's monetary policy during the 1970s, but the inadequacy of such a strategy had become all too evident as 1979 progressed. By the time of its 1979 Annual Report on August 3, the International Monetary Fund (IMF) put it this way:

> In the Fund's 1976 Annual Report, the importance of bringing down inflation and greatly reducing inflationary expectations was stressed. A "gradual" approach was recommended—but one that "would need to be adhered to firmly..."
>
> Now, three years later, it is clear that the suggested strategy of policy has not led to satisfactory results; for the industrial countries, average rates of inflation and unemployment have not been reduced. The reasons for this unsatisfactory outturn are manifold and complex, but perhaps the basic one has been the pursuit of policies that have failed to make a dent in inflationary expectations. It is evident that governments have felt severe economic and political constraints in launching an effective anti-inflation program, since in the short run this would be bound to have adverse employment effects whose timing and magnitude would depend primarily on the ability to reduce inflationary expectations and hence would be difficult to predict. Also noteworthy is that economic forecasting and policymaking have been subject to a substantial degree of error in the unaccustomed situation of "stagflation"—an error often compounded, however understandably, by official optimism toward the future or misleading assessments of past developments...
>
> The upshot has been that "gradualism" as an approach to the reduction of inflation and inflationary expectations has been too "gradual"—in many countries, to the point of no reduction at all. This seems clearly evident from the fact that the overall rate of monetary expansion in the industrial countries has not come down, but has remained about 10 percent in every year since 1975... (IMF, 1979, p. 7)

The historical narrative in the previous section suggests that on October 6, the FOMC acted on the same perception. The Committee clearly had become frustrated with the upward march of inflation despite its previous gradualist policy put in place to resist the trend.

Point Four

As will be discussed more fully below in *Point Eleven*, Federal Reserve officials had long accorded a significant role in the inflation process to excessive monetary stimulus, along with the important effects imparted by "exogenous factors" that also affected measured inflation. As will be seen in that discussion, however, Chairman Burns had questioned the practical ability of monetary policy to resist the various pressures acting against sufficient monetary restraint to maintain price stability. In opposition to that view, the position of the monetarists had the intellectual attraction of purity—that, on a sustained basis, "inflation was always and everywhere a monetary phenomenon." This argument had a universal acidity that dissolved all other influences on long-term inflation, except for money growth. And the appreciable rise of actual inflation in association with often-above-target money growth brought ever-widening support for the monetarist argument that the culprit was none other than the Federal Reserve

itself. Accordingly, it was ever-more generally perceived that controlling money growth was a prerequisite for controlling inflation.

That money growth had been excessively rapid entering the fall of 1979 could not really be questioned. In the third quarter of the year, the levels of M1 and M2 were 1½ percentage points below the upper bounds of their respective 3 to 6 percent and 5 to 8 percent ranges for the year only because of their respective low –2.1 percent and 1.8 percent rates of change recorded in the first quarter. With M1 and M2 growing at respective rates of 7.6 percent and 9.5 percent in the second quarter and of 8.6 percent and 11.9 percent in the third quarter, the Axilrod-Sternlight memorandum informed the FOMC that

> rates of growth have been accelerating and have been above the longer-run ranges, well above most recently...
>
> For the monetary aggregates as a group to be within their ranges by the time the year is over, a considerable slowing from their recent pace is required. (Axilrod and Sternlight, 1979, p. 2)

Taking a longer perspective, the two upper panels of Figure 5 show that, over each of the last four years of the decade of the 1970s, either M1 or M2 growth exceeded the upper bound of its announced annual range.[8] This experience, of course, had added empirical support for the contention that a causal link connected money growth and inflation. A decade after the procedural change, Stephen Axilrod summarized the approach as follows:

> The obvious problem—it was an easy period in that sense—was to control inflation. One way to do it was to impose an M1 rule on yourself, pay little attention to GNP forecasts, and just let the economy adjust...[The FOMC] used M1 successfully as that sort of bludgeon to receive a rapid reduction in inflation... (Axilrod, 1990, pp. 578-79)

Monetarists buttressed their case by contending that monetary targeting on a consistent basis over time—that is, without "base drift"—would take advantage of the longer-run predictability of the velocity of money. Karl Brunner had underscored concern about base drift under the old operating procedures.

> It [the Shadow Open Market Committee] also warned that the Federal Reserve's internal procedures were ill suited to execute an effective monetary control. The traditional mode of implementing policy would remain, in the Shadow Committee's view, an uncertain and unreliable instrument for the purposes defined by House Concurrent Resolution 133. The Committee emphasized, moreover, the potential drift built into monetary growth as a result of the peculiar targeting techniques evolved by the Federal Reserve Authorities. (Brunner, 1977, p. 2)

Effective monetary control would ensure, monetarists said, that prices would stay stable on average over time and therefore that inflation expectations at more distant horizons would be anchored at a low level. They contended that several economic advantages would flow from such a situation. They also argued that high and volatile inflation and inflation expectations made reliance on an interest rate as the main operating target for monetary policy even more problematic than it already was otherwise. After all, the significance for spending of a particular nominal interest rate was degraded as uncertainty rose about the true level of the real interest rate and as speculative investment gained in importance.

Point Five

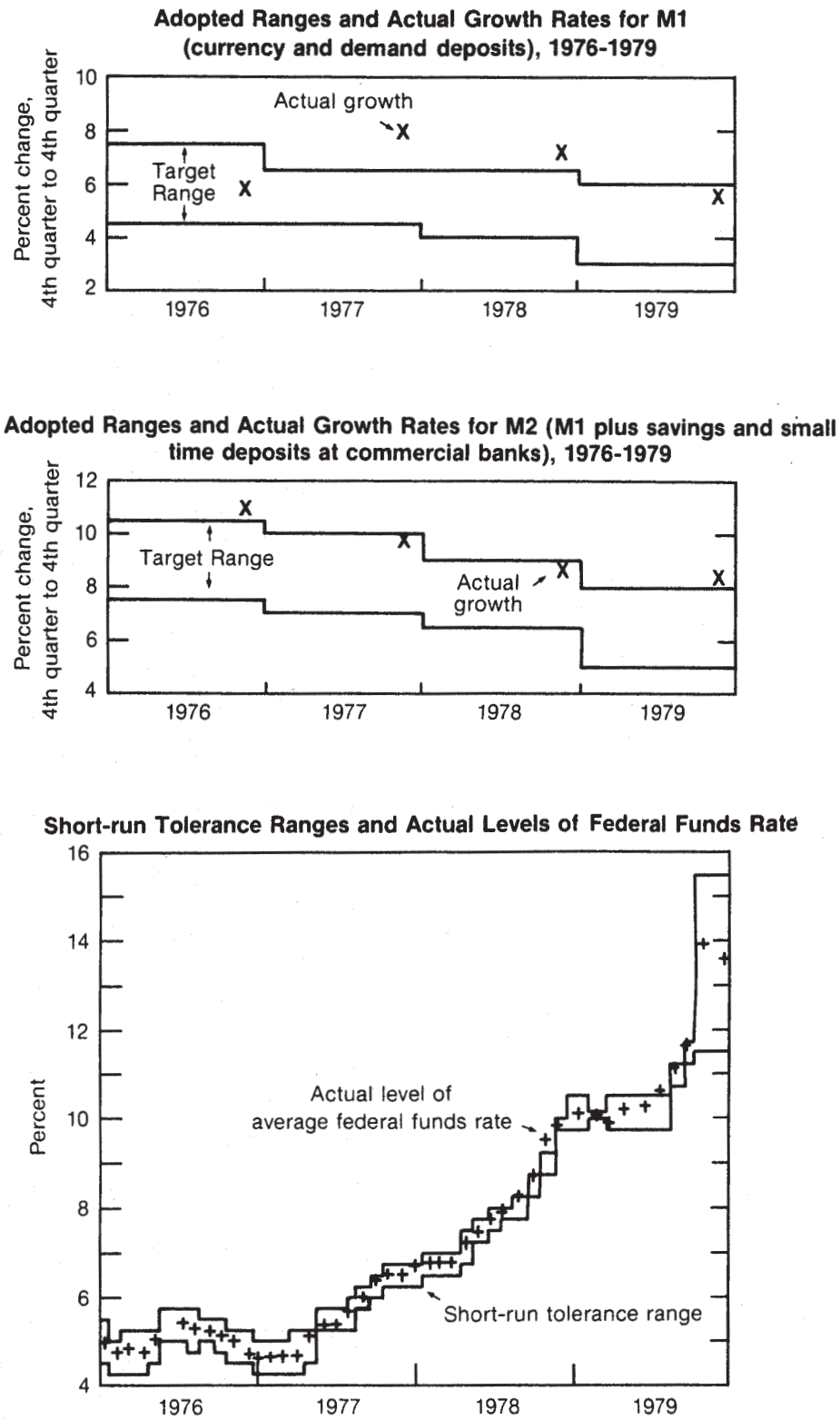
A separate argument of monetarism was about *how* to control money growth, asserting that the monetary base or total reserves should be used as the operating target.[9] The Shadow Open Market Committee (SOMC) expressed the point this way in early February 1980:

> The SOMC favors an immediate return to the 6% growth rate for base money that was achieved in the first and second quarters of

[8] This figure is reproduced from Lindsey (1986, p. 177, Exhibit 5-1).

[9] See, for example, Johannes and Rasche (1979, 1980, 1981). Table 1 in the 1981 paper translates the "New Federal Reserve Technical Procedures for Controlling Money" into the money multiplier framework used by monetarists.

Figure 5


Adopted Ranges and Actual Growth Rates for M1 (currency and demand deposits), 1976-1979
Percent change, 4th quarter to 4th quarter
Actual growth
Target Range
1976
1977
1978
1979
Adopted Ranges and Actual Growth Rates for M2 (M1 plus savings and small time deposits at commercial banks), 1976-1979
Percent change, 4th quarter to 4th quarter
Target Range
Actual growth
Short-run Tolerance Ranges and Actual Levels of Federal Funds Rate
Percent
Actual level of average federal funds rate
Short-run tolerance range

> 1978. A 6% average rate of growth of the base in each quarter of 1980 will continue the policy we advocated at our September 1979 meeting. (SOMC, 1980, p. 6-7)

This monetarist argument was rejected by FOMC staff, which drew on a different strand of the literature to recommend nonborrowed reserves as the primary alternative operating target to the federal funds rate. But this strand of the literature did not contend that as a technical matter nonborrowed reserves were superior to the federal funds rate in an empirical horse race in which each approach was used optimally in setting an operating target based on the expected outcome for the money stock; rather, in such a case the two were virtually dead even in controlling money (Sivesind and Hurley, 1980, pp. 199-203; Axilrod and Lindsey, 1981, pp. 246-52).

Instead, what tipped the scales in favor of nonborrowed reserves was the practical observation that a monetary authority deliberately setting the funds rate would be unlikely to select the level that it expected to induce the targeted money stock because the implied volatility of the funds rate would be more than the authority could stomach. Because of what Governor Wallich called "inertia in the adjustment of the funds rate to needed levels under the old procedure," a nonborrowed reserves operating target was thought likely to work out better in practice in controlling money (Wallich, 1980, p. 5). Even if the authority chose an initial level that would not give rise to the appropriate funds rate for the targeted money growth, further automatic movement of the funds rate within the control period but outside the authority's discretion was believed likely to deliver monetary growth closer to its target than in the case of a funds rate operating target where the initial level was simply maintained. Over time, closer monetary management would imply that inflation would be brought under more certain restraint as well.

Point Six

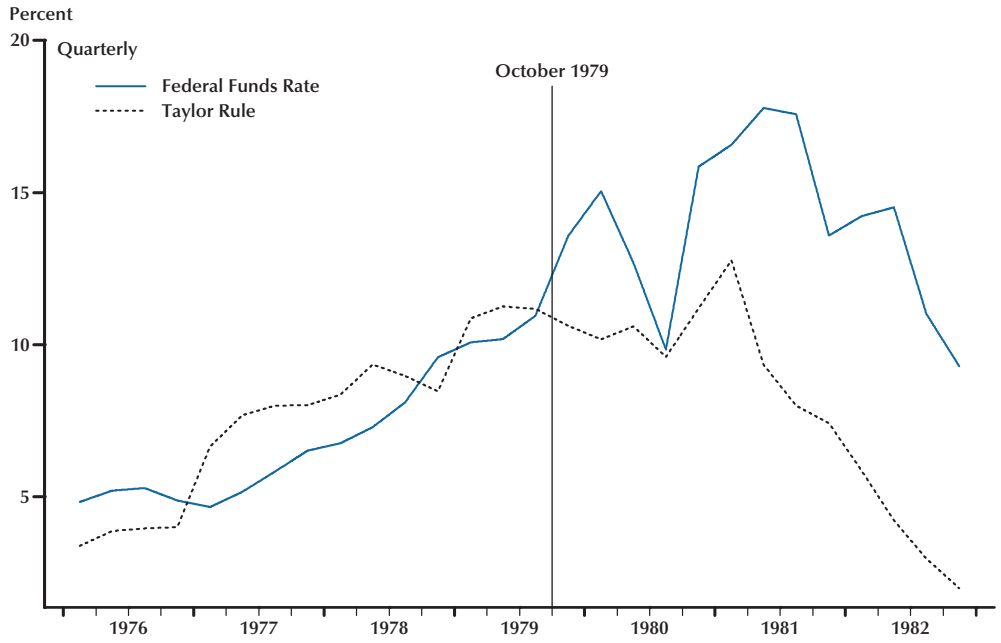
The Committee recognized that the switch to a reserves-based approach to monetary control would be more likely to allow the federal funds rate in the short run to move as necessary to whatever level would prove consistent with more restrained money growth and lower inflation. But given that the appropriate level, as well as the induced automatic movement, could not be known in advance by the monetary authority, for the federal funds rate to have the scope to be significantly more variable, the Committee would have to establish a substantially wider permissible band of funds rate movement. This band, which was published in the directive, is portrayed in the lower panel of Figure 5 introduced in *Point Four*. On October 6, the Committee widened this band from 1/2 percentage point to 4 percentage points. The small crosses in that panel, which depict the average federal funds rate between FOMC meetings, also suggest that federal funds in fact began trading over a much wider range.

Figure 6 offers an alternative perspective: A standard forward-looking Taylor rule has a tendency to predict a funds rate from early 1976 through mid-1979 that not only exhibits fairly subdued movements but also comes reasonably close to the actual funds rate set by the FOMC. (Figure 6, it should be noted, does not even employ the effects of a lagged funds rate to capture the "interest rate smoothing" that the Committee unquestionably put in place along with its reaction to forecasts of inflation and real economic activity over virtually all of the decade of the 1970s [Orphanides, 2002]). The figure's Taylor rule uses Greenbook forecasts of inflation relative to an assumed 2 percent target and of real GNP relative to the real-time estimates of potential output, as described in Orphanides (2003b). Other than its reliance on forecasts and data available in real time to the FOMC for its policy deliberations, it follows Taylor's (1993) classic parameterization, including the coefficients he originally suggested for the Committee's responsiveness to inflation and the output gap and his assumption of 2 percent for the equilibrium real funds rate. Numerous studies over the past decade have suggested that adherence to such a policy rule should represent rather good, if not optimal, monetary policy and should be expected to deliver reasonably good macroeconomic performance.[10] By this rationale,

[10] See, for example, the studies in Taylor (1999).

Figure 6

Forecast-based Taylor Rule



and since the Committee's actions up to the summer of 1979 line up well with the Taylor rule prescriptions, policy should have been considered successful. However, it is precisely this reasoning that highlights the fragility of supposedly efficient Taylor rule prescriptions. The strategy of exact adherence to this rule would not have delivered much better outcomes than the policy in place before the reforms of October. And adherence after October 1979 would have prevented the tightening necessary for controlling inflation. Adoption of the new operating procedures shifted policy away from the pitfalls of the unreliable guidance suggested by the Taylor rule.

Point Seven

Chairman Volcker explained in 1992 that he did not believe that he would have been able to get the FOMC to accept overtly the increase in the funds rate that ultimately proved necessary to rein in inflationary money growth.

> [T]he general level of interest rates reached higher levels than I or any of my colleagues had really anticipated. That, in a perverse way, was one benefit of the new technique; assuming that those levels of interest were necessary to manage the money supply, I would not have had support for deliberately raising short-term rates that much. (Volcker and Gyohten, 1992, p. 170)

Indeed, Chairman Volcker realized this potential difficulty with deliberate tightening in real time. Greider wrote,

> Early in his tenure, Volcker had directed the senior staff to begin technical studies on changing the Fed's basic operating method, and after the embarrassment of the board's 4-3 vote on September 18, Volcker pushed the idea more aggressively. (Greider, 1987, p. 105)

Joseph B. Treaster put the point slightly differently in his book published in 2004.

> In the middle of his second month as Fed Chairman, Volcker began developing a strategy

> for implementing what would be the single most important decision of his career. His insight, triggered by the reaction to the close vote, was that as confident as he felt at the moment, there might very well be a point, before inflation had been stopped, at which a majority at the Fed would say, No more. "When you have to make an explicit decision about interest rates all the time," Volcker said years later, "people don't like to do it. You're always kind of playing catch-up. I wanted to discipline ourselves."
>
> His solution, which now seems breathtakingly simple, was to take the cutting-edge decision out of the hands of the members of the Fed—or at least make it seem that way... (Treaster, 2004, pp. 147-48)

As Henry Wallich noted soon after the FOMC adopted the new procedures,

> At the policy level, the reserve-based procedure has the advantage of minimizing the need for Federal Reserve decisions concerning the funds rate. Interest rates become a byproduct, as it were, of the money-supply process. (Wallich, 1980, p. 4)

William Greider quoted Governors Teeters, Rice, and Partee as to the desirability of automatic interest rate movements and their tendency to distance the outcome from the monetary authority's discretion.

> "Under the new system," Nancy Teeters observed, "we could say what we were doing was concentrating on the monetary aggregates. It was perfectly obvious to me that if you set the money growth too low, that would send interest rates up. That was never in doubt. The problem with targeting the Fed Funds rate is that you had to set it. This did let us step back a bit."
>
> Emmett Rice, who had joined the board four months earlier, had questioned interest-rate targeting himself, convinced that it would make more sense to control reserves directly..."This meant you were not directly responsible for what happened to interest rates. This was one of the advantages. If interest rates had to go to 20 percent—and I have to say that nobody thought they would go that high—then this would be the procedure doing it. I wouldn't call it a cover, but I don't think anyone on the committee would have been willing to vote to push interest rates as high as 20 percent. This was a way to achieve a result, a more effective way to get there."
>
> Chuck Partee, the other reluctant "dove," was attracted to the operating shift by a different argument. Partee was not a monetarist himself, but he thought that the monetarist approach might overcome a flaw in the Fed's institutional reflexes—sticking stubbornly with a strong position too long and causing more damage to the economy than it had intended...
>
> "It may sound odd, but I would prefer the evenhanded approach of the monetarists. I became very concerned about a mind-set that would lead us right in to a recession—get tight and stay tight...I found myself far less hostile to the notion that we might have a fairer approach by targeting the money supply than I was to the idea that we should raise interest rates one time and keep raising them. The problem is, there is also a hesitancy to reduce interest rates once they have been raised. My concern grew out of my reflection on several earlier recessions, particularly 1974-1975. My concern was that we would be slow to respond to weakness and permit a substantial contraction in money and credit to occur. There would be a great chance of that, that we might just get locked into a position of holding tight for a rather extended period." (Greider, 1987, pp. 111-12)

Point Eight

Stephen Axilrod explained the import of the FOMC's implicit decision to renounce interest rate smoothing some 15 years after the new procedures were adopted.

> [T]he Great Inflation [of the 1970s]...came about because of an interaction of a culture of extreme policy caution and a number of unanticipated changes in the economic environment. That is, in the culture of the time the policy instrument, say, the funds rate, was adjusted very carefully—slowly and in small increments...In that context you can think about the policy

of 1979-82 as an effort to break the culture of extreme policy caution. (Axilrod, 1996, p. 232-33)

Point Nine

After October 6, 1979, the FOMC set, and published in the policy record, short-run targets for money growth over the three months ending in the last month of the current quarter, based on the desired approach to the annual ranges that were announced in February and July in accord with the Humphrey-Hawkins Act. With the non-borrowed reserves path derived from these targets, along with the Committee's initial borrowing assumption, the evolution of the actual federal funds rate between FOMC meetings would depend primarily on money-stock developments relative to the targets over that period.

This process obviously has nothing to do with Committee estimates of the NAIRU or of the associated estimates of potential output, nor does it have anything to do with gaps of unemployment or output from "full employment" levels. Actually, from a money-demand perspective, outcomes for the growth of the money stock in the current quarter have more to do with the *growth* of output ending in the current quarter than with an *output gap* (see, in particular, Orphanides, 2003b, Section 2.5). As Orphanides has pointed out, misestimates of the NAIRU and potential output and the associated misestimates of the unemployment and output gaps were primary causes of the inflation of the 1970s (Orphanides, 2002, 2003a). Thus, it is understandable that the FOMC implicitly forswore gap analysis in the fall of 1979 (Orphanides, 2004; Orphanides and Williams, 2004).

Figure 7 provides a graphical illustration of the gap analysis–based dilemma. As seen in the middle panel, based on the available estimates of potential supply, actual output had fallen well short of potential output and the gap was projected to deteriorate even before the fears of recession appeared on the horizon in 1979.[11] This slack alone should have eventually led to a gradual easing of inflationary pressures, which can be seen in the forecast of inflation in the top panel. Throughout 1979, this reasoning suggested that holding back on tightening policy appeared to provide a reasonable balance of the Committee's objectives, affording gradual disinflation and economic expansion. In retrospect, the 1979 estimates of potential proved overly optimistic, explaining why the policy prescriptions from this gap-based analysis were overly expansionary. But this was not recognized at the time. Continued adherence to gap-based analysis would have prolonged the policy of inappropriate, even if inadvertent, monetary ease. The policy reform in October short-circuited this process.

Point Ten

The monetary policy process of short-run money targeting also is not explicitly dependent on the longer-term economic forecasts of the Board members and Reserve Bank presidents. Although their sense of the outlook implicitly could affect the Committee's money targets, initial borrowing assumption, and choice for the funds rate band, the influence of opinions about the future of the economy over the actual course of the federal funds rate is clearly less direct than with a federal funds operating target in which the Committee sets its operating objective based in important part on its opinion of the outlook.

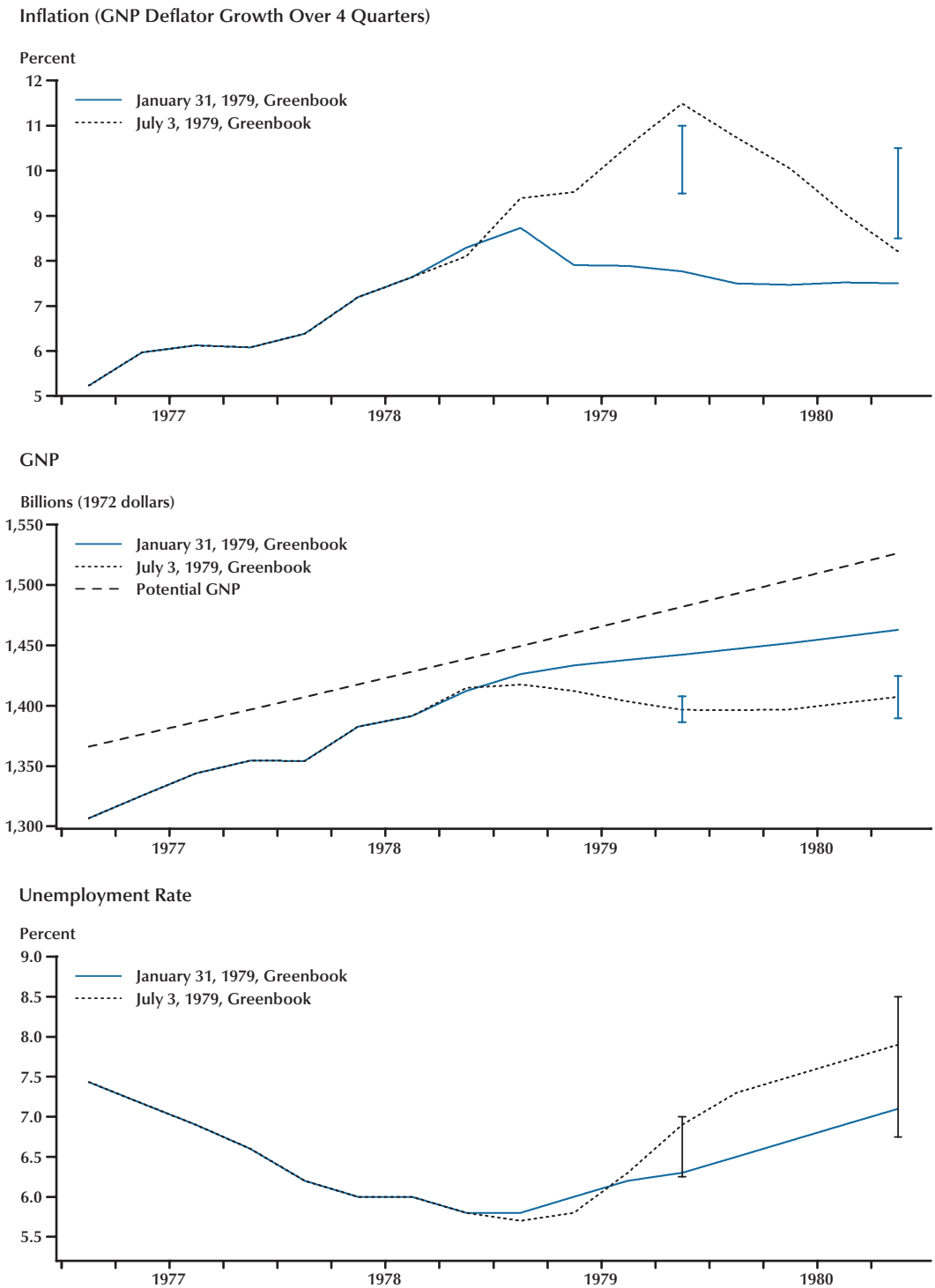
This much looser connection between the stance of policy and the uncertain economic forecasts of FOMC members is, of course, consistent with Chairman Volcker's denigration of the accuracy of any economic forecasts that was cited above as well as Axilrod's earlier observation that after the adoption of the new techniques the FOMC avoided basing policy on forecasts. The new operating procedures, with their dependence on near-term outcomes for money, guaranteed that error-prone longer-term economic projections of both prices and real GNP would not interfere with the coming battle against virulent and entrenched inflation.

The Board staff's economic projection in mid-1979 did not offer an accurate outlook for real growth. Figure 7 confirms that, by July 1979, the

[11] Potential output is from Council of Economic Advisors (1979, p. 75). This estimate, which was prepared in February 1979, was also employed by the Federal Reserve Board staff as its estimate throughout 1979.

Figure 7

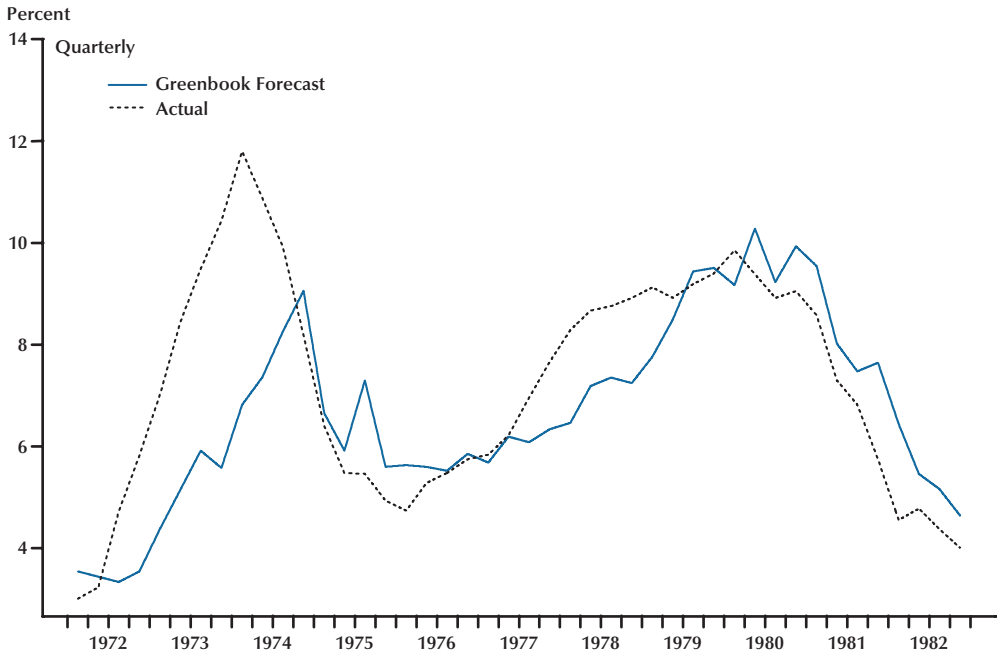
Greenbook Monetary Policy Report Projections



NOTE: Vertical line segments indicate range of Board consensus projections as presented in the July 17, 1979, Monetary Policy Report.

Figure 8

Inflation Forecasts and Outcomes
(Three-Quarter-Ahead Growth in GNP Deflator Over Four Quarters)



Greenbook was predicting that a recession had begun by the second quarter of 1979, as clearly shown by the forecasted decline in the level of real GNP through the end of the year. (In retrospect, real GNP instead is known to have registered positive growth in each quarter of that year.) The lower panel of Figure 7 displays the associated staff prediction of a sharp rise in unemployment through the end of 1980. As a result of the projections by the time of the July Greenbook, of steep increases in the output and employment gaps, along with moderating energy prices, average four-quarter deflator inflation was foreseen to abate appreciably in 1980, after spiking through 1979.

The staff had established a history of excessive optimism in forecasting inflation in the 1970s. Figure 8 demonstrates this record visually. It presents for the 1970s the successive underpredictions of the average four-quarter rate of inflation in the deflator in mid-quarter Greenbooks—plotted in the quarter of that Greenbook's publication—three quarters in advance of the last predicted quarter, as in the Taylor rule noted in *Point Six*. The bias in the inflation forecasts, of course, is closely related to the overly optimistic measures of potential supply discussed in *Point Nine*. The inflation forecasts were systematically lower than they should have been simply because of the persistent perceptions of economic slack that was not actually there. The evidence had not yet been assembled showing that basing inflation forecasts on real-time estimates of the output gap may be unreliable (Orphanides and van Norden, 2003).

Point Eleven

With its actions on October 6, the Committee fully assumed its unique responsibility for the attainment of long-term price stability. To understand the nature of this change, it is necessary to discuss the attitudes of previous FOMCs.

Under Chairman Burns, the common thread

running through many communications on monetary policy was that the Federal Reserve and other critical influences ultimately shared responsibility for the too-rapid rise in prices. Excessive fiscal deficits were a commonly referenced contributing source. The cost-push effect of union power through wage negotiations also was regarded as playing an important role, as was corporate discretion over administered product prices. After mid-decade, OPEC's cartel-like pricing was thought to influence not just relative prices but also overall trend inflation. By the 1970s, the economics profession had advanced sufficiently that most FOMC members had accepted a vertical long-run Phillips curve in which the equilibrium unemployment rate was independent of the inflation rate. Rather, despite rousing anti-inflationary speeches and testimony, the Federal Reserve had not really taken to heart its own sole responsibility for the average rate of inflation over the long pull. It is the central bank alone that has the duty of ensuring secular price stability, along with its other objective of promoting maximum employment or, relatedly, sustainable economic growth, in the intermediate term. These objectives were enshrined in the Federal Reserve Act in 1977.

Although he never mentioned this 1977 statutory addition, former Chairman Burns presented the 1979 Per Jacobsson lecture in Belgrade on September 30, entitled "The Anguish of Central Banking," in which he delved more deeply into the dilemma of monetary policymaking—attributing it to this fundamental factor:

> the persistent inflationary bias that has emerged from the philosophic and political currents that have been transforming economic life in the United States and elsewhere since the 1930s. The essence of the unique inflation of our times and the reason central bankers have been ineffective in dealing with it can be understood only in terms of those currents of thought and the political environment they have created...
>
> Inflation came to be widely viewed as a temporary phenomenon—or provided it remained mild, as an acceptable condition. "Maximum" or "full" employment, after all, had become the nation's economic major goal—not stability of the price level...Fear of immediate unemployment—rather than fear of current or eventual inflation—came to dominate economic policymaking...
>
> Viewed in the abstract, the Federal Reserve System had the power to abort the inflation at its incipient stage fifteen years ago or at any later point, and it has the power to end it today. At any time within that period, it could have restricted the money supply and created sufficient strains in financial and industrial markets to terminate inflation with little delay. It did not do so because the Federal Reserve was itself caught up in the philosophic and political currents that were transforming American life and culture... (Burns, 1979, pp. 9, 13, 15)

Chairman Burns gave the following basic reason for why the role of the central bank in fighting inflation in a democracy would be "subsidiary" and "very limited," thus rendering it able to cope "only marginally" with inflation, causing him to think that "we would look in vain to technical reforms as a way of eliminating the inflationary bias of industrial countries" (Burns, 1979, pp. 21-22):

> Every time the Government moved to enlarge the flow of benefits to the population at large, or to this or that group, the assumption was implicit that monetary policy would somehow accommodate the action. A similar tacit assumption was embodied in every pricing or wage bargain arranged by private parties or the Government. The fact that such actions could in combination be wholly incompatible with moderate rates of monetary expansion was seldom considered by those who initiated them, despite the frequent warnings by the Federal Reserve that new fires of inflation were being ignited. If the Federal Reserve then sought to create a monetary environment that fell seriously short of accommodating the upward pressures on prices that were being released or reinforced by governmental action, severe difficulties could be quickly produced in the economy. Not only that, the Federal Reserve would be frustrating the will of Congress—a Congress that was intent on providing additional services to the electorate and on assuring that jobs and incomes were maintained, particularly in the short run.

> Facing these political realities, the Federal Reserve was still willing to step hard on the monetary brake at times—as in 1966, 1969, and 1974—but its restrictive stance was not maintained long enough to end inflation...As the Federal Reserve...kept testing and probing the limits of its freedom to undernourish the inflation, it repeatedly evoked violent criticism from both the Executive establishment and the Congress and therefore had to devote much of its energy to warding off legislation that would destroy any hope of ending inflation. This testing process necessarily involved political judgments, and the Federal Reserve may at times have overestimated the risks attaching to additional monetary restraint. (Burns, 1979, pp. 15-16)

In essence, Burns suggested that if a central bank had committed the expansionary errors that generated inflation, as had happened in the late 1960s and 1970s in the United States, public and political support appeared necessary to maintain the much tougher policies that might be required to restore stability. Without such support, it could be questioned whether a central bank had the mandate for such action. Nonetheless, Burns ended his lecture on an optimistic note, observing that the political environment was indeed shifting in that direction.

When Chairman Volcker was appointed to the Board, public support of anti-inflationary action had become quite high, and political sentiment appeared much more conducive than ever before to strong actions resisting inflation. By the late 1970s, public opinion polls consistently identified inflation as a greater problem than unemployment. In any event, Chairman Volcker said in an interview on PBS's *Commanding Heights* (2000) that he had listened to and been much affected by this lecture by Chairman Burns before he returned to Washington. He thought that Chairman Burns was saying that as a practical matter the Federal Reserve was "rather impotent" in fighting inflation. While that might have been the case earlier in the decade, Chairman Volcker obviously disagreed that this assessment was still correct in 1979. In retrospect, he was right. The FOMC at the end of the day proved able to live up to its obligation of being responsible for establishing and maintaining stable prices over time.

Point Twelve

That a tightening of monetary policy could evoke "violent criticism" by "frustrating the will" of a Congress intent on "assuring that jobs and incomes were maintained," as Chairman Burns contended, can be supported from the contemporaneous statements about the economic goals of the elected officials themselves. For example, on October 19, 1979, the Senate majority leader, Robert C. Byrd, Democrat from West Virginia, declared the following:

> Attempting to control inflation or protect the dollar by throwing legions of people out of work and shutting down shifts in our factories and mines is a hopeless policy. (Greider, 1987, p. 149)

As another example, Representative Henry S. Reuss, Democrat from Wisconsin, chairman of the House Committee on Banking, Finance, and Urban Affairs, said this after the four-to-three vote on the discount rate on September 18, 1979:

> For the first time, Fed members are wondering out loud whether it really makes sense to throw men and women out of work, and businesses into bankruptcy, in order to "rescue the dollar" by chasing ever-rising European interest rates. (Berry, 1979, p. A1)

Although Representative Reuss was a general supporter of the new operating procedures, at Chairman Volcker's first Humphrey-Hawkins testimony on February 19, 1980, this is what he said:

> Last year, following our first hearings, under the procedures established in Humphrey-Hawkins, we issued a report on March 12, 1979, agreed to by all except one of our members.
>
> The key recommendation of that report was "anti-inflationary policies must not cause a recession."
>
> So far, the Federal Reserve's policies have not caused a recession and for that, you deserve our appreciation...
>
> The Federal Reserve cannot cure inflation with monetary shock treatment and it shouldn't try. (U.S. House of Representatives, 1980b, pp. 1-2)

In 1982, with the economy having slid into a recession, both Republicans and Democrats intro-

duced legislation that would have required the Federal Reserve to keep *real* interest rates within the range of historical experience, which could have potentially interfered with the conduct of monetary policy in a damaging manner.

In *Point Three* above, we saw that the IMF noted "that it is evident that governments have felt severe economic and political constraints in launching an effective anti-inflation program, since in the short run this would be bound to have severe employment effects." Perhaps in part to circumvent those political constraints, the FOMC members appreciated that the new procedures distanced them from the setting of the funds rate, as *Point Seven* demonstrated, and Chairman Volcker's answer to the question about real-side impacts in the press conference on October 6, as quoted above, was sufficiently noncommittal that William Greider claimed that "he evaded the point and concealed his real expectations" (Greider, 1987, p. 123).

But these inferences inevitably enter into the realm of speculation, because the motivation of participants in the onrush of history is rarely specified at the time. Even so, it is difficult to escape the conclusion that potential criticisms of FOMC policy by politicians, who in coming years actually would show stirrings—by introducing legislation—of using their power to affect the FOMC's makeup or freedom of action, engendered in Committee members the desire to obscure their responsibility for real-side developments.

"WHAT WE HAVE HERE IS A FAILURE TO COMMUNICATE!"—OR NOT!

Indisputably, market participants were somewhat confused, especially early on, by what the new procedures were and what they portended for monetary aggregates and the money market, let alone for longer-term interest rates, real magnitudes, and inflation. One diagnosis would be to highlight a failure by the Federal Reserve to communicate the nature of its new policy approach soon enough and with enough specificity to satisfy the public's, and especially market participants', pressing desire to know. In particular, between October 6, 1979, and February 1, 1980, the FOMC did not release any detailed summary of its new technique. In consequence, at its meeting on February 3-4, 1980,[12] the SOMC held that

> [t]he Federal Reserve should announce further details about its procedures to reduce the long-run trend of money growth and reestablish its credibility by actually achieving its announced targets. This would be the most effective way to eliminate the entrenched belief that the rate of inflation will continue to rise in the Eighties. (SOMC, 1980, p. 2)

Was one reason for this reticence that the FOMC was operating under a legacy of secrecy inherited from the tenures of Chairmen Martin, Burns, and Miller? (See, Goodfriend, 1986.) Could this tradition be used to explain, at least in part, why, for example, the Axilrod-Sternlight memorandum was not released immediately? Immediate release of this memorandum shortly after October 6 would have revealed, for all the world to see, a systematic, considered monetary policy approach.

An alternative diagnosis would be that existing contingences, inevitable complexities, the intended audience, and unavoidable uncertainties all posed severe challenges to clear communication, which could be surmounted only over time. As has already been seen in the historical record, the FOMC actually had adopted the new operating procedures on a temporary, contingent basis, awaiting evidence on just how effectively they would work given the uncertainties involved, including those regarding money demand (FOMC Transcript, 10/6/1979, pp. 9-10, 15). However, as Peter Sternlight learned, presumably to his chagrin, it is difficult to make the point initially that new procedures have "experimental" elements without seeming to undercut the resolve and understanding of the agency implementing them. As the rational expectations revolution has emphasized, a "permanent" commitment has a much more powerful effect on expectations than a "temporary" one. To be sure, the FOMC did not

[12] The SOMC meeting was on Sunday, February 3, 1980, so the members of the committee were not aware of the attachment to Volcker's February 1 Joint Economic Committee testimony.

stress publicly the contingent nature of its adoption of the new operating technique. Still, the Committee did not discuss and reaffirm its earlier tentative decision to adopt the new approach until it met on January 8, 1980. Only afterward was Chairman Volcker ready to release publicly the "technical" description of the new procedures, which he did on February 1, 1980.

In addition, the new procedures, without question, were complex. The Axilrod-Sternlight memorandum, which describes the essence of the new procedure, was composed as a background paper presenting a policy choice to the FOMC, for which their writing was well suited. It certainly was not written with the simplicity and pedantry needed for public consumption. Financial market participants are trained and paid primarily to buy low and sell high. Admittedly, they have a longer attention span for digesting, and a greater capacity to grasp, Federal Reserve analyses describing the intricacies of monetary policymaking than does the public at large. But even with a hypothetical manual containing a perfect prediction and complete elucidation of what the new procedures would be and how they would work, it is probable that market participants would have been able to assimilate the main features of those procedures only gradually from practical experience.

Furthermore, certain features simply could not have been known by the Federal Reserve in advance. Although the basic procedures had been considered before their approval on October 6, 1979, some elements could not have been settled except through the passage of time. Initially, these inherently uncertain, and thus imperfectly describable, features included (i) how aggressive the FOMC would be in setting and varying the monetary target paths, the initial borrowing assumption, and the band for allowable funds trading; (ii) how extensive intermeeting policy-related adjustments to the nonborrowed reserves target path would be; (iii) how extensive intermeeting technical "multiplier" adjustments to the nonborrowed reserves target path would be; and (iv) how responsive the monetary aggregates, the real economy, and inflation would be to these various ministrations.

FOMC communication, operating within this context, naturally had the obligation to strive for maximum conciseness and clarity; but in judging the Federal Reserve's success in public communication in this case, especially late in 1979 and early in 1980, a historian must carefully parse the words used by the principals. Take as an example the interview that appeared in the *WSJ* on October 11, in which a contemporary reader may not consider the "Fed official" to be a paragon of clear communication (see p. 206). But such a reading risks misinterpreting the meaning of the words used in what arguably was an informative description of a complex, responsive, and discretionary monetary policy approach.

First, a "rule of thumb" was meant to convey something that the Federal Reserve certainly was not going to propound: an oversimplified summary of a complex underlying system. Second, at the time, the word "rule" by itself had a different meaning than it does today because John Taylor's famous usage, which has been adopted by the profession, has altered its definition among economists to mean merely a "guideline" subject to judgmental overthrow. Then, the word "rule" had been used influentially by Milton Friedman in the "rules versus discretion" debate to mean a legislated requirement that would have to be followed strictly. Besides "nondiscretionary," a "rule"—also unlike today's sense—was "nonresponsive" to current business cycle developments as well, as in Friedman's k-percent money growth rule or Allan Meltzer's monetary base growth rule. Only later did Allan Meltzer and Bennett McCallum introduce and advocate variable base growth in a nondiscretionary rule, explicitly employing the concept of a "responsive, nondiscretionary rule" (Meltzer, 1987; McCallum, 1988). Third, the word "unpredictable" apparently did not pass the Fed official's lips; instead, it was the reporter's word, although Chairman Volcker did believe that some "uncertainty" about future monetary policy settings could be useful in curtailing "speculation" (Volcker and Gyohten, 1992, p. 170). Finally, today's vantage point makes it clear—although it may have been less clear in the interview—that the "Fed official" was saying, not that a thought-out systematic structure of the

new procedures did not "exist" (since it certainly did in the Axilrod-Sternlight memorandum), but rather that the Federal Reserve's "future behavior" hadn't taken place and obviously couldn't yet be pictured in detail. Only the passage of time could clarify the emerging contours of the operational landscape.

WAS CHAIRMAN VOLCKER...

In attempting to draw lessons for the present day from the October 1979 policy reform, it seems necessary to classify the essential characteristics that made Chairman Volcker's FOMCs successful at fighting inflation and setting the stage for Chairman Greenspan's FOMCs to finish the job. This section addresses the questions of whether Chairman Volcker was (i) a monetarist? (ii) a nominal income targeter? (iii) a new, neo, or old-fashioned Keynesian? (iv) an inflation targeter? or (v) a great communicator?

A Monetarist?

Chairman Volcker's scientific views on the merits and demerits of the doctrine of monetarism arguably changed little during his years as President of the New York Federal Reserve Bank and Chairman of the Board of Governors, judging by various FOMC transcripts, speeches, and testimony. As already seen, he subscribed to the long-run connection between average money growth and inflation, although some (but not all) non-monetarist macroeconomists at the time would have agreed with this secular linkage. He also expressed this point of view in September 1976, when he presented an extended analysis of monetarism to an academic audience. He first characterized the school not only as having correctly insisted that money matters but also as having

> usefully emphasized the danger of confusion between nominal and real rates and the role of price expectations. They have forcefully made the case for the view that in the long run velocity is not related to the stock of money and that, in the same long run, an excess supply of money contributes not to real income or wealth but simply to inflation. (Volcker, 1976, p. 251-52.)

However, he then prophetically noted that

> no one should be under the illusion that any tactical change will end controversy that, in the last analysis, stems more from different judgments about relevant policy variables than about operating techniques. (Volcker, 1976, p. 253)

He outlined many of the disadvantages to money targeting that in the second half of 1982 would ring the death knell, though admittedly at first in a muted way, to monetary targeting at a low growth rate:

> [This points out] the simple fact that, whatever the stability in the relationship between money and nominal income in the longer run, there is considerable instability in the relationship over time horizons relevant to policymakers. Certainly the relationships between money, interest rates, and nominal income have been unusual over the year or so since I rejoined the Federal Reserve...I can only conclude that, in periods such as that we have just been through, we need to be alert to possible shifts in the demand for money. (Volcker, 1976, p. 252)

He continued as follows:

> [W]e must constantly balance the danger of *under*reacting to deviations of the aggregates from target paths against the danger of *over*-reacting...Clearly, there are risks in not responding to bulges or shortfalls in the money supply relative to objectives...
>
> But the danger of overreacting to deviations in the aggregates from targets is just as real... Attempts to respond immediately to shifting reserve availability and allowing the money market abruptly to tighten or ease could therefore easily result in whipsawing of the market... Since only a relatively small fraction of the impact of a given move in reserve availability or money market conditions is reflected in the behavior of the monetary aggregates in the short run, very large movements in reserves and money market conditions might be needed to correct short-run aberrations. Worse, the lagged effect of these moves might then have to be offset by even larger movements in the opposite direction in the subsequent period—a process

> that could easily lead to a serious disruption of the whole mechanism. (Volcker, 1976, p. 254)

He argued that if a central bank turns toward significant monetary restraint, it can induce difficult reactions on the real side, with broader ramifications.

> It is hardly a satisfactory answer to say that central banks in principle can always resist inflationary pressures by simply refusing to provide enough money to finance them. Set against persistent expansionary pressures, aggressive wage demands, monopolistic or regulatory patterns that resist downward price adjustments, and other factors affecting cost levels, such an approach would threaten chronic conflict with goals of growth and employment that must rank among the most important national objectives. In a democracy, the risk would not be just to the political life of a particular government, but to our way of government itself...
>
> In this larger social and political setting, we should perhaps think of central banks themselves as "endogenous" to the system. A theory of chronic inflation that points only to the money supply is not going to prove adequate to understand—or deal with—inflation in today's world. The danger is that it may discourage the search for particular remedies for particular problems...
>
> The monetarists, emphasizing old truths in modern clothing, have provided a large service in redressing the balance. It is in pressing the point to an extreme that the danger lies—the impression that only money matters and that a fixed rate of reserve expansion can answer most of the complicated problems of economic policy. (Volcker, 1976, p. 255-56)

As to the monetarist arguments on technical issues of operating procedures, he also articulated positions that foreshadowed the FOMC's side in future debates and in the Staff Study in 1981.

> While I do not pretend to econometric expertise, I do know that a massive amount of research has been conducted in this area. The apparent result is that the relationship between money and reserve aggregates, particularly in the short run, appears no more reliable than the relationship between interest rates and money...
>
> We have techniques to make the needed forecasts with both the interest rate and reserve approaches. The trouble is that the forecast errors are large no matter what procedure is used, particularly over periods of one to three months. Indeed, unimpressive as they are, I am told some of the correlations observed in the historical data between reserve measures and monetary measures would prove to be spurious under a regime of rigid reserve targeting. (Volcker, 1976, p. 253-54)

When the entire 13-paper Staff Study (BOG, 1981) was published, the Federal Reserve gave the results a lot of play, ranging from an extended discussion in the February 1981 Humphrey-Hawkins report, to a press conference, to two conferences for economists (the conference for academic economists was April 17, 1981, with lead-off statements from Karl Brunner and Stephen Goldfeld, and the conference for market economists was April 21, 1981), to a *Federal Reserve Bulletin* article by Stephen Axilrod (1981).

Monetarists did not believe that the FOMC had gone nearly far enough in the reforms of October 1979 and seized on the Staff Study to reiterate their points. Milton Friedman critically reviewed the experience (Friedman, 1982). Peter Sternlight and Stephen Axilrod vied in person with Robert Rasche and Allan Meltzer in a heralded debate on April 30, 1981, at The Ohio State University (Rasche et al., 1982). Even so, two of the Staff Study's papers were published by Karl Brunner, editor of the *Journal of Monetary Economics*.[13] In addition, at a conference held at the Federal Reserve Bank of St. Louis in October 1981, David E. Lindsey was asked to examine the institutional changes needed to improve control of the money stock.[14]

Even during the period of monetary targeting, Chairman Volcker made his skeptical opinion of monetarism plain, first to Congress and then later to his FOMC colleagues.

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[13] Tinsley, von zur Muehlen, and Fries (1982); Lindsey et al. (1984).

[14] See Lindsey (1983).

> **Chairman Volcker**...I would remind you that nothing that has happened—or that I've observed recently—makes the money/GNP relationship any clearer or more stable than before. Having gone through all these redefinition problems, one recognizes how arbitrary some of this is. It depends on how you define [money]. (FOMC, Transcript, 1/8-9/1980, pp. 13-14)

Finally, the FOMC's departure from low-growth monetary targeting after mid-1982, and the subsequent downgrading of M1 itself as well as replacement of nonborrowed reserves with borrowed reserves in the fall of that year, which are beyond the scope of this paper, suggest as well that Paul A. Volcker did not qualify as a monetarist.

A Nominal Income Targeter?

Nominal income targeting was in the air in the late 1970s and early 1980s in the writings of James Tobin, Bennett McCallum, Robert Gordon, and others. In a sense, money and nominal income targeting could be viewed as closely related. Indeed, to emphasize this point, James Tobin even referred to GNP targets as "velocity adjusted aggregates" (Tobin, 1985). Thus, the following quotation from Chairman Volcker's 1981 Humphrey-Hawkins testimony perhaps could be read as the statement of a closet nominal-income targeter:

> I would like to turn to the targets for 1981. Those targets were set with the intention of achieving further reduction in the growth of money and credit, returning such growth over time to amounts consistent with the capacity of the economy to grow at stable prices. Against the background of the strong inflationary momentum in the economy, the targets are frankly designed to be restrictive. They do imply restraint on the potential growth of the *nominal* GNP. If inflation continues unabated or rises, real activity is likely to be squeezed. As inflation begins noticeably to abate, the stage will be set for stronger real growth. (Volcker, 1981, pp. 5-6)

However, this interpretation would be inaccurate. To be sure, monetary targeting would constrain the growth of nominal GNP, which is what Chairman Volcker was pointing out. But literal nominal GNP targeting would not have met with his approval, at least in the environment facing the Committee in 1979, for two reasons at a minimum.

First, a more directly controllable intermediate target than GNP was necessary to restore the public's confidence in the Federal Reserve's commitment to conquering inflation. While policy could be adjusted to maintain M1 growth within an announced range over relatively short periods, thus demonstrating that the Federal Reserve meant business, that could not be said of a nominal GNP target. The lags in the transmission process were, as they remain, too long, uncertain, and variable for that purpose, and too many other factors outside a central bank's control influence nominal income over short intervals. Second, nominal income targeting would not have represented as stark a break from the gradualist policies of the past as the Committee must have felt was necessary. As described by Tobin, and in light of the policy lags involved, nominal income targeting would require the central bank to continue to fine-tune the stance of policy on the basis of predictions of the future, hardly a recipe for success given the profession's sad forecasting record earlier in the 1970s. Stephen Axilrod later offered the following summary regarding the superiority of monetary targets:

> A money supply guide has two virtues: the central bank can be held reasonably responsible and accountable for its achievement, and it will serve as an anchor to the windward against erroneous assessments of ongoing and predicted economic and price developments. (Axilrod, 1985, p. 600)

In 1979, Chairman Volcker himself clearly put predominant priority on conquering inflation. Nominal GNP targeting did not appear as certain a strategy for gaining the public's confidence and for fairly promptly achieving that goal as monetary targeting did.

A New, Neo, or Old-fashioned Keynesian?

A basic policy recommendation arising from the Keynesian framework, old, new, and neo, is

that policy can be successful in stabilizing the economy by aiming to align aggregate demand with the nation's potential supply. In one sense, the theoretical argument behind this reasoning is impeccable, under the assumption that the implied policy prescription can be applied in practice. But Volcker rejected the premise that policy should actively seek to close output or unemployment and related gaps, judging that the informational requirements of such calculations were simply untenable.

The original Taylor rule, which used outcomes for the estimated output gap, that is, actual output less potential output, provides a useful illustration of the gap-closing Keynesian perspective. But unlike this Taylor rule, the reaction function consistent with targeting money growth instead, from a money-demand perspective, would use outcomes for estimated output growth. That is, whereas the Taylor rule stresses the role of the output gap for setting policy, a reaction function for controlling money growth would instead stress the growth rate of output relative to that of potential—that is, the change in the output gap. And indeed, estimated policy reaction functions suggest that, while Federal Reserve policy appeared to respond to such gaps quite strongly before Volcker became Chairman, this was no longer the case afterward (Orphanides, 2003b, 2004).

Because he had little tolerance for gap analysis, it is clear that he should not be placed in any of these camps. It is less certain that these camps were any more tolerant of inflation than he was, but he obviously had a very low tolerance for inflation.

An Inflation Targeter?

Does that mean that he anticipated today's advocates of inflation targeting, such as Governor Ben Bernanke, Thomas Laubach, Rick Mishkin, Adam Posen, and the current IMF or the central bank practitioners in New Zealand, Australia, Canada, England, Sweden, Korea, Poland, and South Africa?[15] Not really, to the extent that they attempt to heighten central bank transparency through an announced, explicit numerical target or range for the inflation rate. Instead, in a speech before an audience of academics in 1983—jocularly called "Can We Survive Prosperity?"[16]—Chairman Volcker proposed a qualitative definition of price stability.

> A workable definition of reasonable "price stability" would seem to me to be a situation in which expectations of generally rising (or falling) prices over a considerable period are not a pervasive influence on economic and financial behavior. Stated more positively, "stability" would imply that decision-making should be able to proceed on the basis that "real" and "nominal" values are substantially the same over the planning horizon—and that planning horizons should be suitably long. (Volcker, 1983, p. 5)

His disdain for forecasts as a policymaking tool also would have turned him against some recent practices for attempting to attain an inflation target. All things considered, he certainly didn't sound like a prototypical inflation targeter.

A Great Communicator?

In his days as president of the New York Federal Reserve Bank, he referenced approvingly the degree of openness in the policy record:

> I might note in passing that the amount of information provided in these records probably sets a standard among the major central banks in the world, and represents a degree of openness entirely unknown to a central banker of an earlier generation. (Volcker, 1976, p. 253)

Chairman Volcker advanced the case for effective communication early in his tenure at the Board, as well as the advantages of monetary targeting in this regard.

> All of this puts a special burden on those of us developing and implementing policy to "get it right," to communicate our purposes and intentions effectively, and to persevere with needed policies.
>
> In that context, I am satisfied that the greater

[15] See Bernanke et al. (1999).

[16] Early in the preparation process for this speech, he even more jocularly suggested the following title: "What Economists Don't Know—That Can Hurt You!" (David Lindsey's recollection.)

> emphasis we have placed on monetary targeting in recent years, supplemented by the change in operating techniques, has assisted both in communicating what we are about and achieving the internal discipline necessary to act in a timely way. (Volcker, 1980f, p. 6)

For the not-quite-three years of serious (if not always effective) short-term monetary targeting, FOMC communication indisputably was more transparent than in the surrounding years, when the FOMC did not intend for its communication to be very open—and succeeded admirably in realizing its intention. Despite the transparency under monetary targeting, the Committee was accused of adopting the new operating procedures only as a smokescreen to obscure its intention to markedly increase short-term interest rates. We have found no evidence to substantiate this claim and therefore consider it invalid. Instead, what does make for a fascinating debate, as there are two legitimate sides, is whether the Committee's communication during the period of monetary targeting moved toward openness as completely as it should have. In what follows, we try in a single discussion to give the flavor of each side of the debate.

The fanfare surrounding the announcement of the new procedures, the testimonies of Chairman Volcker and other Board members, the speeches by Board members and Reserve Bank presidents, the Humphrey-Hawkins reports, the official staff studies, the *Bulletin* article, and the unofficial staff papers must have served a communications end. The general principles underlying the new approach were well explained, and the FOMC, if only by dint of repetition, must have gotten these messages across over time, at least to some extent.

To be sure, the Committee convinced most observers that it meant business in large measure only by successfully reducing actual inflation as time went on. Survey responses regarding inflationary expectations and long-term interest rates did not respond immediately to the Federal Reserve's new operating procedures and associated stirring words; instead, it took some years, along with the reduction in actual inflation, for them to come down on a sustained basis. Market participants understandably would have been somewhat skeptical initially that real reforms would continue when the going got rough, so they needed to see the lower inflation results before they would fully believe that a "regime change" had occurred. Whether publicly quantifying its inflation goal would have allowed the FOMC to shorten this period of adjustment can be debated. In any event, observers on the outside from the beginning could see the new operating procedures working themselves out in money markets as advertised in those Federal Reserve descriptions. While the Federal Reserve did not publish its short-run target paths for M1 and reserves, let alone the Federal Reserve's daily balance sheet or the reserve factor forecasts made by staff at the Trading Desk and the Board, most people on the outside did not care to know about the detailed plumbing of the new monetary control procedures.[17] Instead, they just wanted to be sure that those on the inside were in fact minding the store and would "get it right," in Chairman Volcker's phrase.

The communications problems that did emerge concerned the public's basic understanding of exactly what constituted "getting it right," because effective monetary targeting proved to be no easy matter. Although beyond the scope of this paper, the increasing challenges of monetary targeting and the eventual departure from it via a nonborrowed reserves-based operating procedure, whatever the departure's merits or demerits, in Chairman Volcker's mind clearly could not be discussed openly—despite its only temporary adoption in the first place—perhaps partly in light of the favorable public comments the FOMC had made about the approach.

This brings us to the basic question of whether Chairman Volcker could be classified as a great, or even mediocre, communicator? One aspect of this question in turn can be decomposed thusly: Was communication about the future stance of policy transparent, and why or why not? Was

[17] At the January 1980 FOMC meeting, President Roos asked about heightening market knowledge and "dynamism" by releasing the reserve paths publicly. Peter Sternlight replied that intermeeting adjustments to those paths would only sow confusion if the quantitative process were carried out in public. He said, though, that more explanation of the "general methodology" would be warranted (FOMC, Transcript, 1/8-9/1980, pp. 9-10).

communication about the present stance of policy transparent, and why or why not?

The first component question is the easier to answer. As a simple matter of pure logic, knowing and revealing publicly anything about the future stance of policy requires knowledge not only about the FOMC's ultimate objectives and future reaction function but also about the outlook for economic activity and inflation. As the historical narrative repeatedly demonstrated, Chairman Volcker was not just skeptical about but almost dismissive of economists' attempts to forecast the future. Indeed, he expressed the view that basing policy on such efforts had proven to be a counterproductive strategy in the 1970s. Given that attitude, he certainly would not have wanted the central bank to suffer the indignity of having its public statements about its own future policy stance, which necessarily would have had to rest on those same error-prone forecasts, frequently proven wrong by the march of events. This was obviously the case during the episode of monetary targeting. Even after the fall of 1982, when the Committee was instructing the Desk to pursue a borrowing operating target, the FOMC did not try to hint at what the future level of borrowing might be.

The answer to the second component question, about publicly describing the current policy stance, is much more difficult to prove—though not to provide—because it is necessarily more speculative. People tend not to express "politically incorrect" sentiments—to use the term former Governor Laurence Meyer has recently employed in a different macroeconomic context—on the record for historians later to uncover (Meyer, 2004, pp. 75-76). Thus, much of what follows cannot be conclusively demonstrated, but is based on the "atmospherics" around the Board in the 1980s (David Lindsey's recollection). A major role was played by political threats to FOMC independence, which also is largely beyond the scope of this paper, as is politicians' switch to deploying an altogether different strategy in the first half of the 1990s, which involved certain issues of transparency, and naturally induced an alternative defensive posture by the Federal Reserve. The post-1982 threats to Federal Reserve independence came from members of both parties in the Congress and fed back on the lack of transparency of the Federal Reserve under Chairman Volcker. Particularly in the post-monetary-targeting portion of his tenure as Board Chairman, the FOMC was guarded in its communicative detail. Indeed, the FOMC of this period revealed its propensity for "constructive ambiguity," a term that always could be used in polite company. A less-inhibited modern observer instead might call the Committee "opaque" or, even worse, "non-transparent."

Actually, what is not so transparent to the modern observer was precisely the Committee's defensive motivation at the time. An important concern was to avoid criticism, which could well have resulted in political pressure, which in turn could well have adversely affected the conduct of monetary policy. It is worth remembering that congressional criticism of what would now be termed sound, anti-inflationary monetary policy was not uncommon at the time. Sharp criticism of interest rate hikes by politicians, who ultimately might be successful in passing legislation altering the Federal Reserve's makeup or limiting its maneuvering room, would only render an already difficult decision to tighten even more difficult.

Without transparency, a decision that likely or certainly would have raised the funds rate, but not the discount rate, would not have been known even to the market cognoscenti any earlier than the next day through the signals imparted by the operations of the Trading Desk. And the action might or might not have been covered in financial news stories on the business pages of the newspapers, but not before the day after that. By then the news would have been sufficiently outdated that few politicians would have bothered to comment in real time.

By contrast, with the transparency of, for example, an immediate announcement of a change in the stance of policy, reports by the media would have been immediate. Commentators, including politicians, would have given their reactions on camera the same afternoon. The story would have been covered in the television news programs that evening and then would have appeared on the front pages of the major newspapers the next day. In other words, transparency would have

transformed the action from a little-noticed technical adjustment in the obscure market for bank reserves into a big deal. In the resulting goldfish bowl, tightening would have been harder to decide to do—yielding worse monetary policy and hence inferior national economic results.

In light of these considerations, Volcker's advice to a "new central banker," as recounted by Mervyn King, is entirely understandable:

> When I joined the Bank of England in 1991, I was fortunate enough to be invited to dine with a group that included Paul Volcker. At the end of the evening I asked Paul if he had a word of advice for a new central banker. He replied—in one word—"mystique." That single word encapsulated much of the tradition and wisdom of central banking at that time. (King, 2000)

This advice is, of course, not that of a great communicator.

Summary

The fundamentally negative answers to the last several questions imply that Chairman Volcker cannot readily be pigeonholed. To be sure, he unswervingly held to the end of vanquishing inflation. However, he was pragmatic in his choice of means. Paul A. Volcker, whose FOMCs went much of the way to conquering inflation, was a true original.

CONCLUSIONS

Inflation was well entrenched in the United States by the time President Carter appointed Paul Volcker Chairman of the Federal Reserve in 1979. For more than a decade, the Federal Reserve had attempted to cure the problem with a seemingly appropriate gradualist approach. By nudging short-term interest rates in small steps, monetary policy could be sufficiently expansionary to support reasonably high employment and growth, thereby avoiding recession, while at the same time restrictive enough to maintain some slack in aggregate demand, thereby making progress on inflation. In theory, by focusing on short-run demand management, both economic stability and gradual progress on inflation could be attained. Instead, this approach delivered instability and an ever-worsening inflationary psychology.

In 1978, Paul Volcker had already recognized that an approach placing greater emphasis on controlling inflation, instead of the strategy in place, would be more fruitful.

> Wider recognition of the limits on the ability of demand management to keep the economy at a steady full employment path, especially when expectations are hypersensitive to the threat of more inflation, provides a more realistic point for policy formulation. So do the increasing, and in my mind well-justified, concerns with the problem of inflation by the national administration and by the citizenry. (Volcker, 1978, pp. 61-62)

Throughout the first half of 1979, Volcker was part of a vocal minority on the FOMC noting that the inflationary situation was approaching crisis proportions. But agonizing fears of recession kept the majority in Chairman Miller's FOMC from tightening policy to the extent necessary to contain inflation. President Carter's nomination of Paul Volcker to be Chairman of the Federal Reserve in late July started to shift this balance. But by late September 1979, the FOMC came to face the underlying crisis that Paul Volcker had worried aloud about since the first FOMC meeting of the year: mounting inflationary momentum and accompanying heightened inflation expectations. In addition, a policy crisis had recently emerged as well, whose proximate trigger was the reaction in the media and commodity markets to the four-to-three split of the Board of Governors in its discount rate vote on September 18. Prior to that vote but after his nomination as Chairman on July 25, Volcker had been portrayed in the media as an invincible general leading the war against inflation. By contrast, in its reporting on the discount-rate vote, the media pictured Volcker as a general whose troops, if not deserting, were in major retreat. Jumps in commodity prices also revealed that the FOMC had lost credibility regarding its commitment to an anti-inflationary policy.

A "strategic plan" was required that would restore the public's faith in the FOMC and contain

"inflationary psychology." It had become clear to the FOMC that the "plan" had to be made public, break dramatically with established practice, allow for the possibility of substantial increases in short-term interest rates, yet be politically acceptable, and convince financial market participants and people more generally that it would succeed. The new operating procedures, focusing on using nonborrowed reserves to keep monetary growth within the announced ranges for the year, satisfied these conditions. The available record does not suggest that the FOMC was converted to monetarist ideology. The "monetarist experiment" of October 1979 was not really monetarist! Rather, the new techniques were conditionally adopted for pragmatic reasons—there was a good chance that they would succeed in restoring stability. In essence, the Committee accepted that, under the prevailing circumstances, controlling monetary growth presented a robust approach to taming inflation. The "plan," while undoubtedly not perfect, turned out to be pretty good. It accomplished its major objectives of reversing rising inflationary expectations and taking the crucial initial steps in a two-decade-long journey back to price stability. And, perhaps as important, it instilled a focus on controlling inflation and inflationary expectations as an enduring aspect of Federal Reserve monetary strategy.

REFERENCES

ABC News' Issues and Answers. Transcript. October 29, 1979.

Allen, John H. "Bond Prices Score Strong Gains." *New York Times*, September 20, 1979, p. D9.

Axilrod, Stephen H. "New Monetary Control Procedure: Findings and Evaluation from a Federal Reserve Study." *Federal Reserve Bulletin*, April 1981.

Axilrod, Stephen H. "Consequences and Criticisms of Monetary Targeting: Comment." *Journal of Money, Credit, and Banking*, November 1985, *17*(4, Part 2), p. 60.

Axilrod, Stephen H. "Comment" in *Financial Sectors in Open Economies: Empirical Analysis and Policy Issues*. Washington, DC: Board of Governors of the Federal Reserve System, 1990.

Axilrod, Stephen H. "General Discussion" presented at the symposium *Achieving Price Stability*, sponsored by the Federal Reserve Bank of Kansas City, 1996.

Axilrod, Stephen H. and Lindsey, David E. "Federal Reserve System Implementation of Monetary Policy: Analytical Foundations of the New Approach." *American Economic Review, Papers and Proceedings*, May 1981, pp. 246-52; presented at the American Economic Association Meeting, Denver, CO, September 6, 1980.

Axilrod, Stephen H. and Sternlight, Peter. "Proposal for Reserve Aggregates as Guide to Open Market Operations," October 4, 1979, Memorandum to the Federal Open Market Committee, in Federal Open Market Committee, Transcript, Conference Call. Washington, DC: Board of Governors of the Federal Reserve System, October 5, 1979.

Bennett, Robert A. "Reserve Board, by 4-3, Raises Rate on Loans to Banks to Record 11%." *New York Times*, September 19, 1979, p. A1.

Bernanke, Ben S.; Laubach, Thomas; Mishkin, Frederic S. and Posen, Adam S. *Inflation Targeting: Lessons from the International Experience*. Princeton, NJ: Princeton University Press, 1999.

Berry, John. "Fed Lifts Discount Rate to Peak 11% on Close Vote." *Washington Post*, September 19, 1979, p. A1.

Board of Governors of the Federal Reserve System. Minutes. Washington, DC: various dates.

Board of Governors of the Federal Reserve System. *66th Annual Report of the Board of Governors, 1979*. Washington, DC: 1979a.

Board of Governors of the Federal Reserve System. Greenbook for the February 6, 1979, meeting. Washington, DC: January 31, 1979b.

Board of Governors of the Federal Reserve System. Bluebook. Washington, DC: February 2, 1979c.

Board of Governors of the Federal Reserve System. Press Release. Washington, DC: October 6, 1979d.

Board of Governors of the Federal Reserve System. Transcript of Press Conference. Washington, DC: October 6, 1979e.

Board of Governors of the Federal Reserve System. *New Monetary Control Procedures*. Volumes I and II, Federal Reserve Staff Study. Washington, DC: February 1981.

Brunner, Karl. "The Dilemma of Inflationary Policies." Position paper prepared for the 9th meeting of the Shadow Open Market Committee, September 19, 1977.

Burns, Arthur F. "The Anguish of Central Banking." Per Jacobsson Lecture, Belgrade, Yugoslavia, September 30, 1979.

Carter, Jimmy. White House Statement, October 6, 1979, in *Public Papers of the Presidents of the United States: Jimmy Carter, 1979*. Book II. Washington, DC: Government Printing Office, 1980.

Commanding Heights. PBS Interview with Paul Volcker, Transcript, September 26, 2000, http://www.pbs.org/wgbh/commandingheights/shared/minitextlo/int_paulvolcker.html.

Council of Economic Advisors. *1979 Economic Report of the President*. Washington, DC: 1979.

Clark, Lindley H. Jr. "The Monetarists Grow Wary." *Wall Street Journal*, October 12, 1979, p. 22.

Conderacci, Greg. "Fed Warns That Unpredictable Posture Will Continue as Part of Its Policy Switch." *Wall Street Journal*, October 11, 1979, p. 3.

Cowan, Edward. "High-Interest Foes Fear Deeper Slump." *New York Times*, September 20, 1979, p. 1.

Federal Open Market Committee. Transcripts. Washington, DC: Board of Governors of the Federal Reserve System: various dates.

Federal Open Market Committee. *Briefing*. Washington, DC: Board of Governors of the Federal Reserve System: May 22, 1979a.

Federal Open Market Committee. "Report of Open Market Operations." FOMC Meeting. Washington, DC: Board of Governors of the Federal Reserve System: August 14, 1979b.

Friedman, Milton. "Monetary Policy: Theory and Practice." Lecture delivered July 5, 1981; *Journal of Money, Credit, and Banking*, February 1982, *14*(1), pp. 95-118.

Garino, David P. "St. Louis Fed Is Jubilant Over New Stress on the Money Supply in Monetary Policy." *Wall Street Journal*, October 9, 1979, p. 6.

Goodfriend, Marvin. "Monetary Mystique: Secrecy and Central Banking." *Journal of Monetary Economics*, January 1986, *17*(1), pp. 63-92.

Greider, William. *Secrets of the Temple: How the Federal Reserve Runs the Country*. New York: Simon & Schuster, 1987.

Herman, Tom. "Bankers Foresee Problems in Executing And Enforcing Fed Anti-Inflation Plan." *Wall Street Journal*, October 11, 1979, p. 6.

International Monetary Fund. *Developments in the World Economy: Annual Report*. Washington, DC: August 3, 1979.

Johannes, J.M. and Rasche, Robert H. "Predicting the Money Multiplier." *Journal of Monetary Economics*, July 1979, *5*, pp. 301-25.

Johannes, J.M. and Rasche, Robert H. "Monetary Control: The Implementation Experience, Retrospective and Prospective," in Karl Brunner, ed., *A Symposium on the Federal Reserve and Its Public Accountability*. Rochester, NY: Center for Research on Government Policy and Business, Graduate School of Management, University of Rochester, 1980, pp. 49-87.

Johannes, J.M. and Rasche, Robert H. "Can the Reserves Approach to Monetary Control Really Work?" *Journal of Money, Credit, and Banking*, August 1981, *13*, pp. 298-313.

Kichline, James L. FOMC Briefings. Washington, DC: Board of Governors of the Federal Reserve System: March 20, 1979a; April 17, 1979b; May 22, 1979c.

King, Mervyn. Address to the joint luncheon of the American Economic Association and the American Finance Association, Boston, MA, January 7, 2000.

Lindsey, David E. "Nonborrowed Reserve Targeting and Monetary Control," in Laurence H. Meyer, ed., *Improving Money Stock Control*. Boston: Kluwer-Nijhoff Publishing, 1983; Presented at the conference *Improving Money Stock Control: Problems, Solutions, and Consequences*, co-sponsored by the Federal Reserve Bank of St. Louis and the Center for the Study of American Business, Washington University, St. Louis, MO, October 30, 1981.

Lindsey, David E. "The Monetary Regime of the Federal Reserve System," in Colin D. Campbell and William R. Dougan, eds., *Alternative Monetary Regimes*. Baltimore: The Johns Hopkins University Press, 1986.

Lindsey, David E.; Farr, Helen T.; Gillum, Gary P.; Kopecky, Kenneth J. and Porter, Richard D. "Short-Run Monetary Control: Evidence under a Non-Borrowed Reserve Operating Procedure." *Journal of Monetary Economics*, January 1984, *13*(1), pp. 87-111.

MacNeil-Lehrer News Hour. Transcript, October 10, 1979.

McCallum, Bennett T. "Robustness Properties of a Rule for Monetary Policy." *Carnegie-Rochester Conference Series on Public Policy*, 1988, *29*, pp. 173-203.

Melton, William C. *Inside the Fed: Making Monetary Policy*. Homewood, IL: Dow Jones-Irwin, 1985.

Meltzer, Allan H. "Limits of Short-Run Stabilization Policy." *Economic Inquiry*, 1987, *25*, pp. 1-14

Meyer, Laurence H. *A Term at the Fed: An Insider's View*. New York: HarperCollins, 2004.

Orphanides, Athanasios. "Monetary Policy Rules and the Great Inflation." *American Economic Review*, May 2002, *92*(2), pp. 115-20.

Orphanides, Athanasios. "The Quest for Prosperity without Inflation." *Journal of Monetary Economics*, April 2003a, *50*(3), pp. 633-63.

Orphanides, Athanasios. "Historical Monetary Policy Analysis and the Taylor Rule." *Journal of Monetary Economics*, July 2003b, *50*(5), pp. 983-1022.

Orphanides, Athanasios. "Monetary Policy Rules, Macroeconomic Stability and Inflation: A View from the Trenches." *Journal of Money, Credit and Banking*, April 2004, *36*(2), pp. 151-175.

Orphanides, Athanasios and van Norden, Simon. "The Reliability of Inflation Forecasts Based on Output Gaps in Real Time." Working Paper 2003-01, CIRANO, January 2003.

Orphanides, Athanasios and Williams, John C. "The Decline in Activist Stabilization Policy: Natural Rate Misperceptions, Learning and Expectations." Working Paper 337, European Central Bank, April 2004.

Rasche, Robert H.; Meltzer, Allan H; Sternlight, Peter D. and Axilrod, Stephen H. "Money, Credit and Banking Debate: Is the Federal Reserve's Monetary Control Procedure Misdirected?" *Journal of Money, Credit, and Banking*, February 1982, *14*(1), pp. 119-47.

Shadow Open Market Committee. Policy Statement. February 4, 1980.

Sivesind, Charles and Hurley, Kevin. "Choosing an Operating Target for Monetary Policy." *Quarterly Journal of Economics*, February 1980, pp. 199-203.

Taylor, John B. "Discretion versus Policy Rules in Practice." *Carnegie-Rochester Conference Series on Public Policy*, December 1993, *39*, pp. 195-214.

Taylor, John B., ed. *Monetary Policy Rules*. Chicago: University of Chicago Press, 1999.

Tinsley, P.A.; von zur Muehlen, P. and Fries, G. "The Short-Run Volatility of Money Stock Targeting." *Journal of Monetary Economics*, September 1982, *10*(2), pp. 215-37.

Tobin, James. "On Consequences and Criticisms of Monetary Targeting, or Monetary Targeting: Dead at Last?: Comment." *Journal of Money, Credit and Banking*, November 1985, *17*(4 Part 2), pp. 605-09.

Treaster, Joseph B. *Paul Volcker: The Making of a Financial Legend*. Hoboken, NJ: John Wiley & Sons, 2004, pp. 61-62.

U.S. Congress Joint Economic Committee. *Domestic and International Implications of the Federal Reserve's New Policy Actions*. Hearings before the Subcommittee on International International, November 5, 1979. Washington, DC: Government Printing Office, 1980.

U.S. House of Representatives. "The New Federal Reserve Technical Procedures for Controlling Money," in *Measurement and Control of the Money Supply*. Hearings before the Subcommittee on Domestic Monetary Policy, March 20 & 25, 1980. Washington, DC: Government Printing Office, 1980a.

U.S. House of Representatives. *Conduct of Monetary Policy*. Transcript. Committee on Banking, Finance and Urban Affairs. Washington, DC: Government Printing Office, February 18, 1980b.

U.S. House of Representatives. "Monetary Policy for 1980." Third Report by the Committee on Banking, Finance and Urban Affairs. House Report No. 96-881. Washington, DC: Government Printing Office, April 15, 1980c.

U.S. Senate. *Nomination of Paul A. Volcker*. Hearings before the Committee on Banking, Housing, and Urban Affairs. Washington, DC: Government Printing Office, 1979.

U.S. Senate. "Federal Reserve's First Monetary Policy Report for 1980." Hearings before the Committee on Banking, Housing, and Urban Affairs. Washington, DC: Government Printing Office, February 25, 1980.

Volcker, Paul A. "The Contributions and Limitations of 'Monetary' Analysis." Remarks before the American Economic Association and the American Finance Association, September 16, 1976 (reprinted in Federal Reserve Bank of New York *Monthly Review,* October 1976).

Volcker, Paul A. *The Rediscovery of the Business Cycle*. London: Free Press, 1978.

Volcker, Paul A. "A Time of Testing." Remarks before the American Bankers Association, October 9, 1979a.

Volcker, Paul A. Statement. Joint Economic Committee, U.S. Congress. Washington, DC: Government Printing Office, October 17, 1979b.

Volcker, Paul A. Remarks before the National Press Club, January 2, 1980a.

Volcker, Paul A. Prepared statement. Hearings before the Joint Economic Committee, U.S. Congress. Washington, DC: Government Printing Office, February 1, 1980b.

Volcker, Paul A. Statement. Committee on Banking, Housing, and Urban Affairs, U.S. Senate. Washington, DC: Government Printing Office, February 4, 1980c.

Volcker, Paul A. Statement. Committee on Banking, Finance and Urban Affairs, House of Representatives. Washington, DC: Government Printing Office, February 19, 1980d.

Volcker, Paul A. Remarks, "Economic Outlook for the 80s." January 15, 1980 (reprinted in *Texas Business Executive*, Summer 1980e).

Volcker, Paul A. Statement. Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs, House of Representatives. Washington, DC: Government Printing Office, November 19, 1980f.

Volcker, Paul A. Statement. Committee on Banking, Housing, and Urban Affairs, U.S. Senate. Washington, DC: Government Printing Office, February 25, 1981.

Volcker, Paul A. "Can We Survive Prosperity?" Remarks before the Joint Meeting of the American Economic Association and the American Finance Association, San Francisco, December 28, 1983.

Volcker, Paul A. and Gyohten, Toyoo. *Changing Fortunes: The World's Money and the Threat to American Leadership*. New York: Times Books, 1992.

Wallich, Henry C. "Techniques of Monetary Policy." Remarks before the Missouri Valley Economic Association, March 1, 1980.

Wallich, Henry C. and Keir, Peter. "The Role of Operating Guides in U. S. Monetary Policy: A Historical Review." *Federal Reserve Bulletin*, September 1979.

Wall Street Journal. "Quotes for Gold Continue Surging on New Rumors." September 18, 1979a, p. 3.

Wall Street Journal. "Fed, in a 4-3 Vote, Tightens Credit Reins By Lifting Discount Rate to Record 11%." September 19, 1979b, p. 2.

Wall Street Journal. "Gold's Price Surges $24 an Ounce At London, Hits a Record $375.75." September 19, 1979c, p. 8.

Wall Street Journal. "Gold Price Falls, Partly Recovers in Later Trading." September 20, 1979d, p. 2.

Wall Street Journal. "Fed Indicates It Wants Credit to Get Tighter." September 20, 1979e, p. 5.

Wall Street Journal. "Rumors Send Prices in Gold, Other Markets into Day-Long Chaos." October 3, 1979f, p. 1.

Wall Street Journal. "Monetary Medicine: Fed's 'Cure' is Likely to Hurt in Short Run by Depressing Economy, Analysts Say." October 9, 1979g, pp. 1, 6.

Wall Street Journal. "New York Fed Seeks to Lessen Confusion on Monetary Moves." October 10, 1979h, p 3.

Commentary

Stephen H. Axilrod

Lindsey, Orphanides, and Rasche (2005) have covered issues involved in the hows and whys of the Fed's bold and effective policy shift of October 1979 comprehensively and very well. In my comments, I will follow their outline, thus presenting something like variations on a theme. Perhaps there will be some counterpoint. No truly discordant notes seem in the offing.

HOW

It is difficult to separate the hows and whys of the Fed's policy shift, as it is with many other seminal events, and I find the authors' division of reasons and events within those two categories, as well as my own, to be somewhat arbitrary. Their discussion of "how" encompasses events from the beginning of 1979 through the spring of 1980. It involves a time line covering the last part of the Miller years at the Fed (when Volcker served as president of the Federal Reserve Bank of New York and thus vice chairman of the Federal Open Market Committee [FOMC]), to the appointment of Volcker as Chairman of the Board of Governors on August 6, 1979 (and thus Chairman of the FOMC), to market disturbances on September 18 (when a discount rate rise was announced but with a split vote of four to three), to the famous policy announcement on October 6, shortly after Volcker returned a bit early from an annual meeting of the International Monetary Fund (IMF) and International Bank for Reconstruction and Development (IBRD) held in Yugoslavia and just a few days before the next scheduled meeting of the FOMC on October 16.

But such a relatively limited time period does not quite do full justice to the story. For instance, the whole history of unsuccessful Fed monetary policies in the 1970s as the great inflation evolved and intensified, along with unsuccessful forays by the Fed and the Treasury into foreign exchange market intervention as confidence in the dollar on exchange markets waned, were factors in how and when the policy shift of 1979 occurred. In other words, more was involved in "how" than events during the time line traced by the authors.

In discussing "how," I would also place very great stress on the appointment of Volcker as Chairman. Lindsey, Orphanides, and Rasche do not, in my reading, give enough weight to his unique contribution. Indeed, I believe the events of October 1979 represent one of the few instances in monetary history when a significant policy change—a change that was essentially a paradigm shift—would not have occurred except for the presence and influence of one individual. No doubt, inflation would have been tamed in the 1980s without Volcker as Chairman—the time was right, history was beckoning. But without him, it would have been accomplished through more traditional means, less promptly, and, in my opinion, with more economic disruption and social turmoil over time than was experienced through the short, though relatively deep, recession that the country did experience.

Such a dramatic shift as did occur was enabled because Volcker combined two characteristics not usually found in a leader. He was, for one thing, something of an artist in policy in that he could think and act beyond the normal bounds of central bank practice of the day. Second, he

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was technically so highly proficient, and also very interested, in the arcana of monetary operations that his colleagues on the Board and FOMC could be quite confident in his ability to understand the details of the complex technical process underlying the new approach. Thus, they could feel comfortable in his ability readily to oversee operations and ensure that the staff engineers of the new machinery were operating it correctly in line with FOMC wishes.

It is not easy to find both characteristics in one person. Moreover, this combination of policy artistry on a foundation of high technical capacity gave Volcker himself the confidence, and perhaps more importantly the aura, to be convincing not only to his colleagues but also to the public, whom he also had to win over to the idea that the new policy would work and that the Fed would indeed stick to it.

With regard to the specific timing triggers for the policy change, I am a little surprised by the emphasis the authors place on the events of September 18. Perhaps I am surprised because I have not retained them in mind over the years. That is not evidence one way or another, of course, but still it makes me a bit doubtful about the extent to which they were crucial. On that particular day the FOMC made a decision to tighten but, in the usage of the period, did not announce it. On the same day, the Board also announced a rise in the discount rate, but three out of seven members voted against it. (They were presumed to be doves.) The combined action seemed to have had a destabilizing effect on markets, since such a narrow vote on the discount rate was interpreted to mean that the Fed's resistance to inflationary pressures would not be strong enough.

The authors seem to suggest that if FOMC decisions had been announced immediately, as they are now, then the market might not have been so doubtful about the Fed's anti-inflationary intentions. I am not so sure of that. An announcement in the early afternoon of the FOMC decision to tighten a bit further, coupled with an announcement in the late afternoon of the narrowly voted discount rate increase, might well have been equally confusing to the market. For instance, it might have signaled that the Fed would not be eager to raise rates even further, especially so because some who voted against the announced discount rate increase had also voted for the unannounced open market tightening. As a result, markets may have been thrown into no less consternation than they in fact were.

Basically, announcements or no announcements, the whole history of Fed policy over the previous decade had led to a severe erosion in the institution's anti-inflation credibility in financial markets as well as in markets for goods and labor. Adverse expectations were occasioning mini-crisis after mini-crisis in credit and foreign exchange markets, whether fully justified or not by the actual situation at the time they occurred. In my memory, the problems were most pointed in foreign exchange markets. In any event, it was not so much a particular market event, such as the sharp rise in commodity prices of September 18, but more importantly a deteriorating trend in markets generally that was continuing into late summer and early fall, especially in the foreign exchange market, that clearly signaled the need for a paradigm shift in domestic monetary policy. Various approaches had been tried in earlier years to shore up the foreign exchange value of the dollar, including currency interventions of differing intensities and degrees of international coordination. None had worked effectively because U.S. domestic monetary policy had little credibility.

In that respect, the new approach to policy, by shifting domestic monetary policy to a more determined anti-inflation stance, could also be expected to help stabilize the dollar on exchange markets, with positive spillover effects that would help support the Fed's basic goal of containing and rolling back the domestic rate of inflation and inflation expectations. In that context, I am convinced that the major policy shift of October was well in process and probably would have taken place in any event before the next scheduled FOMC meeting on October 16, though I cannot be absolutely sure on this point. Incidentally, on this, and on other statements in this paper, I should certainly not be interpreted as necessarily reflecting the views of Paul Volcker—or, for that matter, any other member of the FOMC at the time.

The time line as I saw it may be biased by my limited perspective—which was somewhat like that of a mouse confined to a treadmill, working away at keeping the monetary machinery going. I do recall a brief discussion with Volcker, shortly after he arrived, to the effect that the staff was ready to control the money supply more directly through a reserve targeting procedure if and when he wished to move in that direction. Much of the mechanism had been worked out years earlier. As I remember, a staff subcommittee that I chaired had recommended to its parent subcommittee composed of FOMC members—and set up early in the Burns years to review the structure of the FOMC policy directive—that M1 be taken as the intermediate target for policy and nonborrowed reserves be employed as the day-to-day operating mechanism for control. The parent subcommittee did not adopt that recommendation.

I literally do not remember when Volcker came back to begin discussing operational issues more seriously with me. I do remember his telling me that I could not go to Yugoslavia with the U.S. delegation since I (along with Peter Sternlight, who managed open market operations at the New York Fed) needed to begin the preparation of a formal document to be sent to the FOMC describing how the new policy would work in practice. Since I was not the least bit surprised about the need to stay behind, I have always assumed that the issue had already been settled in his mind and that he felt confident about the outcome of an FOMC vote. Thus, my memory, such as it is, while not inconsistent with at least some emphasis on the events of September 18, would be quite consistent with the view that Volcker had made up his mind earlier and that September 18 was not much more than one more mini-crisis along the way (which is my own opinion on the matter).

For some time, Volcker must have been in the process of checking with FOMC members; I assume that later, after he was sure of going ahead, he informed a few key policymakers outside the Fed whose understanding of the policy and its implications was important to its successful public launch. His trip to the IMF/IBRD meeting in Yugoslavia (where key international finance ministers and central bankers were assembled) and early return were quite possibly the final informational step. It would have been necessary to act promptly thereafter, and before the next regularly scheduled FOMC meeting, in part because of the possibility of undesirable leaks once a number of people around the world were knowledgeable about what was in train.

WHY

I think of "why" a little differently from Lindsey, Orphanides, and Rasche. Their 12 reasons, for one thing, seem to conflate the immediate policy problem at the time with issues related to the long-run stance of policy. Moreover, their list also includes as separate reasons a number of factors—for example, more funds rate flexibility, switching away from efforts to control money through interest rates and effects on money demand to more direct money supply control, and distancing the FOMC from the day-to-day level of the funds rate—that were essentially intrinsic to targeting a reserve aggregate, that went along with making it a desirable solution to the immediate policy problem. In so structuring their list of reasons, the authors, while in effect more or less correctly identifying the particular trees in the forest planted by policy, risk losing sight of what were the basic reasons for planting this particular forest in the first place.

I would emphasize three whys for the particular decision, made on October 6, to shift from targeting interest rates to targeting a reserve aggregate in the implementation of monetary policy.

First, the Federal Reserve badly needed to regain its credibility as an inflation fighter.

A new policy regime would be a signal step toward that end; it would reinforce, in the minds of the public, the Fed's determination to bring inflation under control. By emphasizing a new approach to controlling money, the Fed was sending a message that it would not repeat the mistakes of the 1970s. In that period, the Fed indicated that the money supply was a key, if not the principal, intermediate-term operating target; however, unfortunately, its actual policy actions came to lead the market to believe that the institution was not in practice prepared to do what was necessary

to meet its stated objective. For instance, the Fed shifted the base for its money growth targets every three months or so and thus did not make up for the all-too-prevalent overshoots in growth relative to its initial intentions. One of the governors of the day, Henry Wallich, coined the apt phrase "base drift" to describe this practice. Anti-inflation credibility was soon lost, as prices kept rising and the Fed's inability or unwillingness to attain its monetary targets was perceived as a principal cause.

Second, if credibility was to be regained with minimum disruption, markets had to be convinced within a reasonably short period that the new approach would be effective.

By effective, I mean that it would in practice lead to more certain control of the money supply and, thus, of inflation. It was expected that shifting to a control mechanism that was based on the multiplier relationship between the supply of reserves and the supply of money would have a better chance of yielding closer control of the money supply than would continuing with a control mechanism based on estimating the demand for money given the various explanatory variables that could be considered (and indeed were by a large number of econometricians both inside and outside the Fed), such as interest rates, income, and the various lagged relationships involved.

Third, it would be advantageous if the natural and virtually unavoidable caution with which policymakers approach their meeting-by-meeting policy decisions became less of an impediment to effective anti-inflationary action.

This was accomplished by making aggregate reserves (and thus, in effect, the money supply directly) the day-to-day instrument for policy instead of the federal funds rate, since FOMC members would be voting on, and presumably sticking to, an operational monetary supply target and would no longer be voting on week-to-week decisions about the federal funds rate (within a broad range). Policymakers are normally not given to bold frequent changes in their chosen operational instrument. When the federal funds rate was the instrument prior to late 1979, it was moved with due caution, generally in quarter- or half-point increments—an experience repeated after 1982, when the funds rate or, for a while, its very close relative, banks' adjustment borrowing at the discount window, once again became the policy instrument.

But with the money supply in effect both the policy target and instrument (converted for operating purposes into related reserve aggregates and for day-to-day technical reserve supplying decisions into nonborrowed reserves), policymakers could retain their conservatism toward the basic policy instrument. They could maintain their initial money supply target and derived aggregate reserve instrument, with appropriate technical adjustments, meeting after meeting while distancing themselves, as Lindsey, Orphanides, and Rasche put it, from the behavior of the funds rate. Bold market action would ensue, as the funds rate would be permitted, and expected, to vary within a wide range in the process of achieving the given money supply objective.

Much, if not all, of the three points above are subsumed in the authors' first eight reasons. I will glide over reasons nine and ten. It is their reasons eleven and twelve that give me the most pause, though the problem might be largely semantic. Point eleven states that a further reason for the policy shift was to demonstrate that the Fed had more clearly assumed "full central bank responsibility for the attainment of long-term price stability," while point twelve goes on to give as another reason for the policy change that it more clearly avoids "difficult questions of overt responsibility for intermediate-term real-side developments."

I would not think about the 1979 policy shift in those terms. The central bank is always responsible for price stability and also simply cannot avoid some responsibility for intermediate-term real economic developments. I would interpret the new procedure as a practical approach for implementing the Fed's responsibility for price stability in the situation of the time—following a period when it had become clear that the Fed had failed in carrying out that responsibility. Whether the approach of the 1979 program would be suitable permanently would depend on many factors, not least of which being the further evolution of

financial technology and its implications for the role, stability, and predictability of "money" and "money-like" assets in relation to prices and the economy generally.

The new procedures were designed to reestablish the Fed's anti-inflation credibility. That was their essential purpose. In the process, the real side of the economy was subordinated for a while, but I never detected any basic lessening of concern for the real economy on the part of policymakers. As it turned out, in face of a short but deep recession, together with surprisingly rapid progress in reducing inflation, the new procedures were abandoned in 1982.

Communication Issues

The most important area of communication for making the new procedures as effective as possible was between the Fed and the market. After a hiccup or two at the start, that communication path worked well. It worked in large part because Volcker went around the country saying in one forum after another that the Fed would stick to it and because the Fed did indeed do so (and, by the way, in the face of some formidable obstacles, such as the Carter-inspired credit control program of the time). The point was to convince not only financial market participants but also business and labor that inflation would certainly come under control. If expectations could be turned around quickly, and cost and price pressures muted, the pain inflicted on the economy as reasonable overall price stability was restored would obviously be lessened. In that regard, I should note the importance of President Reagan's handling of the air controllers' strike of the period. His firmness helped convince labor and business as a whole that the economic atmosphere had changed and that restraint on wage increases, and presumably therefore on price increases, was the better part of valor.

CHARACTERIZING VOLCKER

I am not at all sure that the Lindsey, Orphanides, and Rasche paper needed to get into the questions they raise about whether Paul Volcker was a monetarist, a nominal income targeter, a Keynesian of one sort or another, an inflation targeter, or a great communicator. Nor do I see much value to the questions for drawing lessons for the present day with its very different financial, economic, and social circumstances.

In any event, I do not believe any of the economic policy slots they suggest contain the man. I would say, rather, that he was an eminently practical person, who very well understood how important it was for the health of the economy and the country to bring inflation down and to restore the Fed's anti-inflation credibility. Moreover, he also had enough political astuteness to grasp that political and social conditions in the country at the time presented him with a window of opportunity for implementing a paradigm shift in policy that might well make the process of controlling inflation more convincing and quicker. In his choice of policy instrument, he was a practical monetarist for a three-year period.

On the question of whether Volcker was or was not a great communicator, they conclude that he was not. I do not agree. They seem to base their conclusion in large part on Volcker's response to Mervyn King when the latter asked if he had some word of advice for a new central banker. Volcker, so King reports, responded with one word—"mystique." Lindsey, Orphanides, and Rasche conclude that is not the advice of a great communicator; they take this view mainly, it seems, because that advice was given by a man who also presided over a central bank that had been less transparent in announcing policy decisions (the FOMC did not in those days announce its decisions immediately) than major central banks are today.

Surely, our authors are at risk of making something akin to a category error. The mystique of a central banker would seem to me to have little to do with whether or not policy decisions are transparent (that is, announced when made). Mystique is more the product of the success of the policies actually pursued and the extent to which the public associates that success with the person in charge of policy. In that sense, Greenspan today has a kind of mystique. And in that very same sense, Volcker in his day had a kind of mystique.

The advantage of mystique to a policy chief is that public confidence in the policy he represents will be high and his word (i.e., his communications with the market, the public generally, and the Congress) will be more readily believed and accepted—with a practical effect, for instance, that market expectations more likely will reinforce rather than work against policy. That mystique, and its benefits for communication, can readily be lost, or at least eroded, when policies seem to go wrong (whether transparent in announcement or not), as, for example, appears to have been experienced by Greenspan, at least for a while, following the stock market crash at the beginning of this millennium.

In short, "mystique" is what helps turn a Fed Chairman into a great communicator, although "great" might be a bit too grand an adjective when referring to the rather mundane occupation of central banking. At any rate, to me mystique is a trait that enhances a Chairman's stature and confidence in the institution he heads, thus aiding the implementation and communication of policies irrespective of the process by which the institution itself decides to announce policies.

REFERENCES

Lindsey, David E.; Orphanides, Athanasios and Rasche, Robert H. "The Reform of October 1979: How It Happened and Why." Federal Reserve Bank of St. Louis *Review*, March/April 2005, *87*(2, Part 2), pp. 187-235.

The Monetary Policy Debate Since October 1979: Lessons for Theory and Practice

Marvin Goodfriend

Monetary theory and policy have been revolutionized in the two decades since October 1979, when the Federal Reserve under the leadership of Paul Volcker moved to stabilize inflation and bring it down. On the side of practice, the decisive factor was the demonstration that monetary policy could acquire and maintain credibility for low inflation, and improve the stability of both inflation and output relative to potential. On the theory side, the introduction of rational expectations was decisive because it enabled models of monetary policy to incorporate forward-looking elements of aggregate demand and price-setting, long known to be critically important for policy analysis, so as to understand how monetary policy achieved the favorable results found in practice.

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1 INTRODUCTION

In retrospect, the Federal Reserve tightening of monetary policy begun under the leadership of Paul Volcker in October 1979 stands as a decisive turning point in the postwar monetary history of the United States. With some ups and downs, inflation rose from around 1 percent to over 10 percent in the preceding two decades. The Volcker Fed brought inflation down to around 4 percent by 1984 after a difficult period of sustained disinflationary monetary policy. In the two decades since, inflation has been reduced to a range in 2003 that Chairman Greenspan characterized as "effective price stability," thanks to the consistent inflation-fighting actions of the Greenspan Fed.

The Volcker disinflation and the stabilization of inflation has had an enormous influence on the theory and practice of monetary policy.[1] This paper reviews how monetary policy has been shaped by that experience. A large part of the story is that central bankers and academic economists learned from each other and both learned from evidence accumulated in the conquest of inflation. Monetarist theory and evidence on money supply and demand, and on the relationship between money and inflation, encouraged the Volcker Fed to act against inflation. The successful stabilization and eventual elimination of inflation at reasonable cost in light of subsequent benefits, without wage and price controls, and without supportive fiscal policy actions, vindicated the main monetarist message. However, the Fed's reliance on interest rate policy since then appears to contradict monetarist teaching that money must play a central role in the execution of monetary policy. Modern models of interest rate policy owe more to post-monetarist rational expectations reasoning and notions of credibility and commitment to policy rules born of the rational expectations revolution.

Much macroeconomic theory developed before October 1979 remains at the core of models of monetary policy in use today. The notion of a permanent trade-off between inflation and unemployment has been discredited. However, the forward-looking theory of consumption and

[1] See, for instance, Blinder (2004) and Fischer (1994).

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investment developed decades ago remains at the core of the modern theory of aggregate demand. And Keynesian dynamic rational expectations sticky-price models of monetary policy pioneered in the late 1970s and early 1980s by Guillermo Calvo, Stanley Fischer, and John Taylor remain at the core of models of aggregate supply today. Keynesian models predict an inverse relationship between the change in inflation and the output gap. That view was confirmed by the severe recession accompanying the Volcker disinflation. Since then, the success in stabilizing inflation has given credence in practice to the rational expectations idea that a central bank committed to making low inflation a priority can anchor inflation expectations and improve the stability of both inflation and output relative to potential.

Section 2 sets the stage for the discussion to follow by reviewing the practice and theory of monetary policy as of October 1979. Section 3 describes the key empirical features of the Volcker disinflation and the lessons that they teach. Section 4 summarizes current consensus views on the theory and practice of monetary policy that emerged from the disinflation experience and related theoretical developments. Topics covered are as follows: the consensus theoretical model of monetary policy, implicit inflation targeting in practice, explicit interest rate policy, and communication policy. In Section 5 we consider current controversies related to each aspect of monetary theory and practice discussed in Section 4.

2 EXPERIENCE AND THEORY AS OF OCTOBER 1979

The Volcker Fed was encouraged to embark on a disinflationary course by a practical appreciation of the problems in failing to make low inflation a priority, and by a theoretical understanding that inflation should and could be stabilized and brought down with monetary policy. This section describes the destabilizing go-stop policy cycles that characterized inflationary monetary policy prior to 1979 and summarizes briefly Keynesian and monetarist thinking as it related to the promise and prospects for the stabilization of inflation as of 1979.

2.1 Inflationary Go-Stop Monetary Policy Prior to 1979

A combination of factors explains the unprecedented peacetime inflation that tripled the general price level in the two decades prior to the Volcker disinflation.[2] Most important was the willingness to tolerate each burst of inflation in the expectation that it would soon die down. In retrospect, the public's willingness to accept the upward drift of the price level after World War II was probably the origin of the loss of credibility for low inflation that eventually helped to unhinge inflation expectations in the 1960s and thereafter. There was little understanding at first of the role played by inflation expectations in propagating wage and price inflation and the scope for monetary policy to anchor inflation expectations. Finally, the idea that inflation could permanently reduce unemployment, which gained currency in the 1960s, appeared to provide a benefit to some inflation.

When one adds to the above inclinations and beliefs that the Fed was charged with conducting monetary policy on a discretionary basis, one can understand the go-stop monetary policy that characterized the decades prior to October 1979. During that period the Fed tended to justify periodic actions to contain inflation against an implicit objective for low unemployment. Inflation would rise slowly as monetary policy stimulated employment in the go phase of the policy cycle. By the time the public and Fed became sufficiently concerned about rising inflation for monetary policy to act against it, pricing decisions had already begun to embody higher inflation expectations. At that point, a given degree of restraint on inflation required a more aggressive increase in short-term interest rates, with greater risk of recession. There was a relatively narrow window of broad public support for the Fed to tighten monetary policy in the stop phase of the policy cycle. The window opened after rising inflation was recog-

[2] See, for instance, Hetzel (1998) and Orphanides (2002).

nized as the major concern and closed when tighter monetary policy caused the unemployment rate to begin to rise. Often the Fed did not take full advantage of the window of opportunity to raise rates because it wanted more confirmation that higher rates were called for and it was concerned about the recessionary consequences. Once the unemployment rate peaked and began to fall, however, the public's anxiety about it diminished. And the Fed could fight inflation less visibly by lowering interest rates gradually and prolonging the stop phase of the policy cycle.[3]

The tolerance for rising inflation and the sensitivity to recession meant that go-stop cycles became more inflationary over time. The average unemployment rate rose, too, perhaps because increasingly restrictive monetary policy was needed on average to prevent inflation from rising still faster. Aggressive price- and wage-setting behavior tended to neutralize the favorable employment effects of monetary stimulus in the go phase of the policy cycles. As the Fed attempted to offset these unfavorable developments, inflation and expected inflation moved higher. Lenders demanded unprecedented inflation premia in long-term bond rates, and the absence of an anchor for inflation caused inflation expectations and long bond rates to fluctuate widely.

2.2 The Theory of Monetary Policy as of October 1979

James Tobin's (1980) comprehensive review of stabilization policy written for the 10th anniversary of the *Brookings Papers on Economic Activity* contains a good summary of macroeconomic theory as it related to monetary policy, unemployment, and inflation at the time. The five main points of what he calls the consensus macroeconomic framework, *vintage 1970*, are as follows[4]:

(1) Prices are marked up labor costs, usually adjusted to normal operating rates and productivity trends…and rates of price and wage increase depend partly on their recent trends, partly on expectations of their future movements, and partly on the tightness of markets for products and labor.

(2) Variations in aggregate demand, whether a consequence of policies or of other events, affect the course of prices and output, and wages and employment, by altering the tightness of labor and product markets, and in no other way.

(3) The tightness of markets can be related to the utilization of productive resources, reported or adjusted unemployment rates, and capacity operating rates. At any given utilization rate, real output grows at a steady pace…reflecting trends in supplies of labor and capital and in productivity. According to Okun's law, in cyclical fluctuations each percentage point of unemployment corresponds to 3 percent of GDP [gross domestic product].

(4) Inflation accelerates at high employment rates because tight markets systematically and repeatedly generate wage and price increases in addition to those already incorporated in expectations and historical patterns. At low utilization rates, inflation decelerates, but probably at an asymmetrically slow pace. At the Phelps-Friedman "natural rate of unemployment," the degrees of resource utilization generate no net wage and price pressures up or down and are consistent with accustomed and expected paths, whether stable prices or any other inflation rate. The consensus view accepted the notion of a nonaccelerating inflation rate of unemployment (NAIRU) as a practical constraint on policy, even though some of its adherents would not identify NAIRU as full, equilibrium, or optimum employment.

(5) On the instruments of demand management themselves, there was less consensus. The monetarist counterrevolution had provided

[3] Friedman (1964) discusses go-stop monetary policy. Also, see Goodfriend (1997) and Shapiro (1994). Taylor (1979) provides quantitative evidence that can be interpreted as inefficient go-stop policy. See, especially, his Figure 1. Romer and Romer (1989) document that since World War II the Fed tightened monetary policy decisively to contain inflation on six occasions: October 1947, September 1955, December 1968, April 1974, August 1978, and October 1979. The unemployment rate rose sharply each time.

[4] The five points are taken from Tobin (1980, pp. 23-25).

debate over the efficacy of monetary and fiscal measures, the process of the transmission of monetary policies to total spending, and the proper indicators and targets of monetary policy.

Remarkably, much of this consensus remains at the core of modern mainstream models of monetary policy today, as discussed in Section 4.

Tobin was more pessimistic than other Keynesian economists, such as Arthur Okun (1978), that disinflationary monetary policy alone could bring down inflation at an acceptable unemployment cost. Tobin's views are worth recalling because they capture the more pessimistic Keynesian thinking about the power of monetary policy to control inflation, and they provide some contrast with more optimistic monetarist views discussed below that gained currency in the inflationary decades prior to October 1979. For instance, in the same paper, we learn that Tobin thought that the path of real variables would have been disastrously worse had the path of nominal GDP growth been held to 4 percent per year since 1960. He regarded "the inertia of inflation in the face of nonaccommodative policies [as] the big issue." Tobin's view was that "the price- and wage-setting institutions of the economy have an inflation bias. Consequently, demand management cannot stabilize the price trend without chronic sacrifice of output and employment unless it is assisted, occasionally or permanently, by direct incomes policies of some kind."[5] A few pages later Tobin says that he thinks it would be "recklessly imprudent to lock the economy into a monetary disinflation without auxiliary incomes policies."[6]

Monetarists led by Milton Friedman, Karl Brunner, and Allan Meltzer were optimistic that the Fed could and should use monetary policy alone to bring inflation down. Monetarist theory and its prescriptions for monetary policy were based on the quantity theory of money, evidence from many countries showing that sustained inflation was associated with excessive money growth, and evidence that inflation could be stopped by slowing the growth of the money supply.[7]

In particular, monetarists demonstrated convincingly that the demand for money was sufficiently stable in the United States to enable the central bank to bring the inflation rate down by reducing the trend rate of growth of the monetary aggregates. And monetarists argued successfully that, although the introduction of money substitutes could adversely impact the stability of money demand in the short run, money demand was sufficiently stable and money supply sufficiently controllable by a central bank over time that financial innovations did not fundamentally alter the central bank's power over inflation. By assembling a convincing body of theory and evidence that controlling money was necessary and sufficient for controlling inflation, and that a central bank could control money, monetarists laid the groundwork for the Volcker Fed to take responsibility for inflation after October 1979 and bring it down.

Monetarists, however, like Keynesians, believed that a disinflation would be costly. Previous experience with go-stop policy made it clear that there was a short-run unemployment cost of fighting inflation. The temporary unemployment cost of a large permanent disinflation would likely exceed the cost of previous temporary attempts to contain inflation in the stop phase of the policy cycle. Both Keynesians and monetarists then understood that the unemployment cost of permanent disinflation could be reduced greatly if the Fed could acquire credibility for low inflation.[8] In a credible disinflation, money growth and inflation would slow together, with little increase in unemployment.[9]

On the other hand, if the disinflation were not credible, then wage and price inflation would

[5] Tobin (1980, p. 64).

[6] Tobin (1980, p. 69).

[7] See, for example, Friedman (1968, 1989), Meltzer (1963), Poole (1978), Sargent (1986), and the regular reports of the Shadow Open Market Committee led by Karl Brunner and Allan Meltzer.

[8] Fellner (1979), Sargent (1986), and Taylor (1982) contain early discussions of the role of credibility in minimizing the cost of disinflation.

[9] In fact, Ball (1994) pointed out that a fully credible disinflation could produce a temporary increase in employment for some sticky price specifications.

continue as before, and the public would drive interest rates up and asset prices down as it competed for increasingly scarce real money balances. In that case, unemployment would rise and come down only as the disinflation gained credibility, wage and price inflation slowed, interest rates fell, asset prices rose, and aggregate demand rebounded.

Monetarists tended to be more optimistic than Keynesians about the potential role for credibility because monetarists saw a greater role for expectations in wage and price setting and a smaller role for inertia. And monetarists thought that monetary policy could exert a greater influence over expected inflation than did Keynesians. At any rate, in October 1979 it was not at all clear how quickly the Volcker Fed could acquire credibility for low inflation, how costly a disinflation might be, or even whether it could succeed at all, given the pressure that would be brought to bear on the Fed as a result of the accompanying recession.

3 LESSONS FROM THE VOLCKER DISINFLATION

By October 1979 the level and volatility of inflation and inflation expectations resulting from two decades of inflationary go-stop monetary policy greatly complicated the pursuit of stabilization policy. Large real interest rate policy actions were necessary to stabilize the economy. Moreover, it became increasingly difficult to track the public's inflation expectations to tell how nominal federal funds rate policy actions translated into real rate actions. The public found it increasingly difficult to discern the Fed's policy intentions, and the Fed found it increasingly difficult to gauge the state of the economy and how the economy would respond to its policy actions. The opportunity for policy mistakes was enlarged. In short, there was a breakdown in mutual understanding between the public and the Fed.

The Fed rarely sought publicity for its monetary policy actions. However, confidence had deteriorated to such an extent by October 1979 that the Fed broke sharply with tradition and grabbed the headlines with a dramatic high-profile announcement that it had changed operating procedures to place greater emphasis on controlling money.[10] That dramatic announcement served three main purposes: (i) it associated the Fed with monetarists and thereby bought some credibility against inflation, (ii) it enabled the Fed to blame high interest rates on tighter monetary control, and (iii) it signaled that the Fed would take responsibility for inflation and staked the Volcker Fed's reputation on containing inflation in order to build the Fed's credibility as an inflation fighter. Importantly, the Volcker Fed did not talk much about *disinflation* in October 1979. Its public statements and Federal Open Market Committee (FOMC) transcripts from the fall of 1979 make clear that its objective was more modest: *to stabilize and contain* an increase in inflation and inflation expectations. A reading of the FOMC transcripts also makes clear that the Fed came to regard disinflation as a feasible and preferable course of action only gradually as events unfolded in 1980 and 1981. What follows is a brief summary of the key aspects of the Volcker disinflaton and their lessons for monetary policy. In reviewing these events we will see why and how the Volcker Fed produced the sustained disinflation.

3.1 Loss of Room to Maneuver

The big surprise for the Volcker Fed in the months after October 1979 was that its room to maneuver between fighting inflation and fighting recession disappeared.[11] In effect, the Fed lost the leeway to choose between stimulating employment in the go phase of the policy cycle and fighting inflation in the stop phase. The Volcker Fed raised the nominal federal funds rate by about 3 percentage points in the fall of 1979 in its opening fight against inflation. But evidence that the economy was moving into recession caused the Fed to pause in its aggressive tightening. January 1980 later turned out to be a National Bureau of Economic Research business cycle peak, validating

[10] See Lindsey, Orphanides, and Rasche (2005).

[11] See, for instance, FOMC (1980; Report on Open Market Operations, February 4-5, pp. 3-4; and Joseph F. Ziesel, Chart Show, February 5).

the Fed's concern about a recession. But with the federal funds rate held steady, the 30-year (long) bond rate jumped by around 2 percentage points between December and February, despite a weakening economy. A number of factors contributed to the unprecedented collapse of bond prices and increase in inflation expectations evident in the sharp rise in the bond rate. Among the most important were the spike in inflation in early 1980, the ongoing increase in oil prices, the incredible rise in the price of gold to around $850 per ounce in January, and the Soviet invasion of Afghanistan. That said, the Fed's hesitation to tighten policy at the first sign of recession probably contributed to the inflation scare by creating doubts in the public's mind of the Fed's willingness to incur the unemployment cost to contain inflation.

The unprecedented challenge to its credibility as an inflation fighter made clear that the Fed had lost the *flexibility* to use interest rate policy to stabilize employment and output. The Fed reacted aggressively to the inflation scare by raising the federal funds rate 3 percentage points to 17 percent in March! The short recession that occurred in the first half of 1980 resulted from the tightening of monetary policy in conjunction with the imposition of credit controls.[12] When the magnitude of the downturn became clear, however, the Fed cut the federal funds rate by around 8 percentage points between April and July to act against it. Real GDP fell anyway, at around a 10 percent annual rate in the second quarter. But the recession ended quickly with the aggressive easing of monetary policy and the lifting of credit controls in June, and real GDP bounced back with 8 percent annual growth in the fourth quarter of 1980. Unfortunately, inflation remained high throughout 1980.

3.2 Tactics, Credibility, and Cost

Observing the resurgence of economic activity, the Fed quickly moved the federal funds rate back up by early 1981 to 19 percent. As measured by personal consumption expenditures (PCE) inflation, which was around 10 percent at the time, real short-term interest rates were then a very high 9 percent. A recession began in July 1981 that would take the unemployment rate from around 7 percent to nearly 10 percent at the recession trough in November 1982. PCE inflation fell by around 5 percentage points to the 5 percent range by the first quarter of 1982, and the Fed brought the funds rate down by 5 percentage points as well. Thus, the Fed maintained real short-term interest rates of 9 percent, even as the unemployment rate continued to rise. One reason that policy remained extraordinarily tight even after the break in inflation is that the behavior of long bond rates suggested that the Fed's credibility as an inflation fighter continued to deteriorate.[13] The long rate actually rose by 3 percentage points from January 1981 to more than 14 percent in October, even as the economy weakened. And the bond rate remained in the 13 to 14 percent range until it began to come down in the summer of 1982. Only then, in the third quarter of 1982, did the Fed begin to reduce real short-term interest rates and pave the way for a recovery. Thereafter, inflation stabilized at around 4 percent and real GDP grew by around 6.5 percent and 4.5 percent in 1983 and 1984, respectively.

A number of factors help to explain why the Fed went ahead with the disinflation in 1981 and why the disinflation succeeded. First, the disastrous developments in 1980 taught the Fed that attempting to stabilize inflation *at a high level* was costly for the following reasons[14]: (i) High inflation invited inflation scares that the Fed was compelled to counteract by raising short-term real interest rates, with great risk of recession; (ii) high inflation invited interventions, such as credit controls, that could be equally damaging to the economy; and (iii) containing inflation at a high level would likely require the Fed to maintain a larger average output gap than otherwise to prevent inflation from rising further.

Second, the events of 1980 heightened the public's unhappiness with high inflation. Public

[12] See Schreft (1990).

[13] A reading of the 1981 transcripts reveals the FOMC's concern with high long-term interest rates and the high inflation expectations that they reflect. For instance, see Chairman Volcker's remarks on page 39 of the August 18, 1981, transcript.

[14] For instance, see Chairman Volcker's remarks in the FOMC transcript from July 7, 1981, p. 36.

support, together with the support of the new Reagan administration, encouraged the Volcker Fed to pursue disinflationary monetary policy in 1981.

Third, the Fed did the hard work of raising the federal funds rate to 17 percent in the spring of 1980. The Fed then took advantage of the window of opportunity that presented itself during the rebound in economic activity in the second half of 1980 to return the federal funds rate to that range. Moving the federal funds rate back up aggressively signaled the Fed's commitment and determination to renew the fight against inflation in 1981. By positioning itself with a 19 percent nominal, and 9 percent real, federal funds rate, the Fed could then let the economy disinflate without having to *raise* the nominal funds rate further and could *lower* the nominal federal funds rate as the disinflation took hold.

3.3 The Inflation Scare Problem and Preemptive Interest Rate Policy

Severe credibility problems flared up during the Volcker era as "inflation scares" in the bond market—falling bond prices due to sharply rising inflation premia in long-term interest rates.[15] Inflation scares presented the Fed with a costly dilemma: Ignoring them could encourage more skepticism about the Fed's fight against inflation, but raising real short rates in response risked precipitating a recession or worsening a recession already in progress. There were four prominent inflation scares in the Volcker era. As discussed above, the first scare in early 1980 shocked the Fed into a 3-percentage-point tightening of the federal funds rate in March and was pivotal in persuading the Fed to pursue a more explicitly disinflationary course. The second scare in 1981, with bond rates remaining high through mid-1982, contributed to the Fed's prolonging the 1981-82 recession.

The third inflation scare took the long-term rate from the 10 percent range in mid-1983 to over 13 percent in the summer of 1984. Remarkably, the bond rate was then only about 1 percentage point below its peak in 1981 even though inflation was about 6 percentage points lower in 1984 and inflation remained in the 4 percent range throughout the inflation scare of 1983-84! In this case, the Fed followed the long rate up with the federal funds rate, taking the funds rate up by around 3 percentage points to the 11 percent range in mid-1984 before the bond rate began to come down. The bond rate then fell by 6 percentage points to the 7 percent range by early 1986, about 3 percentage points below where it had been at the start of the inflation scare. The Fed's aggressive containment of the scare apparently made the public confident of another 3-percentage-point reduction in the trend rate of inflation.

The successful containment of the 1983-84 inflation scare was the most remarkable feature of the Volcker disinflation. The Fed had succeeded in reducing inflation temporarily in many preceding go-stop policy cycles.[16] Preemptive interest rate policy actions in 1983-84 finally put an end to inflationary go-stop policy. This success was particularly important for the future because it showed that well-timed, aggressive interest rate policy actions could defuse an inflation scare and preempt rising inflation without creating a recession.

The Volcker Fed was confronted with a fourth inflation scare in 1987, the last year of Chairman Volcker's leadership of the Fed. The 1987 scare was marked by a 2-percentage-point rise in the bond rate between March and October. This time the Volcker Fed reacted little to the scare, perhaps because GDP growth was weaker than in 1983-84 and there was less risk of an increase in the actual inflation rate. In light of the Volcker Fed's demonstrated determination to act against inflation earlier in the decade, however, the 1987 scare was striking evidence of the fragility of the credibility of the Fed's commitment to low inflation.

4 CONSENSUS THEORY AND PRACTICE OF MONETARY POLICY

The period since October 1979 has seen a considerable convergence in the theory and prac-

[15] See Goodfriend (1993), Gurkaynak, Sack, and Swanson (2003), Ireland (1996), and Orphanides and Williams (2005).

[16] This point is emphasized by Shapiro (1994).

tice of monetary policy. On the theory side, New Neoclassical Synthesis models (alternatively called New Keynesian models) of monetary policy embody key components from Keynesian, monetarist, rational expectations, and real business cycle macroeconomics. On the policy side, it is widely agreed that central banks can and should use monetary policy to maintain low inflation over time and that the commitment to price stability enhances the power of monetary policy to stabilize employment over the business cycle. The agreed-upon desirability and feasibility of a priority for price stability was born of the practical experience reviewed above in conjunction with theory developed since October 1979.

In what follows, we review the nature and origin of key elements of the current consensus. First, we review the components of the consensus theory of monetary policy. Second, we review the reasons for the rise of implicit inflation targeting as the strategy of monetary policy in practice. Third, we explain the emergence of explicit interest rate policy as the means of implementing, discussing, and analyzing monetary policy. Fourth, we discuss the transition from the practice of secrecy to transparency in communicating monetary policy actions, concerns, and intentions to the public.

4.1 The Consensus Model

The modern New Neoclassical Synthesis (or New Keynesian) consensus macroeconomic model of monetary policy is a dynamic general equilibrium model with a real business cycle core and costly nominal price adjustment. The consensus model and its implications for monetary policy have been exposited from somewhat different perspectives in Goodfriend and King (1997), Clarida, Galí, and Gertler (1999), Woodford (2003), and Goodfriend (2004).[17] A convergence in thinking is clear from a reading of these diverse expositions. The heart of the baseline model is compactly represented by the following two equations.

There is a "forward-looking IS function" in which current aggregate demand relative to potential output depends positively on expected future income and negatively on the short-term real interest rate. It resembles the original Keynesian IS function except for its reliance on expected future income. The dependence of current aggregate demand on expected future income dates back to the theory of consumption developed by Fisher (1930) and Friedman (1957).

There is an "aggregate supply function," also called a price-setting function, that relates current inflation inversely to the current markup (or output gap) and expected future inflation. This aggregate supply function can be derived directly from Calvo's (1983) model of staggered price setting and is closely related to the pioneering work of Stanley Fischer and John Taylor (see Taylor, 1999b).

The modeling of expected future income in the IS function and expected future inflation in the aggregate supply function reflects the introduction of rational expectations into macroeconomics by Robert Lucas in the 1970s.[18] Rational expectations theory and solution methods provided a convincing and manageable way to model expectations. Moreover, rational expectations theory taught that it is critically important in analyzing monetary policy to let expectations rationally reflect changes in the way that monetary policy is imagined to be conducted.

By solving the IS function forward, it is possible to express current aggregate demand relative to potential in terms of the expected path of future short-term real interest rates and future potential output. To the extent that price-level stickiness enables monetary policy to exert leverage over the path of real interest rates, both current and expected interest rate policy actions determine current aggregate demand.

By solving the inflation-generating function forward, one can see that the current inflation rate depends inversely on the path of expected future markups. The model implies that inflation will remain low and stable if monetary policy manages aggregate demand to stabilize the output gap to keep the average markup at the profit-maximizing markup. In other words, monetary

[17] See also the papers in Mankiw and Romer (1991).

[18] See Lucas (1976, 1981).

policy maintains price stability by anchoring expected future markups at the profit-maximizing markup so firms do not wish to change prices. Monetary policy that stabilizes the markup at its profit-maximizing value makes the macroeconomy behave like the underlying core real business cycle model with flexible prices. From this perspective, "flexible price real business cycle models of aggregate fluctuations are of practical interest, not as descriptions of what aggregate fluctuations should be like *regardless* of the monetary policy regime, but as descriptions of what they would be like under an *optimal* monetary policy regime."[19]

Looking back at Tobin's summary of consensus thinking about monetary policy in 1980, much remains from that time. There is the idea that prices are marked up over costs; that price trends depend on expectations and on tightness of labor and product markets; that variations in aggregate demand alter inflation by influencing the tightness of markets; that there is a natural rate of unemployment (where output equals potential) at which wage and price setters perpetuate the going rate of inflation (presumably at the profit-maximizing markup); that inflation accelerates when output is expected to exceed potential (the markup is expected to be compressed); and that inflation decelerates when output is expected to fall short of potential (the markup is expected to be elevated). The main advances since then are due to (i) the proven power of monetary policy to reduce and stabilize inflation and inflation expectations at a low rate and (ii) the progress in modeling expectations rationally to understand how monetary policy consistently committed to stabilizing inflation can achieve favorable results.

The model of monetary policy is closed with a description of how policy is imagined to be conducted. Rational expectations teaches that it is not possible to tell how a monetary policy action influences behavior unless it is modeled as part of systematic *policy*. Hence, the model cannot be employed to analyze policy actions without specifying how policy is conducted. There are two ways to do this. One can assume that the central bank employs a rule for its policy instrument, such as a Taylor interest rate rule or a McCallum monetary base rule. Or one can assume that the central bank chooses its instrument each period to maximize a welfare function, which could be derived to reflect household utility in the model. Each way of closing the model has advantages and disadvantages. An ad hoc policy rule can be chosen to approximate a central bank's reaction function in practice. The problem is that an ad hoc rule is unlikely to be optimal in the model in question. On the other hand, optimal policy in the model may not give rise to a policy rule that a central bank would follow in practice, and it may not be optimal at all if the model is incorrect.[20] Kydland and Prescott (1977) first pointed out that optimal monetary policy is likely to be time inconsistent and that monetary policy may be suboptimal if a central bank cannot commit to a policy rule.[21]

4.2 Implicit Inflation Targeting

With respect to the practice of monetary policy, the most important development since October 1979 has been the rise of *implicit* inflation targeting as the core of the Fed's strategy of monetary policy.[22] This is remarkable in retrospect because no one would have predicted it in October 1979. For instance, although monetarists insisted that price stability ought to be the primary goal of monetary policy, their reading of monetary history suggested that the inflation rate itself could not serve as a practical guide for monetary policy and an operational criterion for performance because of the long and variable lags of nearly two years in the effect of monetary policy on inflation.[23] Hence, monetarists recommended monetary targeting as the means by which a central bank should control the inflation rate.

[19] Woodford (2003, p. 410). Goodfriend and King (1997) and Goodfriend (2004) emphasize this point.

[20] See McCallum (1999) and Svensson (1999).

[21] See, also, Barro and Gordon (1983).

[22] The Fed does not have a formal inflation target. But Goodfriend (2003b) argues that monetary policy conducted by the Greenspan Fed may be characterized as a form of implicit inflation targeting. See Bernanke and Mishkin (1997) for a formal definition of inflation targeting.

[23] See Friedman (1960, pp. 87-88).

The rise of implicit inflation targeting is the result of a number of factors.[24] Most important, the Fed has shown that a consistent commitment to price stability *can* stabilize inflation within a relatively narrow range at a low rate over the business cycle. Second, the unemployment cost (associated with go-stop policy and inflation scares) of *failing* to make low and stable inflation a priority is now well understood. Third, anchoring inflation expectations is understood to produce three critical benefits: (i) It helps the Fed to know how its nominal federal funds rate target changes translate into real interest rate movements, which helps the Fed gauge the likely impact of its policy actions on the economy; (ii) it enables the Fed to buy time to recognize and counteract threats to price stability before they develop into inflation or deflation scares; and (iii) it enhances the flexibility of interest rate policy to react aggressively (without an inflation scare in bond markets) to shocks that threaten to destabilize financial markets and/or create unemployment. Fourth, macroeconomic performance since the Volcker disinflation has produced two of the longest expansions in U.S. economic history, with two of the shortest contractions in 1990-91 and 2001.

4.3 Explicit Interest Rate Policy

A second practical development of considerable importance since October 1979 has been the Fed's decision since February 1994 to announce publicly its federal funds rate target immediately after each FOMC meeting. This development marked the return to an explicit interest rate policy, last fully acknowledged in the early 1920s. When the Fed embarked on its first campaign to tighten monetary policy in the aftermath of World War I, it did so with widely publicized increases in its discount rate, which the public then understood to anchor money market rates in much the same way the Bank of England's "bank rate" had anchored rates since the 19th century.[25] High interest rates were suspected to have caused the deflation and recession of 1920-21. According to Meltzer's (2003) account, it is no exaggeration to say that the Fed was traumatized by its first use of open interest rate policy.[26] Shortly after that experience, the Fed moved to adopt operating procedures to pursue interest rate policy less visibly. It did so by targeting borrowed reserves.

Borrowed-reserve targeting enabled the Fed to talk about monetary policy in terms of the "degree of pressure on reserves," rather than in terms of interest rates, and to create the illusion that money market rates were determined largely if not completely by market forces. There were three reasons for this.[27] Money market rates floated relative to the discount rate, with a spread that fluctuated with credit risk and the volume of bank reserves that the Fed forced the banking system to borrow from Reserve Banks. Money market rates could be manipulated quietly, without changing the high-profile discount rate, by forcing the banking system to borrow more or less of its reserves at the discount window. The Fed could create the impression that visible (discount rate) interest rate policy *followed* market rates. For instance, if the Fed wanted to raise rates it could first force banks into the window by selling securities. That would raise market rates without raising the discount rate. Later, the Fed could raise and realign the discount rate while buying securities to bring the volume of forced borrowings back down. Of course, the Fed retained the option of *leading* with discount rate changes when it wanted to grab the headlines.

Thus, borrowed-reserve targeting was noisy interest rate policy in which the Fed continued to manage short-term interest rates closely but in a relatively invisible way. It afforded the Fed a means of implementing interest rate policy actions quietly or loudly, depending on what was called for.[28] With some notable exceptions, such as the 1974-79 period, until 1994 the Fed often managed

[24] Feldstein (1997) and Schmitt-Grohé and Uribe (2002), for instance, provide quantitative support for making low inflation a priority.

[25] See Hawtrey (1938).

[26] See Meltzer (2003, pp. 13, 112-16, and 127).

[27] See Goodfriend (2003a).

[28] Goodfriend (1991, p. 21) quotes Governor Strong from 1927 and Chairman Greenspan from 1989, explaining why it is useful for the Fed to have the option to take policy actions quietly or loudly.

short-term interest rates by targeting borrowed reserves.[29]

A number of factors account for the Fed's decision to return to explicit interest rate policy in 1994. The period of high interest rates in the 1970s and 1980s, especially during the Volcker disinflation, gave the Fed a high profile, which it never lost. Greater public scrutiny of monetary policy created pressure for increased transparency of interest rate policy actions. Second, increased instability in the demand for M1 and M2 in the 1980s and early 1990s undermined the case for operating procedures that involved bank reserves and monetary targeting. Third, academic papers (e.g., Goodfriend, 1991, 1993, and Taylor, 1993) began to talk about monetary policy explicitly in terms of interest rates. Fourth, academics learned how to analyze monetary policy in models without money (e.g., Kerr and King, 1996, McCallum, 2001, and Woodford, 2003) and economists at the Board developed models of monetary policy without money (e.g., Brayton et al., 1997). Fifth, with inflation low and stable, the federal funds rate could be expected to move in a relatively low and narrow range. In short, the consensus to implement, discuss, and analyze monetary policy as explicit interest rate policy became overwhelming.

4.4 Communicating Policy Concerns and Intentions

A third practical development of importance since October 1979 has been the remarkable increase in transparency in communicating the concerns and intentions of monetary policy in addition to announcing the federal funds rate target. One can understand this transition as a *change in the means* by which a central bank achieves its primary monetary policy mission: to contribute to macroeconomic stability in a way that leaves maximum freedom of action to private markets. The idea is that monetary policy should be conducted as unobtrusively as possible to minimize interference in markets. Hence, central banks developed a reputation for secrecy.[30] Recent theory and practice reviewed above, however, teaches that a central bank enhances the performance of markets by creating an environment of dependable low inflation. Since transparency creates understanding of the tactics and strategy of monetary policy, transparency rather than secrecy is more apt to strengthen credibility for low inflation. Broadly speaking, that is what accounts for the striking increase in communication with the public that has characterized monetary policy in recent years.[31]

The return to fully explicit interest rate policy in 1994 initiated greater use of communications in support of monetary policy actions. The enhanced visibility of interest rate policy actions increased the public's appetite for transparency and encouraged even more Fed communication with markets. The train of events worked like this: Announcing the federal funds rate targets enabled the federal funds rate futures market to mature. That, in turn, made the path of expected future interest rate policy actions more visible to the public. Market participants and the public began to debate Fed concerns and intentions for future interest rates more openly. By measuring the distance between market expectations and its internal intentions for the future funds rate, the Fed could judge the effectiveness of its communications about monetary policy and how they might be adjusted to achieve a desired effect. The "conversation" between markets and the Fed became particularly important in 2003, when the federal funds rate was 1 percent and the Fed wished to lower the yield curve to fight the deflation risk by steering expected future interest rates lower with language that signaled its intention to be patient in raising interest rates.

Interestingly enough, these developments appear to have re-created the option for the Fed to make interest rate policy actions quietly or loudly. To move interest rates quietly, the Fed moves federal funds rate futures in the desired direction by gradually signaling its intentions

[29] Cook and Hahn (1989) point out that the Fed chose to control the federal funds rate so firmly from September 1974 until September 1979 that the public was able to perceive most changes in the target on the day they occurred. The extent to which the Fed employed borrowed reserve targeting from 1979 to 1994 is controversial. See Cook (1989) and Poole (1982) on the 1979-82 period, and Thornton (2004) on the period after 1982-84.

[30] Goodfriend (1986).

[31] See Blinder (2004) and Ferguson (2002).

through its communications. Later, the Fed simply confirms expectations that it created previously by adjusting its federal funds rate target as expected. On the other hand, if circumstances are such that the Fed wishes to get more attention for its actions, it can surprise markets with federal funds rate policy actions not prepared for in advance. In this way, the Fed can appear either to follow or to lead the market, as it could do with the borrowed-reserve targeting procedures used earlier in its history.

5 CURRENT CONTROVERSIES

There are many controversies within the broad consensus described above—on the theory of monetary policy, inflation targeting, interest rate policy, and communications—that matter for the conduct of monetary policy. Some of these are discussed below.

5.1 Specification and Interpretation of the Monetary Policy Model

The most important controversies in the theory of monetary policy involve the aggregate supply function (price-setting function), because it determines the nature of the short-run trade-off between inflation and unemployment.[32] Clearly, shocks to aggregate demand present no conflict between stabilizing inflation around its objective and stabilizing output around potential. What about shocks to aggregate supply? To appreciate the issues, consider first the baseline price-setting function discussed above derived from Calvo (1983), in which current inflation depends positively on expected future inflation and inversely on the current output gap or the current markup. Goodfriend and King (1997, 2001), King and Wolman (1999), and Goodfriend (2002) emphasize that in this baseline case, fully credible price stability keeps output at its potential and employment at its natural rate. In other words, there is no short-run trade-off between inflation and unemployment, even for shocks to aggregate supply.[33] From this perspective, even those who care mainly about output and employment can support strict price stability.

Yet, many would say that the baseline case is not realistic and, indeed, taking other potential features of the macroeconomy into account can overturn the strong implication that price stability is always welfare-maximizing monetary policy. For instance, John Taylor has emphasized a trade-off in the *long-run variance* of inflation and output relative to potential in models of monetary policy that results from a short-run trade-off in the levels of inflation and unemployment. See, for instance, the papers in Taylor (1999a). Any of the following modifications of the Calvo price-setting function produce a short-run trade-off in inflation and unemployment, adding (i) a "cost" shock that feeds directly into inflation irrespective of expectations or the current markup, (ii) lagged inflation that reflects structural inflation inertia in the price-setting process, and (iii) nominal wage stickiness to the baseline model, which otherwise presumes that wages are perfectly flexible.

With any of these modifications, it is no longer always possible to stabilize both inflation and output at potential. Monetary policy must create a shortfall of aggregate demand relative to potential output to offset the effect of a cost shock or inertial inflation on current inflation. Nominal wage stickiness creates a trade-off with respect to productivity shocks even without modifications (i) and (ii). To see this, first consider a temporary negative shock to productivity in the baseline model. In that case, markup and inflation stabilization both call for a contraction in aggregate demand to conform to the contraction in potential output. And nominal and real wages both fall with productivity, offsetting the effect of the negative shock to productivity on marginal cost and the markup. Thus, when wages are flexible, monetary policy can simultaneously stabilize the output

[32] The aggregate supply function derived from Calvo (1983) has a small long-run trade-off between unemployment and inflation that is ignored in practical applications.

[33] Fully credible price stability means that current inflation and expected future inflation are identical (and consistent with a low-inflation target). In this case, the Calvo price-setting function implies that actual output equals potential output or, equivalently in the baseline model, that the actual markup equals the profit-maximizing markup.

gap and inflation. Things don't work out as neatly if nominal wages are sticky.[34] Then, monetary policy must steer aggregate demand below potential (to raise the marginal physical product of labor) to offset the effect of negative productivity growth on marginal cost in order to stabilize the markup and the inflation rate.

Although these modifications seem realistic, there are reasons to question their importance in practice. First, because marginal cost is already taken into account in the underlying theory, strictly speaking there is no role for a "cost" shock in the price-setting function. The statistical residual found in practice might just reflect measurement error or noise in the modeling of expectations. If one argues that some costs flow directly to prices in a perfectly competitive sector, then theory suggests that the central bank should consider stabilizing only a "core" index of monopolistically competitive sticky prices. Second, theory that justifies structural inertia in the inflation-generating process is controversial.[35] Lags of inflation in an estimated inflation-generating function could reflect persistence introduced into the inflation rate by central bank behavior, especially in the presence of measurement or other specification errors. There is evidence that apparent inflation persistence is reduced when inflation is low and stable.[36] Third, an inflation target of 1 to 2 percent coupled with productivity growth of around 2 percent produces nominal wage growth in the 3 to 4 percent range. Such high average nominal wage growth should keep the economy away from situations in which significant downward nominal wage stickiness, as opposed to slower nominal wage growth, is required to keep price inflation stable and output at potential.

5.2 Should the Fed Adopt an Inflation Target?

Given the Fed's established commitment to low inflation, and the widely agreed-upon benefits derived from putting a priority on price stability, the question is this: Should the Fed adopt an explicit, numerical target range for inflation and strive to keep inflation in or near that range? This debate is well illustrated by an exchange between Goodfriend (2003b) and Kohn (2005). Goodfriend argues that the Greenspan Fed has been targeting inflation *implicitly* in the following senses. First, Chairman Greenspan testified in 1989 in favor of a qualitative low-inflation objective for the Fed, defined as a situation in which "the expected rate of change of the general level of prices ceases to be a factor in individual and business decision-making."[37] Thus, it is reasonable to think that the Greenspan Fed sought to make that definition of price stability a reality over time. Second, the Greenspan Fed targeted inflation *flexibly*. It achieved price stability gradually by leaning against rising inflation in the late 1980s, bringing it down gradually in the early 1990s, holding the line on inflation in 1994, and keeping a measure of inflation favored by the Fed, core PCE inflation, in the 1 to 2 percent range thereafter. Third, it is difficult to imagine that, henceforth, the Greenspan Fed deliberately would target core PCE inflation above 2 percent or below 1 percent. Fourth, the Greenspan Fed has implicitly practiced inflation targeting as *constrained countercyclical stabilization policy*: The Greenspan Fed exploited its credibility for low inflation to lower short-term interest rates aggressively to fight the recession in 2001 and to keep short-term interest rates at historic lows since then to stimulate employment and guard against deflation. Thus, Goodfriend argues that to help perpetuate its current practice of flexible inflation targeting as constrained stabilization policy, the Fed should acknowledge an explicit 1 to 2 percent *long-run* target range for core PCE inflation.

Contrary to Goodfriend, Kohn (2005) argues that the Fed would not have been able to adapt as flexibly to the changing conditions described above if an explicit inflation target had already been in place. So Kohn would not characterize policy pursued by the Greenspan Fed as implicit inflation targeting. Moreover, Kohn argues that

[34] See Erceg, Henderson, and Levin (2000).

[35] See Fuhrer and Moore (1995).

[36] See Cecchetti (1995) and Cogley and Sargent (2001).

[37] Greenspan (1990, p. 6).

even without explicit inflation targeting the economy has enjoyed most of the benefits of low and stable inflation and inflation expectations. He sees little need to adopt a formal inflation target to help perpetuate the focus on price stability in the future. In effect, Kohn thinks that a formal inflation target would exert a needless constraint on countercyclical stabilization policy, in part because he worries that it might be imposed with more unproductive conditions than Goodfriend thinks would be the case.

In return, Goodfriend emphasizes three points. In the long run there are *no* circumstances in which sustained inflation should or need be much higher or lower than today. Monetary policy best encourages employment and economic growth in the long run by stabilizing inflation and inflation expectations. A central bank has an *obligation* to inform Congress formally of these lessons learned from theory and experience of monetary policy since October 1979 and to ask to be held accountable for keeping inflation in or near a 1 to 2 percent target range over time in order to improve congressional oversight of monetary policy.

5.3 Interest Rate Policy with No Role for Money

It is ironic that monetarists deserve much of the credit for laying the groundwork for the Fed's defeat of inflation, yet the Fed currently ignores money in both the implementation and analysis of monetary policy.[38] Moreover, monetarists have long emphasized the dangers inherent in implementing monetary policy using the federal funds rate instead of using bank reserves or the monetary base as the policy instrument.[39] Yet, the Fed has pursued an explicit interest rate policy since 1994. It is worth recalling, then, the nature of the monetarist concerns and to consider more generally the robustness of interest rate policy without any role for money.

Poole (1978) presents the classic monetarist criticism of monetary policy: The Fed has tended to smooth short-term interest rates excessively over the business cycle in the following sense.[40] The Fed has been reluctant to raise short-term interest rates promptly and aggressively enough when the economy strengthens after a recession trough; and the Fed has not lowered rates promptly and aggressively enough when the economy weakens at the start of a recession. Hence, interest rate policy has imparted an excessively procyclical bias to money growth that has exacerbated the business cycle. Poole points out that, in the past, the smoothing of short-term interest rates has actually caused both short- and long-term rates to become more volatile over time. Although Poole doesn't mention it, interest rate smoothing probably played a large part in creating the increasingly inflationary and excessively volatile go-stop cycles before October 1979.

The Fed has learned to adjust interest rates more preemptively since October 1979. It moved interest rates aggressively during the Volcker disinflation, and inflationary go-stop policy cycles are no more. A closer look, however, indicates that some residual problems associated with interest rate smoothing in Poole's sense may remain. For instance, the Fed did not respond with higher short-term interest rates during the 1987 inflation scare—and may have held rates too low for too long after the October 1987 stock market crash, given the increase in inflation that followed. On the other hand, the Fed did move aggressively and preemptively to head off rising inflation in 1994, without creating a recession. Later in the decade, though, the Fed may have exacerbated cyclical instability by holding the federal funds rate target too low for too long.[41]

Only time will tell whether the monetarist argument that interest rate policy is inherently destabilizing will reassert itself. Before leaving this point, however, it must be mentioned that Woodford (2003) has shown that "inertial" interest rate policy may be advantageous. Specifically, if interest rate smoothing is measured by the coefficient on $R(t-1)$ in a rule for $R(t)$, the federal funds rate, then Woodford argues that coefficients above 1 (superinertial interest rate rules) may be optimal.

[38] See Brayton et al. (1997).

[39] McCallum (2000b) presents evidence that monetary base rules performed better over 1970-98 than Taylor-style interest rate rules.

[40] Poole (1978, p. 105-10).

[41] See Goodfriend (2002).

Of course, this requires that the rule also respond vigorously to inflation or expected future inflation and possibly to the output gap.

Whatever one thinks about interest rate policy, there are good reasons why money ought to be integrated into the Fed's operating procedures to some extent. First, the Fed should have a contingency plan to implement "quantitative" policy by expanding its balance sheet in case the zero bound becomes a constraint on interest rate policy. Second, the Fed should have a contingency plan for returning to monetary targeting in the event that high and volatile inflation and inflation expectations cause trouble again. Third, the Fed needs to understand better how interest rate policy should be modified to counteract shocks to the production and use of broad money in the presence of extreme asset price movements or crises of confidence in credit markets.[42]

A final, crucial concern about interest rate policy is this: Explicit interest rate policy as conducted by the Fed today relies heavily for its effectiveness on the *credibility* of the Fed's commitment to price stability.[43] There has been no *explicit* nominal anchor for U.S. monetary policy at least since the United States left the gold standard when the Bretton Woods fixed exchange rate system collapsed in 1973.[44] Six years of monetary chaos after that persuaded the Volcker Fed in October 1979 to work toward establishing an *implicit* nominal anchor by restoring and maintaining credibility for low inflation. Monetary economists have taught, and central bankers have commonly believed, that monetary policy ought to have an explicit nominal anchor such as a link to gold, a fixed foreign exchange rate, an announced path for a monetary aggregate, or an inflation target.[45] Yet Congress has not designated one and the Fed has not adopted an explicit nominal anchor to replace the link to gold. Practical and theoretical developments since October 1979 suggest that monetary policy may not need an explicit nominal anchor after all, at least in some circumstances. It is debatable, however, whether Fed credibility for low inflation alone will prove to be a robust substitute for an explicit nominal anchor in the face of the monetary policy challenges to come, especially since the Fed's commitment to low inflation needs the support of conforming fiscal policy to be fully credible.

5.4 Clarifying Short-Run Communications

Because the Fed does not publicly and explicitly specify a target range for inflation, it must signal its short-run concerns and intentions about inflation and deflation entirely in post-FOMC meeting statements and minutes and in the Chairman's speeches and reports to Congress. Problems that the Fed experienced in 2003 in signaling its concern about deflation raise questions as to whether statements and speeches substitute adequately for an explicit inflation target. For instance, the statement following the May 2003 FOMC meeting, that further disinflation was unwelcome, came as a surprise, and media commentary amplified the nervousness about deflation well beyond what was justified. Expected future funds rates fell sharply and pulled longer-term interest rates down sharply as well. The Fed reduced the federal funds rate less than the widely expected 50 basis points at the June meeting, and longer-term interest rates promptly reversed field.

Broaddus and Goodfriend (2004) point out that if an inflation target range had been in place in 2003, the public could have inferred the Fed's growing concern about disinflation gradually as the inflation rate drifted down earlier in the year. Expected future interest rates likely would have come down smoothly with less chance of overshooting the Fed's intended policy stance. The authors went on to assert that this experience illustrates a more general point. Rational expectations reasoning teaches that the public has difficulty gauging the intent of a Fed policy action taken out of context and, therefore, the Fed will find it particularly difficult to predict the effect of an ad hoc unsystematic policy action. Since the announcement that any more disinflation would be unwelcome was ad hoc by definition, it is not

[42] See Goodfriend (forthcoming).

[43] See Blinder (2000).

[44] The gold standard ceased to provide an effective nominal anchor for monetary policy long before that. See Goodfriend (1988).

[45] See McCallum (2000a).

surprising that it caused confusion. In this case, the reaction was excessive, but in another situation there might have been an insufficient reaction. The point is that the scope for misunderstanding in discretionary communications is great.[46] On this basis, a case can be made that an inflation target would be a valuable addition to the Fed's short-run communications procedures. From this perspective, Broaddus and Goodfriend argue, the Fed has authority from Congress to set an inflation target as part of its operational independence.

In the second half of 2003, the Fed had difficulty convincing financial markets of its inclination to maintain a low federal funds rate for a "considerable period." One possible reason, also argued by Broaddus and Goodfriend, is that policy statements emphasized strong real economic growth during the period but paid insufficient attention to the sizable *gap* in employment and to the cumulative deflation in unit labor costs that had almost certainly widened the gap between actual and profit-maximizing markups. The apparent size of these gaps likely helped to produce the disinflation that occurred in 2003 and contributed to the deflation risk that inclined the Fed to keep the federal funds rate low. Broaddus and Goodfriend argue that the Fed ought to clarify its short-run concerns and intentions by referring to gaps in markups, employment, and output more prominently in its communications in order to make expected future federal funds rates conform more closely to the Fed's preemptive policy intentions. Talking in terms of gap indicators is controversial because of the unfortunate experience in the 1960s and 1970s, when calling attention to employment and output gaps created pressure that led to inflationary monetary policy and poor macroeconomic performance. Nevertheless, Broaddus and Goodfriend argue that times have changed and the Fed could deal with such pressures by announcing an explicit inflation target.

6 CONCLUSION

Monetary theory and policy have been revolutionized in the two decades since the Federal Reserve moved in October 1979 to stabilize inflation and bring it down. It is true that much of today's core theory and practice was already in place by October 1979. For instance, the stickiness of prices was understood to be important, current inflation was understood to depend on expected inflation, and inflation was understood to respond inversely to the output gap. But the advances were revolutionary nevertheless. On the side of practice, the decisive and revolutionary factor was the demonstration that monetary policy has the power to acquire and maintain credibility for low inflation so as to improve the stability of both inflation and output relative to potential. On the theory side, the introduction of rational expectations was decisive because it enabled models of monetary policy to incorporate forward-looking elements of aggregate demand and price setting, long known to be critically important for policy analysis, so as to understand how monetary policy consistently committed to stabilizing inflation could achieve the favorable results found in practice. In short, the period since October 1979 was a remarkable one in which major parallel developments in both theory and experience reinforced each other, making monetary economists and central bankers both more confident of their respective advances.

[46] See McCallum (2004).

REFERENCES

Ball, Laurence. "Credible Disinflaton with Staggered Price-Setting." *American Economic Review*, March 1994, *84*, pp. 282-89.

Barro, Robert J. and Gordon, David B. "A Positive Theory of Monetary Policy in a Natural Rate Model." *Journal of Political Economy*, 1983, *91*, pp. 589-610.

Bernanke, Ben S. and Mishkin, Frederic S. "Inflation Targeting: A New Framework for Monetary Policy?" *Journal of Economic Perspectives*, 1997, *11*, pp. 97-116.

Blinder, Alan S. "Central-Bank Credibility: Why Do We Care? How Do We Build It?" *American Economic Review*, December 2000, *90*, pp. 1421-31.

Blinder, Alan S. *The Quite Revolution: Central Banking Goes Modern*. New Haven, CT: Yale University Press, 2004.

Brayton, Flint; Levin, Andy; Tryon, Ralph and Williams, John. "The Evolution of Macro Models at the Federal Reserve Board." *Carnegie-Rochester Conference Series on Public Policy*, December 1997, *47*, pp. 43-81.

Broaddus, J. Alfred Jr. and Goodfriend, Marvin. "Sustaining Price Stability." Federal Reserve Bank of Richmond *Economic Quarterly*, Summer 2004, *90*, pp. 3-20.

Calvo, Guillermo A. "Staggered Prices in a Utility Maximizing Framework." *Journal of Monetary Economics*, September 1983, *12*, pp. 383-98.

Cecchetti, Stephen G. "Inflation Indicators and Inflation Policy," in Ben S. Bernanke and Julio J. Rotemberg, eds., *NBER Macroeconomics Annual*. Cambridge, MA: MIT Press, 1995, pp. 189-219.

Clarida, Richard; Galí, Jordi and Gertler, Mark. "The Science of Monetary Policy: A New Keynesian Perspective." *Journal of Economic Literature*, December 1999, *37*, pp. 1661-707.

Cogley, Timothy and Sargent, Thomas J. "The Evolution of Postwar U.S. Inflation Dynamics," in Ben S. Bernanke and Kenneth S. Rogoff, eds., *NBER Macroeconomics Annual*. Cambridge: MIT Press, 2001, pp. 331-73.

Cook, Timothy. "Determinants of the Federal Funds Rate: 1979-1982." Federal Reserve Bank of Richmond *Economic Review*, January/February 1989, pp. 3-19.

Cook, Timothy and Hahn, Thomas. "The Effect of Changes in the Federal Funds Rate Target on Market Interest Rates in the 1970s." *Journal of Monetary Economics*, November 1989, *24*, pp. 331-51.

Erceg, Christopher J.; Henderson, Dale W. and Levin, Andrew T. "Optimal Monetary Policy with Staggered Wage and Price Contracts." *Journal of Monetary Economics*, October 2000, *46*(2), pp. 281-313.

Federal Open Market Committee. Transcripts. Washington, DC: Board of Governors of the Federal Reserve System, 1979-81.

Feldstein, Martin. "The Costs and Benefits of Going from Low Inflation to Price Stability," in Christina D. Romer and David H. Romer, eds., *Reducing Inflation: Motivation and Strategy*. Chicago: University of Chicago Press, 1997, pp. 123-66.

Fellner, William. "The Credibility Effect and Rational Expectations: Implications of the Gramlich Study." *Brookings Papers on Economic Activity*, 1979, *1*, pp. 167-89.

Ferguson, R. "Why Central Banks Should Talk." Remarks at the Graduate Institute of International Studies, Geneva, Switzerland, January 2002.

Fischer, Stanley. "Modern Central Banking," in Forrest Capie et al., eds., *The Future of Central Banking: The Tercentenary Symposium of the Bank of England*. Cambridge: Cambridge University Press, 1994, pp. 262-308.

Fisher, Irving. *The Theory of Interest*. Fairfield, NJ: Augustus M. Kelly, [1930] 1986.

Friedman, Milton. *A Theory of the Consumption Function*. Princeton: Princeton University Press, 1957.

Friedman, Milton. *A Program for Monetary Stability*. New York: Fordham University Press, 1960.

Friedman, Milton. Statement before the U.S. Congress, House of Representatives, Committee on Banking and Currency in *The Federal Reserve System After Fifty Years*. Subcommittee on Domestic Finance. Hearings, 88 Cong. 2 Sess. Washington, DC: U.S. Government Printing Office, 1964.

Friedman, Milton. "The Role of Monetary Policy." *American Economic Review*, March 1968, *58*(1), pp. 1-17.

Friedman, Milton. "Quantity Theory of Money," in John Eatwell, Murray Milgate, and Peter Newman, eds., *The New Palgrave: Money*. New York: W.W. Norton & Company, 1989, pp. 1-40.

Fuhrer, Jeffrey and Moore, George. "Inflation Persistence." *Quarterly Journal of Economics*, February 1995, *110*(1), pp. 127-59.

Goodfriend, Marvin. "Monetary Mystique: Secrecy and Central Banking." *Journal of Monetary Economics*, 1986, *17*, pp. 63-92.

Goodfriend, Marvin. "Central Banking Under the Gold Standard." *Carnegie-Rochester Conference Series on Public Policy*, Autumn 1988, *29*, pp. 85-124.

Goodfriend, Marvin. "Interest Rates and the Conduct of Monetary Policy." *Carnegie-Rochester Conference Series on Public Policy*, Spring 1991, *34*, pp. 7-30.

Goodfriend, Marvin. "Interest Rate Policy and the Inflation Scare Problem: 1979-1992." Federal Reserve Bank of Richmond *Economic Quarterly*, Winter 1993, *79*, pp. 1-24.

Goodfriend, Marvin. "Monetary Policy Comes of Age: A 20th Century Odyssey." Federal Reserve Bank of Richmond *Economic Quarterly*, Winter 1997, *83*, pp. 1-22.

Goodfriend, Marvin. "The Phases of U.S. Monetary Policy: 1987 to 2001." Federal Reserve Bank of Richmond *Economic Quarterly*, Fall 2002, *88*, pp. 1-17.

Goodfriend, Marvin. Book Review: Allan H. Meltzer, *A History of the Federal Reserve, Volume I: 1913-1951*. Federal Reserve Bank of Minneapolis *The Region*, December 2003a, *1*, pp. 82-89.

Goodfriend, Marvin. "Inflation Targeting in the United States?" NBER Working Paper No. 9981, National Bureau of Economic Research, September 2003b (also in Ben S. Bernanke and Michael Woodford, eds., *The Inflation Targeting Debate*. Cambridge, MA: National Bureau of Economic Research, 2005, pp. 311-37).

Goodfriend, Marvin. "Monetary Policy in the New Neoclassical Synthesis: A Primer." Federal Reserve Bank of Richmond *Economic Quarterly*, Summer 2004, *90*(3), pp. 21-45 (reprinted from *International Finance*, 2002, *5*, pp. 165-92).

Goodfriend, Marvin. "Narrow Money, Broad Money, and the Transmission of Monetary Policy," in Richard Porter and Peter Tinsley, eds., *Models of Monetary Policy: Research in the Tradition of Dale Henderson*, Washington, DC: Board of Governors of the Federal Reserve System (forthcoming).

Goodfriend, Marvin and King, Robert G. "The New Neoclassical Synthesis and the Role of Monetary Policy," in Ben S. Bernanke and Julio J. Rotemberg, eds., *NBER Macroeconomics Annual*. Cambridge: MIT Press, 1997, pp. 231-82.

Goodfriend, Marvin and King, Robert G. "The Case for Price Stability," in A.G. Herrero et al., eds., *First ECB Central Banking Conference, Why Price Stability?* Frankfurt: European Central Bank, 2001, pp. 53-94; NBER Working Paper No. 8423, National Bureau of Economic Resarch, August 2001.

Greenspan, Alan. Statement before the U.S. Congress, House of Representatives, Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs, *Zero Inflation*. Hearing, 101 Cong. 1 Sess. Washington, DC: U.S. Government Printing Office, 1990.

Gurkaynak, Refet S.; Sack, Brian and Swanson, Eric. "The Excess Sensitivity of Long-term Interest Rates: Evidence and Implications for Macroeconomic Models." Finance and Economics Discussion Series 2003-50, Board of Governors of the Federal Reserve System, February 2003.

Hawtrey, R.G. *A Century of Bank Rate*. London: Longran, 1938.

Hetzel, Robert L. "Arthur Burns and Inflation." Federal Reserve Bank of Richmond *Economic Quarterly*, Winter 1998, *84*, pp. 21-44.

Ireland, Peter. "Long-Term Interest Rates and Inflation: A Fisherian Approach." Federal Reserve Bank of Richmond *Economic Quarterly*, Winter 1996, *82*(1), pp. 21-35.

Kerr, William and King, Robert G. "Limits on Interest Rate Rules in the IS Model." Federal Reserve Bank of Richmond *Quarterly Review*, Spring 1996, *82*, pp. 47-75.

King, Robert G. and Wolman, Alexander L. "What Should the Monetary Authority Do When Prices Are Sticky?" in John B. Taylor, ed., *Monetary Policy Rules*. Chicago: University of Chicago Press, 1999, pp. 349-404.

Kohn, Donald. "Comments on Marvin Goodfriend's 'Inflation Targeting in the United States?'" in Ben S. Bernanke and Michael Woodford, eds., *The Inflation Targeting Debate*. Cambridge, MA: National Bureau of Economic Research, 2005, pp. 337-50.

Kydland, Finn and Prescott, Edward C. "Rules Rather than Discretion: The Inconsistency of Optimal Plans." *Journal of Political Economy*, June 1977, *85*(3), pp. 473-91.

Lindsey, David; Orphanides, Athanasios and Rasche, Robert H. "The Reform of October 1979: How It Happened and Why." Federal Reserve Bank of St. Louis *Review*, March/April 2005, *87*(2, Part 2), pp. 187-235.

Lucas, Robert E. Jr. "Econometric Policy Evaluation: A Critique." *Carnegie-Rochester Conference Series on Public Policy*, 1976, *1*, pp. 19-46.

Lucas, Robert E. Jr. *Studies in Business-Cycle Theory*. Cambridge, MA: MIT Press, 1981.

McCallum, Bennett T. "Issues in the Design of Monetary Policy Rules," in John B. Taylor and Michael Woodford, eds., *Handbook of Macroeconomics*. Amsterdam: Elsevier Science B.V., 1999, pp. 1483-530.

McCallum, Bennett T. "The United States Deserves a Monetary Standard." Unpublished manuscript, Shadow Open Market Committee, 2000a.

McCallum, Bennett T. "Alternative Monetary Policy Rules: A Comparison with Historical Settings of the United States, the United Kingdom, and Japan." Federal Reserve Bank of Richmond *Economic Quarterly*, Winter 2000b, pp. 49-79.

McCallum, Bennett T. "Monetary Policy Analysis in Models without Money." NBER Working Paper No. 8174, National Bureau of Economic Research, 2001.

McCallum, Bennett T. "Misconceptions Regarding Rules vs. Discretion for Monetary Policy." *Cato Journal*, Winter 2004, *23*(3), pp. 365-72.

Mankiw, N. Gregory and Romer, David H., eds. *New Keynesian Macroeconomics*. Volumes 1 and 2. Cambridge, MA: MIT Press, 1991.

Meltzer, Allan H. "The Demand for Money: The Evidence from the Time Series." *Journal of Political Economy*, June 1963, *71*, pp. 219-46.

Meltzer, Allan H. *A History of the Federal Reserve*. Volume 1: 1913-1951. Chicago: University of Chicago Press, 2003.

Okun, Arthur M. "Efficient Disinflation Policies." *American Economic Review*, May 1978, *68*, pp. 348-52.

Orphanides, Athanasios and Williams, John C. "Inflation Scares and Forecast-Based Monetary Policy." *Review of Economic Dynamics*, 2005 (forthcoming).

Orphanides, Athanasios and Williams, John C. "Imperfect Knowledge, Inflation Expectations, and Monetary Policy," in Ben S. Bernanke and Michael Woodford, eds., *The Inflation Targeting Debate*. Cambridge, MA: National Bureau of Economic Research, 2005, pp. 201-34.

Poole, William. *Money and the Economy: A Monetarist View*. Reading: Addison-Wesley Publishing Co., 1978.

Poole, William. "Federal Reserve Operating Procedures: A Survey and Evaluation of the Historical Record Since October 1979." *Journal of Money, Credit, and Banking*, 1982, *14*(4), pp. 575-96.

Romer, Christina D. and Romer, David H. "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz," in Oliver J. Blanchard and Stanley Fisher, eds., *NBER Macroeconomics Annual*. Cambridge, MA: MIT Press, 1989, pp. 121-69.

Sargent, Thomas J. *Rational Expectations and Inflation*. New York: Harper & Row, 1986.

Schmitt-Grohé, Stephanie and Uribe, Martin. "Optimal Fiscal and Monetary Policy under Sticky Prices." NBER Working Paper No. 9220, National Bureau of Economic Research, 2002.

Schreft, Stacey L. "Credit Controls: 1980." Federal Reserve Bank of Richmond *Economic Review*, November/December 1990, pp. 25-55.

Shapiro, Matthew D. "Federal Reserve Policy: Cause and Effect," in N. Gregory Mankiw, ed., *Monetary Policy*. Chicago: University of Chicago Press, 1994, pp. 307-34.

Svensson, Lars E.O. "Inflation Targeting as a Monetary Policy Rule." *Journal of Monetary Economics*, June 1999, *43*, pp. 607-54.

Taylor, John B. "Estimation and Control of a Macroeconomic Model with Rational Expectations." *Econometrica*, September 1979, *47*(5), pp. 1267-86.

Taylor, John B. "Establishing Credibility: A Rational Expectations Viewpoint." *American Economic Review Papers and Proceedings*, May 1982, *72*(2), pp. 81-85.

Taylor, John B. "Discretion Versus Policy Rules in Practice." *Carnegie-Rochester Conference Series on Public Policy*, December 1993, *29*, pp. 195-214.

Taylor, John B., ed. *Monetary Policy Rules*. Chicago: University of Chicago Press, 1999a.

Taylor, John B. "Staggered Price and Wage Setting in Macroeconomics," in John B. Taylor and Michael Woodford, eds., *Handbook of Macroeconomics*. Amsterdam: Elsevier Science B.V., 1999b, pp. 1009-50.

Thornton, Daniel L. "When Did the FOMC Begin Targeting the Federal Funds Rate? What the Verbatim Transcripts Tell Us." Working paper, Federal Reserve Bank of St. Louis, August 2004.

Tobin, James. "Stabilization Policy Ten Years After." *Brookings Papers on Economic Activity*, 1980, *1*, pp. 19-71.

Woodford, Michael. *Interest and Prices: Foundations of a Theory of Monetary Policy*. Princeton: Princeton University Press, 2003.

Commentary

Laurence M. Ball

The conference organizers asked Marvin Goodfriend to survey current mainstream thought on monetary policy. Marvin has done this job very well.

I agree with parts of Marvin's paper (Goodfriend, 2005), such as his discussion of explicit interest rate targeting. However, I disagree with many of the paper's major ideas. These ideas are not just Marvin's; they are part of the current consensus among central bankers and economists. In my opinion, this consensus is flawed.

I will organize my discussion around two related questions. First, what has economic theory since 1979 contributed to practical monetary policy? Second, why has Federal Reserve policy been successful since 1979? In particular, in what ways has the Fed performed better than other central banks?

THE CONTRIBUTIONS OF POST-1979 THEORY

One of Marvin's themes is that monetary theory has been "revolutionized" since 1979. Advances in theory have led to great improvements in real-world policy.

This view is common, but it is not universal. A wise man from St. Louis, Laurence Meyer, has a different opinion. In remarks at a National Bureau of Economic Research conference, Meyer revealed his view of the practical usefulness of post-1979 research.

> People ask me what accounts for my success as an economist and economic forecaster, such as it is. I tell them it's everything I learned in graduate school at MIT in the 1960s, plus the fact that I haven't learned much since then.

I think Meyer's assessment of post-1979 research is on target—especially for research on the unemployment-inflation trade-off, or Phillips curve. As Marvin points out, this trade-off is central to the challenges facing monetary policy. In my opinion, the Phillips-curve research that Marvin discusses has little practical value.

Theory Before 1979

Let me give my take on the history of thought. I agree with Marvin that economists were confused during the 1960s. They believed in a long-run trade-off between output and inflation. They also advanced nonmonetary theories of inflation. For example, some suggested that inflation was caused by greedy firms and labor unions, whose behavior could not be controlled by the Fed (see Nelson, 2004).

Fortunately, a genius arrived on the scene: Milton Friedman. Friedman cleared away confusion. He repeatedly explained to us that "inflation is always and everywhere a monetary phenomenon." In 1968, he explained that the output-inflation trade-off exists only in the short run; in the long run, unemployment must gravitate to its natural rate.

Friedman's views were controversial at first, but they were soon absorbed into mainstream thinking. By 1979, U.S. policymakers had learned Friedman's main lessons. The Fed deserves credit for taking only 11 years to apply cutting-edge theory from 1968. (By contrast, David Ricardo explained the benefits of free trade in 1817, and policymakers are still having trouble grasping his point.)

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Friedman didn't just state general principles about the economy. His address to the American Economic Association also included a precise theory of the Phillips curve. It was presented in two famous sentences:

> [T]here is always a temporary trade-off between inflation and unemployment; there is no permanent trade-off. The temporary trade-off comes not from inflation per se, but from unanticipated inflation, which generally means, from a rising rate of inflation. (Friedman, 1968)

Friedman expressed his theory verbally, but we can easily translate it into equations. Friedman's relation between unemployment and surprise inflation is captured by the expectations-augmented Phillips curve:

$$\Pi_t = E_{t-1}\Pi_t - \alpha(U_t - U^*),$$

where U^* is the natural rate of unemployment. The equivalence of unanticipated inflation and rising inflation means expectations are backward-looking:

$$E_{t-1}\Pi_t = \Pi_{t-1}.$$

Plugging this equation into the previous one yields the "accelerationist" Phillips curve:

$$\Pi_t = \Pi_{t-1} - \alpha(U_t - U^*).$$

This equation relates unemployment to the change in inflation.

Thirty-seven years after Friedman wrote, his Phillips curve is still the best simple theory of the unemployment-inflation trade-off.

Research Since 1979

Marvin argues that monetary theory has advanced greatly since 1979. What are the advances? "On the theory side," Marvin says, "the introduction of rational expectations was decisive." More specifically, rational expectations imply a key role for central banks' "credibility" as inflation fighters. In rational expectations models, an increase in credibility shifts the output-inflation trade-off favorably. Thus a major goal for policymakers is to build credibility. This is a theme throughout Marvin's paper, which uses the terms "credibility" and "credible" 33 times (about average for a modern paper on monetary policy).

These ideas have indeed revolutionized economic theory, producing Nobel prizes for Robert Lucas, Finn Kydland, and Edward Prescott, and probably others. However, I question the usefulness of rational expectations models for understanding inflation in the real world. There are several related reasons.

First, suppose one wants to explain the broad history of U.S. inflation since 1979. The accelerationist Phillips curve still seems the best tool for this job. That is, changes in inflation are well explained by short-run movements in unemployment. The deep recession of the early 1980s caused inflation to fall sharply. Inflation rose a bit in the late 1980s as unemployment fell. And inflation fell moderately during the recessions of the early 1990s and 2000s.

If credibility were really important, one would see shifts in inflation that are not explained by unemployment (or obvious supply shocks). In these episodes, changes in credibility would shift the short-run Phillips curve. We haven't seen such episodes in the United States or other countries with moderate inflation. When Sargent (1983) looked for an example, he had to go back to France in the 1920s—and even this case is disputed by historians. The concept of credibility is not useful for explaining the history of inflation.

Researchers have looked for credibility effects in various ways, and most results are negative. Some examples:

- Inflation expectations in the United States are measured by several surveys. These expectations consistently follow actual inflation with a lag. Again, there are no unusual episodes that might be explained by credibility effects.
- In theory, greater credibility reduces the cost of disinflation—the sacrifice ratio. In practice, this doesn't happen. Debelle and Fischer (1994) find that sacrifice ratios are *higher* for central banks that have a higher level of independence, which should be more credible. Sacrifice ratios are especially

high for Germany under the Bundesbank—probably the most credible central bank in history. The sacrifice ratio for the U.S. disinflation of 1990-94, after a decade of credibility building by Volcker and Greenspan, was high compared with previous U.S. disinflations (Zhang, 2001).

- Over the past 15 years, many central banks have adopted inflation targeting. Their stated objectives include greater credibility and anchored inflation expectations. However, cross-country comparisons produce little evidence that inflation targeting changes the behavior of output or inflation (Ball and Sheridan, 2005).

The "New Synthesis" Model

In the past decade, many researchers have converged on a specific model of the economy. Marvin accurately calls it the "modern consensus model." It is sometimes called the "New Neoclassical Synthesis" and sometimes the "New Keynesian Synthesis"— the model is so hot that the Keynesians and Classicals fight over who gets credit for it.

As Marvin discusses, the model is "a dynamic general equilibrium model with a real business cycle core and costly nominal price adjustment." Specifically, the model uses the Taylor/Calvo specification of staggered price setting. The model produces the following version of the Phillips curve:

$$\Pi_t = E_t \Pi_{t+1} - \alpha(U_t - U^*).$$

This equation is the centerpiece of the New Synthesis model.

The New Synthesis model has strong microfoundations. The derivation of the Phillips curve is simple and elegant. It is easy to see why so many graduate students use this model in their dissertations. However, for the purposes of monetary policy, the model has a problem: It is wildly counterfactual.

Mankiw (2001) provides the definitive debunking of the New Synthesis model. He shows that, in the model, a monetary contraction that reduces inflation also causes an output boom. This result is the *opposite* of the common empirical finding that disinflations cause recessions. The source of the theoretical result is a bit subtle: It involves the fact that the Phillips curve includes current expectations of future inflation, not past expectations of current inflation. In any case, the model's absurd predictions make it a poor tool for policy analysis.

As Marvin discusses, researchers have tried to fix the New Synthesis model by adding cost shocks, combining rigidity in wages and prices, and so on. In most cases, the output-inflation trade-off still has the wrong sign. The only thing that works is adding lagged inflation to the Phillips curve. But the New Synthesis model does not justify this term. Adding it is equivalent to ignoring the model and going back to the accelerationist Phillips curve.

WHY HAS THE FED SUCCEEDED (COMPARED WITH OTHER CENTRAL BANKS)?

As President Poole told us, this conference celebrates the Fed's success over the past 25 years. I think the celebratory mood reflects a consensus that the Fed has performed better than most central banks. Like undergraduates, central banks are graded on a curve. So let's discuss how the Fed has outperformed its peers.

The Fed has *not* been unusually successful in reducing inflation. All major countries have done this. Table 1 shows inflation rates in 1979 and 2003 for 18 developed countries. In 1979, inflation ranged from 4 percent in the Netherlands to 24 percent in Portugal; the United States was near the middle of the pack at 11.5 percent. In 2003, most inflation rates were near 2 to 3 percent; the U.S. rate of 2.3 percent was again about average. Since 1979, central banks around the world have been determined to reduce inflation. And it's easy to accomplish this goal if policymakers are willing to slow the economy sufficiently.

What *does* distinguish the Fed's record is the relatively benign behavior of U.S. unemployment. Table 2 gives summary statistics for unemployment since the end of the Volcker disinflation

Table 1

CPI Inflation (%)

Country	1979	2003	Change
Portugal	23.5	3.3	–20.2
Spain	15.7	3.0	–12.7
Italy	14.6	2.7	–11.9
New Zealand	13.7	1.8	–11.9
United Kingdom	13.5	2.9	–10.6
Ireland	13.2	3.5	–9.7
United States	**11.3**	**2.3**	**–9.0**
France	10.7	2.1	–8.6
Denmark	9.6	2.1	–7.5
Finland	7.5	0.9	–6.6
Canada	9.1	2.8	–6.3
Australia	9.1	2.8	–6.3
Sweden	7.2	1.9	–5.3
Japan	3.7	–0.3	–4.0
Germany	4.1	1.1	–3.0
Belgium	4.5	1.6	–2.9
Norway	4.8	2.5	–2.3
Netherlands	4.2	2.1	–2.1

(1984-2003). The first column of the table ranks countries by average unemployment. The U.S. figure of 5.8 percent is in the lower part of the distribution.

Of course it is doubtful whether central banks influence average unemployment. They have greater effects on volatility. The second column of Table 2 ranks countries by the standard deviation of annual unemployment, and here the United States is tied for lowest.

The final column shows the highest annual unemployment rate in each country. This statistic measures central banks' success in avoiding deep recessions. For the United States, the highest unemployment rate is 7.5 percent. This figure is beaten only by Japan (where unemployment is a misleading measure of slack) and Norway (by less than 1 percent). The median of highest unemployment across countries is 10.5 percent. I think the experience of deep recessions is why most central banks are not celebrating the past 25 years.

What Accounts for Moderate Unemployment?

Marvin suggests an explanation for the U.S. unemployment experience. He attributes it to the Fed's determination to control inflation:

> [A] central bank committed to making low inflation a priority can anchor inflation expectations and improve the stability of both inflation and output relative to potential...[T]he unemployment cost (associated with go-stop policy and inflation scares) of *failing* to make low and stable inflation a priority is now well understood. (Goodfriend, 2005, pp. 244, 252)

I think Marvin is off by 180 degrees. The Fed has done better than other central banks because it has *not* been as single-minded about fighting inflation. It has reduced inflation, but it has also paid attention to the real economy. In particular, it has eased aggressively during recessions. This behavior accounts for the Fed's high rankings in Table 2.

This point is clear from a 1994 paper by Romer and Romer, "What Ends Recessions?" Romer and Romer examine the Fed's reaction to each U.S. recession between World War II and the early 1990s. In every case, the Fed cut interest rates sharply near the start of the recession. Volcker and Greenspan were at least as aggressive as their predecessors. Since Romer and Romer's paper, this pattern has continued with the recession of 2001.

Marvin notes the Fed's reaction to the 1980 recession, but he is critical: "[T]he Fed's hesitation to tighten policy at the first sign of recession probably contributed to the inflation scare" (pp. 248). In contrast, Romer and Romer show that Fed easings were essential for ending recessions. And these actions did not conflict with disinflation. In particular, Volcker eased when recessions started in 1980 and 1981, points when inflation was still high. However, because of earlier tightening, there was plenty of disinflation in the monetary pipeline.

I have compared the Fed's responses to recessions with those of other central banks (Ball, 1999). In many countries, policymakers have *not* cut

Table 2

Unemployment 1984-2003

Country	Mean	Country	Standard deviation	Country	Maximum
Japan	3.3	**United States**	**1.1**	Japan	5.4
Norway	4.3	France	1.1	Norway	6.6
Sweden	5.4	Japan	1.1	**United States**	**7.5**
Netherlands	5.6	Italy	1.3	Netherlands	8.9
United States	**5.8**	Belgium	1.4	Portugal	9.2
Portugal	6.1	Australia	1.4	Denmark	9.6
Denmark	6.3	Norway	1.5	Germany	9.7
New Zealand	6.6	Canada	1.5	Sweden	9.9
Germany	7.4	Germany	1.5	New Zealand	10.4
Australia	7.9	Denmark	1.5	Australia	10.6
United Kingdom	8.0	Portugal	1.7	Belgium	10.8
Belgium	8.5	New Zealand	1.9	United Kingdom	11.2
Canada	9.0	Netherlands	1.9	Canada	11.4
Finland	9.3	United Kingdom	2.1	France	11.7
Italy	9.8	Spain	2.9	Italy	11.7
France	9.9	Sweden	2.9	Finland	16.8
Ireland	11.7	Finland	4.3	Ireland	16.8
Spain	15.2	Ireland	4.8	Spain	19.8

interest rates when recessions occurred. Consequently, unemployment has stayed high or risen further.

Let me discuss one example from the United Kingdom. A U.K. recession began in 1979, but the Bank of England kept interest rates high. The Bank explained why in its *Quarterly Bulletin* of June 1980:

> Government fiscal and monetary policies are designed to bring about a progressive reduction in inflation, and need to be continued until that end is accomplished: a less restrictive policy would clearly be inappropriate at a time when inflation is so high...The influence of monetary restraint can only be gradual and pervasive, with effects to be looked for over a period of years.

The Bank of England showed none of the Fed's "hesitation" about tightening during a recession. Policy stayed tight until the mid-1980s.

The main effect of this tough policy was to keep unemployment high. Unemployment stayed above 10 percent through 1986. In the United States, by contrast, unemployment was high in 1982-83 but then fell rapidly. Inflation fell by about the same amount in the two countries, so the United Kingdom's extra unemployment did not accomplish much.

In the 1980s and 1990s, it was common for European central banks to maintain tight policy during recessions. Sometimes the reason was anti-inflationary zeal, as in the United Kingdom. In other cases, such as in France in the 1980s, policymakers wanted to ease but were constrained by the exchange rate mechanism. Either way, excessive tightness produced unnecessary unemployment.

CONCLUSION: THEORY AND PRACTICE

Current monetary theory encourages central banks to focus single-mindedly on fighting infla-

tion. In rational expectations models, this focus benefits the real economy as well as reduces inflation. Unfortunately, there is little evidence that this approach works in the real world.

Many central banks have followed the prescriptions of theory. They have kept policy tight, even during recessions. This behavior has produced long periods of high unemployment.

The Fed's approach to policy has been more balanced. It has tried to control both inflation and unemployment, and it has succeeded. Fortunately, like Laurence Meyer, the Fed has not learned modern theory too well.

REFERENCES

Ball, Laurence. "Aggregate Demand and Long-Run Unemployment." *Brookings Papers on Economic Activity*, 1999, *2*, pp. 189-251.

Ball, Laurence and Sheridan, Niamh. "Does Inflation Targeting Matter?" in Ben S. Bernanke and Michael Woodford, eds., *The Inflation-Targeting Debate*. Chicago: University of Chicago Press, 2005.

Bank of England. *Quarterly Bulletin*, June 1980.

Debelle, Guy and Fischer, Stanley. "How Independent Should a Central Bank Be?" in Jeffrey C. Fuhrer, ed., *Goals, Guidelines, and Constraints Facing Monetary Policymakers*. Boston: Federal Reserve Bank of Boston, 1994.

Friedman, Milton. "The Role of Monetary Policy." *American Economic Review*, March 1968, *58*, pp. 1-17.

Goodfriend, Marvin. "The Monetary Debate Since October 1979: Lessons for Theory and Practice." Federal Reserve Bank of St. Louis *Review*, March/April 2005, *87*(2, Part 2), pp. 243-62.

Mankiw, N. Gregory. "The Inexorable and Mysterious Trade-off Between Unemployment and Inflation." *Economic Journal*, May 2001, *111*(471), pp. C45-61.

Nelson, Edward. "The Great Inflation of the Seventies: What Really Happened?" Working Paper 2004-001, Federal Reserve Bank of St. Louis.

Romer, Christina D. and Romer, David H. "What Ends Recessions?" in Stanley Fischer and Julio J. Rotemberg, eds., *NBER Macroeconomics Annual 1994*. Cambridge, MA: MIT Press, 1994, pp. 13-57.

Sargent, Thomas J. "Stopping Moderate Inflations: The Methods of Poincare and Thatcher," in Rudiger Dornbusch and Mario Henrique Simonsen, eds., *Inflation, Debt, and Indexation*. Cambridge, MA: MIT Press, 1983.

Zhang, Lawrence Huiyan. "Sacrifice Ratios with Long-lived Effects." Working Paper 446, Johns Hopkins University, April 2001.

The International Implications of October 1979: Toward a Long Boom on a Global Scale

John B. Taylor

I am pleased and honored to be here to share my thoughts on the momentous event that occurred on October 6, 1979, and I thank Bill Poole, Bob Rasche, and Dan Thornton for being such gracious hosts. I will argue tonight that the masterful decisions made that day represented a critical first step in reasserting American leadership in economic policy around the world. This leadership, which continues today, has benefited not only the United States but also the entire international community. It has brought forth policies that have increased price stability, lessened fluctuations in output and employment, and promoted longer, more sustained economic expansions around the globe while restoring the dollar as a stable reserve currency.

Anyone who was more than just a casual observer of economic policymaking at the time realized that the measures announced on October 6 represented a major change in the conduct of monetary policy. If pursued to their conclusion, the measures would break the back of a vicious cycle of accelerating prices. If translated into new lasting principles of monetary policy, the specific measures would represent a true "regime" change. However, armed with monetary policy models that incorporated both inflation momentum and rational expectations, I also realized that tighter control of money was going to be associated with considerable economic strain for a period of time—not as bad or as long-lasting a strain as some pessimists had predicted, but a severe strain nonetheless. This would require exceptional fortitude by the Federal Reserve and broad support from elsewhere in the government.

EVENTS PRECEDING OCTOBER 6, 1979

It is difficult today to appreciate how desperate the economic situation had become 25 years ago. It is difficult because the United States has enjoyed a prolonged period—a long boom—of low inflation and long economic expansions since the early 1980s. But by 1979, inflation had moved up to a double-digit pace and threatened to spiral higher. The economy was showing signs of weakness, and many were predicting recession and rising unemployment. The mood in financial markets was becoming one of deep gloom, as the dollar was sinking and interest rates were soaring. Surveys showed that inflation expectations were climbing to unprecedented double-digit levels, and public opinion polls were consistently indicating that inflation was the number one worry.

Needless to say, confidence in U.S. macroeconomic management had been plunging both at home and abroad and had no doubt fallen to a post-World War II low. For its part, the Federal Reserve had been setting ranges for money growth that it thought to be consistent with bringing inflation down. However, it had been overshooting or pressing the upper limits of those ranges regularly. To many observers, the Fed's difficulty in keeping the monetary aggregates within the announced ranges were owed to its operating procedures, which involved actions to move the federal funds rate that were too little and too late, leaving the Fed behind the curve.

On August 6, 1979, a new Chairman of the Fed—Paul Volcker—took office. At first, the arrival of Volcker came as a relief to market participants. Through his public record and statements, Paul

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Volcker was seen to challenge the common wisdom of the time that inflation had favorable effects on employment. Instead, he believed that inflation was a corrosive force that undermined economic performance. His views were consistent with then-new advances in macroeconomics that pointed to the futility of trying to exploit an inflation-unemployment trade-off, and perhaps he was influenced by such views. In any case, many market participants hoped that he would succeed in bringing inflation down. He was experienced, having served for four years as president of the New York Fed and five years as Under Secretary of the Treasury.

However, the confidence of market participants in Volcker's ability to lead the Fed on a disinflationary path was shaken on September 18. On that day the Federal Reserve Board approved a discount rate hike of 50 basis points to accompany a Federal Open Market Committee decision to tighten policy. But the vote, publicly announced, was very close—only four to three—and commentary that followed suggested that the chance of further tightening was all but gone. With money and prices accelerating, the situation looked bleak.

OCTOBER 6, 1979

What followed was one of the most masterful efforts in history by the head of a central bank to deal with a growing national and international problem. In the weeks after the September meeting, Paul Volcker put together a package that received the support of every member of the Board and every Reserve Bank president. It contained three key items: First, a full-percentage-point increase in the discount rate; that appealed to those believing the situation called for another traditional dose of monetary medicine. Second, a marginal reserve requirement on managed liabilities of large banks; that appealed to those who wanted to take action to restrain the surge in bank lending. And third, the new reserve-based operating procedures.

The new operating procedures allowed the Fed to say, with some legitimacy, that it was the market, and not the Fed, that was setting the level of the funds rate. The procedures also appealed to those who believed that a reserve-based operating procedure would result in more timely and sizable interest rate responses to inflation, which would help the Fed stay in front of rather than fall behind the inflationary curve. In retrospect, that may have been the most lasting feature of the October 1979 measures. The procedures also offered more two-way flexibility for prompt downward movements in the federal funds rate, which appealed to those who voted against the September 18 discount rate hike, fearing the economy was already sliding into recession.

THE AFTERMATH OF OCTOBER 6, 1979

The sustained monetary restraint called for by the operating procedures implied a protracted period of economic weakness. It called for a degree of fortitude by Chairman Volcker and his colleagues that had been highly atypical of central banks in the late 1960s and 1970s. This had to have been a very lonely and nerve-wracking period for the Federal Reserve. Stories abound about the daily mail deliveries of scraps of two-by-fours from the ailing construction sector with inscriptions begging for relief, and about angry farmers who circled the Fed building on Constitution Avenue, not to mention the countless letters protesting high interest rates.

Chairman Volcker and his colleagues were resolute for the next couple years, and their efforts, along with subsequent ongoing vigilance to prevent the economy from overheating, paid tremendous dividends for the United States. Core consumer price index inflation, which surpassed 11 percent in 1979, fell to under 5 percent in 1982. It has since been brought down further and held down under Chairman Alan Greenspan's leadership. With this, inflation expectations have marched down to very low levels, while public opinion polls have shown that inflation worries have moved completely off the radar screen.

KNOWLEDGE AND LEADERSHIP

The October 6 events and their immediate aftermath provide a wonderful case study on

implementation of economic policy in practice. In my view, both knowledge and leadership are essential if one is to get the job done. Simply knowing the economic theory or proposing the economic reform is not enough. The Fed, under Chairman Paul Volcker, understood the true seriousness of the inflation problem. They and many others in academia and elsewhere understood the economic forces that were causing the rising inflation that had plagued the United States through much of the 1970s.

But implementing the solution required leadership and skillful coalition-building. As I have emphasized, the measures taken on October 6, 1979, were designed to receive wide support at the FOMC, and they got wide support. Implementation also required a high level of technical knowledge and good operational management within the Fed staff—especially given that the lagged reserve requirements in place at the time were not well suited for reserve-based monetary control. Moreover, implementation required staying the course for several years through very difficult times, and this is where support from elsewhere in the government—both the administration and Congress—was essential.

INTERNATIONAL IMPACTS AND THE SPREAD OF KNOWLEDGE AND LEADERSHIP

The United States was not the only country struggling with inflation in the late 1970s. Inflation had reached double digits in the United Kingdom, Italy, France, and Canada and was even high in Germany. The policy shift by the United States was followed by the United Kingdom, which adopted a monetary targeting framework in March 1980.[1] Many of the other countries, however, held to the view that monetary policy was ineffective in controlling inflation and focused on incomes policies to restrict the growth of wages and prices. These differences in views were evident at the Executive Board of the International Monetary Fund.[2] Over time, however, this shift in focus of monetary policy occurred in all the developed economies and also in many emerging market and developing economies.

To understand this diffusion of knowledge, note that two lasting monetary principles emerged from the specific monetary measures of October 6, 1979, even though the measures themselves ended in 1982. It was these principles that spread around the world.

First is a commitment to price stability. A central bank needs to be committed to price stability, and this view is now widespread. Indeed, according to a recent survey of 94 central banks, 96 percent have price stability as a statutory goal.[3] A milestone in this area occurred in 1989, when New Zealand adopted legislation that required the central bank, in consultation with the government, to set an inflation target, a change that was followed by other countries. By 1998, 54 central banks had set inflation targets.[4]

Second is the focus of central banks on more systematic and transparent procedures for setting the policy instruments in a way that will bring about the goal of price stability. Both theory and empirical studies indicate that monetary control is easier if monetary policy objectives are seen as credible, enabling economic agents to adjust their behavior to those objectives, and policy transparency has enhanced credibility. In comparing the pre- and post-October 1979 periods, one finds that monetary policy in the United States has become more responsive both to changes in inflation and changes in output. During the late 1960s and the 1970s, a 1-percentage-point rise in the rate of inflation resulted on average in a less than 1-percentage-point rise in the federal funds rate. Since then, the federal funds rate has increased by more than 1 percentage point for every 1-percentage-point rise in inflation. This difference is of fundamental importance. If the federal funds rate rises by less than the inflation rate, real

[1] Goodhart (2005) notes that the Bank of England was considering changing its operating procedures in 1979.

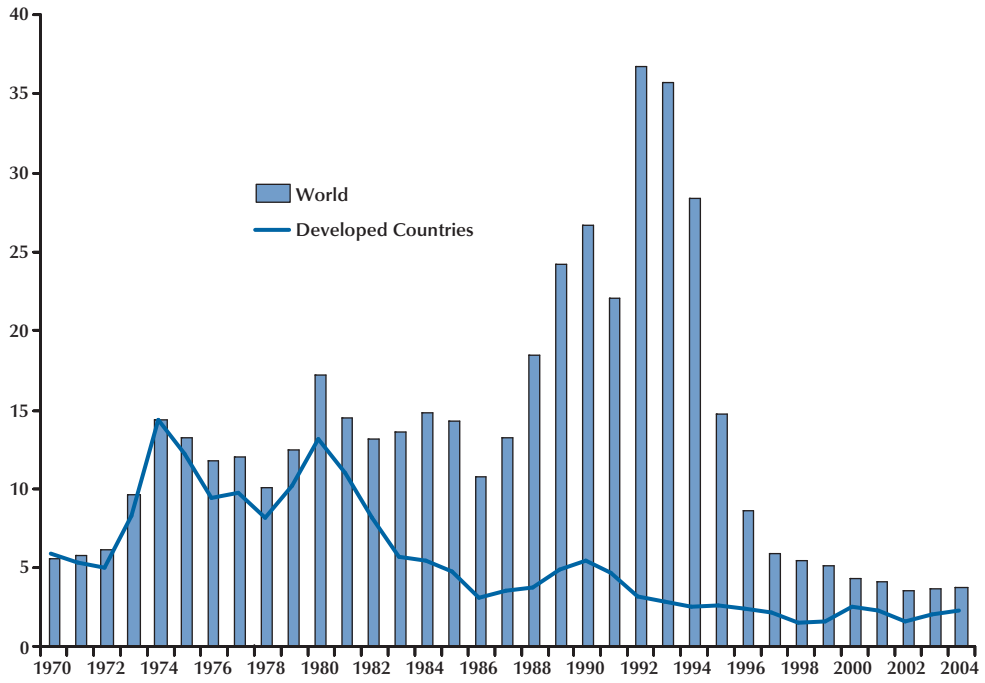
[2] Boughton (2001).

[3] Mahadeva and Sterne (2000).

[4] Mahadeva and Sterne (2000).

Figure 1

Consumer Price Inflation (1970-2004)



SOURCE: IMF, International Financial Statistics, and World Economic Outlook.

interest rates decline. It was this failure to focus on real interest rates that allowed inflation to accelerate in the 1970s. This greater responsiveness is not unique to the United States but also has been observed in other countries.[5]

The focus on price stability and on accompanying policy procedures has resulted in a sustained decline in inflation throughout the world (see Figure 1). The developed economies showed a declining trend after 1980. Inflation in these economies fell from an average of 13 percent in 1980 to 2 percent in 1997 and has remained close to 2 percent since then—tracking closely the experience in the United States.

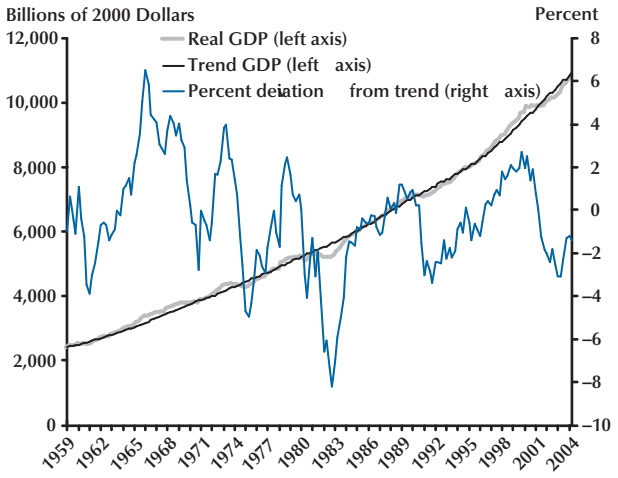
Inflation in the emerging markets remained persistently high well after the drop in the developed economies. By the mid-1990s, however, the changes in the monetary policy process had become more common throughout the world. The deceleration in inflation has been amazing. As recently as 1994, inflation in the emerging markets averaged 65 percent; over the past four years, in contrast, it has been around 6 percent.

As inflation has declined, so has its variability. In the developed economies, inflation variability, as measured by its standard deviation, fell from 3.4 percent in the 1980s to 1.3 percent in the 1990s and so far this decade is less than 1 percent. In the emerging markets the variability of inflation fell from 24 percent in the 1990s to less than 1 percent this decade. There is now little difference between the variability of inflation in the developed and emerging economies. This remarkable accomplishment is a direct result of the changes in the monetary policy process that began 25 years ago.

[5] Clarida, Galí, and Gertler (1998).

Figure 2

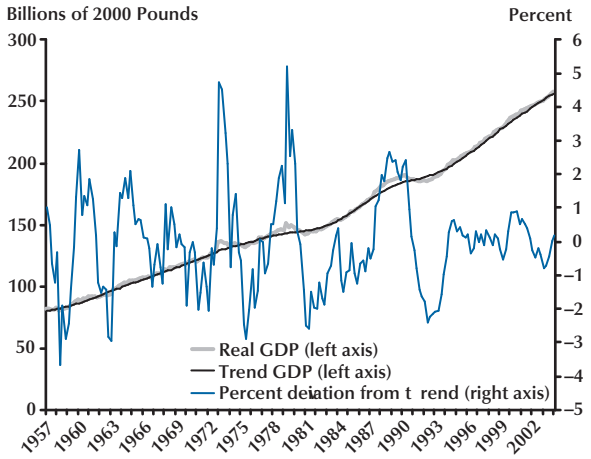
U.S. Real GDP (percent deviation from trend)



SOURCE: Bureau of Economic Analysis and the Congressional Budget Office.

Figure 3

United Kingdom Real GDP (percent deviation from trend)



SOURCE: IMF, International Financial Statistics, and the U.S. Treasury.

REDUCTION IN OUTPUT VOLATILITY AND THE LONG BOOM

Impressive as these results are, they are only one part of a good story. At about the same time that the Fed was implementing the famous October 6 measures, I published a paper with an estimate of an efficiency frontier between the variability of inflation and output, noting that, with policy in place up until that time, the United States was off the frontier.[6] Looking at the evidence, it is clear that since then we have either gotten closer to the frontier or that the frontier itself has shifted in a favorable direction. In other words, output variability has declined along with inflation variability.

In a Homer Jones Lecture I gave several years ago, I referred to this period of low output volatility in the United States as the "long boom" (see Figure 2). The "great moderation" is another term that has been used to describe the same phenomenon. Since 1955 there have been eight recessions, as determined by the National Bureau of Economic Research (NBER). Two things stand out about the recent recessions. First, they were relatively mild. The average decline in output from peak to trough in the previous six recessions was 2.0 percent. Output in the 1990 recession declined by 1.3 percent. In 2001, output rose slightly (0.5 percent) from (the quarter of the) NBER peak to (the quarter of the) trough. Second, these two recessions were relatively short; both lasted less than eight months. The six previous recessions lasted slightly more than an average of 11 months. Equally important, the past two expansions were the longest peacetime expansions over the entire NBER measurement period that began in 1854. The most recent expansion lasted 120 months, surpassing by 14 months the expansion of the 1960s during the Vietnam War era.

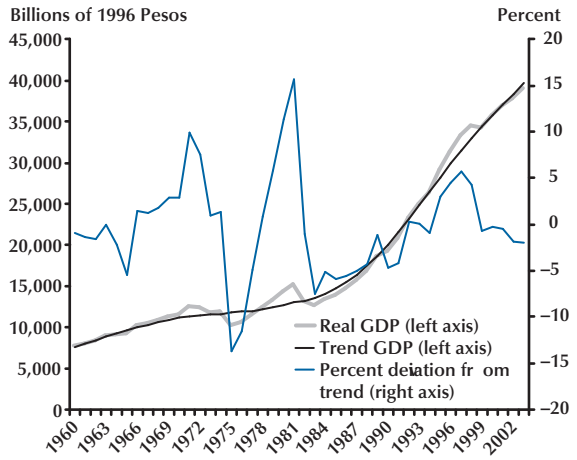
The same phenomenon is found in other counties. In the developed economies as a whole the variability of the real gross domestic product (GDP) (measured as a deviation from trend) fell from 1.8 percent in the 1980s to 1.0 percent in the 1990s and has remained steady since then.[7] The

[6] Taylor (1979).

[7] Trend output is calculated using a Hodrick-Prescott filter.

Figure 4

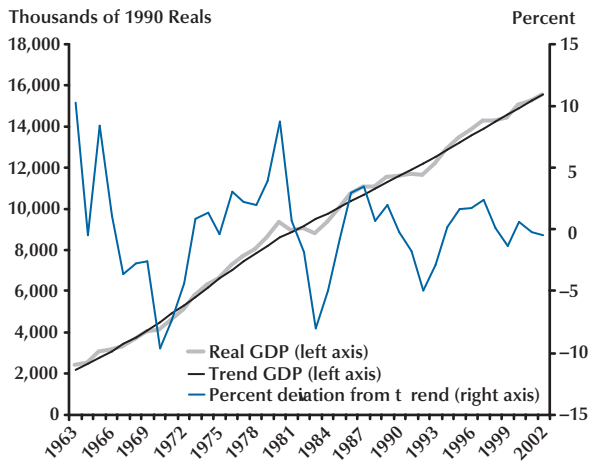
Chile Real GDP (percent deviation from trend)



SOURCE: IMF, International Financial Statistics, and the U.S. Treasury.

Figure 5

Brazil Real GDP (percent deviation from trend)



SOURCE: IMF, International Financial Statistics, and the U.S. Treasury.

experience of the United Kingdom (see Figure 3) is particularly impressive. Since 1992 the United Kingdom has not had a single quarter of negative output growth, as measured by the quarter-to-quarter changes in real gross domestic product. Over the last $4^1/_2$ years, output volatility has only been about 50 basis points.

In the emerging markets, the decline in inflation is still recent, but some emerging market economies have already seen a lowering of the variability of output. In Chile (see Figure 4), output variability declined by half in the 1990s. In Brazil (see Figure 5), output variability has begun to decline, too. I am optimistic that, given continued progress by the emerging markets in maintaining low and stable inflation, these economies will experience a longer boom over the course of this decade.

Several arguments are often cited for the improvement in the output-inflation variability frontier. According to the "good luck" argument, the number and magnitude of shocks hitting the world economy have declined. According to the "structural change" argument, supply shocks have a less pronounced effect on the economy as a result of changes in the structure of the economy. Some changes often cited include an increase in the services sector's share in the economy and improvements in inventory management.

I prefer a policy explanation closely connected to the monetary policy changes that began in October 1979. Reducing substantially the boom-bust cycle has been an important contributor. Recessions in the postwar period typically have been preceded by rises in the rate of inflation. Thus, by keeping inflation low, monetary policy has reduced the likelihood of recessions. Moreover, ending inflation and keeping inflation expectations low has given central banks the credibility to address adverse supply shocks. In the past, in the face of an oil price shock, central bankers were faced with the vexing choice of whether to cushion the loss in output or resist the upward pressure on prices. If they pursued the former, they risked dealing with higher and more entrenched inflation expectations. In contrast, around the globe today, people have become more confident that central banks are not going to allow such shocks to feed into more long-term inflation. As a result, central banks can respond more to the output and employment effects.

It is informative to contrast the discussion of policy responses to the recent run-up in oil prices with discussions that took place in the early 1990s. At that earlier time, there was the widespread view that central banks had to steer a narrow course and provide resistance to the price-level effects of the shock so as to avoid reigniting inflation expectations. Today, the anti-inflation credibility earned over the past couple decades has served to anchor inflation expectations and give central banks more leeway to cushion the output effects.

CONCLUSION

In sum, reflection on the international implications of the momentous event of October 1979 in the United States reveals powerful lessons. I am convinced that the hard-fought gains from new policies that began to be adopted then will continue to pay large dividends in the future. As long as monetary policymakers retain the lessons learned, the long boom that more and more countries are experiencing around the world will be sustainable at a global scale. By remaining vigilant against inflation, central bankers will be able to keep inflation expectations low, giving them more scope to counter shocks. And the more stable economic and financial environment will foster more productivity-enhancing business decisions.

I am optimistic that policymakers in emerging markets and developing countries are learning these lessons as well. Given the hyperinflation and economic instability these countries have experienced in the past, the rewards from better policy are huge. During the past few years, I have worked closely with policymakers in many countries. We have consistently supported these leaders as they implement policies that promote price stability and transparent systematic procedures for adjusting policy instruments. I am convinced these principles will bring substantial long-term benefits to this part of the world, too.

REFERENCES

Boughton, James. *Silent Revolution: The International Monetary Fund 1979-1989*. Washington, DC: International Monetary Fund, 2001.

Clarida, Richard; Galí, Jordi and Gertler, Mark. "Monetary Policy Rules in Practice: Some International Evidence." *European Economic Review*, 1998, *42*(6), pp. 1033-67.

Goodhart, Charles A.E. "Panel Discussion II: Safeguarding Good Policy Practice." Federal Reserve Bank of St. Louis *Review*, March/April 2005, *87*(2, Part 2), pp. 298-302.

Mahadeva, Lavan and Sterne, Gabriel. *Monetary Frameworks in a Global Context*. New York: Routledge, 2000.

Taylor, John B. "Estimation and Control of a Macroeconomic Model with Rational Expectations." *Econometrica*, September 1979, *47*(5), pp. 1267-86.

Panel Discussion I

What Have We Learned Since October 1979?

Ben S. Bernanke

The question asked of this panel is, "What have we learned since October 1979?" The evidence suggests that we have learned quite a bit. Most notably, monetary policymakers, political leaders, and the public have been persuaded by two decades of experience that low and stable inflation has very substantial economic benefits.

This consensus marks a considerable change from the views held by many economists at the time that Paul Volcker became Fed Chairman. In 1979, most economists would have agreed that, in principle, low inflation promotes economic growth and efficiency in the long run. However, many also believed that, in the range of inflation rates typically experienced by industrial countries, the benefits of low inflation are probably small—particularly when set against the short-run costs of a major disinflation, as the United States faced at that time. Indeed, some economists would have held that low-inflation policies would likely prove counterproductive, even in the long run, if an increased focus on inflation inhibited monetary policymakers from responding adequately to fluctuations in economic activity and employment.

As it turned out, the low-inflation era of the past two decades has seen not only significant improvements in economic growth and productivity but also a marked *reduction* in economic volatility, both in the United States and abroad, a phenomenon that has been dubbed "the Great Moderation." Recessions have become less frequent and milder, and quarter-to-quarter volatility in output and employment has declined significantly as well. The sources of the Great Moderation remain somewhat controversial, but, as I have argued elsewhere, there is evidence for the view that improved control of inflation has contributed in important measure to this welcome change in the economy (Bernanke, 2004). Paul Volcker and his colleagues on the Federal Open Market Committee deserve enormous credit both for recognizing the crucial importance of achieving low and stable inflation and for the courage and perseverance with which they tackled America's critical inflation problem.

I could say much more about Volcker's achievement and its lasting benefits, but I am sure that many other speakers will cover that ground. Instead, in my remaining time, I will focus on some lessons that economists have drawn from the Volcker regime regarding the importance of credibility in central banking and how that credibility can be obtained. As usual, the views I will express are my own and are not necessarily shared by my colleagues in the Federal Reserve System.

Volcker could not have accomplished what he did, of course, had he not been appointed to the chairmanship by President Jimmy Carter. In retrospect, however, Carter's appointment decision seems at least a bit incongruous. Why would the President appoint as head of the central bank an individual whose economic views and policy goals (not to mention personal style) seemed, at least on the surface, quite different from his own? However, not long into Volcker's term, a staff economist at the Board of Governors produced a paper that explained why Carter's decision may in

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fact have been quite sensible from the President's, and indeed the society's, point of view. Although the question seems a narrow one, the insights of the paper had far broader application; indeed, this research has substantially advanced our understanding of the links among central bank credibility, central bank structure, and the effectiveness of monetary policy.

Insiders will have already guessed that the Board economist to whom I refer is Kenneth Rogoff, currently a professor of economics at Harvard, and that the paper in question is Ken's 1985 article, "The Optimal Degree of Commitment to an Intermediate Monetary Target" (Rogoff, 1985).[1] The insights of the Rogoff paper are well worth recalling today. Rather than considering the paper in isolation, however, I will place it in the context of two other classic papers on credibility and central bank design, an earlier work by Finn Kydland and Edward Prescott and a later piece by Carl Walsh. As I proceed, I will note what I see to be the important lessons and the practical implications of this line of research.[2]

Central bankers have long recognized at some level that the credibility of their pronouncements matters. I think it is fair to say, however, that in the late 1960s and 1970s, as the U.S. inflation crisis was building, economists and policymakers did not fully understand or appreciate the determinants of credibility and its link to policy outcomes. In 1977, however, Finn Kydland and Edward Prescott published a classic paper, entitled "Rules Rather than Discretion: The Inconsistency of Optimal Plans" (Kydland and Prescott, 1977), that provided the first modern analysis of these issues.[3] Specifically, Kydland and Prescott demonstrated why, in many situations, economic outcomes will be better if policymakers are able to make credible commitments, or promises, about certain aspects of the policies they will follow in the future. "Credible" in this context means that the public believes that the policymakers will keep their promises, even if they face incentives to renege.

In particular, as one of Kydland and Prescott's examples illustrates, monetary policymakers will generally find it advantageous to commit publicly to following policies that will produce low inflation. If the policymakers' statements are believed (that is, if they are credible), then the public will expect inflation to be low and demands for wage and price increases should accordingly be moderate. In a virtuous circle, this cooperative behavior by the public makes the central bank's commitment to low inflation easier to fulfill. In contrast, if the public is skeptical of the central bank's commitment to low inflation (for example, if it believes that the central bank may give in to the temptation to overstimulate the economy for the sake of short-term employment gains), then the public's inflation expectations will be higher than they otherwise would be. Expectations of high inflation lead to more aggressive wage and price demands, which make achieving and maintaining low inflation more difficult and costly (in terms of lost output and employment) for the central bank.

Providing a clear explanation of why credibility is important for effective policymaking, as Kydland and Prescott did, was an important step. However, these authors largely left open the critical issue of how a central bank is supposed to obtain credibility in the first place. Here is where Rogoff's seminal article took up the thread.[4] Motivated by

[1] Rogoff's paper was widely circulated in 1982, a sad commentary on publication lags in economics.

[2] In focusing on three landmark papers, I necessarily ignore what has become an enormous literature on credibility and monetary policy. Walsh (2003, Chap. 8) provides an excellent overview. Rogoff (1987) was an important early survey of the "first generation" of models of credibility in the context of central banking.

[3] In another noteworthy paper, Calvo (1978) made a number of points similar to those developed by Kydland and Prescott (1977). The extension of the Kydland-Prescott "inflation bias" by Barro and Gordon (1983a) has proved highly influential.

[4] Rogoff was my graduate school classmate at M.I.T., and I recently asked him for his recollections about the origins of the "conservative" central banker. Here (from a personal e-mail) is part of his response:

> [T]he paper was mainly written at the Board in 1982…It came out as an IMF working paper in February 1983 (I was visiting there), and then the same version came out as an International Finance Discussion paper [at the Board of Governors] in September 1983…The original version of the paper…featured inflation targeting. Much like the published paper, I suggested that having an independent central bank can be a solution to the time consistency [that is, credibility] problem if we give the bank an intermediate target and some (unspecified) incentive to hit the target…I had the conservative central banker idea in there as well, as one practical way to ensure the central bank placed a high weight on inflation. Larry Summers, my editor at the [*Quarterly Journal of Economics*], urged me to move that idea up to the front

the example of Carter and Volcker, Rogoff's paper showed analytically why even a President who is not particularly averse to inflation, or at least no more so than the average member of the general public, might find it in his interest to appoint a well-known "inflation hawk" to head the central bank. The benefit of appointing a hawkish central banker is the increased inflation-fighting credibility that such an appointment brings. The public is certainly more likely to believe an inflation hawk when he promises to contain inflation because they understand that, as someone who is intrinsically averse to inflation, he is unlikely to renege on his commitment. As increased credibility allows the central bank to achieve low inflation at a smaller cost than a noncredible central bank can, the President may well find, somewhat paradoxically, that he prefers the economic outcomes achieved under the hawkish central banker to those that could have been obtained under a central banker with views closer to his own and those of the public.

Appointing an inflation hawk to head the central bank may not be enough to ensure credibility for monetary policy, however. As Rogoff noted in his article, for this strategy to confer significant credibility benefits, the central bank must be perceived by the public as being sufficiently independent from the rest of the government to be immune to short-term political pressures. Thus Rogoff's proposed strategy was really two-pronged: The appointment of inflation-averse central bankers must be combined with measures to ensure central bank independence. These ideas, supported by a great deal of empirical work, have proven highly influential.[5] Indeed, the credibility benefits of central bank autonomy have been widely recognized in the past 20 years, not only in the academic literature but, far more consequentially, in the real-world design of central banking institutions. For example, in the United Kingdom, the euro area, Japan, and numerous other places, recent legislation or other government action has palpably strengthened the independence of the central banks.[6]

Rogoff's proposed solution to the credibility problems of central banks does have some limitations, however, as Ken recognized both in his paper and in subsequent work. First, although an inflation-averse central banker enhances credibility and delivers lower inflation on average, he may not respond to shocks to the economy in the socially desirable way. For example, faced with an aggregate supply shock (such as a sharp rise in oil prices), an inflation-averse central banker will tend to react too aggressively (from society's point of view) to contain the inflationary impact of the shock, with insufficient attention to the consequences of his policy for output and employment.[7] Second, contrary to an assumption of Rogoff's paper, in practice, the policy preferences of a newly appointed central banker will not be precisely known by the public but must be inferred from policy actions. (Certainly the public's perceptions of Chairman Volcker's views and objectives evolved over time.) Knowing that the public must make such inferences might tempt a central banker to misrepresent the state of the economy (Canzoneri, 1985) or even to take suboptimal policy decisions; for example, the central banker may feel compelled to tighten policy more aggres-

section and place inflation targeting second. This, of course, is how the paper ended up.

[Regarding the Fed], Dale Henderson and Matt Canzoneri liked the paper very much…[M]any other researchers gave me feedback on my paper (including Peter Tinsley, Ed Offenbacher, Bob Flood, Jo Anna Gray, and many others)… Last but perhaps most important, there is absolutely no doubt that the paper was inspired by my experience watching the Volcker Fed at close range. I never would have written it had I not…ended up as an economist at the Board.

[5] Walsh (2003, Section 8.5) reviews empirical research on the correlations of central bank independence and economic outcomes. A consistent finding is that more-independent central banks produce lower inflation without any increase in output volatility.

[6] The benefits of central bank independence should not lead us to ignore its downside, which is that the very distance from the political process that increases the central bank's policy credibility by necessity also risks isolating the central bank and making it less democratically accountable. For this reason, central bankers should make communication with the public and their elected representatives a high priority. Moreover, central bank independence does not imply that central banks should never coordinate with other parts of the government, under the appropriate circumstances.

[7] Lohmann (1992) shows that this problem can be ameliorated if the government limits the central bank's independence, stepping in to override the central bank's decisions when the supply shock becomes too large. However, to preserve the central bank's independence in normal situations, this approach would involve stating clearly in advance the conditions under which the government would intercede, which may not be practicable.

sively than is warranted in order to convince the public of his determination to fight inflation. The public's need to infer the central banker's policy preferences may even generate increased economic instability, as has been shown in a lively recent literature on the macroeconomic consequences of learning.[8]

The third pathbreaking paper I will mention today, a 1995 article by Carl Walsh entitled "Optimal Contracts for Central Bankers," was an attempt to address both of these issues.[9] To do so, Walsh conducted a thought experiment. He asked his readers to imagine that the government or society could offer the head of the central bank a performance contract, one that includes explicit monetary rewards or penalties that depend on the economic outcomes that occur under his watch. Remarkably, Walsh showed that, in principle, a relatively simple contract between the government and the central bank would lead to the implementation of monetary policies that would be both credible and fully optimal. Under this contract, the government provides the central banker with a base level of compensation but then applies a penalty that depends on the realized rate of inflation—the higher the observed inflation rate, the greater the penalty.

If the public understands the nature of the contract and if the penalty assessed for permitting inflation is large enough to affect central bank behavior, the existence of the contract would give credence to central bank promises to keep the inflation rate low (that is, the contract would provide credibility).[10] Walsh's contract has in common with Rogoff's approach the idea that, in a world of imperfect credibility, giving the central banker an objective function that differs from the true objectives of society may be useful. However, Walsh also shows that the contracting approach ameliorates the two problems associated with Rogoff's approach. First, under the Walsh contract, the central banker has incentives not only to achieve the target rate of inflation but also to respond in the socially optimal manner to supply shocks.[11] Second, as the inflation objective and the central banker's incentive scheme are made explicit by the contract, the public's problem of inferring the central banker's policy preferences is significantly reduced.

There have been a few attempts in the real world to implement an incentive contract for central bankers—most famously a plan proposed to the New Zealand legislature, though never adopted, which provided for firing the governor of the central bank if the inflation rate deviated too far from the government's inflation objective.[12] But Walsh's contracts are best treated as a metaphor rather than as a literal proposal for central bank reform. Although the pay of central bankers is unlikely ever to depend directly on the realized rate of inflation, central bankers, like most people, care about many other aspects of their jobs, including their professional reputations, the prestige of the institutions in which they serve, and the probability that they will be reappointed.

Walsh's analysis and many subsequent refinements by other authors suggest that central bank performance might be improved if the government set explicit performance standards for the central bank (perhaps as part of the institution's charter or enabling legislation) and regularly compared objectives and outcomes. Alternatively, because central banks may possess the greater expertise in determining what economic outcomes are both feasible and most desirable, macroeconomic goals might be set through a joint exercise of the govern-

[8] Evans and Honkopohja (2001) is the standard reference on learning in macroeconomics. Recent papers that apply models of learning to the analysis of U.S. monetary policy include Erceg and Levin (2001) and Orphanides and Williams (forthcoming).

[9] Persson and Tabellini (1993) provided an influential analysis of the contracting approach that extended and developed many of the points made by Walsh (1995).

[10] An objection to this conclusion is that, although the central bank's incentives are made clear by the contract, the public might worry that the government might renege on its commitment to low inflation by changing the contract. Those who discount this concern argue that changing the contract in midstream would be costly for the government, because laws once enacted are difficult to modify and because changing an established framework for policy in an opportunistic way would be politically embarrassing.

[11] A key assumption underlying this result is that the central banker cares about the state of the economy as well as about the income provided by his incentive contract.

[12] In personal communications, Walsh reports to me that he was visiting a research institute in New Zealand at the time of these discussions. Walsh's reflection on the New Zealand proposals helped to inspire his paper.

ment and the central bank. Many countries have established targets for inflation, for example, and central bankers in those countries evidently make strong efforts to attain those targets. The Federal Reserve Act does not set quantitative goals for the U.S. central bank, but it does specify the objectives of price stability and maximum sustainable employment and requires the central bank to present semiannual reports to the Congress on monetary policy and the state of the economy. Accountability to the public as well as to the legislature is also important; for this reason, the central bank should explain regularly what it is trying to achieve and why. In sum, Walsh's paper can be read as providing theoretical support for an explicit, well-designed, and transparent framework for monetary policy, one which sets forth the objectives of policy and holds central bankers accountable for reaching those objectives (or at least for providing a detailed and plausible explanation of why the objectives were missed).

In the simple model that Walsh analyzes, the optimal contract provides all the incentives needed to induce the best possible monetary policy, so that appointing a hawkish central banker is no longer beneficial. However, in practice—because Walsh's optimal contracts can be roughly approximated at best, because both the incentives and the policy decisions faced by central bankers are far more complex than can be captured by simple models, and because the appointment of an inflation-averse central banker may provide additional assurance to the public that the government and the central bank will keep their promises—the Walsh approach and the Rogoff approach are almost certainly complementary.[13] That is, a clear, well-articulated monetary policy framework, inflation-averse central bankers, and autonomy for central banks in the execution of policy are all likely to contribute to increased central bank credibility and hence better policy outcomes. Of course, other factors that I could not cover in this short review, such as the central bank's reputation for veracity as established over time, may also strengthen its credibility (Barro and Gordon, 1983b; Backus and Driffill, 1985).[14]

Let me end where I began, with reference to Paul Volcker and his contributions. I have discussed today how Volcker's personality and performance inspired one seminal piece of research about the determinants of central bank credibility. In focusing on a few pieces of academic research, however, I have greatly understated the impact of the Volcker era on views about central banking. The Volcker disinflation (and analogous episodes in the United Kingdom, Canada, and elsewhere) was undoubtedly a major catalyst for an explosion of fresh thinking by economists and policymakers about central bank credibility, how it is obtained, and its benefits for monetary policymaking. Over the past two decades, this new thinking has contributed to a wave of changes in central banking, particularly with respect to the institutional design of central banks and the establishment of new frameworks for the making of monetary policy.

Ironically, the applicability of the ideas stimulated by the Volcker chairmanship to the experience of the U.S. economy under his stewardship remains unclear. Though the appointment of Volcker undoubtedly increased the credibility of the Federal Reserve, the Volcker disinflation was far from a costless affair, being associated with a minor recession in 1980 and a deep recession in 1981-82.[15] Evidently, Volcker's personal credibility notwithstanding, Americans' memories of the inflationary 1970s were too fresh for their inflation expectations to change quickly. It is difficult to know whether alternative tactics would have helped; for example, the announcement of explicit inflation objectives (which would certainly have been a radical idea at the time) might have helped guide inflation expectations downward more quickly, but they might also have created a political backlash that would have doomed the entire effort. Perhaps no policy approach or set of institutional

[13] Several authors have shown this point in models in which the inflation bias arising from noncredible policies differs across states of nature; see, for example, Herrendorf and Lockwood (1997) and Svensson (1997).

[14] But see Rogoff (1987) for a critique of models of central bank reputation.

[15] Evidence on the behavior of inflation expectations after 1979 supports the view that the public came to appreciate only very gradually that Volcker's policies represented a break from the immediate past (Erceg and Levin, 2001).

arrangements could have eliminated the 1970s inflation at a lower cost than was actually incurred. If so, then the significance of Paul Volcker's appointment was not its immediate effect on expectations or credibility but rather that he was one of the rare individuals tough enough and with sufficient foresight to do what had to be done. By doing what was necessary to achieve price stability, the Volcker Fed laid the groundwork for two decades, so far, of strong economic performance.

REFERENCES

Backus, David and Driffill, John. "Inflation and Reputation." *American Economic Review*, June 1985, *75*(3), pp. 530-38.

Barro, Robert J. and Gordon, David B. "A Positive Theory of Monetary Policy in a Natural Rate Model." *Journal of Political Economy*, August 1983a, *91*(4), pp. 589-610.

Barro, Robert J. and Gordon, David B. "Rules, Discretion, and Reputation in a Model of Monetary Policy." *Journal of Monetary Economics*, July 1983b, *12*(1), pp. 101-21.

Bernanke, Ben S. "The Great Moderation." Remarks before the Eastern Economic Association, Washington, DC, February 20, 2004.

Calvo, Guillermo A. "On the Time Consistency of the Optimal Policy in a Monetary Economy." *Econometrica*, November 1978, *46*(6), pp. 1411-28.

Canzoneri, Matthew B. "Monetary Policy Games and the Role of Private Information." *American Economic Review*, September 1985, *75*(5), pp. 547-64.

Erceg, Christopher J. and Levin, Andrew T. "Imperfect Credibility and Inflation Persistence." Finance and Economics Discussion Series 2001-45, Board of Governors of the Federal Reserve System, October 2001.

Evans, George W. and Honkopohja, Seppo. *Learning and Expectations in Macroeconomics*. Princeton, NJ: Princeton University Press, 2001.

Herrendorf, Berthold and Lockwood, Ben. "Rogoff's 'Conservative' Central Banker Restored." *Journal of Money, Credit, and Banking*, November 1997, *29*(4, Part 1), pp. 476-95.

Kydland, Finn E. and Prescott, Edward C. "Rules Rather than Discretion: The Inconsistency of Optimal Plans." *Journal of Political Economy*, *85*(3), June 1977, pp. 473-92.

Lohmann, Suzanne. "Optimal Commitment in Monetary Policy: Credibility versus Flexibility." *American Economic Review*, March 1992, *82*(1), pp. 273-86.

Orphanides, Athanasios and Williams, John C. "Imperfect Knowledge, Inflation Expectations, and Monetary Policy," in Ben S. Bernanke and Michael D. Woodford, eds., *The Inflation Targeting Debate*. Chicago, IL: University of Chicago Press for NBER (forthcoming).

Persson, Torsten and Tabellini, Guido. "Designing Institutions for Monetary Stability." *Carnegie-Rochester Conference Series on Public Policy*, December 1993, *39*, pp. 53-84.

Rogoff, Kenneth. "The Optimal Degree of Commitment to an Intermediate Monetary Target." *Quarterly Journal of Economics*, November 1985, *100*(4), pp. 1169-89.

Rogoff, Kenneth. "Reputational Constraints on Monetary Policy." *Carnegie-Rochester Conference Series on Public Policy*, Spring 1987, *26*, pp. 141-82.

Svensson, Lars E.O. "Optimal Inflation Contracts, 'Conservative' Central Banks, and Linear Inflation Contracts." *American Economic Review*, March 1997, *87*(1), pp. 98-114.

Walsh, Carl E. "Optimal Contracts for Central Bankers." *American Economic Review*, March 1995, *85*(1), pp. 150-67.

Walsh, Carl E. *Monetary Theory and Policy*. Second Ed. Cambridge, MA: MIT Press, 2003.

What Have We Learned Since October 1979?

Alan S. Blinder

My good friend Ben Bernanke is always a hard act to follow. When I drafted these remarks, I was concerned that Ben would take all the best points and cover them extremely well, leaving only some crumbs for Ben McCallum and me to pick up. But his decision to concentrate on one issue—central bank credibility—leaves me plenty to talk about.

Because Ben was so young in 1979, I'd like to begin by emphasizing that Paul Volcker retaught the world something it seemed to have forgotten at the time: that *tight monetary policy can bring inflation down at substantial, but not devastating, cost*. It seems strange to harbor contrary thoughts today, but back then many people believed that 10 percent inflation was so deeply ingrained in the U.S. economy that we might be doomed to, say, 6 to 10 percent inflation for a very long time. For example, Otto Eckstein (1981, pp. 3-4) wrote in a well-known 1981 book that "To bring the core inflation rate down significantly through fiscal and monetary policies alone would require a prolonged deep recession bordering on depression, with the average unemployment rate held above 10%." More concretely, he estimated that it would require 10 point-years of unemployment to bring the core inflation rate down a single percentage point,[1] which is about five times more than called for by the "Brookings rule of thumb."[2] As it turned out, the Volcker disinflation followed the Brookings rule of thumb rather well. About 14 cumulative percentage point–years of unemployment above the nonaccelerating inflation rate of unemployment (NAIRU) drove core inflation down by 6.2 percentage points over the six years spanning 1980 to 1985.[3] Yes, disinflation hurt, but much less than what the pessimists envisioned. Volcker may have enhanced the Fed's credibility; I certainly think so. But that did not improve the inflation-unemployment trade-off.

The forced march of core inflation down from 10 percent to 4 percent in the early 1980s taught us a second lesson that, I believe, is the essence of Paul Volcker's legacy: that *sometimes the central bank has to be single-minded about fighting inflation*, and that the strong will of a determined leader like Volcker is one key ingredient. When Volcker took the helm, the nation's problem was clear—too much inflation—and so was the solution—sustained tight money. It only required someone with iron will to apply the solution to the problem. Lindsey, Orphanides, and Rasche (2005) ask at this conference whether Volcker was a monetarist, a Keynesian, an inflation targeter, and so on. They seem to answer no in each case. To me, the right short characterization of Paul Volcker as Chairman of the Fed is simple: He was a highly principled and determined inflation hawk.

I would like to contrast these two Volcker lessons, which are the foci of this conference, with two quite different lessons that we can take away from the Greenspan era. The first is that, in apparent contradiction to what I just said, *flexibility in monetary policy is very important*. The contradiction is only apparent, not actual, because the worlds faced by Paul Volcker and Alan Greenspan were starkly different. During the Greenspan years, inflation has flared up only once, in 1990-91, and then only briefly. Instead, Greenspan has faced, among other things, two severe stock market crashes, a period of fragile bank balance sheets in the early 1990s, the rolling international financial

[1] Eckstein (1981, p. 46).

[2] This rule of thumb was due to a number of members of the Brookings Panel on Economic Activity in the 1970s, including Arthur Okun, George Perry, and William Nordhaus, but especially arose from a series of papers by Robert Gordon.

[3] The calculation assumes a NAIRU of 5.8 percent, which was the actual unemployment rate of 1979.

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crises of 1997 and 1998,[4] the surprising productivity acceleration after 1995, a brief flirtation with deflation, and the need to pull off several "soft landings." Excruciatingly tight money was not the right solution to any of these problems. I daresay that history will not remember Alan Greenspan as the man who took 17 years to bring inflation down from 4 percent to 2 percent. Rather, it will remember him as the Fed Chairman who dealt so well with a remarkable variety of difficult challenges over a prolonged period of time.

Here's a test. Try a little mental free-association with the phrase "accomplishments of Paul Volcker as Chairman of the Fed."[5] I think all of you will immediately think of "conquering inflation," or something synonymous with that. Now try "accomplishments of Alan Greenspan as Chairman of the Fed." Here there are so many choices that I doubt that even this well-informed group could ever agree on a single answer. My own choice would be how spectacularly well he recognized and dealt with the productivity acceleration after 1995. But others will have their own favorite on the long and impressive Greenspan hit parade.

That hit parade brings me naturally to the fourth lesson, which is that *fine tuning is actually possible* if you combine enough skill with a modicum of good luck. I began my economic education in the halcyon days of Walter Heller, when a number of economists really believed in fine-tuning. By the time I started teaching at Princeton in 1971, however, this belief had been shattered. But Alan Greenspan's remarkable performance should bring it roaring back. Greenspan probably shuns the label "fine-tuner." But his record is replete with delicate decisions over moves of 0 versus 25 basis points or 25 versus 50 basis points, with careful management of the exact monthly timing of this rate increase or that rate decrease, with several actual and attempted soft landings, with influencing markets with minor variations in wording, and so on. If that is not fine-tuning, I don't know what is. And you know what? It worked. We've had only two mild recessions during Greenspan's long watch. As a result, the bar for the next Chairman of the Fed has been set extraordinarily high.

My fifth lesson goes back to the Volcker years. Curiously, it seems not to have been mentioned at this conference yet. So let me say it: *Money-supply targeting can be hazardous to a nation's health*. Lindsey, Orphanides, and Rasche (2005) have discussed whether or not we should view the money-growth rule as a "political heat shield" that Volcker selected opportunistically to fend off criticisms of excruciatingly tight money. Frankly, after reading their paper I'm not sure whether their answer is yes or no. (My own view is yes.) But regardless, two things seem clear—and I state them here, at the Federal Reserve Bank of St. Louis, of all places. First, the Fed overdid monetary stringency in 1980-81 partly because of the misbehavior of velocity.[6] And second, rescuing the economy in 1982 required abandoning the experiment with monetarism. I shudder to think what might have happened to the U.S. economy in 1982 and thereafter if the Federal Open Market Committee (FOMC) had stubbornly stuck to its money growth targets. But Volcker and his colleagues were too smart—and insufficiently doctrinaire—to do that. (By the way, that's a good combination of attributes for a central banker.)

If a central bank abandons monetary aggregates, what should it put in their place? Many experts now answer: inflation targets. But that just pushes the question back one stage to this: What instrument should the central bank use to pursue its inflation target? After all, no matter how much theoretical models try to pretend that it is, the inflation rate is *not* a control variable. Milton Friedman taught us years ago that the nominal interest rate is a bad choice; fixing it can even lead to dynamic instability. The *real* interest rate, we have learned in the Volcker and Greenspan years, is a far better choice. And that is my sixth lesson.

Greenspan, in particular, has focused attention on an update of Wicksell's "natural interest rate" concept that we now call the *neutral real federal funds rate*. And, more by his actions than

[4] Analogously to these last two, Volcker had to devote a great deal of time and energy to debt crisis in the developing countries that erupted in 1982 and the consequent concentration of risks on the balance sheets of many money center banks.

[5] The last five words are important. I am in awe of Volcker's many accomplishments since leaving the Federal Reserve System.

[6] Specifically, I do not believe the Fed ever intended to cause a recession as deep as the one we had.

by his rhetoric, he has called attention to the Taylor rule as a useful benchmark. For current purposes, I write the Taylor rule as a guide for setting the *nominal* funds rate in a way that stabilizes both inflation and output:

$$i = r^* + \pi + \alpha(\pi - \pi^*) + \beta(y - y^*),$$

where i is the nominal funds rate, r^* is the neutral level of the real funds rate, π is the inflation rate, y is the (log) of output, and π^* and y^* are the targets for inflation and output, respectively. We think of monetary policy as "easy" when $i < r^* + \pi$ and as "tight" when $i > r^* + \pi$.

I view the Taylor rule as a useful way of thinking about monetary policy, although it is not, and John Taylor did not intend it to be, a literal rule in the Friedmanite sense. Several aspects of the Taylor rule are worth mentioning. The first is that *both* α and β are positive. This means, for example, that there may be times when it is appropriate for the central bank to hold its interest rate *below* neutral even though the inflation rate is *above* target.[7]

The second aspect constitutes my seventh lesson. The requirement that α be positive means that *the central bank should react more than point for point to changes in the inflation rate*. For example, under Taylor's choice of $\alpha = 1/2$, each 1-point move in the inflation rate would induce the central bank to adjust its policy rate by 150 basis points in the same direction, meaning that the real funds rate moves by 50 basis points in that direction. If α is not positive, the central bank would be allowing rising inflation to *reduce* the real federal funds rate—a potentially destabilizing policy.

My last few lessons were learned in the Greenspan era. The eighth lesson is hardly ever mentioned, but I think it should be. Three times during the Greenspan era, the Fed demonstrated that *doing nothing can constitute a remarkably effective, even bold, monetary policy*.

The first such episode started in July or September 1992 and lasted until February 1994.[8] To stimulate an economy that seemed to be fighting substantial financial "headwinds," the Fed held the nominal funds rate at 3 percent, which at the time meant that the *real* funds rate was kept at around zero, for about 18 months. This sizable and long-lasting monetary stimulus helped get the economy rolling in 1994 and thereafter. The third such episode was a similar effort to stimulate a sluggish economy. The Fed lowered the nominal funds rate to 1.25 percent in November 2002 and then to 1 percent in June 2003—and then held it there until June 30, 2004, a period of 12 to 19 months, depending on when you want to start counting. In both of these cases, the degree of monetary stimulus was quite large and the length of time for which it was applied was very long, by the standards of central banking. In that sense, each of these periods of "doing nothing" constituted a boldly expansionary policy.[9]

The middle episode of "doing nothing" was a bit different from the other two but, if anything, was an even bolder departure from standard central banking practice. From January 1996 until June 1999, the Fed did not raise interest rates to restrain the booming economy even though the unemployment rate kept falling through any reasonable estimate of the NAIRU.[10] Janet Yellen and I (2001) have called this episode the years of "forbearance," and it constituted a real gamble that Greenspan took over the objections of a number of FOMC members.[11] Other than his oft-expressed skepticism about the NAIRU concept, the stated basis for Greenspan's refusal to raise rates was his belief—which was subsequently ratified by the data—that productivity had accelerated and would continue on a high trajectory, thereby justifying a faster trend growth rate.[12] The gamble paid off handsomely.

[7] Conversely, if y is high enough, the central bank will want "tight money," even if inflation is already below target.

[8] The Fed cut the funds rate to 3.25 percent in July 1992 and to 3 percent in September 1992.

[9] During much of the more recent episode, the inflation rate was drifting down, so the real funds rate was actually rising slightly. In the 1992-94 episode, inflation was quite constant.

[10] There was actually one 25-basis-point rate hike in March 1997. But the FOMC also reduced the funds rate by 75 basis points following the financial crisis in the fall of 1998.

[11] For more details on this episode from an insider's perspective, see Meyer (2004).

[12] Higher productivity growth, by itself, does not lead to an ever-decreasing NAIRU. But favorable supply shocks and the related hypothesis that *actual* productivity was running ahead faster than productivity as *perceived* by workers will lead to a transitory decline in NAIRU. On the latter, see Blinder and Yellen (2001, Chap. 6).

All three of these episodes, but especially the last, lead naturally to my ninth lesson. Another significant part of the Greenspan legacy is the demonstration that *a central bank can be strongly pro-growth without being irresponsible*. This, I think, is a genuine benefit of the Federal Reserve's much-maligned dual mandate to support *both* low inflation *and* high employment, coupled with a Chairman willing to make use of it. It would, I believe, have been much more difficult for an inflation-targeting central bank, or for a bank like the European Central Bank with a mono-goal, to forbear in 1996-99 the way the Fed did.

During these three periods of FOMC "inaction," intermediate and long rates were not marking time. Similarly, during the most recent Federal Reserve tightening (June 1999–May 2000) and easing (January 2001–June 2004) cycles, bond rates moved around quite a bit—generally in the direction the Fed wanted. This leads to the tenth lesson learned since 1979: If the central bank lets the markets in on its thinking, *the markets can do part of the work of monetary policy*. Specifically, if the markets believe the central bank will soon be raising (lowering) rates, intermediate and long rates will rise (fall) in anticipation, thereby tightening (easing) "monetary policy" before the policymakers lift a finger.

Outsourcing part of the work to the bond market in this way has two interesting, and probably salutary, implications for monetary policy. First, and less important, the central bank should not have to move its policy rate around as much, in either direction, as would be necessary without the anticipatory behavior of the bond market. Second, and more important, the lags in monetary policy should be reduced by the bond market's reactions. Not so many years ago, central bankers and economists viewed long rates as *following* short rates with a substantial lag—which slowed down the transmission of monetary policy impulses into the real economy. Nowadays, many central bankers and economists see long rates as *leading* short rates.

This anticipatory process can work, however, only if the central bank communicates its intentions to the markets effectively. Thus, and this is my final lesson from post-1979 experience, *greater transparency can enhance the effectiveness of monetary policy*. The old tradition at central banks was, of course, to say little and to say it cryptically. That's how the temple kept secrets. There is still far too much secrecy for my taste. But the unmistakable trend, both at the Fed and around the world, is toward greater transparency.

I could go on and on about why I think this is a salutary trend, both for democracy and for monetary policy—and I have.[13] But I think it is now time to relinquish the platform to Ben McCallum. Suffice it to say that while the Federal Reserve has often hesitated over specific incremental increases in disclosure, and while it has sometimes warned of adverse consequences from greater transparency, virtually none of these adverse consequences have ever come to pass, and the Fed has never regretted its step-by-step movements toward greater openness.[14] At least that's my reading of the history since 1994. If they disagree, there are plenty of current and former Federal Reserve officials present here today to dispute what I have just said.

REFERENCES

Blinder, Alan S. *The Quiet Revolution: Central Banking Goes Modern*. New Haven, CT: Yale University Press, 2004.

Blinder, Alan S. and Yellen, Janet L. *The Fabulous Decade: Macroeconomic Lessons from the 1990s*. New York: Century Foundation Press, 2001.

Eckstein, Otto. *Core Inflation*. Englewood Cliffs, NJ: Prentice-Hall, 1981.

Lindsey, David E; Orphanides, Athanasios and Rasche, Robert H. "The Reform of October 1979: How It Happened and Why." Federal Reserve Bank of St. Louis *Review*, March/April 2005, *87*(2, Part 2), pp. 187-235.

Meyer, Laurence H. *A Term at the Fed: An Insider's View*. New York: Harper Business, 2004.

[13] On this trend, see Blinder (2004, Chapter 1).

[14] After this October 2004 St. Louis conference, the FOMC took yet another step in the direction of greater transparency by deciding to release its minutes earlier.

What Have We Learned Since October 1979?

Bennett T. McCallum

MODEL COMPARISON

The question posed for this panel cannot be answered entirely straightforwardly, for different analysts knew (i.e., believed) different things about monetary policy in October 1979, and the same is true now. But I will try to speak to the spirit of the question in an operational way by briefly contrasting mainstream models that are being used now, for policy analysis, with ones that were being used then. For the "now" portion of this comparison it is easy to write down a prototypical model, which is basically the one labeled as the "consensus" model by Goodfriend (2005) in his contribution to this conference. One might quibble with the term consensus, since some economists do not approve of this model, but it is in fact a very standard starting point, among policy analysts, for elaboration or in some cases disagreement. So, the agenda now is to compare it to its counterpart of 1979. How might one select a 1979-vintage model for that purpose? Well, in October of 1979, I was in the midst of writing a paper (McCallum, 1980) that was designed to demonstrate the effects of incorporating rational expectations (RE) into an otherwise mainstream macro model. Using that paper's model to represent those typical in 1979 might not be a perfect solution, but it is probably as good as anyone could reasonably expect.

Consider, then, the following basic model, circa 1979:

$$(1)\ y_t = b_0 + b_1(R_t - E_t\Delta p_{t+1}) + v_t \qquad b_1 < 0$$

$$(2)\ \Delta p_t = E_{t-1}\Delta p_t + \alpha_1(y_t - \bar{y}_t) + \alpha_2(y_{t-1} - \bar{y}_{t-1}) + u_t \qquad \alpha_1 > 0,\ \alpha_2 < 0$$

$$(3)\ m_t + \mu_0 + \mu_1 m_{t-1} + \mu_2(y_t - \bar{y}_{t-1}) = e_t \qquad \mu_1 > 0,\ \mu_2 < 0$$

$$(4)\ m_t - p_t = c_0 + c_1 y_t + c_2 R_t + \eta_t \qquad c_1 > 0,\ c_2 < 0$$

$$(5)\ \bar{y}_t = \gamma_0 + \gamma_1 \bar{y}_{t-1} + a_t \qquad \gamma_1 > 0$$

Here the symbols are as follows: y_t = log of output, $\bar{y}_t$ = log of natural-rate output, p_t = log of price level, m_t = log of money stock, R_t = one-period interest rate, and v_t, u_t, e_t, η_t, a_t = stochastic shocks. Equation (1) represents an IS function in which the rate of spending on goods and services is taken to depend (negatively) on the real rate of interest. Equation (2) is a "natural rate" type of Phillips curve or price adjustment relationship, with the unit coefficient on $E_{t-1}\Delta p_t$ implying the absence of any long-run trade-off, as in Fischer (1977) or Lucas (1973). In addition, (4) is a money demand (or "LM") function of a standard type, while (3) represents monetary policy behavior with the central bank adjusting the money supply[1] each period in a way that responds to the current (or possibly a recent past) output gap. The latter concept refers to the fractional difference between output and its natural rate value, with the latter being generated (exogenously, for simplicity) in equation (5).

Using models of basically the foregoing specification, researchers such as Lucas (1973), Fischer (1977), Sargent (1973), Taylor (1979), and McCallum (1980) conducted RE analysis to determine the dynamic properties of various systems and alternative policy rules. One of the main objects of analysis was to determine whether the systematic components of monetary policy rules, or only the purely random components, have effects on the cyclical properties of real variables—including employment and especially the output gap—when expectations are formed rationally.

[1] Researchers who were concerned with operationality, such as Andersen and Jordan (1968) and Brunner and Meltzer (1976), tended to use the monetary base as the instrument variable in policy specifications that would be represented by (3) in the model.

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Lucas (1972, 1973), Sargent (1973), and most notably Sargent and Wallace (1975) argued that the behavior of the gap would be unaffected by alternative monetary policy rules, while Fischer (1977) and Taylor (1979) took the opposing position. My review (McCallum, 1980) concluded that there were plausible specifications that would support each position. It should be emphasized, however, that most policy analysis being conducted at the time was not of this type, focusing on properties of dynamic systems, but instead featured point-in-time exercises of the type that RE analysis showed to be (in many cases) fundamentally misleading.

For comparison, today's prototype model can be written, in its simplest form, as follows:

$$(6)\ y_t = b_0 + b_1(R_t - E_t\Delta p_{t+1}) + E_t y_{t+1} + v_t \qquad b_1 < 0$$

$$(7)\ \Delta p_t = \beta E_t \Delta p_{t+1} + \alpha_1(y_t - \bar{y}_t) + u_t \qquad \alpha_1 > 0$$

$$(8)\ R_t = \mu_0 + \Delta p_t + \mu_1(\Delta p_t - \pi^*) + \mu_2(y_t - \bar{y}_{t-1}) + e_t \qquad \mu_1 > 0,\ \mu_2 > 0$$

$$(9)\ m_t - p_t = c_0 + c_1 y_t + c_2 R_t + \eta_t \qquad c_1 > 0,\ c_2 < 0$$

$$(10)\ \bar{y}_t = \gamma_0 + \gamma_1 \bar{y}_{t-1} + a_t \qquad \gamma_1 > 0$$

Here, there are three major changes from the model of 1979. First, the term $E_t y_{t+1}$ enters the counterpart of the IS function (1), reflecting that equation's origin as a consumption Euler equation, with consumption substituted out in favor of output, to represent optimizing behavior by rational optimizing households.[2] Second, the usual Phillips or price adjustment relation (7) differs from (2) by having $\beta E_t \Delta p_{t+1}$ instead of $E_{t-1}\Delta p_t$ as the reference expected inflation rate. Again, this specification is more readily justified by optimizing analysis, due in this version to Calvo (1983) and a host of follow-up papers, including King and Wolman (1996). Finally, the most striking change is in the monetary policy rule (8), which is here expressed in terms of the one-period nominal interest rate, used as an instrument variable, instead of the growth rate of the (base) money supply. This change in the usual modeling practice, which was given an important impetus by Taylor (1993), undoubtedly represents a move in the direction of realism since actual central banks of industrial countries almost invariably use some short-term nominal interest rate as their "operating target." Whether that mode of policy behavior is socially desirable is not an entirely settled matter, although the preponderance of opinion has certainly moved in that direction, partly under the forceful influence of Woodford (1999, 2003).

Of course, today's models often do not include any money demand relation such as (9). Given the absence of monetary aggregate variables from (6) and (7), this omission becomes formally innocuous when policy is conducted as in (8), as has been explained numerous times (e.g., McCallum, 1999). Today's models do not imply that no such money demand relation obtains, of course, but merely that their specification does not influence the dynamic behavior of the main macro variables given the remainder of the (recursive) system.

There are two other ways, besides this change in the monetary policy instrument, in which today's policy analysis usually differs from that of 1979. The first has already been mentioned; it is that today the standard mode of policy analysis involves a comparison of the behavior of target variables (e.g., inflation and the output gap) under different maintained policy rules, rather than point-in-time exercises.[3] The other is that today's models are constructed in a manner that attempts to respect both theory and evidence, by using optimization-based general equilibrium analysis in an attempt to develop systems that are potentially structural—and thus immune to the Lucas critique (Lucas, 1976)—and by specifying the models quantitatively, either as a result of econometric estimation or by selection of their parameter values on the basis of a careful calibration (of the type emphasized in the real business cycle literature).

[2] This simplest version of the model does not include endogenous investment spending, as distinct from consumption. Endogenous investment can be included fairly readily, but some users instead calibrate the sensitivity of spending to the real interest rate so as to match the consumption-plus-investment value, rather than the one appropriate to consumption alone.

[3] I would definitely include the design of optimal policy rules under the former heading, despite various reservations mentioned in McCallum and Nelson (2004).

PROMINENT TOPICS

A second way to approach the question "What have we learned?" would be to consider specific topics that have been prominent—of major professional interest—among monetary economists since October 1979. A list of such topics that I have put together fairly quickly includes those given below. The ordering is roughly, but not strictly, chronological.

i. Operating procedures
ii. Sacrifice ratios
iii. Credibility
iv. Commitment versus discretionary policy optimization
v. Central bank independence
vi. Vector autoregression (VAR) models
vii. Real business cycle models
viii. New Keynesian models
ix. Structural VAR models
x. New neoclassical synthesis models
xi. Transparency and communication
xii. Interest rate smoothing
xiii. Taylor rules
xiv. Inflation targeting
xv. Analysis with real-time data
xvi. The zero lower bound on nominal interest rates
xvii. Optimality from a "timeless perspective"
xviii. Targeting versus instrument rules
xix. Indeterminacy, learnability, and E-stability

Most of these topics are of considerable intellectual content and interest; indeed, I have been interested in a majority of them myself. But, in trying to answer "What have we learned?" it would seem best to strive for a shorter and more practically oriented list, in part because merely to specify the meaning of each of the terms and provide a citation of the key references would require several pages. In the next and final section, accordingly, I will try to produce one.

WHAT HAVE WE LEARNED? A SHORT LIST

First, we have learned to conduct monetary policy analysis in a manner that seems reasonable to both academic and central bank economists. This is important because it facilitates communication between these two groups of analysts. I have argued (McCallum, 1999) that this convergence of viewpoints has proceeded to the point where one usually cannot tell from examination of a particular research paper whether it was written by an academic or a central bank economist. For this healthy development I would give much credit to the simple but insightful exposition of Taylor (1993). It is, of course, possible to worry about how much of today's highly technical research actually influences policymakers, such as members of the FOMC. But there are positive indications, both at the Board of Governors and at regional Federal Reserve Banks. Not only in the Fed, but also in the central banks of other countries (e.g., the Bank of England, the European Central Bank, the Bank of Japan), it has become fairly common for the top monetary policymaking committee to include research economists among its voting members. (Indeed, several are present at this conference!)

Second, we have learned that the crucial requirement for a central bank is to give top priority to the task of keeping inflation low. At least this is the message that I perceive from all the attention that has been paid to "inflation targeting." Terminologically, there is a bit of a problem with respect to the formal literature on that subject, for it is unclear why an optimizing central bank with an objective function of the form

(11) maximize

$$E_0 \sum_{t=0}^{\infty} \beta^t \left[(\pi_t - \pi^*)^2 + \lambda (y_t - \bar{y}_t)^2 \right] \qquad \lambda \geq 0$$

should be called an inflation targeter rather than an "output gap targeter," especially if λ is relatively large. But in practice, each recognized inflation-targeting central bank has emphasized achievement of a low inflation rate as its top priority. So I think that it can be said that there is much agreement on what I regard as the crucial requirement.

With respect to the objective function (11), several researchers (e.g., Orphanides, 2001, 2003; McCallum, 2001) have argued that it would be dangerous for the central bank to respond strongly to an operational measure of the output gap, in part because of the great difficulty that prevails in practice in obtaining satisfactory estimates of the natural-rate value, $\bar{y}_t$, or even in agreeing on the proper concept to utilize for the latter. A strong response to the level of the gap is not necessarily the same as adopting a large value of λ in (11), it should be noted. It is the same under discretionary optimization, but with the "timeless perspective" approach the implied optimality condition involves the *change* in the output gap, in which case the undesirable effects of natural-rate mismeasurement tend to cancel out to a substantial extent (Orphanides, 2003).[4]

Finally, I think that we have seen that it is possible for central banks to avoid the inflation bias that results from period-by-period discretionary re-optimization when the target level of output exceeds the natural-rate value. I hope that this is because central banks are now avoiding discretionary period-by-period re-optimization, choosing instead to make policy in a committed, rule-like fashion. Some form of timeless perspective behavior, that does not try to exploit conditions that happen to prevail currently, is necessary to avoid several types of suboptimality, including the one mentioned above. But it remains somewhat unclear what the actual current situation is, in terms of central bank behavior.

REFERENCES

Andersen, Leonall C. and Jordan, Jerry L. "The Monetary Base—Explanation and Analytical Use." Federal Reserve Bank of St. Louis *Review*, August 1968, *50*(8), pp. 7-11.

Brunner, Karl, and Meltzer, Allan H. "An Aggregative Theory for a Closed Economy," in Jerome Stein, ed., *Monetarism*. Amsterdam: North-Holland, 1976.

Calvo, Guillermo A. "Staggered Prices in a Utility-Maximizing Framework." *Journal of Monetary Economics*, September 1983, *12*(3), pp. 383-98.

Fischer, Stanley. "Long-Term Contracts, Rational Expectations, and the Optimal Money Supply Rule." *Journal of Political Economy*, February 1977, *85*(1), pp. 191-205.

Goodfriend, Marvin. "The Monetary Policy Debate Since October 1979: Lessons for Theory and Practice." Federal Reserve Bank of St. Louis *Review*, March/April 2005, *87*(2, Part 2), pp. 243-62.

King, Robert G. and Wolman, Alexander L. "Inflation Targeting in a St. Louis Model of the 21st Century." Federal Reserve Bank of St. Louis *Review*, May/June 1996, *78*(3), pp. 83-107.

Lucas, Robert E. "Expectations and the Neutrality of Money." *Journal of Economic Theory*, April 1972, *4*(2), pp. 103-24.

Lucas, Robert E. "Some International Evidence on Output-Inflation Tradeoffs." *American Economic Review*, June 1973, *63*(3), pp. 326-34.

Lucas, Robert E. "Econometric Policy Evaluation: A Critique." *Carnegie-Rochester Conference Series on Public Policy*, 1976, *1*, pp. 19-46.

McCallum, Bennett T. "Rational Expectations and Macroeconomic Stabilization Policy: An Overview." *Journal of Money, Credit, and Banking*, November 1980, *12*(4, Part 2), pp. 716-46.

McCallum, Bennett T. "Recent Developments in the Analysis of Monetary Policy Rules." Federal Reserve Bank of St. Louis *Review*, November/December 1999, *81*(6), pp. 3-12.

McCallum, Bennett T. "Should Monetary Policy Respond Strongly to Output Gaps?" *American Economic Review*, May 2001, *91*(2), pp. 258-62.

McCallum, Bennett T. and Nelson, Edward. "Targeting vs. Instrument Rules for Monetary Policy." NBER Working Paper 10612, National Bureau of Economic Research, June 2004.

[4] For a discussion of the timeless-perspective approach, see Woodford (2003, Chap. 7).

Orphanides, Athanasios. "Monetary Policy Rules Based on Real-Time Data." *American Economic Review*, September 2001, *91*(4), pp. 964-85.

Orphanides, Athanasios. "The Quest for Prosperity Without Inflation." *Journal of Monetary Economics*, April 2003, *50*(3), pp. 633-63.

Sargent, Thomas J. "Rational Expectations, the Real Rate of Interest, and the Natural Rate of Unemployment." *Brookings Papers on Economic Activity*, 1973, *2*, pp. 429-72.

Sargent, Thomas J. and Wallace, Neil. "Rational Expectations, the Optimal Monetary Instrument, and the Optimal Money Supply Rule." *Journal of Political Economy*, April 1975, *83*(2), pp. 241-54.

Taylor, John B. "Estimation and Control of a Macroeconomic Model with Rational Expectations." *Econometrica*, September 1979, *47*(5), pp. 1267-86.

Taylor, John B. "Discretion versus Policy Rules in Practice." *Carnegie-Rochester Conference Series on Public Policy*, November 1993, *39*, pp. 195-214.

Woodford, Michael. "Optimal Monetary Policy Inertia." NBER Working Paper 7261, National Bureau of Economic Research, July 1999.

Woodford, Michael. *Interest and Prices: Foundations of a Theory of Monetary Policy*. Princeton: Princeton University Press, 2003.

Panel Discussion II

Safeguarding Good Policy Practice

Roger W. Ferguson Jr.

I am pleased to address this conference commemorating the 25th anniversary of the historic monetary policy changes implemented in October 1979. In my prepared remarks, I would like to focus on two issues with respect to safeguarding good monetary policy practice. First, I will discuss what constitutes good monetary policy practice and review the Federal Reserve's record in satisfying its mandates in recent decades. Then, I will speculate on how good policy outcomes come about. In particular, I will discuss the role of policy transparency, central bank leadership, and alternative monetary policy regimes in preserving effective monetary policy. Of course, the usual caveat to my remarks applies: I will express my own views, and you should not interpret them as the position of the Federal Open Market Committee (FOMC) or of the Board of Governors of the Federal Reserve System.

ASSESSING THE FEDERAL RESERVE'S PERFORMANCE AFTER 1979

When assessing what constitutes good monetary policy practice, I prefer to focus not on theory but on the reality of the Federal Reserve's objectives. In contrast to many other central banks, the Federal Reserve has been assigned a "dual mandate"—to pursue policies that both maintain price stability and achieve maximum sustainable economic growth and employment. Good policy practice can be judged by the outcomes achieved. Therefore, I would like to briefly outline the Federal Reserve's performance with respect to the level and the variability of inflation and growth. To be sure, the strong economic performance over the past two decades has several possible explanations, but the practice of monetary policy has likely contributed by helping to preserve macroeconomic stability.

With respect to price stability, inflation in the United States over the past decade or so has clearly been lower and more stable than it was earlier in our history. In fact, annual inflation in the price index of personal consumption expenditures excluding food and energy—core PCE—averaged just over 2 percent from 1990 through the end of 2003 and consistently remained within a range—roughly 1 to 4 percent—that is relatively narrow compared with historical experience. This period contrasts sharply with the 14-year period from 1965 through the end of 1979, when annual core-PCE inflation averaged just over 5 percent and fluctuated between 3 and 10 percent. The recent experience of the United States with inflation has been similar in some respects and dissimilar in others to that of other countries. For example, based on the Organisation for Economic Co-operation and Development's (OECD's) measures of overall consumer price inflation, prices rose at an annual average rate of about 3 percent in the United States from 1990 through 2003, compared with about 3 percent in the euro area and in the United Kingdom and roughly 1 percent in Japan.[1] But, more important, the volatility of

[1] Data are from the *OECD Economic Outlook* (No. 75, Excel spreadsheet).

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inflation was lower in the United States than in these other economies.

An equally important indicator of the success of the Federal Reserve's monetary policy is private expectations for future inflation. Measures of inflation expectations obtained from financial asset prices clearly indicate that market participants expect that the Federal Reserve will maintain low and stable inflation. For example, although the difference between the yields on nominal inflation-indexed and Treasury securities is an imperfect measure that includes complicating factors, such as inflation risk and liquidity premiums, the five-year break-even inflation rate five years ahead has averaged about 2 1/2 percent over the past five years and has fluctuated in a narrow range of about 1 1/2 to 3 1/2 percent. Survey measures confirm that inflation expectations over this period have been subdued and well anchored. The University of Michigan's survey of 10-year inflation expectations has averaged less than 3 percent and has stayed within a very narrow range over the past five years.

Assessing the outcomes with respect to the Federal Reserve's goal of maximum sustainable output growth is inherently more difficult. Estimates of the relevant measures, such as the non-accelerating inflation rate of unemployment (NAIRU), which in recent years has been decreasing according to some estimates, have very wide confidence intervals. But we can point to some evidence suggesting that the United States has enjoyed, besides subdued and stable inflation, some favorable developments with respect to output and employment. Certainly, we can document substantial gains in productivity in recent decades in the United States. According to the OECD, business sector labor productivity growth in the United States averaged about 2 percent from 1990 through the end of 2003, compared with about 1 1/2 percent in the euro area and in Japan over the same period. And since the mid-1990s, this gap has widened, with annual productivity growth averaging about 2 1/2 percent since 1995 in the United States, compared with about 1 1/2 percent in Japan and just less than 1 percent in the euro area over the same period.[2]

Another important measure of the success of monetary policy is how well the FOMC has responded to threats to our nation's financial stability. This claim is surely hard to quantify. But everyone would agree that, compared especially with the deleterious effects of the Federal Reserve's policy response during the Great Depression, the Fed has responded effectively to more-recent crises so as to help minimize the impact of such shocks on the greater economy. These episodes include the stock market crash of October 1987, the Asian financial crisis, and the collapse of Long-Term Capital Management in the late 1990s. Thanks in no small part to the flexibility of our policy framework, which I will discuss in greater detail in a few moments, the Federal Reserve appropriately discharged its responsibility as lender of last resort by providing ample liquidity and ensuring confidence during these and other troubling episodes, including the aftermath of the terrorist attacks of September 11, 2001.

There is greater disagreement about how well the Federal Reserve responded to the bursting in recent years of the so-called bubble in technology stocks. This topic is broad, but I would like to note that, as many of my colleagues and I have previously argued, prospectively addressing perceived asset-price bubbles is a matter of such great uncertainty that, even with the benefit of hindsight, it is not clear that policy decisions in the late 1990s, for example, should have been any different. In any case, the recession that followed the sharp decline in stock prices was shallow by historical standards.

HOW CAN WE SAFEGUARD GOOD POLICY OUTCOMES?

I would now like to turn to issues related to preserving, as best we can, a continuation of good policy practice in the future.

Central Bank Transparency

Consider first the important role of central bank transparency. Transparency of central bank

[2] These data on productivity growth are also from the *OECD Economic Outlook* (No. 75, Excel spreadsheet).

decisionmaking is desirable, not only for economic reasons but also because it is supportive of central bank independence within a democratic society. Because of the lagged effects of monetary policy on output and prices, the time horizon of central bankers is necessarily more distant than that of other policymakers. Thus, the central bank needs substantial insulation from political pressures to execute policy: An independent monetary authority is less tempted to make policy for the short term, such as boosting output or refinancing national budgets, at the expense of long-run objectives. Of course, the goals of monetary policy should be determined within the democratic process, but the central bank should have discretion to achieve those ends. In short, an appropriate arrangement within democratic societies is for central banks to have independence with respect to the instruments, but not the goals, of monetary policy, and transparency is an appropriate condition for that independence.

Besides its inherent virtues in a democratic society, transparency can enhance monetary policy's economic effectiveness by more closely aligning financial market forces with central bankers' intentions. Like other central banks, the Federal Reserve controls only a very short-term interest rate—the overnight federal funds rate. However, theory and empirical evidence suggest that longer-term interest rates and conditions in other financial markets, which reflect expectations for short-term rates, matter most for monetary policy transmission to the economy. If the monetary authority is transparent about the rationale and the stance of policy as well as its perception of the economic outlook, then investors can improve their expectations of future short rates.[3]

The path that monetary policy will follow in the future is uncertain even to policymakers because that trajectory will depend on incoming news about the economy and the implications of that news for the economic outlook. But announcing policy decisions in a timely manner and explaining those decisions fully allows market participants to better anticipate the response of policy to unexpected developments and to speed needed financial adjustments.

Central Bank Leadership

Next, I consider the role of the individuals entrusted with the responsibility for making policy decisions. Although monetary policy frameworks have a potentially great influence on macroeconomic outcomes, we should not forget that the individuals who serve in central banks themselves have a crucial role in preserving policy outcomes. Even with a monetary policy regime that follows best practices and shapes the decisionmaking process, ultimately, individuals' beliefs and perceptions still matter for the actual policy taken.

An interesting recent study of the history of the Federal Reserve by Christina Romer and David Romer finds a very strong link between the skill and knowledge of the FOMC, particularly the Chairman, and macroeconomic outcomes.[4] For example, with little reference to transformations in the disclosure policy and the independence of the Federal Reserve over the years, they ascribe the policy successes of two periods—the 1950s and the 1980s and 1990s—to a conviction of Federal Reserve Chairmen regarding the high costs of inflation and their tempered views about the sustainable levels of output and employment. In contrast, they attribute the deflationary and counterproductive policies of the 1930s to the erroneous belief that monetary policy can do little to stimulate output and that the economy can actually overheat at low levels of capacity utilization.

But there is one aspect of the process that Romer and Romer do not emphasize enough—the ability of central bankers in general, and indeed members of the FOMC in particular, to withstand political pressures. In addition, central bankers should have a thorough and practical, rather than a purely academic, understanding of the economy and, given the Federal Reserve's objective to preserve financial stability, of financial markets and institutions.

The Committee's institutional memory may also matter in this context. Today, the FOMC is

[3] See Lange, Sack, and Whitesell (2003), Poole, Rasche, and Thornton (2002), and Bernanke, Reinhart, and Sack (2004) for evidence relating to the increased transparency of the FOMC over the past several years to the predictability of short-term interest rates.

[4] See Romer and Romer (2004, pp. 129-62).

well versed in the monetary history of the 1970s and 1980s, for example, and recognizes the great efforts that previous members of the FOMC undertook to achieve price stability. I trust that future generations of policymakers will continue to share that understanding and thus help to preserve good policy outcomes.

Will Inflation Targets Preserve Good Policy Practice?

Finally, I would like to touch on a topic that is perhaps more controversial in the context of safeguarding good policy practice. Several academic and professional economists, including distinguished colleagues of mine at this conference, have eloquently advocated the adoption of explicit numerical goals for central bank objectives, most notably inflation targets. The adoption of numerical targets, it is argued, facilitates central bank accountability and better anchors private expectations about inflation and monetary policy and thereby yields better macroeconomic outcomes.

Quantifying central bank objectives has some positive aspects and, certainly, vigorous advocates. Nonetheless, I harbor significant reservations about this approach regarding both its practical implementation, in the specific context of the Federal Reserve System, and its demonstrated effectiveness based on inferences from the recent experience of regimes around the world that have specific numerical targets, particularly with respect to inflation.

A basic, yet difficult, issue is the selection of a particular price index to guide policy, even in the case of a single goal such as inflation. Experience tells us that economies and the composition of productive enterprises change over time, and therefore the appropriate index and inflation value for the monetary authority would also need to change to reflect technological and other advances. In light of this inherent uncertainty associated with the construction of a price index, one might be concerned that choosing and rigidly adhering to an inappropriate index could have negative economic consequences that might outweigh prospective benefits.

Also, we must consider the ramifications of quantified goals in the context of our democracy. That is, the quantification of objectives becomes even more problematic for central banks, such as the Federal Reserve, with multiple democratically based mandates, some of which are notably less disposed to quantification than others. For example, considering our dual mandate from the Congress, how do we measure maximum sustainable employment? Indeed, as I mentioned previously, estimates of the NAIRU and other possible related measures that address the full-employment objective, such as the output gap, have uncomfortably wide confidence intervals and are far more controversial than selecting a target for a specific price index.

Of course, the central bank could in principle quantify only the inflation objective. However, I fear that quantifying one goal and not the other would present problems because the monetary authority might inadvertently place more emphasis on the quantified goal at the expense of the nonquantified objective. Doing so would seem inappropriate. The ease of quantification should not influence how the Federal Reserve pursues its dual mandate.

In addition, I worry about the potential loss of flexibility from the implementation of an inflation target, as explicit numerical goals might inhibit the central bank's focus on output variation or financial stability. I would argue that, besides the episodes of financial turmoil in the late 1990s mentioned earlier, supply shocks, such as large increases in oil prices that simultaneously increase the price level and decrease aggregate output, can be problematic for inflation-targeting regimes.

Of course, some variants of the approach—so-called flexible inflation targeting, for instance—can address the issues I just raised by stipulating wide target ranges, by maintaining escape clauses that allow inflation to diverge from the target, or by aiming at average inflation over the business cycle. But the credibility gains from inflation targeting seem to me to be inversely related to its flexibility. Simply, credibility is less likely to be gained and expectations are less likely to be anchored if the central bank frequently uses escape clauses, widens the target bands, or pushes out its time horizon.

Ultimately, real credibility for achieving goals must come from performance, and predetermined frameworks do not seem to be a necessary or a sufficient condition to safeguard desirable policy outcomes. Observation of more-recent Federal Reserve actions reveals the apparent preferences of policymakers. In recent years, the Federal Reserve has apparently leaned against disinflation when core inflation has threatened to fall much below 1 percent and, similarly, against inflation when the core rate has threatened to rise above 2 to $2^1/_2$ percent. The Federal Reserve has demonstrated this strategy without the formal adoption of a specific inflation target or range for the FOMC.

Given the subdued and stable inflation witnessed over the past 14 years, I have to ask: What would be gained from a formal goal for inflation? Can we draw compelling general inferences from the recent experience of inflation-targeting central banks? As a caveat regarding this evidence, economists have very limited data to work with, as the first recognizable inflation-targeting regime appeared in New Zealand in 1990. But to date, I would argue that the case for inflation targeting has yet to be proven.

Certainly, I would not deny that numerical inflation targets have proven useful for several countries in particular circumstances. One example is the United Kingdom, where, in the aftermath of "Black Wednesday" in October 1992, an inflation target helped provide a nominal anchor after sterling was removed from the European exchange rate mechanism. I should also add that the Bank of England has quite successfully helped to achieve low and stable inflation ever since. In addition, inflation targeting can have demonstrable benefits in lower-income countries that have experienced high and variable inflation rates in the recent past.

In several cases, quantified inflation targeting has served as a means of achieving the central bank independence necessary to focus more effectively on controlling inflation. That is, the adoption of an inflation target is frequently part of a broader program to increase the autonomy and transparency of central bank practice. But inflation targeting is not the only means by which to achieve these ends. Again, the recent experience in the United States that I have noted is an object lesson in this regard.

Unfortunately, the empirical evidence for industrial countries available to date generally appears insufficient to assess the success of the inflation-targeting approach with confidence. For example, it is unclear whether the announcement of quantitative inflation targets lessens the short-run trade-off between employment and inflation and whether it helps anchor inflation expectations. In addition, some research, controlling for other factors, fails to isolate the benefits of an inflation target with respect to the level of inflation or its volatility over time, and output does not seem to fluctuate more stably around its potential for countries that have adopted numerical targets.[5] Future data may or may not produce compelling evidence, but I maintain that the case today for inflation targets in countries that already enjoy low and stable inflation rates has certainly not been proven.

With respect to both its practical implementation, particularly in the United States, and the empirical evidence to date, I submit that the adoption of a numerical inflation target does not promise any obvious incremental benefits, at least in countries that have already achieved reasonable price stability. That said, a continuing commitment to price stability is certainly important, and the Federal Reserve has established a solid record of such commitment.

CONCLUSION

Based on this brief review, I conclude that, at least since the policy reform of October 1979, most observers would agree that the Federal Reserve has achieved generally good policy practice and outcomes. In my assessment, good policy practice cannot be safeguarded with certainty using a single rule or framework, such as inflation targeting. Good outcomes ultimately depend on flexible execution of an evolving strategy and policymakers with an unwavering commitment to low and stable inflation as the foundation for maximum sustainable growth.

[5] See, for example, Ball and Sheridan (2003) and Castelnuovo, Nicoletti-Altimari, and Rodriguez-Palenzuela (2003).

REFERENCES

Ball, Laurence and Sheridan, Niamh. "Does Inflation Targeting Matter?" NBER Working Papers Series No. 9577, National Bureau of Economic Research, March 2003.

Bernanke, Ben S.; Reinhart, Vincent R. and Sack, Brian P. "Monetary Policy Alternatives at the Zero Bound: An Empirical Assessment." Finance and Economics Discussion Series 2004-48, Board of Governors of the Federal Reserve System, September 2004.

Castelnuovo, E.; Nicoletti-Altimari, S. and Rodriguez-Palenzuela D. "Definition of Price Stability, Range and Point Inflation Targets: The Anchoring of Long-Term Inflation Expectations." Working Paper Series No. 273, European Central Bank, September 2003.

Lange, Joe; Sack, Brian and Whitesell, William. "Anticipations of Monetary Policy in Financial Markets." *Journal of Money, Credit, and Banking*, December 2003, *35*(6), pp. 889-909.

Poole, William; Rasche, Robert H and Thornton, Daniel L. "Market Anticipations of Monetary Policy Actions." Federal Reserve Bank of St Louis *Review*, July/August 2002, *84*(4), pp. 65-94.

Romer, Christina D. and Romer, David H. "Choosing the Federal Reserve Chair: Lessons from History." *Journal of Economic Perspectives*, Winter 2004, *18*(1), pp. 129-62.

Safeguarding Good Policy Practice

Charles A.E. Goodhart

I want to start with two matters that are relevant to the main theme of this conference but slightly extraneous to the particular topic that I have been allotted.

First, you, here in the United States, were not the only country considering a change in monetary control methods in the early autumn of 1979; we in the United Kingdom were also reviewing the pros and cons of various forms of monetary control at exactly the same time. Indeed, when John Fforde, the Bank's Executive Director in charge of monetary policy, visited the Federal Reserve Bank of New York at the end of October to find out about your new techniques, he reported back comparing your new mechanism to those already under consideration in the Bank. The gist of what was then being discussed here is available in the Green Paper on Monetary Control, published in March 1980 by the Bank and the Treasury (H.M. Treasury and Bank of England, 1980).[1]

I do not think that there was much difference in analysis between us. Fforde noted that your new nonborrowed reserve target mechanism led to a quasi-automatic response in short-term interest rates to undesired movements in the target aggregate, exactly like several of the possible responses that we were considering. But he noted that the cutting edge of this American version of our own considered variant was the enforced use of the discount window and exploitation of the associated non-price deterrent to such use, which in turn caused the banks to bid up for federal funds. This then enabled the authorities to say that they were restraining the supply of reserves while the market was setting the rate of interest. Fforde describes this as an appearance of market-generated interest rates, with the role of the authorities being to some degree disguised. The only real point of

[1] The internal Bank papers relating to these discussions will become available in 2009.

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analytical issue between us was whether international capital flows could possibly cause dynamic instability in such a system, a greater worry to us than to you.

The differences between us were not analytical, but lay in the political context. You then still had the Carter presidency and a Congress whose willingness to accede to interest rate hikes that would be strong enough to combat deeply entrenched inflationary expectations was questionable. By then we had Mrs. Thatcher as Prime Minister, and Ministers and political advisors to whom monetarism was a matter of faith. We, in the United Kingdom, were in the unusual situation of having a government that was far more hawkish than its central bank on the need for deflation.

In this context, our concern in the Bank was not so much that policy would not be made sufficiently tight to bring down inflation, but that the means of doing so would bring with it unnecessary collateral damage. We feared that monetarist Ministers and political advisors might believe that monetary base control was an *alternative* to interest rate changes, not just a mechanism for bringing them about. We also feared that Ministers would place an exaggerated faith in the closeness of the various linkages, between the monetary base and the target broader aggregate and between the chosen monetary aggregate and nominal incomes. If I may say so, this latter concern had formed the core of Goodhart's law[2] propounded just a few years earlier. All this is set out in my *Economic Journal* article of 1989, "The Conduct of Monetary Policy." But the point of this first extraneous comment is that what distinguished the Fed from the Bank of England in 1979 was the political context, not any difference in economic theory or analysis.

My second extraneous comment arises from a reaction to the Faust and Henderson paper entitled "Is Inflation Targeting Best Practice Monetary Policy?" and particularly Ben Friedman's (2004) discussant commentary on that, in the July/August 2004 issue of your *Review* that covered your preceding conference on inflation targeting. Here Ben Friedman excoriates (inflation targeting) central banks in general, and the Bank of England in particular, for focusing solely, or at least excessively, on inflation in their comments and reports. In this respect he fails to mention the letters that the Bank is required by law to send openly, and to be published, to the Chancellor should inflation ever deviate by more than 1 percent from its target. Surely the expectation would be that any severe supply shock, oil prices or whatever, would cause such a deviation in the short run. The letter to the Chancellor would give the Bank the perfect platform to explain how it would trade off output deviations against inflation deviations, and the Chancellor could write back if he did not like the proposed trade-off.

When the British Monetary Policy Committee (MPC) first met, we expected, on the basis of past evidence of inflation variability, to have to write such a letter about once per year. However, none have been written in the seven years of the MPC's existence. In some ways this is a pity because it obscures how one key feature of the system is supposed to work. It is a consequence of the fact that the volatility of inflation has collapsed in the past decade, since we turned to inflation targeting in 1993. Figure 1 is taken from Benati (2004). But we have not achieved greater stability of inflation by sacrificing output volatility. That, too, has declined, though much less dramatically (Figure 2). And in this context, not surprisingly perhaps, interest rates have also been less variable.

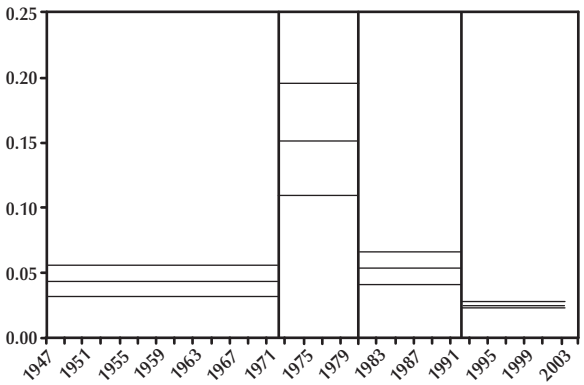
Such an overall marked reduction in volatility was neither expected in advance, nor, after the event, fully understood, though surely better policies played some role. Meanwhile, the Bank (and the MPC) is being criticized on statistical grounds for continuing to show a wider fan chart, especially for inflation, than recent history would suggest (Wallis, 2004). Given that we do not really understand the reason for that collapse in volatility, I have to confess that, if I were still on the MPC, I would reckon that tightening up the fan chart width in the light of past stability would be the harbinger of future bad luck.

Another concern is whether the private sector might unduly internalize such remarkable stability, and—along the lines of the Modigliani-Miller

[2] Goodhart's law is "that any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes" (Goodhart, 1984, p. 96).

Figure 1

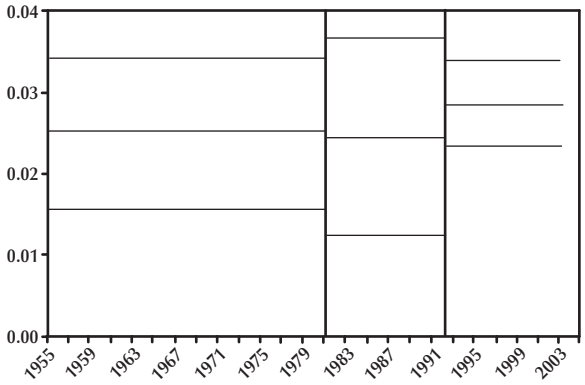
RPIX Inflation



NOTE: Estimated conditional mean and 95% confidence bands (delta method).

Figure 2

Real GDP Growth



NOTE: Estimated conditional mean and 95% confidence bands (delta method).

theorem, but now applied to policy—partially undo it.

In his excellent book *Risk*, John Adams (1994), a social scientist at University College in London, analyzes the ways in which humans react to risk. In the most remarkable, and in some ways shocking, part of his work, Adam records that most road safety legislation, car seat belts, for example, has actually led to an overall *increase* in fatal traffic accidents. While his results are clearly disturbing, I have not heard that they have been controverted.

What is going on then? The key feature is that most road safety regulation makes the environment safer for the driver, and the inhabitants of the car, who are often family or friends. Appreciating that they are safer, it shifts the return, the trade-off, between safety and speed in favor of speed. Of course, the driver wants more of both, so the number of fatalities in cars *does* tend to go down, but only at the expense of more fatalities for those outside the better-protected cars—that is, pedestrians and bicyclists.

It is entirely in the spirit of John Adams's work to argue that one could reduce traffic accidents more certainly if, instead of an air bag, it was mandatory that each car had a six-inch spike pointing up at the driver from his steering wheel, preferably painted red and dripping fake red gore. Do you seriously doubt that this requirement, I hesitate to call it reform, would sharply reduce speeds, shift people back to public transport and bicycles, and overall greatly reduce traffic-related fatalities? Yet, of course, it will not happen. It is not supposed to be part of the authorities' remit to make life more, not less, dangerous for some, often politically powerful, sectors of society. Perhaps, notably in the field of financial regulation, sometimes this is what the authorities should be doing!

Be that as it may, let me try to apply such insights to monetary policy. If inflation, and with it interest rates, is now likely to be more stable, this enables the private sector to assume more risk, in the shape of greater leverage and driving-down risk premia in asset markets. If the authorities make the conjuncture safer, the private sector is bound to undo some part of that to restore their desired risk/return equilibrium. It is this kind of analysis that lies behind the argument that greater stability of goods and services prices will generate potentially greater instability in asset prices, and whether—and, if so, how—a central bank could and should deal with the latter.

But this latter general topic is "old hat," having been thoroughly chewed over in innumerable

conferences and articles, and I doubt if such Modigliani/Miller undoing of stability is a *serious* danger to monetary policymakers. Equally, I would tend to dismiss two other bug-bears: (i) that the central bank might lose control of its power to set interest rates, perhaps for some technological reason, e-money and all that (see the discussion, edited by Adam Posen, in *International Finance*, 2000); or (ii) that deflationary pressures could cause nominal interest rates to reach the zero-bound, and then the central bank might become powerless. (See the papers given at the Bank for International Settlements conference on deflation in June 2004.)

One issue that does concern me is that the entirely domestic focus on inflation targeting, and the more nuanced version of that conducted here and by the European Central Bank, could lead to a combination of internal price stability and external exchange rate instability. Since few would want to sacrifice domestic price stability in pursuit of greater exchange rate stability, this raises the question of whether the monetary authorities might summon up slightly more courage to intervene in foreign exchange markets on those occasions when they felt convinced that markets had overshot and gotten it wrong.

A major problem here is that our understanding of the determinants and dynamics of the foreign exchange market, at least in the short and medium run, is so lacking that it takes a brave central bank official to call an overshoot. Indeed, one of the few stylized facts in this field, that exchange rates would appreciate in response to an increase in domestic interest rates, has been called into question in recent years. Insofar as international capital flows have become increasingly equity, rather than debt, related, a rise in interest rates could reduce rather than encourage inward capital flows.

A decade or so ago, one of the main transmission channels for monetary policy, at least for small- and medium-sized open economies, was external. That is to say, a rise in interest rates was expected to appreciate the currency, and the pass-through of lower import prices would help to lower inflation. Nowadays both of those influences, the effect of interest rates on exchange rates and of exchange rates on domestic prices, have been perceived as more muted and, even in the case of interest rates, ambiguous of sign.

In place of external effects, the continuing build-up of personal assets and debts is, perhaps, making personal expenditures more sensitive to monetary policy. My point, however, is not that the transmission mechanism might be changing, but rather that there is, perhaps, rather greater uncertainty about the coefficients in these relationships. There is certainly a continuing, maybe enhanced, danger of getting the policy response wrong because of uncertainty about the transmission mechanism.

Faced with such uncertainty, central banks will surely be even keener than ever on gradualism, whatever the theories of robust policy responses and the need for learning may advocate. Those runners who lead the earlier stages of long-distance races are very exposed. Perhaps the safest place for central banks is slightly off the pace, behind, but close to, the curve.

The past 15 years or so have been a period of enormous success for central banks. Some of that success may have been fortuitous, with a relatively benign political and economic conjuncture, with some other part due to a once-for-all effect of declining inflation and inflation volatility, combined with falling, and quite stable, interest rates. One must expect conditions to become more difficult over the next 15 years.

If so, there may well be increasing political attacks on central bank independence, the more so where real economic growth becomes slow or stuttering. The analytical concept of the vertical Phillips curve is not one that lends itself easily to the public imagination. The idea that an increase in interest rates to safeguard price stability may be the best way to maintain long-run growth is not self-evidently obvious, especially to indebted business men.

Moreover, there is often a problem with democratic legitimacy, perhaps especially so in the Eurozone, and least in the United Kingdom. The main dangers that I see are political rather than economic. Combine slower growth with perhaps a mistake in judging the transmission mechanism, and it is easy to see how a populist politician

might choose to run against central bank independence. I have elsewhere (e.g., Goodhart, 2002; Goodhart and Meade, 2004) tried to draw an analogy between the independence of the legal system and the operational independence of central banks. The latter, however, is more recent, less entrenched in our social and political mores, and far more fragile than that of the legal system. It could still all go wrong; if it did so, I would expect the chief weakness to be political fragility.

REFERENCES

Adams, John. *Risk*. London: UCL Press, 1994.

Bank for International Settlements. *Understanding Low Inflation and Deflation*. Proceedings from the conference at Brunnen, Switzerland, June 18-19, 2003. Basel: forthcoming.

Benati, Luca. "Evolving Post-World War II U.K. Economic Performance." *Journal of Money, Credit, and Banking*, Special Issue August 2004, *36*(4), pp. 691-717.

Faust, John and Henderson, Dale W. "Is Inflation Targeting Best-Practice Monetary Policy?" Federal Reserve Bank of St. Louis *Review*, July/August 2004, *86*(4), pp. 117-143.

Friedman, Benjamin M. "Is Inflation Targeting Best-Practice Monetary Policy? Commentary." Federal Reserve Bank of St. Louis *Review*, July/August 2004, *86*(4), pp. 145-49.

Goodhart, Charles A.E. *Monetary Theory and Practice: The UK Experience*. London: Macmillan, 1984.

Goodhart, Charles A.E. "The Conduct of Monetary Policy." *Economic Journal*, June 1989, *99*(396), pp. 293-346.

Goodhart, Charles A.E. "The Constitutional Position of an Independent Central Bank." *Government and Opposition*, Spring 2002, *37*(2), pp. 190-210.

Goodhart, Charles A.E and Meade, Ellen. "Central Banks and Supreme Courts." *Moneda y Crédito*, 2004, *218*, pp. 11-59.

H.M. Treasury and Bank of England. "Monetary Control." Green Paper Cmnd. 7858. London: HMSO, March 1980.

Posen, Adam S., ed. *International Finance*, Special Issue: The Future of Monetary Policy, July 2000, *3*(2), pp. 187-308.

Wallis, Kenneth F. "An Assessment of Bank of England and National Institute Inflation Forecast Uncertainties." National Institute *Economic Review*, July 2004, *189*(1), pp. 64-71.

Safeguarding Good Policy Practice

William Poole

I can't help recognizing an emotional note in my reaction to this conference. Yesterday, we enjoyed three superb scholarly papers. Allan Meltzer's paper left me depressed, and the Lindsey, Orphanides, Rasche paper left me elated. Marvin Goodfriend's paper left me with hope for the future.

But now I'll try to be a dispassionate social scientist. This panel inevitably overlaps somewhat the previous one on what we have learned since October 1979. In no small part, what we have learned *since* October 1979 starts with what we learned *from* the Great Inflation and how it was brought to an end. Going forward, we need to incorporate in policy practice both sound theory and lessons from history.

I will make five major points, none of which is new but all of which deserve attention in the context of this conference. First, good science is extraordinarily important. Second, market confidence in the central bank is essential for good monetary policy. Third, stability of the real economy requires price stability. Fourth, central bankers have an obligation to communicate clearly with the general public. Fifth, we should not underestimate the role of leadership.

GOOD SCIENCE

The problems of the 1960s and 1970s were partly—not totally, but partly—the consequence of bad economics. Allan Meltzer has discussed those issues, and I do not need to repeat his argument here.

I note especially that Chairman Martin's dismissal of economics and economists does not make for happy reading today. I hope that we never again see Federal Open Market Committee (FOMC) members with that attitude. Policymakers need not be professional economists, but they must be able to understand what economists bring to the table.

How do we safeguard a high level of expertise in the FOMC of the future? There is no way to ensure that the appointment process will always put the right people on the FOMC. But I think we can help to guard against appointment errors by working with Reserve Bank directors, who choose Reserve Bank presidents, with Congress, and with opinion leaders in general. Those of us in leadership positions today, and everyone else with monetary policy expertise, need to spend time in helping to instill in the general public a deeper understanding of monetary policy responsibilities. We need to discuss what characteristics are necessary for policymakers to be successful. I hope that we never again have appointments yielding the results of the 1930s, 1960s, and 1970s.

The largest gap in macroeconomics is the weak understanding of the relationship between real and nominal variables. In our models, we employ a Phillips-curve type of relationship to model inflation, or changes in the rate of inflation. In our models, a departure of the actual rate of inflation from the expected rate depends on a current and expected future real gap measure of some sort. I simply distrust this model, on both theoretical and empirical grounds. Empirically, I don't think it works very well, and theoretically it ought not to work very well.

I'd love to hear Chairman Greenspan offer a systematic exposition of his enormous success in forecasting inflation pressures. My sense of what I do, which I think is not dissimilar to what most FOMC members do, is attempt to intuit future inflation pressures from current observed pressures as they show up in both price changes and resource pressures, or real gaps, in individual markets. The approach is not totally without theory; for example, wage changes are evaluated in light of expected productivity trends. I attempt to sort out temporary from more lasting wage and

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price changes and attempt informally to construct an appropriately weighted average of disparate experience in various sectors. I look closely at data on inflation expectations, but treat such data carefully because longer-run expectations are really a vote of confidence on the Fed and not an independent reading on inflation.

I am extremely uncomfortable with this approach and believe that it is an invitation to future mistakes. I don't know what better to do.

PUBLIC CONFIDENCE

A standard feature of monetary analysis in recent years is that market confidence in the central bank is tremendously important. Retaining confidence requires, above all, successful outcomes. There is no adequate substitute for good results. The market does not require perfection—people do understand in broad outline what the central bank can and cannot do. People understand that some small mistakes are inevitable. Still, the market will surely lose confidence from mistakes occurring year after year after year.

Once confidence is gone, restoring it is incredibly costly. That is one of the prime lessons of U.S. experience in the late 1970s and early 1980s and experience around the world. To restore confidence, it is necessary to achieve, or least make progress on, policy objectives of price stability and full employment.

Making progress on policy objectives is far more important than hitting an intermediate target such as a steady, moderate rate of money growth. To the noneconomist, intermediate targets are highly technical in character. I am not an engineer, for example, and really don't care what engineers say about the strength of steel when bridges fall down. Similarly, the noneconomist really doesn't care about the rate of money growth. If it works, fine, but stable money growth is not a substitute for price stability. Of course, an intermediate target may be of transitional importance in restoring confidence, as the 1979-82 experience shows.

Restoring confidence may require—indeed, I suspect in most cases *does* require—bearing a lot of pain to demonstrate that a central bank is serious about meeting its responsibilities. The recession of 1981-82 is such an event. The market wants to see the central bank is able to bear pain, and the reasoning is simple. If you cannot withstand a lot of pain, why should anyone believe you are serious given all the pressures to change course? Technical explanations can always be offered to explain a change in policy direction, but if it appears that technical mumbo jumbo is an excuse for not completing the job, then confidence will not be restored. Thus, a change in policy direction will require a fairly understandable explanation once a fair amount of pain has been endured.

The logic of pain seems inescapable. Inflation cannot fall permanently unless inflation expectations come down. Expectations will not come down in the absence of confidence that the central bank will keep inflation down in the future. Confidence in the central bank will not be obtained unless the market becomes convinced that the central bank, and the political system more generally, has the institutional strength to maintain low inflation. The real test of institutional strength is capacity to bear pain.

The rational expectations argument of costless disinflation through restoration of credibility never appealed to me. In 1979, given what the Fed had said and done over the preceding 15 years, it would have been irrational to have granted the Fed instant credibility.

PRICE STABILITY AND REAL ECONOMIC STABILITY

My third point is that maintaining price stability is extraordinarily important for stability of the real economy. The idea that we can trade off employment stability against inflation stability is flawed. I do not want to deny that there may be some trade-off around the edges, but the key regularity is that instability of inflation and real growth are positively correlated. Tolerance of higher inflation is not a recipe for creating higher employment or improved employment stability, but just the reverse. The reason is that inflation instability creates more instability in inflation expectations and wider dispersion in the expected rate of inflation.

Greater variability and dispersion of inflation expectations increases the magnitude of expecta-

tional errors and therefore increases misallocations in the real economy. Moreover, an increase in inflation tends to reduce the market's confidence in the central bank, which, in turn, makes it more difficult for the central bank to adjust its policy to help stabilize the real economy. This point was demonstrated dramatically in the 1980-82 period. Given weak market confidence in the Federal Reserve's willingness to control inflation, the Fed was not able to switch gears toward a less restrictive policy as employment weakened in the 1981 recession. The central bank could not switch gears because doing so ran the risk of undoing tentative progress in restoring the market's confidence in the central bank.

The arguments I have just offered flow from sound economics—the observed positive correlation between inflation instability and employment instability is what we ought to expect.

COMMUNICATION

Allan Meltzer discussed the intellectual environment that made the Great Inflation possible. By the 1960s, traditional central bank concern over inflation had come to be regarded as old fashioned and the new economics promise of an optimal trade-off of modest inflation to buy lower unemployment had won many converts. Although the Federal Reserve, especially the Board of Governors, included converts, the Fed also included leaders who shared traditional concerns about inflation. My memory of this period, which I have not tried to research for accuracy, is that traditional concerns were not stated forcefully by articulate defenders of price stability within the Fed.

Central bankers can influence public debates, if they try. One of the lessons I draw from the Great Inflation is that those of us in leadership positions in the Federal Reserve have an obligation to communicate actively. If we do not, by default we leave the debate to others. I think that academics are important to public debates primarily through the longer-run force of their scholarly contributions. These are all that really matter in the long run; in the short run, some academics command public attention, but not very many and not much attention in the scheme of things. Press attention is concentrated on politicians, office-holders in general, and business leaders who control large resources. Federal Reserve office-holders immediately attract press attention, by nature of their positions. As a Reserve Bank president, I have an opportunity to reach an audience far larger than I ever had as a professor at Brown University.

The communications environment is quite different today from the early 1980s, when the Fed released relatively little information. In the interest of full disclosure, I was one of the skeptics when the Fed abandoned reserve targeting in the late summer of 1982. My fear was that the Fed would embark once again on a policy that would permit inflation to rise. As a monetary economist, perhaps I knew too much; I found the Fed's explanation for switching from nonborrowed-reserves to borrowed-reserves control in 1982 an example of the technical mumbo jumbo I referred to earlier. But the market bought the argument, and the fact that monetarists such as I were suspicious was irrelevant. I was wrong, and I am certainly happy that I was wrong.

Still, the current environment of much greater Fed openness has probably raised the standard of what will be required in debates in the future. If the Fed makes major mistakes and must again embark on a campaign to restore credibility, I suspect that it will have to pursue a more open dialog with the public.

In any event, safeguarding good policy practice from political pressures will require ongoing communication with Congress, market professionals, leading citizens, and the general public. Good monetary policy will be easier, and more effective, with widespread understanding of what constitutes good policy. That to me is one of the clear lessons of the Great Inflation.

LEADERSHIP

My last point concerns the role of leadership. This conference is a celebration of Paul Volcker's leadership.

Central bank leadership requires at times a willingness to push hard enough to get the job

done—and recognition of how hard is too hard. The central bank does not want to get itself fired through changes in law or appointments that undermine the bank's authority. Pushing hard enough but not too hard is obviously a dicey act at times, requiring political judgment and acumen, but it is nevertheless one that central bank leadership must be able to pull off successfully.

I appreciate, at a much deeper level today than I did at the time, the extent of Paul Volcker's achievements in the 1979-82 period. Saying that is not meant to imply a negative comment about his achievements in later years. But certainly 1979-82 was a critical period in U.S. monetary history. I know that Paul Volcker did not do the job alone—support from President Reagan was critical. That said, there was no guarantee that President Carter would appoint Paul Volcker. Volcker was a logical, but not inevitable, appointment. President Carter could instead have appointed a Chairman who would have continued the policy of drift. The inflation rate would have continued to rise, and the pain of unwinding the inflation would have been greater.

The Great Inflation is understandable, but was not unavoidable. Stronger leadership by Chairman Martin would have cut short the early development of inflation. Chairman Burns could have stopped it. The intellectual and political environment of the 1960s and 1970s certainly had a lot to do with making the Great Inflation possible. Still, the Great Inflation was not inevitable.

Leadership really does matter.

Reflections on the October 6, 1979, Meeting of the FOMC

Robert P. Black

Sometime during the week of the October 6, 1979, meeting of the Federal Open Market Committee (FOMC), I received a telephone call from Chairman Paul Volcker, as I assume did the 11 other presidents of the Reserve Banks. Chairman Volcker had just returned from a meeting of the International Monetary Fund in Belgrade, where the air was charged with worries about inflation, the foreign exchange markets, and various other forms of speculation. In his call he stated that he was going to call a meeting of the FOMC on Saturday, October 6, to address possible changes in the operating procedures of the Committee to place more emphasis on controlling the monetary aggregates.

At the first two meetings following his appointment as Chairman, I had dissented in favor of tighter money because of worries of the type that boiled over in Belgrade. I had not taken these dissents lightly, because of doubts about my own judgment and the high esteem in which I held the Chairman, but I felt strongly that the Committee had been inadvertently too "easy" in a very volatile and inflationary environment that could result in serious consequences unless the Committee made a strong commitment to a "tighter" policy.

I believe I remember almost precisely my words to the Chairman as he outlined his intentions for the October 6 meeting: "Mr. Chairman, you won't get any argument from me. I've thought for a long time that we ought to adopt procedures of the type you outlined." My enthusiasm was tempered by only one factor—the necessity of missing my usual Saturday golf game, my chief outside diversion at the time. It was, however, a trade-off I welcomed enthusiastically, since I concluded that the meeting was likely to yield very positive results for monetary policy.

On October 5, the Chairman convened a telephone conference call with the Board and the 12 Reserve Bank presidents and described in more detail what he was planning and the logistics of the meeting. In view of the speculative fever then rampant and the damage that could have arisen if word of the meeting leaked out, he told us that reservations had been made for us at various hotels in lieu of the one where we typically stayed. He also pointed out that the Pope was in Washington and that the considerable press attention that would be devoted to his visit would provide useful cover for our meeting. Finally, he told us that we would each receive by confidential wire a memorandum from Messrs. Axilrod and Sternlight that would outline the possible procedures and targets that he thought we should consider.

I ate alone at my hotel that night and did not discover until the next day that at least one of my fellow presidents had also stayed there. After having studied the memorandum and other material as carefully as I could, I went to bed quite happy, since I was convinced that the Committee was about to make a major improvement in our operating procedures the next day.

THE OCTOBER 6 MEETING

The meeting opened with a briefing on the economy by Jim Kichline, the associate economist to the Committee who typically provided the Committee with an economic briefing, and was followed by some discussion of economic condi-

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tions by members of the Committee and nonvoting presidents. Messrs. Wallich and Volcker then added some brief comments on the troublesome situation that they had observed in Belgrade.

After having described his assessment of real and financial conditions, Chairman Volcker outlined his view of the possibilities for operating policy over the period ahead:

1. Taking measures of the traditional type, which would include a rise in the discount rate coupled with a "significant" increase in the federal funds rate and a possible increase in reserve requirements by the Board latter that day.
2. Adopting the procedures outlined in the Axilrod-Sternlight memo, which would entail tailoring Desk operations to place more emphasis on a reserve path that would achieve money supply targets accompanied by a widening in the range for federal funds.

The Chairman stressed that there were risks with either approach but suggested that new procedures seemed necessary because the old approach clearly had serious deficiencies. He also cautioned that it would also be necessary to move the federal funds rate down promptly if the situation reversed itself. He had concluded that both foreigners and the administration would welcome a strong package despite some uneasiness about a change in techniques. He emphasized that he did not think the approach should be purely mechanical, that it should give the Desk considerable discretion in conducting operations, and that it should be revisited when needed in the future. He also expressed the hope that whatever approach was adopted would have widespread support in the Committee.

Right from the beginning, there was broad support for the new procedures, although the strength of the support varied from participant to participant. I believe that I was one of the most enthusiastic supporters and would have favored a longer-term commitment to the new procedures than was subsequently adopted. I long ago had begun thinking of the FOMC as occupying the position of a monopolist that could control the aggregates, within reasonable limits, or the federal funds rate, but not both simultaneously. Since I interpreted the historical empirical evidence as demonstrating that the rate of growth in the money supply had a much closer relationship to the price level and output than did the federal funds rate, I was strongly in favor of placing primary emphasis on the money supply and letting the federal funds rate fluctuate as widely as necessary to achieve the money supply target. I even went so far as to say at one point during the meeting that I felt better about what I'd heard that day than at any time since I began attending meetings of the FOMC many years before.

THE DECISION

There was a great deal of discussion about what the appropriate numbers should be under the new procedures toward which the Committee seemed to be moving. Everyone was well aware that the nature of money was changing and would likely change further, that there was slippage between any reserve number and the aggregates, and that the institutional arrangements were not perfect.

After long and arduous discussion, the Committee settled on the following ranges for its targets for the September-December period:

1. M1—an annual rate on the order of $4^1/_2$ percent
2. M2 and M3—an annual rate of about $7^1/_2$ percent
3. Federal funds rate—a range of $11^1/_2$ to $15^1/_2$ percent
4. An initial borrowing assumption of around $1.5 billion

Since such rates of expansion would produce growth in the upper parts of the ranges adopted during the previous July meeting, the Committee agreed that somewhat slower rates of growth would be acceptable.

The vote in favor of the new procedures was unanimous. The group agreed that an announcement of these changes should be made promptly, but no decision as to the exact timing was made before the meeting adjourned.

After the meeting, the Board approved an increase in the discount rate from 11 percent to 12 percent and established a marginal reserve requirement of 8 percent on total managed liabilities of member banks, Edge Act corporations, and U.S. agencies and branches of foreign banks.

I supported more emphasis on long-term targeting than did most of my colleagues because (i) I thought the market needed to be assured of our longer-run intentions and (ii) I still felt that targeting the federal funds rate without additional emphasis on long-run targets was unlikely to produce predictable behavior of the aggregates. My main fear was that we would not raise the federal funds rate sufficiently if we overshot the targets, since it's always less difficult to ease than to tighten. As I had observed the history of the System's past policy actions, I felt that there was little doubt that most of the errors of the FOMC had resulted from having adopted too easy rather than too tight a policy.

In subsequent meetings after October 6, I concluded that we still needed to move more rapidly to tighten than we did. This led to my dissenting for tighter money five out of eight times the next two times I was a voting member during the tenure of Chairman Volcker. On one occasion following a prolonged discussion, I looked up at him and said, "It pains me, Mr. Chairman, but I think that I should dissent again." He smiled, glanced at me, and said, "It doesn't pain me!"

His comment led to some playful speculation among some of my colleagues that he wasn't worried about what I said because no one would pay any attention, but I know that he never sought "yes" participants and wanted everyone to feel free to vote his or her convictions. Moreover, I think he may possibly have welcomed the dissent as a means of helping shift the consensus nearer the position he really wanted, since a Chairman doesn't have the luxury of dissenting!

SUBSEQUENT DEVELOPMENTS

Subsequent years have brought many and rapid financial innovations; it has become more and more difficult to determine the best aggregates to control; and the slippages between reserve measures and aggregates have become more troublesome. Accordingly, the FOMC abandoned the formal setting of monetary aggregate targets in the 1990s and began leaning primarily on the federal funds rate as its operating target. It wisely preserved, however, a willingness to move the funds rate more promptly over a wider range in response to inflationary and real economic developments—a procedure I consider the single most important decision reached that afternoon on October 6, 1979.

I think that the System has done a superb job in recent years under these revised procedures and deserves our highest praise, although I confess to some continuing discomfort about the absence of any formal aggregate targets. One thing seems certain to me, however. I do not believe that such success would have come without the bold decision the Committee made that fateful Saturday in 1979! It is quite gratifying to have been a small part of that group that initially launched the Committee in what I believe has been the correct direction. Our country—indeed, the whole world—has benefited greatly from its commitment and courageous decisions.

Personal Recollections

Philip E. Coldwell

As requested in the invitation to this monetary policy conference, I have reviewed my personal records and the published documents of the Federal Open Market Committee (FOMC) to refresh my memory of the August policy discussions leading up to the FOMC meeting of October 1979. My personal recollections of the policy discussions in the years leading up to August 1979 are colored by my dissents from the majority opinion. In almost all of those dissents, I wanted a tighter policy, especially in the years 1978 through 1979. Some of my unhappiness was fostered by pressure from the Carter administration, which seemed to be aimed at an easier policy.

I have presented below my personal record of my recommendations to the FOMC, with comments on economic and financial conditions.

1. Recession fears are fading as potential defense build-up influences expectations on jobs, materials, prices, inventories, and credit.
2. The fundamental fact of high inflation is the one certainty of the coming year, and, unless dampened, the possibilities of rising inflation will grow.
3. Gradualism in economic policy is a lovely theory but a practical monstrosity. Gradualism promises long-run improvement, but short-run events always seem to interfere.
4. Credit availability is high, and, with expectations of continued inflation, the interest rate restraint is minimal.
5. Banker attitudes reflect no feeling of quantitative limits and, to the contrary, see business as usual. It almost seems that the only thing that would impress them would be a major recession.
6. Fiscal policy portrays an aura of restraint, but I hope you will forgive me if I say I don't believe it. The possibility of defense expansion, the coming election, any weakening in the economy, and the continual pressure for welfare spending all lead toward a higher rate of expenditures and a lessening of the tax cut restraint.
7. Recent trends in international finance point to some dollar strength, but this could fade if the interest rate relation between countries narrows and our inflation rate stays high. The problems of export and import trade balances are still with us.
8. Thus, my recommendation to the FOMC is to err on the side of restraint. The long-run costs of inflations are so disruptive that even a recession is acceptable.

During the 1978 and 1979 meetings of the FOMC, the policy discussions ran the gamut of fiscal policy, monetary policy, foreign exchange policy, and the uncertainties of rising inflation. Even the monetary policy measuring sticks of interest rates and monetary aggregates were under considerable debate. My own policy preference was to tighten availability of funds by raising interest rates. I was not enamored with monetary aggregates, because their interpretations and measures of use were far from clear. Moreover, the FOMC was split as to the degree of interest rate change to be adopted.

Several of the Board members had become increasingly irritated with the policy of small

Philip E. Coldwell was a member of the Board of Governors of the Federal Reserve System from 1974 to 1980.

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steps toward fighting inflation that the majority of Board members supported. Thus, we supported the change toward the use of monetary aggregates as a means of more stringent and effective inflation control. Because my term on the Board expired in February 1980, I had less knowledge of the FOMC actions after that date. However, Congressional actions and Board policies created definitional problems in the use of money aggregates.

Given the 25 years since the 1979 period, I must say that my memory has dimmed. Nevertheless, the positions presented above reflect my recollections.

It should be remembered that part of the economic and financial chaos of the 1978-80 period was the change to a new administration and the turnover of governors on the Federal Reserve Board. Only three of the same governors were on the Board from January 1, 1978, to December 31, 1979. In 1978 there were four governors who resigned or died. In 1979, four members of the Board, including the Chairman and three governors, changed. The turnover in the administration and in the Federal Reserve Board created a distinct change in policy toward easier spending and only weak step-by-step Board actions to reduce inflation.

Reflection on the FOMC Meeting of October 6, 1979

Joseph R. Coyne

On October 6, 1979, I was one of 33 persons who attended the most defining and important meeting of the Federal Open Market Committee (FOMC) during my more than 30 years at the Federal Reserve Board. It might well have been the most important monetary policy meeting in the entire history of the Federal Reserve System.

Inflation was on a dangerous upward curve at the time and didn't seem to be responding very well to policy actions. Chairman Volcker was especially concerned and called the special meeting that would change our lives throughout the entire System for several years to come.

Since I am not an economist, my reflections about this meeting and its aftermath don't fall under the heading of an economic treatise but involve day-to-day experiences that flowed from the meeting. They include the Pope, Gail Cincotta and consumer activists, purple hearts, two-by-fours, keys, and a corporal in a John Wayne movie.

The Pope was in town at the time of the meeting and probably diverted a great deal of public attention from what was happening elsewhere in Washington. Our meeting began at 10:10 a.m. and ended a few minutes before 4 p.m., as I recall. I immediately asked the Chairman if we could have a press conference. He said yes and asked what time; I said 6 p.m.

Two of my staff and I began calling various members of the press. Keep in mind that in those days there were no cell phones or Internet. News services and newspapers were on a weekend status, and it was a quiet news day in Washington, generally, except for the Pope's visit.

Then my telephone rang. It was the chief of the CBS Washington Bureau. He said he only had one crew working that day and it was covering the Pope. He asked if our press conference was going to make big news. Without hesitating, I said he would remember the press conference long after the Pope had left town. He sent the crew and never complained. I hope the Pope has forgiven me.

The turnout at the press conference was large—more than 50 press attended, a few still in their Saturday-at-home working clothes. At one point, Irving R. Levine of NBC, apparently anxious to get the news on TV, tried to end the discussion by saying, "Thank you, Mr. Chairman." But others stopped him. They wanted more.

My next reflection is about consumer activists and, especially, Gail Cincotta. Mrs. Cincotta was from Chicago and an old-school activist for the consumer—make a lot of noise and you'll get attention.

Activist groups had scheduled a meeting in Baltimore and wanted Chairman Volcker to address them about high and rising interest rates. This is when I began to feel like the corporal in a John Wayne movie. You know, John Wayne is riding with his cavalry unit in the Old West when a group of hostile Indians appears on the horizon. Wayne says, "Corporal, take the point."

Needless to say, I wasn't too enthralled about the Chairman addressing this meeting. I discussed the invitation letter from Mrs. Cincotta with him, and he, noting that the meeting was in Baltimore, suggested that we turn for help to then President Bob Black of the Federal Reserve Bank of Richmond.

So, I telephoned President Black, and it turned out that he, too, had a corporal. He assigned one of his top officers to go to Baltimore and appear

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at the meeting. I later received a letter from that officer explaining the rough verbal treatment he got and that he was really unable to deliver any type of reasonable speech.

That corporal later became the vice president of the new Baltimore Branch and still later was appointed president of the Federal Reserve Bank of Dallas. I like to think I was somehow instrumental in furthering Bob McTeer's career.

My turn as the corporal came quickly. Mrs. Cincotta, not soothed by events in Baltimore, brought her group to Washington. Three busloads of protesters wound up at the Board's C Street entrance and began demonstrating against high interest rates. One demonstrator wore a shark's costume—the "loan shark." I went down to negotiate with her, not by myself, mind you, but with two very tall staff economists, Peter Keir and Bob Lawrence.

She wanted the entire group to meet inside the building with the Chairman. He agreed to a meeting but with a much smaller group. After a long period of negotiation, she reluctantly cut the number to about 15. Tensions ran high during the meeting, which lasted about 45 minutes to an hour. Afterward, Chairman Volcker went down to the C Street entrance and made some off-the-cuff remarks to the crowd—with the "shark" standing nearby.

Later, Mrs. Cincotta said that, since members of the various consumer groups involved lived in various parts of the country, she would like to schedule a series of meetings with us in various cities to discuss our policies. They would select the cities and arrange the meeting sites. I thought this was a great idea because it would show our willingness to at least listen to their concerns and probably discourage them from picketing our buildings.

To make a long story short, we held the meetings and sent at least two senior officials from the Board and two from each Reserve Bank where the meetings were held. As you might expect, the meetings ranged from tense to extremely tense to sometimes threatening.

This is where the purple hearts came in. The graphics section whipped up some purple-colored pin cushions shaped like hearts and suggested they be awarded to those who had faced the verbal darts and spears that flew at the regional meetings. The Chairman himself made the presentations at a formal Board meeting.

After regional meetings in nine cities, including New York, Chicago, San Francisco, Richmond, and Des Moines, Mrs. Cincotta requested another meeting with the Chairman in Washington. He agreed, but the meeting broke up when a few of the visitors started shouting and walked out. A few days later, we awarded the Chairman a purple heart for his valiant efforts.

Next came the farmers. They had planned a march on Washington to complain about economic conditions and came complete with their tractors, parking them at the foot of Capitol Hill. We thought we were safe.

But without warning, some tractors showed up on C Street, and again the "corporal" was called. Fortunately, it was a small group of farmers, so we found a vacant conference room and invited them in. Their lawyer did most of the talking. What they wanted were low-cost loans from the Reserve Banks similar to those made by the Reserve Banks to some businesses during the Great Depression. They were turned down.

Meanwhile, the Board received hundreds, perhaps even thousands, of small pieces of lumber, each measuring exactly 2x4x9 inches. They were sent by home builders and realtors, and each carried a message such as "Cut the deficit" or "Lower interest rates." NBC News took a picture of a stack of them in the Chairman's office.

Keys also arrived, representing houses that weren't being built and cars that weren't being sold. One Congressman delivered a big batch of keys, which Governor Partee received on behalf of the Board. He then presented the Congressman with a cardboard sword, made by our graphics section, with the inscription "Cut the Deficit." Governor Partee, incidentally, also attended the regional meeting in Chicago and received one of the purple hearts.

As you can see from all this, the effects of the 1979 meeting were widespread throughout the country. The number of stories that could be told are almost endless. So let me close with some

reflections about two trips to Las Vegas that still stick in my mind.

During the period of high interest rates following the 1979 FOMC meeting, the Chairman made a trip to Las Vegas to address the annual convention of the National Association of Home Builders. Although the home building market was extremely weak, the delegates gave him a polite reception and even two standing ovations.

The realtors were in equally bad shape at that time, but, a few years later, delegates to the annual convention of the National Association of Realtors gave the Chairman a resounding standing ovation when he walked into the convention hall.

That applause was just one indication of the results that grew from the procedures adopted by the FOMC at its meeting of October 6, 1979. That meeting planted the seed that eventually broke the back of inflation and laid the groundwork for the period of economic growth that we have enjoyed—with little or no inflation—over the past two decades.

Reflections on October 6, 1979, and Its Aftermath

Charles Freedman

INTRODUCTION

Canada is the quintessential "small open economy." It has very close ties with the United States in both trade and capital movements. On the financial side, interest rate movements in the United States can affect Canada fairly quickly through their influence on the exchange rate and on domestic interest rates. As a result, economic and financial developments in the United States have an important influence on the Canadian economy and on policymaking in Canada.

The changes in the Federal Reserve operating procedures of October 6, 1979, and the subsequent wide fluctuations in short-term and long-term U.S. interest rates had significant effects on interest rate and exchange rate developments in Canada and thereby on Canadian monetary policy. This paper examines a variety of issues related to these developments. The next section of the paper sets out the background to the Canadian economic situation in the latter part of the 1970s. In the following section, I examine the analyses carried out in the Bank of Canada in response to the announcement of October 6, focusing particularly on the analysis of the new operating procedures announced on that date. The subsequent section of the paper looks at the effects of the change in the U.S. policy framework and of the resulting U.S. interest rate movements on Canadian financial developments and on the way they affected policymaking in Canada. A final section offers some concluding remarks.

BACKGROUND

The Bank of Canada was facing problems similar, but not identical, to those facing the Fed in 1979. Following the adoption of targets for the monetary aggregate M1 in November 1975, inflation (as measured by the 12-month increase in the consumer price index [CPI] excluding food and energy) had decelerated from about 9 percent in the second half of 1975 to a low of about 5$^1/_2$ percent in mid-1978. This reflected policies aimed at a gradual disinflation: monetary policy through a reduction in M1 growth from 1975 on and wage and price controls over the 1975-78 period. Subsequently, there was a marked intensification of inflationary pressures in the Canadian economy from both external factors (the rise in commodity prices and U.S. inflation) and internal factors (the pressure of demand in the Canadian economy), in spite of the continued deceleration of M1. Inflation increased to about 8 percent by mid-1979. At the time, a lot of emphasis for the rise in inflation was placed on special factors, especially the exit from wage and price controls and the effects of the renewed rise in oil prices related to the revolution in Iran in early 1979. In retrospect, an important part of the explanation for the divergence of the path of inflation growth from that of M1 growth was the high interest rate elasticity of the demand for M1.[1] This meant that, when M1 growth tended to rise above target as a result of an increase in price inflation, the rise in interest rates needed to keep M1 on target was

[1] There may also have been insufficient adjustment for the downward shift in M1 in response to financial innovations when the targets were rebased.

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not large enough to slow down demand growth sufficiently to slow inflation, at least in the short to medium run.[2] Subsequently, financial innovation weakened the link between M1 growth and output and inflation developments so much that the Bank of Canada withdrew the M1 target in November 1982.

ANALYSES CARRIED OUT IN RESPONSE TO THE OCTOBER 6 ANNOUNCEMENT

At the time of the announcement, I was chief of the Department of Monetary and Financial Analysis at the Bank of Canada, which had responsibility for monitoring and evaluating U.S. financial developments. In response to the announcement by the Fed on Saturday October 6 (Board of Governors, 1979), I wrote an initial memorandum dated October 10 (Freedman, 1979) to the Governor of the Bank of Canada (with copies to all senior officials at the Bank). I noted the four key elements of the package: (i) the discount rate increase of 1 percentage point, (ii) the marginal reserve requirement on the increase in managed liabilities, (iii) the increased emphasis on controlling the supply of bank reserves, and (iv) moral suasion on banks to avoid loans supporting speculative activity in gold, commodity, and foreign exchange markets. Much of the attention in the memorandum was devoted to the first two items. However, the two paragraphs on the new techniques of monetary control are worth quoting at length.

> There is relatively little in the press release that throws light on the manner in which reserves control is to be implemented. Although the Fed re-affirmed its objective of controlling the growth of M1 and M2…, it may well be that the main result of reserve base control will be to control the growth of bank credit. Indeed, the combination of reserve base control and increased reserve requirements will act together to reduce the growth of total bank assets and liabilities…
>
> On the other hand, if the Fed intends to use control of the reserve base to achieve M1 and M2 targets, one can raise the question of how well base control would operate when the liabilities subject to reserve requirements differ from the aggregate on which the central bank is targeting. Indeed, given the complexity of the U.S. system of reserve requirements, the relationship between M1 and M2 targets and growth of base is likely to be very loose. Since the only way in which the demand for narrow definitions of money balances can be affected in the short run is by interest rate changes, one can interpret base control as a means of getting interest rate changes in a much more automatic way and without the political fallout normally engendered by discretionary changes in interest rates. Thus, in the near term, the major result of base control will probably be to widen substantially the bands within which the federal funds rate is permitted to fluctuate. If the Fed wishes to prevent changes in borrowed reserves from offsetting its changes in unborrowed reserves, it will either have to let the discount rate fluctuate more widely (or perhaps tie it to a market rate) or to impose administrative controls on the use of borrowed reserves.

Clearly, the initial press release on October 6 gave us relatively little to go on in understanding the new procedures. It was only with the release of the staff memorandum (Volcker, 1980) at the time of Chairman Volcker's testimony to the Senate Committee on Banking, Housing, and Urban Affairs on February 4, 1980, that the Bank of Canada was able to undertake a more in-depth analysis of the technical elements of the new procedures. However, I would note that between 1978 and 1980 a number of internal memoranda on base control, as well as a published technical report (Clinton and Lynch, 1979), had been written by members of the staff in response to the aca-

[2] Thiessen (1983). The need for a relatively low interest rate elasticity on money demand is similar to the Taylor principle that nominal interest rates should rise more than one-to-one with a rise in inflation.

demic literature, the work at the Federal Reserve Bank of St. Louis and the Swiss National Bank, and the research being done in England, including at the Bank of England (Goodhart, 2005), on base control and money market multipliers.

In a subsequent memorandum dated June 16, 1980 (Freedman, 1980), I analyzed the movements of interest rates, nonborrowed reserves, borrowed reserves, required reserves, and the various monetary aggregates to see whether in fact the Fed had been following its announced modus operandi:

> If it has been so doing, one might conclude that the substantially increased volatility of interest rate movements since last October is an inherent property of base control, at least in the form practiced by the Fed. If, on the other hand, the Fed has not been following its announced procedures, then one can argue that the recent movements of interest rates have been at least in part the result of discretionary Fed action and not simply the automatic result of the base control.

The conclusion of the memorandum was as follows:

> The above analysis has proceeded on the assumption that the Fed has controlled non-borrowed reserves with the objective of controlling monetary targets. To interpret the movements of non-borrowed reserves and interest rates in the period since October 1979 then requires the additional assumption that the Fed's horizon is very short and therefore that sharp movements in interest rates are a natural outcome of the technique of control. An alternative explanation of the events of the last six months can be offered in terms of the traditional control of interest rates. In this form of exegesis the interest rate increases of February and March were aimed at breaking inflationary psychology and the subsequent interest rate declines were for the purpose of fighting the ensuing recession. With the passage of time one should be able to distinguish between the two competing hypotheses.

Thus, the issue of whether the Fed was using discretion or simply following a more rigid set of techniques remained open.

The technical analysis at the Bank of Canada of the interest rate implications of base control led to a conference presentation at the end of October 1980 (Freedman, 1983), also published as a National Bureau of Economic Research working paper (Freedman, 1981), entitled "Some Theoretical Aspects of Base Control." This paper examined the implications of base control from the perspective of a series of increasingly complex models, before presenting a short analysis of the new Federal Reserve procedures in light of the theoretical models. The exposition of the Fed procedures relied heavily on the staff paper released by the Board in early 1980 and drew on the discussion in Lang (1980). (As an aside, I would note that in mid-1980 I presented this paper to seminars at the St. Louis and the Kansas City Federal Reserve Banks. The response at the Kansas City Fed was largely one of agreement with my analysis of the new techniques, while an economist at the St. Louis Fed commented that I sounded as if I were working at the Board of Governors in Washington, which was not intended as a compliment.)

Interestingly, there appears to have been no discussion of the change in technical procedures at the Fed in official Bank of Canada publications or in speeches by senior officials. This was in line with the general principle that a central bank did not comment publicly on the approach to monetary policy by other central banks. However, there was considerable discussion of the increase in the volatility of U.S. interest rates and its implications for Canada, to which I will now turn.

POLICY IMPLICATIONS

The substantially higher level and increased volatility of U.S. interest rates following the October 6 announcement received a great deal of attention in Canada and in Bank of Canada discussions. The initial context, as described earlier, was one of considerable inflationary pressures in Canada from both external and internal sources. These developments warranted a rise in interest rates in Canada as well.

A major issue for the Bank of Canada was how to respond to the "extraordinary volatility of interest rates in the United States." The Bank noted in its annual report for 1980 that "movements of this magnitude in U.S. interest rates were bound to have substantial effects on interest rates in Canada or on the foreign exchange value of the Canadian dollar or on both" (Bank of Canada, 1981, p. 9). For reasons that will be discussed shortly, the Bank chose to run policy in such a way that some of the impact of U.S. interest rate movements in 1980 fell on Canadian interest rates and some on the exchange rate. Thus, the "swings in Canadian short-term interest rates, while considerable, were much smaller than in the United States and the value of the Canadian dollar in U.S. funds almost always moved inversely with U.S. interest rates" (p. 9).

As a result of the increased volatility in interest rates, the Bank of Canada announced on March 10, 1980, that the Bank Rate, the minimum interest rate that the Bank charges on its advances to the chartered banks, would in the future be set at 1/4 percentage point above the average rate established in the weekly tender for 91-day Treasury bills issued by the Government of Canada (Bank of Canada, 1980). The change to a floating Bank Rate was made to give the Bank of Canada additional flexibility in the disturbed state of external financial markets.[3] The floating Bank Rate proved to be a useful mechanism in the more volatile environment for interest rates and remained in place until February 1996.

There were two major issues that confronted a country like Canada (and other open economies as well) in the face of the sharply increased volatility of U.S. interest rates in the 1979-81 period.[4] First, what are the policy implications for a country wishing to achieve its announced target for monetary aggregate growth? Second, and relatedly, what is the role of the exchange rate in the setting of policy?

In analyzing the possible responses of a small open economy with a monetary aggregate target to U.S. interest rate movements, there were three cases to be considered: (i) the nominal interest rate increase in the United States reflected an increase in real interest rates; (ii) the nominal interest rate increase reflected an increase in inflationary expectations; and (iii) the rise in the nominal interest rate reflected a rise in inflationary expectations, but the exchange market interpreted it as a rise in the real rate.[5,6]

The first case, that the nominal interest rate movements reflected real interest rate movements, was the most relevant in the 1979-81 period. The small open economy could react to a rise in real interest rates in the United States by one of two polar responses or by an intermediate response. One polar response would be to leave its policy interest rate unchanged. This would result in a depreciation of its currency, upward pressure on demand and inflation, and an increase in M1 relative to its target. The other polar response would be to raise the domestic interest rate by the same amount as the interest rate increase in the United States. This would result in an unchanged foreign exchange rate (at least initially), but the increase in domestic interest rates would lead to a reduction in M1, lower aggregate demand, and downward pressure on inflation.

One intermediate response would be to move the domestic interest rate in the same direction as the interest rate in the United States, but by a lesser amount, in order to keep M1 unchanged in the medium run. The higher interest rate would

[3] The Bank emphasized in its press release that its influence "on the level and movement of short-term interest rates in Canada will not be greatly different with a floating Bank Rate than it has been with a fixed Bank Rate...A floating Bank Rate does not mean a 'hands off' policy by the Bank" (Bank of Canada, 1980).

[4] This section of the paper relies heavily on my presentation at the Kansas City Fed conference of August 1982 (Freedman, 1982). As noted in that article, my analysis of the possible responses to U.S. interest rate movements in a small open economy with a monetary aggregate target drew heavily on earlier work by Pierre Duguay, then Assistant Chief in the Department of Monetary Analysis and now Deputy Governor at the Bank of Canada.

[5] While the analysis in this paper is done in the context of an increase in U.S. interest rates, it also holds with signs reversed for a decline in U.S. interest rates

[6] The analysis is partial in the sense that it does not take account of the spillover effects into the small open economy of movements in U.S. aggregate demand. It also focuses on movements in U.S. interest rates that are perceived to be transitory. For U.S. interest rate increases that are perceived to be long-lasting, domestic interest rates in a small open economy would over time have to match those in the United States, with adjustments to shocks occurring in the long run via exchange rate movements.

lead directly to an appreciable reduction in the demand for M1 and would also put downward pressure on aggregate demand. The change in the spread between Canadian and U.S. interest rates would lead to a depreciation in the Canadian dollar (but less than in the first polar case), which would put upward pressure on aggregate demand and on Canadian prices. Over the medium run, the downward pressure on M1 from the direct effect of the interest rate increase would be offset by the upward pressure on M1 from higher aggregate demand and the rise in Canadian prices resulting from the depreciation. That is, the outcome of the rise in the interest rate and the fall in the value of the Canadian dollar would be somewhat higher aggregate demand, composed of an improved trade balance and weaker domestic demand. In the short run, the combined interest rate increase and depreciation would likely result in a temporary decline in M1 because the interest rate increase would probably affect M1 demand more rapidly than would the upward movements in aggregate demand and prices.

If the interest rate increase in the United States were a reflection of increased inflationary expectations in that country and if it were so interpreted by financial markets, there would be no need for the small open economy to adjust its interest rates, unless it too were facing inflationary pressures. With unchanged real interest rates in the two countries, there should be no change in the exchange rate. Hence, the interest rate movements in the large country should have no effect on demand or inflation in the small open economy.

In the 1979-81 period, the very volatile movements in U.S. interest rates were interpreted largely as real interest rate movements, although some component of them may have reflected changes in inflation expectations. Initially, demand and inflationary developments in Canada called for a tightening of policy, but to a lesser extent than in the United States. Hence, Canadian monetary policy aimed at adjusting interest rates in the same direction, but not to the same extent, as U.S. interest rate movements. The Bank of Canada explained, as follows, its policy of adjusting interest rates to a greater extent than indicated by the short-run movements of M1:

> The Bank of Canada has preferred to react immediately to moderate potential exchange-rate movements rather than to wait until an increase in inflation, induced by the exchange rate, has pushed up M1. While these actions by the Bank of Canada have on occasion caused M1 to move below the target range or to remain there longer than would otherwise be the case, these temporary divergences from target have typically been brief. (Thiessen, 1983)

Thus, policy actions taken in the face of U.S. interest rate movements were seen as a form of "short-circuiting." That is, the Bank adjusted interest rates not only in response to current developments in M1 but also to avoid *future* movements in M1 that would result from insufficient adjustment of interest rates and the associated movement of the Canadian dollar.

The policy of letting some of the pressure from U.S. interest rate movements fall on domestic interest rates and some on the exchange rate worked reasonably well in 1980. However, strong inflation pressures in Canada in 1981 along with weakness in the exchange rate for the Canadian dollar resulted in Canadian interest rates moving up more than U.S. interest rates during the year.

CONCLUDING REMARKS

The developments in the 1979-81 period led to an increased emphasis on the role of the exchange rate in the conduct of policy. Initially, as described above, the increased focus on the exchange rate was done in the context of a strategy that targeted M1. Subsequently, after the withdrawal of the monetary aggregate target in November 1982, considerable attention was placed on the direct effects of exchange rate movements on inflation and their indirect effects on aggregate demand.[7]

[7] Crow (2002, p. 154) puts it as follows: "Hanging on to the exchange rate as best we could was not the real objective but rather, with the crumbling of M1 targets, another way of guiding monetary policy in an anti-inflationary direction. In other words, shadowing the US dollar was a means to an end. The end was a better inflation performance, using the instrument and the rationale that was immediately available—the exchange rate—as a means for nudging Canada along that path."

This culminated some years later in the development of the Monetary Conditions Index (MCI), which integrated into a single measure the effects of the two channels through which monetary policy operates in a small open economy—interest rate changes and exchange rate changes (Freedman, 1995). The Bank of Canada was well aware of the importance of interpreting the source of any exchange rate movement in deciding on the appropriate policy response. However, the financial markets tended to treat all exchange rate movements as resulting from "portfolio shocks" of the sort that were prevalent in the 1979-81 period, and indeed for quite some period thereafter, rather than effects of "real shocks" (such as changes in the relative prices of commodities produced in Canada). This led them to expect an offsetting interest rate movement for all exchange rate movements. Eventually, in 1998, because of the difficulties of communicating to the markets the importance for the policy process of the source of the exchange rate movement, the Bank abandoned the MCI measure as an input into monetary policy actions. Nonetheless, as was the case in the 1979-81 period, it still remains important to interpret the source of any exchange rate shock in deciding how to respond to it.

REFERENCES

Bank of Canada. "Record of Press Releases." Bank of Canada *Review*, March 1980, pp. 29-30.

Bank of Canada. *Annual Report of the Governor to the Minister of Finance for the Year 1980*. Ottawa: February 1981.

Board of Governors of the Federal Reserve System. "Announcements: Monetary Policy Actions." *Federal Reserve Bulletin*, October 1979, pp. 830-32.

Clinton, Kevin and Lynch, Kevin. "Monetary Base and Money Stock in Canada." Technical Report 16, Bank of Canada, July 1979.

Crow, John W. *Making Money: An Insider's Perspective on Finance, Politics, and Canada's Central Bank*. Etobicoke, Canada: John Wiley & Sons Canada, Ltd., 2002.

Freedman, Charles. "A Preliminary Analysis of the Federal Reserve Measures of October 6." Unpublished memorandum, Bank of Canada, October 10, 1979.

Freedman, Charles. "Interpreting U.S. Monetary Developments since October 6, 1979." Unpublished memorandum, Bank of Canada, June 16, 1980.

Freedman, Charles. "The Effect of U.S. Policies on Foreign Countries: The Case of Canada," in Federal Reserve Bank of Kansas City, ed., *Monetary Policy in the 1980s*. Kansas City: Federal Reserve Bank of Kansas City, 1982, pp. 97-118.

Freedman, Charles, "Some Theoretical Aspects of Base Control." NBER Working Paper No. 650, National Bureau of Economic Research, March 1981; also in D. Purvis, ed., *The Canadian Balance of Payments: Perspectives and Policy Issues*. Montreal: The Institute for Research on Public Policy, 1983, pp. 19-44.

Freedman, Charles. "The Role of Monetary Conditions and the Monetary Conditions Index in the Conduct of Policy." Bank of Canada *Review*, Autumn 1995, pp. 53-59.

Goodhart, Charles A.E. Panel Discussion II: "Safeguarding Good Policy Practice." Federal Reserve Bank of St. Louis *Review*, March/April 2005, *87*(2, Part 2), pp. 298-302.

Lang, Richard W. "The FOMC in 1979: Introducing Reserve Targeting." Federal Reserve Bank of St. Louis *Review*, March 1980, *62*(2), pp. 2-25.

Thiessen, Gordon G. "The Canadian Experience with Monetary Targeting," in Paul Meek, ed., *Central Bank Views on Monetary Targeting*. New York: Federal Reserve Bank of New York, 1983, pp. 100-04.

Volcker, Paul. "The New Federal Reserve Technical Procedures for Controlling Money," in hearings before the U.S. Senate Committee on Banking, Housing, and Urban Affairs, February 4-5, 1980. 96th Congress, 2nd session. Washington, DC: Government Printing Office, 1980, pp. 13-16.

What Remains from the Volcker Experiment?

Benjamin M. Friedman

Assessing the lasting impact of any experiment in economic policymaking requires, first of all, understanding in what key respects that experiment represented a departure from prior established practice. The new policymaking framework that the Federal Reserve System began to employ in October 1979 is no exception. Specific quantitative targets for growth of the money stock, or for either borrowed or nonborrowed reserves in the banking system, have long since disappeared from the Federal Reserve's approach to formulating and implementing monetary policy. Yet there remains a widespread sense that the world of monetary policymaking in the United States has been somehow different since 1979. What exactly is different, and in what respects those differences stem from the innovations introduced in 1979, are questions well worth addressing.

The conventional representation of economic policymaking, applicable to monetary policy no less (and maybe far more readily) than to other familiar contexts, posits a policymaker deploying whatever instruments may be available to best achieve a finite set of typically conflicting objectives, subject to the constraints presented by existing institutional arrangements and technology and by the behavior of the relevant actors in the economy's private sector. In the specific case of monetary policy, the policy problem is simplified because the central bank normally has only one genuine instrument at its disposal—namely, its provision of reserves to the economy's banking system.[1] The problem is also more complex, however, because the central bank is free to specify its provision of reserves in terms of either the quantity of reserves or their price (in other words, the relevant interest rate).[2] Yet a further complexity arises in that the central bank's provision of reserves (or setting of the interest rate) affects the aspects of economic activity policymakers are seeking to influence only over time. As a result, under some circumstances it may be helpful to formalize ways of exploiting information about what is happening in the meanwhile by focusing policy on still other observable aspects of economic activity—in this instance, the most obvious example is the money stock—that of course differ from the genuine objectives being pursued but that may provide some indication of the extent to which those objectives are being achieved.

Thinking about monetary policy in this familiar way provides a structured framework for asking what was, or is, new about any specific innovation: (i) Is it a change in the objectives that policymakers are seeking to achieve? (ii) Is it a change in the choice of policy instrument—in the case of monetary policy, the quantity versus the price dimension in the provision of reserves? (iii) Is it a change in the way auxiliary aspects of economic activity are being used to steer policy in the context of time lags in the effect of central bank actions on the ultimate objectives of monetary policy?

[1] As a technical matter, the central bank can also typically adjust the amount of reserves (if any) that banks are required to maintain in relation to their outstanding deposits. But under most circumstances, changes in reserve requirements and changes in the provision of reserves are equivalent for purposes relating to the broad macroeconomic objectives of monetary policy.

[2] It is also possible to specify the central bank's provision of reserves in terms of some combination of quantity and price (that is, a reserve-supply function with positive but finite elasticity).

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Most public discussion of the Volcker experiment at the time emphasized (ii) and (iii)—in particular, the joint implication that under the new policymaking framework market interest rates (the facet of monetary policy of which most citizens are most acutely aware) were now free to fluctuate far more freely than in the past. The subsequent academic literature has likewise mostly focused on either (ii) or (iii). With time, however, what was new with regard to neither (ii) nor (iii) has survived. If there has been anything lasting from the apparent sea change of October 1979, therefore, it lies in (i).

To be specific, the broad public discussion of the Federal Reserve's new approach in 1979 primarily emphasized the elevation of quantitative money growth targets—element (iii)—from the irregular and mostly peripheral role they had played, beginning in the early 1970s, to center stage: The Federal Open Market Committee (FOMC) decided what money growth it sought going forward and articulated its policy in terms of what open market operations the System Account needed to conduct to keep the money stock as close as possible to the targeted trajectory.

The subsequent history of money growth targets for monetary policy, in the United States as well as elsewhere, is thoroughly well-known and need not be reviewed in any detail. Almost immediately after October 1979, actual events belied the conventional presumption among most advocates of money growth targets that the major monetary aggregates would move roughly in synchrony so that choosing just which among them was the right one to target was at best a secondary consideration. Prominent monetarist economists publicly argued that policy was too easy, or too tight, depending on which measure they chose to emphasize. The FOMC had chosen to place primary emphasis on the narrow M1 aggregate, but by 1982 that measure displayed so little tie to either income growth or price inflation that the Committee formally moved away from it. Evidence since then shows that by the mid-1980s M1 had disappeared altogether as an observable influence on policymaking, and the same happened to the broader M2 measure by the early 1990s.[3] In 1987 the FOMC stopped setting a target for M1 growth, and in 1993 the Federal Reserve publicly acknowledged the "downgrading" of its M2 target—a change that most observers of U.S. monetary policy had already noticed well before then.

The reasons for the breakdown of what had seemed to be longstanding relationships (though in fact even then they were probably less reliable than they appeared) between money and income, or money and prices, have also been thoroughly studied. The standard list includes financial innovation, deregulation, and globalization of markets for deposits and other closely substitutable financial assets. But the main point here is simply that the reliance on money growth targets that was key to at least the public presentation of the new monetary policy regime in 1979 has now entirely disappeared.

The same is true for element (ii), the use of, in turn, several variants of an open market operating procedure based on the quantity of either nonborrowed or borrowed reserves. In part, the 1979 change in (ii) was a consequence of the change in (iii): Once the proximate objective of policy was to control money growth, doing so by fixing a measure of reserves month-to-month seemed likely to deliver better results than fixing the overnight interest rate. In time this presumption too came to appear doubtful. But the issue became moot because the FOMC abandoned money growth targets anyway.

The only way some version of a reserves-based operating procedure could have survived, once the money growth targets were gone, would have been if policymakers thought the relationship between reserves growth and economic activity was more reliable than the relationship between interest rate growth and economic activity. Few economists have been prepared to make that case.[4]

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[3] See Friedman (1997) for a review of this evidence, but the associated empirical literature is vast.

[4] Following the enormous body of work by Brunner and Meltzer, and in more recent times by McCallum, many economists have argued for a reliable relationship between economic activity and the monetary base. The key difference is that the monetary base includes—indeed, mostly consists of—currency in circulation. Hence, the base may or may not be a plausible replacement for money stock as an intermediate target of monetary policy, but it is not a plausible short-run operating instrument.

As a result, the Federal Reserve has gone back to carrying out monetary policy by fixing a short-term interest rate—in the modern context, the overnight federal funds rate—just as it did for decades prior to 1979.[5]

That leaves (i). Did the Volcker experiment represent a new, presumably greater weighting attached to achieving "price stability" vis-a-vis the other objectives of monetary policy? And, if so, has that greater weighting survived?

The post-1979 record of price inflation in the United States surely creates some prima facie presumption to this effect. After reaching either near double-digit levels (the gross domestic product deflator) or low double-digit levels (the consumer price index) in the late 1970s, inflation dropped to roughly 4 percent per annum in the 1980s, then 3 percent and eventually 2 percent in the 1990s. Cyclical considerations perhaps obscure the underlying trend in the current decade, but to date there is certainly no clear indication of resurgent inflation beyond the 2 to 3 percent per annum range. More to the point, the impression is both widespread and confident that, were such a resurgence to begin to develop, the Federal Reserve would act vigorously to resist and reverse it.

Does this, however, represent a genuine change in the weighting placed on inflation among policymakers' sometimes competing objectives, plausibly one that can be dated to October 1979? Or is there some other explanation, independent of the Volcker experiment?

One point worth making explicitly is that, to the extent that one standard objective of monetary policy is smoothness in short-term interest rates, there is no evidence that the increased tolerance for interest rate fluctuations that the Federal Reserve exhibited during the Volcker period has survived. One of the most frequent criticisms of monetary policy operating procedures based on fixing short-term nominal interest rates is that central banks have traditionally proved too hesitant to adjust the interest rates they set, and when they do move interest rates they have tended to do so too slowly. The usual explanation is that, in addition to their objectives for such macroeconomic variables as price inflation and the growth of output and employment, central banks also take seriously their responsibility to maintain stable and well-functioning financial markets, together with the (more questionable) assumption that sudden or wide fluctuations in short-term interest rates are inimical to achieving that goal. For this reason, now-conventional expressions of operating rules for monetary policy, such as the Taylor rule, normally include a lagged interest rate along with measures of inflation and output (or employment) relative to the desired benchmark.[6]

Part of what distinguished the Volcker experiment was the unusually wide (albeit not totally unconstrained) fluctuations of short-term interest rates that occurred under the Federal Reserve's quantity-based operating procedures. (Indeed, one element of the folklore surrounding the entire episode is the claim that the adoption of money growth targets, and the reserves-based operating procedure that went with them, was in part simply a diversion that enabled the Federal Reserve to put in place far higher interest rates than would otherwise have been politically possible.) Merely glancing at a chart showing the time path of interest rates in recent years immediately shows that no such fluctuations have been allowed to occur. Might the Federal Reserve again permit them if doing so seemed necessary to rein in incipient inflation? Perhaps so, but on the evidence there is no ground for claiming that this aspect of the 1979 experiment has survived either.

What remains, then, is the question of whether 1979 brought a new, greater weight on the Federal Reserve's objective of price stability vis-a-vis its objective of output growth and high employment. To be sure, that is one interpretation of the historical experience both before 1979 and after. But there are other interpretations as well, especially in light of the record not just in the few years immediately preceding 1979 but substan-

[5] During some periods before 1979, the FOMC specified its policy in terms of the net free-reserves position of the banking system, but most Federal Reserve economists (and most market participants) understood that net free reserves was a close proxy to short-term interest rates.

[6] See also Barro (1989) for a theoretical analysis of the implications of interest rate smoothing as a part of monetary policy.

tially before as well. The United States experienced little inflation in the 1950s and not much in the 1960s either.[7] Hence, the historical evidence is also consistent with the view that the 1970s were exceptional rather than that the experience since 1979 has differed from what went before as a whole.

Even the idea that the Volcker experiment represented a return to the greater policy weight on price stability vis-a-vis real outcomes that had motivated the Federal Reserve before the 1970s, and that this renewed commitment to price stability has lasted ever since, would make the events of 1979 a major and lasting contribution to U.S. monetary policymaking. But here, as well, other explanations are also possible. For example, perhaps policymakers in the 1970s were just as committed to the objective of price stability as they were before and have been since, but required some significant experience in an inflationary environment in order to understand, and begin to respond appropriately to, the newly relevant distinction between nominal and real interest rates. Perhaps policymakers in the 1970s were no less committed to the objective of price stability but were operating under a different (in retrospect, some have argued, a flawed) understanding of the broader economic behavior constraining the relationship between their actions and the resulting policy outcomes.[8] Perhaps policymakers were no less committed to price stability but simply faced an extraordinary sequence of macroeconomic shocks (OPEC, anchovies, etc.) that were, temporarily, adverse from the perspective of achieving either price stability or desired rates of real growth and levels of unemployment.[9]

Resolving the merits of these and other potential interpretations of the historical record—interpretations that, importantly, are in no way mutually inconsistent—is surely a worthwhile object of empirical research. It is also a necessary underpinning of any judgment of whether what happened in October 1979 actually represented a change in the weight that policymakers attach to the objective of price stability.

Finally, one further aspect of what 1979 may or may not have been about bears attention. Perhaps what was important about the changes represented by (iii), and in a subsidiary way, then, by (ii), was not the specifics of money growth targets and reserves-based operating procedures but rather the concrete expression that they embodied of the desire in many quarters to impose some form of ongoing discipline on the monetary policymaking process—in the traditional language of this subject, to impose "rules" where there had been "discretion."

Whether the use of money growth targets, with the FOMC free to choose and then change the target as it saw fit, did or did not qualify as a kind of "rule" in this context is a matter of debate, in part substantive and in part semantic. But to the extent that it was a form of rule for this purpose—and the argument for money growth targets has often been made on just those grounds—it, too, clearly failed to survive. Federal Reserve policymaking in recent years has epitomized what "discretion" in monetary policy has always been about.

Precisely for this reason, advocates of rules over discretion today continue to seek some way of moving Federal Reserve policymaking in that direction. The proposal of this kind that has attracted the most interest currently is "inflation targeting." Whether adopting inflation targeting would be a good or bad step for U.S. monetary policy is a separate issue.[10] But one reason the issue is even on the agenda today is that the movement in this direction that the experiment of October 1979 represented did not last either.

REFERENCES

Barro, Robert J. "Interest-Rate Targeting." *Journal of Monetary Economics*, January 1989, *23*, pp. 3-30.

[7] Before the Treasury–Federal Reserve Accord in 1951, monetary policy was constrained by the wartime commitment to fix interest rates. Before then, the Depression rendered the question moot. Drawing inferences from the pre-Depression experience seems of little relevance to this discussion.

[8] Two examples of arguments along these lines are DeLong (1997) and Sargent and Cogley (2005).

[9] This too is a familiar argument. For a contemporary statement, see Blinder (1979). See Orphanides (2004) for a particularly interesting recent reincarnation.

[10] For a compact statement of the views on either side, see Mishkin (2004) and Friedman (2004).

Blinder, Alan S. *Economic Policy and the Great Stagflation*. New York: Academic Press, 1979.

DeLong, J. Bradford. "America's Peactime Inflation: The 1970s," in Christina D. Romer and David H. Romer, eds., *Reducing Inflation: Motivation and Strategy*. Chicago: University of Chicago Press, 1997.

Friedman, Benjamin M. "The Rise and Fall of Money Growth Targets as Guidelines for U.S. Monetary Policy," in Iwao Kuroda, ed., *Towards More Effective Monetary Policy*. Houndmills: Macmillan Press, 1997.

Friedman, Benjamin M. "Why the Federal Reserve Should Not Adopt Inflation Targeting." *International Finance*, March 2004, *7*, pp. 129-36.

Mishkin, Frederic S. "Why the Fed Should Adopt Inflation Targeting." *International Finance*, March 2004, *7*, pp. 117-27.

Orphanides, Athanasios. "Monetary Policy Rules, Macroeconomic Stability, and Inflation: A View from the Trenches." *Journal of Money, Credit, and Banking*, April 2004, *36*, pp. 151-75.

Sargent, Thomas J. and Timothy, Cogley. "The Conquest of U.S. Inflation: Learning, Model Uncertainty, and Robustness." *Review of Economic Dynamics*, 2005 (forthcoming).

Why Did the Great Inflation Not Happen in Germany?

Otmar Issing

GERMAN MONETARY POLICY UNTIL 1973

When I first became aware of the title of the special conference at the Federal Reserve Bank of St. Louis, "Reflections on Monetary Policy 25 Years After October 1979," I was puzzled for a moment and spontaneously asked myself what happened in 1979. Then it came to my mind that, while the United States suffered from the Great Inflation, this was not at all the case for Germany. This contribution deals with the possible reasons for this and asks for the lessons that could be drawn from such experiences.

To better understand this episode, one has to go back to the previous regime of fixed exchange rates. At the beginning of the 1970s, the Federal Republic of Germany found itself in a difficult economic situation caused, in essence, by high and rising inflation due to external pressures and fiscal and wage policies. At the same time, the possible ways for monetary policy to react to this inflationary environment were limited, as its freedom to act was constrained by the Bretton Woods system of fixed exchange rates. Consequently, from the second half of 1970, monetary growth—measured in terms of M1 or the central bank money stock—was very strong. In line with this development, bank lending to domestic non-banks was also expanding fast.

At the same time, German foreign exchange reserves rose by 40.9 billion Deutsche marks over the period from 1970 to May 1971 compared with an increase of 14.9 billion Deutsche marks from January 1968 to September 1969.[1] It should be noted that in various episodes the external component of money creation was even higher than the growth of the monetary base, implying that the internal contribution of money creation was negative. The excessive rate of monetary expansion was an expression of the fact that, to a large extent, the Bundesbank had lost control of the money supply.

FROM 1973 TO 1979—REGAINING MONEY SUPPLY CONTROL

The Move Toward a New Monetary Concept

In March 1973, the Bundesbank was relieved of its obligation to intervene in the foreign exchange market with respect to the fixed parity against the U.S. dollar. The end of the Bretton Woods system and the transition to floating exchange rates in March 1973 gave the Bundesbank new scope for the control of domestic monetary conditions. While this did not mean complete freedom from exchange rate constraints, the strongest and most immediate external pressure had been removed. New opportunities opened up for monetary policy. In response, the Bundesbank pioneered the use of pre-announced annual growth targets for the money stock, the first of which was published in December 1974.[2]

[1] See Issing (1996b) for a more detailed discussion.

[2] See Table 1 for a more detailed overview. For a fuller exposition, see also Issing (1992) and Deutsche Bundesbank (1995). It should also be noted that the practice of monetary targeting was continued until the year 1998—the end of the Deutsche mark as a currency.

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The choice of a monetary target in 1974 undoubtedly signaled a fundamental regime shift. Not only was it a clear break with the past but also a decision to discard alternative approaches to monetary policy.[3] There were two main arguments in favor of providing a quantified guidepost for the future rate of monetary expansion. First, and foremost, was the intention of controlling inflation through the control of monetary expansion. Second, the Bundesbank tried to provide a guidance of agents' (especially wage bargainers') expectations through the announcement of a quantified objective for monetary growth.[4] Therefore, with its new strategy, the Bundesbank clearly signaled its responsibility for the control of inflation. At the same time, the Bundesbank expressed its view that, while monetary policy conducted by maintaining price stability in the longer run would exert a positive impact on economic growth, the fostering of potential growth in the economy should be considered a task of fiscal and structural policies, while employment was a responsibility of the social partners conducting wage negotiations.

However, the Bundesbank made it clear from the beginning that it could not and would not promise to reach the monetary target with any degree of precision. Accordingly, in this period the new regime of monetary targeting was in many respects an experiment.

Determination of the Money Growth Target

From the outset, the Bundesbank recognized the importance of adopting a simple, transparent, and, at the same time, comprehensible method for the derivation of the annual monetary targets.[5] Unlike some academic monetarists, the Bundesbank favored broad monetary aggregates. The choice of such aggregates was based not least on the perception that, in countries with highly developed financial markets, substantial portfolio shifts between saving, time, and sight deposits might be observed. In essence, the targeted growth rate was derived as the sum of the predicted growth in potential output, the "normative" rate of inflation that was deemed acceptable in the medium term, and the trend rate of change in the velocity of circulation of money.

This approach reflected the insight that monetary growth consistent with this derivation would create the appropriate conditions for real growth in line with price stability. While these basic relationships were uncontested over medium- to longer-term horizons, the Bundesbank was fully aware that they might not strictly apply over the shorter term. On a month-to-month or quarter-to-quarter basis and even beyond, the basic relationship between the money stock and the overall domestic price level was often obscured by a variety of other factors such as supply and demand shocks. Any attempt to strictly tie money growth to its desired path in the short term might have led to disturbing volatility in interest and exchange rates, thus imposing unnecessary adjustment costs on the economy. Accordingly, the Bundesbank repeatedly pointed to the medium-term nature of its strategy.

First, experiences with monetary targets were not particularly encouraging. Between 1975 and 1978, the quantitative targets were clearly (and in 1978 considerably) overshot (see Table 1). Nevertheless, the Bundesbank was able to slow down inflation from the high levels before to 2.7 percent in 1978. During this period, the Bundesbank gained valuable insights into the new regime and introduced a number of technical modifications (see Table 1). These experiences helped the Bundesbank to enhance the monetary targeting concept from its experimental stage into a fully fledged strategy. As a consequence, at the end of 1978, the potential-oriented monetary targeting strategy had been established and had proven its value. Therefore, the Bundesbank was well prepared when Germany entered especially troubled waters.

[3] It must be recognized that the start of monetary targeting was characterized by a high degree of uncertainty. After all, Germany had just come out of the Bretton Woods "adjustable peg" system in which many topics were seen as irrelevant.

[4] See Schlesinger (1983) on this issue.

[5] See also Issing (1997) for the following considerations.

Table 1

Monetary Targets for the Central Bank Money Stock or the Money Stock M3 and Their Implementation (percentages)

Year	Aggregate*	Target form**	Target value	Actual growth	Target achieved	Inflation rate
1975	CBM	CY	8%	9.5%	No	5.9%
1976	CBM	AA	8%	9.2%	No	4.3%
1977	CBM	AA	8%	9.0%	No	3.7%
1978	CBM	AA	8%	11.4%	No	2.7%
1979	CBM	CY	6-9%	6.4%	Yes	4.1%
1980	CBM	CY	5-8%	4.8%	Yes	5.5%
1981	CBM	CY	4-7%	3.5%	Yes	6.3%
1982	CBM	CY	4-7%	6.0%	Yes	5.2%
1983	CBM	CY	4-7%	7.0%	Yes	3.3%
1984	CBM	CY	4-6%	4.7%	Yes	2.4%
1985	CBM	CY	3-5%	4.5%	Yes	2.0%

SOURCE: Various annual reports of the Deutsche Bundesbank; actual figures are rounded.

*CBM = central bank money; **AA = annual average; CY = in the course of the year, between the fourth quarter of the previous year and the fourth quarter of the current year, 1975 (December 1974 to December 1975).

FROM 1979 TO 1985—THE STRATEGY BEARS FRUIT

1979 to 1981: Monetary Restriction

The economic situation in 1978 was broadly seen as rather comfortable. German real GDP had grown by around 3 percent, accompanied by high levels of employment growth and falling unemployment. The situation was, however, less positive in terms of monetary growth and inflation. Monetary growth had overshot its target, and there were signs of an acceleration in the rate of inflation, which in 1978 stood, on average, at 2.7 percent.[6] Furthermore, the sharp increase in the price of oil hit the German economy. The resulting massive increase in import prices, especially energy prices, augmented by a weakening of the exchange rate, brought about a turnaround in Germany's current account position, leading to a current account deficit in 1979 for the first time in many years.

At the same time, government fiscal policy was clearly expansionary. Thus, fiscal policy rendered the central bank's task even more difficult. Moreover, the European Monetary System (EMS), an exchange rate regime defining the exchange rates of participating currencies in terms of central rates against the European currency unit, had begun rather quietly in March 1979 but subsequently faced tensions and the need to adjust parities as early as September 1979.

It was obvious from the beginning that the direct effect of the oil price shock on consumer prices could not be prevented by monetary policy. At the same time, the Bundesbank had carefully analyzed the lessons of the first oil price shock.

In 1973, the Bundesbank had declared the fight against inflation to be the principal goal of its monetary policy[7] and, in line with this, had already started to slow down inflation (which had peaked at almost 8 percent in mid-1973) when the first oil crisis broke out in October 1973. The rise in oil prices thwarted the efforts of the Bundesbank, while, at the same time, real output started to decline. Being confronted with such a

[6] On the Bundesbank's implementation of monetary targeting, see also Schlesinger (1985).

[7] See Deutsche Bundesbank (1974, p. 45).

situation, the Bundesbank attempted to keep monetary expansion within strict limits to avoid possible spill-over effects into the wage and price setting. In doing so, however, it did not commit itself to any clear strategy and quantification.[8] Instead, the Bundesbank mainly tried to influence the behavior of market participants by means of "moral suasion." However, the social partners more or less ignored the signals given by the Bundesbank and agreed on high increases in nominal wages in 1974, trying to compensate for the loss in real disposable income. As a consequence, unemployment increased and inflation went up.

Against this experience, in 1979 the Governing Council of the Bundesbank was well aware of the threat that the oil price increase could translate again into sustained increases in inflation brought about by second-round effects in wage and price setting.[9] In responding to these challenges, the Bundesbank took decisive action. The discount rate was increased in steps, from 3 percent at the start of 1979 to 7.5 percent in May 1980. In parallel, the Lombard rate was increased from its initial level of 3.5 percent to 9.5 percent in May 1980, and in February 1981 it was increased—as a special Lombard—to as much as 12 percent, the normal Lombard window being closed.[10] In parallel, by subsequently reducing the monetary targets from 1979 onward, the Bundesbank sent out a clear signal for restoring price stability.

Not until the second half of 1981 did the growth rates for the monetary base begin to come down. Toward the end of 1981, there were increasingly clear signs of an easing of price and wage pressures. The Deutsche mark regained confidence in the foreign exchange markets and strengthened again, not only within the EMS but also in relation to the U.S. dollar. In parallel, the external adjustment process was promoted through a slowdown in domestic demand and the current account position improved markedly. Furthermore, through the "monetary warning," the government became aware of the unsustainability of its deficit policy. From then on, budget consolidation was increasingly recognized as being an urgent task.

1982 to 1985: Relaxation and Normalization of Monetary Policy

While the episode from 1979 to 1981 was characterized by a sharply restrictive monetary policy, with the aim of forcing down inflation, the subsequent years 1982-85 can be regarded as a phase of monetary relaxation and normalization.

At the start of this phase, inflation was still very high—the annual average rate for 1982 was 5.2 percent—but it fell steadily to 3.3 percent in 1983, 2.4 percent in 1984, and 2.0 percent in 1985.[11] In line with this, long-term interest rates fell from their peak of 11.4 percent in September 1981 to slightly above 6 percent at the end of 1985.

The German current account ended 1982 in surplus once more, due to the decline in energy prices and the weakening of the domestic economy. On the foreign exchange markets, the Deutsche mark strengthened again. In fact, the Bundesbank proved able to successfully maintain its stability-oriented monetary targeting strategy also within the EMS. De facto, the Bundesbank became the dominant central bank and the Deutsche mark the anchor currency in the EMS, without this having been envisaged in the original design of the system. As in other countries at the time, German fiscal policy in the period 1982-85 was characterized by the initiation and implementation of a long-term consolidation program of the new government, in the course of which it proved possible to limit spending growth and budget deficits significantly. Thus, in contrast to previous periods, fiscal policy did not pose serious problems for monetary policy during this phase.

The Bundesbank's monetary policy was focused on bringing down inflation and restoring the stability of the currency, and it proved able to realize this aim throughout this period. At the same time, the stability-oriented monetary policy fostered the economic recovery.

[8] In fact, the Bundesbank tried to ensure that "monetary expansion was not too great but not too small either." See Deutsche Bundesbank (1974, especially p. 17).

[9] See Schlesinger (1980) on this point.

[10] See Baltensperger (1999) for a more detailed description of this period, the monetary targets, and their realizations.

[11] All figures are annual.

Figure 1

Short-Term Interest Rates in Germany and the United States (percentages per annum, monthly data)

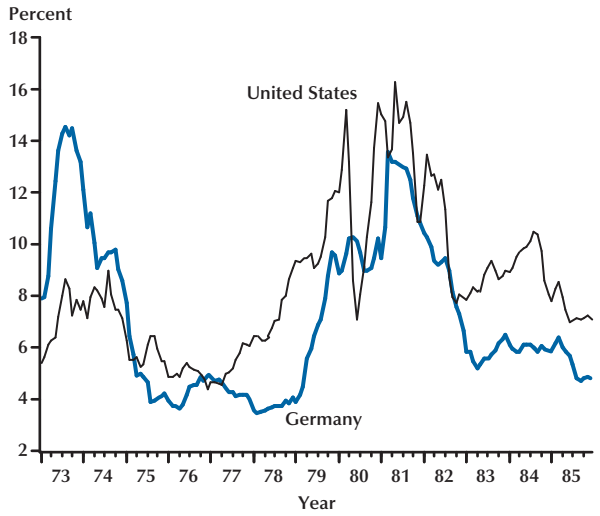
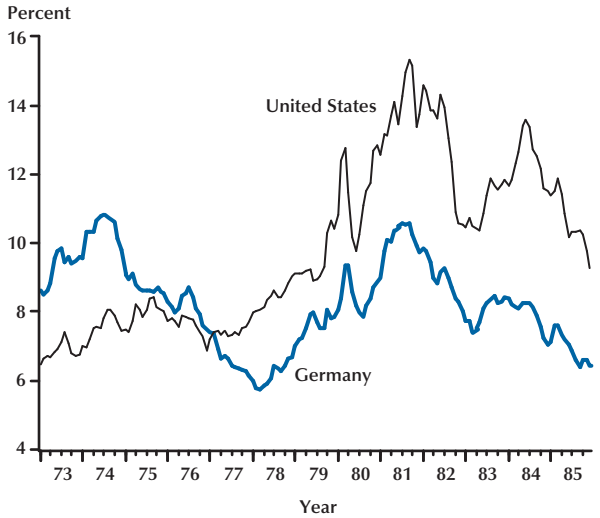


Figure 2

Long-Term Interest Rates in Germany and the United States (percentages per annum, monthly data)



Not least, these experiences provided a strong argument to maintain the monetary policy strategy until the year 1998, which marked the end of the Deutsche mark. The strategy had proven its value in the baptism of fire of the early 1980s. Later, it also successfully guided monetary policy in Germany through the challenges of German Unification and the ERM crisis in 1992-93 and in the preparatory stage for the European Monetary Union.

With the benefit of hindsight, the following interesting results emerge out of a very brief comparison of German and U.S. interest rates and inflation figures. First, short-term interest rates in Germany and the United States rose sharply in 1979, reflecting the restrictive monetary policy (see Figure 1). The German rates, however, did not rise as much as the U.S. rates and started to decline earlier. What is especially interesting is that long-term interest rates rose much less in Germany than in the United States. It is also worth noting that the decline in long-term interest rates in Germany occurred at an earlier stage, followed by a steady decline, until the end of 1985 (see Figure 2). Third, due to the vigorous action by the Bundesbank, Germany experienced much lower inflation rates than did the United States. In fact, after its peak in 1981, when the inflation rate stood at 6.3 percent, the German inflation rate swiftly declined, reaching values of around 2 percent at the end of 1985 (see Figure 3). Fourth, the fact that the Bundesbank had successfully established a high degree of credibility with the public is also mirrored in the fact that nominal wage increases in the years 1979, 1980, and 1981 were considerably lower than their equivalents for the years 1973 and 1974 (see Figure 4).

LESSONS

What are the lessons that can be drawn? Why was Germany in this period successful in terms of monetary stability? Several key aspects seem to emerge from this brief review of Germany's experiences from 1979 to 1985. To begin with, in early 1979, the Bundesbank was well equipped with a monetary policy strategy aiming at the maintenance of price stability over the medium term. The strategy was based on a consistent and

Figure 3

Inflation in Germany and the United States (consumer prices, percentages per annum, monthly data)

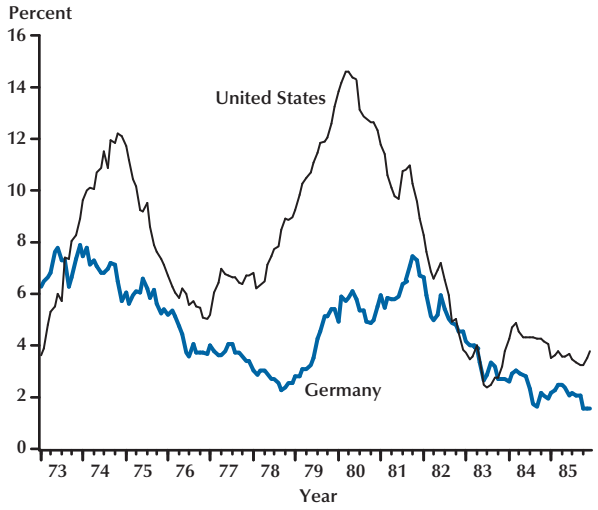
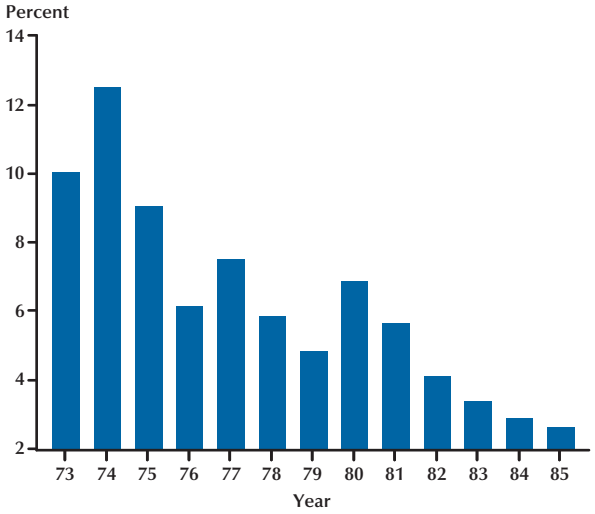


Figure 4

Growth of Average Monthly Wages in German Industry (annual percentage changes)



transparent framework, whose foundations were finally well understood by the public. Although in 1979 the strategy admittedly did not have a long-standing track record, it had been tested under real-life conditions and had been improved continuously. In doing so, it had managed to establish credibility, which in turn had started to set in motion a virtuous circle.

Germany had learned from the mistakes made at the time of the first oil price shock. When the second oil price shock hit the German economy, the Bundesbank was well prepared and—on the basis of its strategy of monetary targeting—acted with vigor and determination. Since the inability of a monetary authority to counteract first-round effects of such supply-side shocks had been clearly recognized, and in light of the experiences of the years 1973-74, the Bundesbank focused on avoiding possible second-round effects that could spread out into the economy. Following this clear orientation, the Bundesbank gave unambiguous guidance to the other economic decisionmakers as well as the public and, over a period of three years, kept a firm sense of direction.

It is fair to say, however, that the Bundesbank's policy benefited to a significant extent from the support of the high inflation aversion in the German public—which should be seen against the experiences with the hyperinflation in 1923 and the destruction of the successor currency ending in the reform of 1948—i.e., the German "stability culture" that had evolved over time after the Second World War. The goal of stable money was and has always been deeply rooted in German society. It was based on a consensus that was largely shared by the citizens. In this way, the German public, not least in critical times, has repeatedly proven to be a loyal ally of a stability-oriented monetary policy. Without this public support, the results might have been quite different. Conversely, the Bundesbank has helped to shape this stability culture in substantive terms. In this respect, the German experience could prove of use also for today's monetary policy.

REFERENCES

Baltensperger, Ernest. "Monetary Policy under Conditions of Increasing Integration (1979-96)," in

Deutsche Bundesbank, ed., *Fifty Years of the Deutsche Mark. Central Bank and the Currency in Germany since 1948*. Oxford: Oxford University Press, 1999, pp. 439-523.

Deutsche Bundesbank. *Annual Report*. Various years.

Gleske, Leonhard. "Nationale Geldpolitik auf dem Wege zur Europäischen Währungsunion," in Deutsche Bundesbank, ed., *Währung und Wirtschaft in Deutschland 1876-1975*. Frankfurt: Fritz Knapp Verlag, 1976, pp. 745-88.

Issing, Otmar. "Theoretical and Empirical Foundations of the Deutsche Bundesbank's Monetary Targeting." *Intereconomics*, 1992, *27*, pp. 289-300.

Issing, Otmar. "Is Monetary Targeting in Germany Still Adequate?" in H. Siebert, ed., *Monetary Policy in an Integrated World Economy Symposium*. Tübingen: Mohr, 1996a.

Issing, Otmar. *Einführung in die Geldpolitik*. 6th Ed. München: Vahlen Verlag, 1996b.

Issing, Otmar. "Monetary Targeting in Germany: The Stability of Monetary Policy and of the Monetary System." *Journal of Monetary Economics*, June 1997, *39*(1), pp. 67-79.

Schlesinger, Helmut. "Notenbankpolitik: weiter am kurzen Zügel." *Wirtschafts Woche*, 1980, Jg. 34, Heft 5, pp. 77-80.

Schlesinger, Helmut. "The Setting of Monetary Objectives in Germany," in P. Meek, ed., *Central Bank Views of Monetary Targeting*. New York: Federal Reserve Bank of New York, 1983, pp. 6-17.

Schlesinger, Helmut. "Zehn Jahre Geldpolitik mit einem Geldmengenziel," in W. Gebauer, ed., *Öffentliche Finanzen und monetäre Ökonomie, Festschrift für Karl Hauser zur Vollendung des 65*. Lebensjahres, Frankfurt am Main, 1985, pp. 123-47.

Von Hagen, Jürgen. "A New Approach to Monetary Policy (1971-78)," in Deutsche Bundesbank, ed., *Fifty Years of the Deutsche Mark. Central Bank and the Currency in Germany since 1948*. Oxford: Oxford University Press, 1999, pp. 403-38.

The International Consequences of the 1979 U.S. Monetary Policy Switch: The Case of Switzerland

Georg Rich

INTRODUCTION

When the news of a fundamental change in U.S. monetary policy hit the Swiss National Bank (SNB) in October 1979, its key officials welcomed the Fed's decision with noticeable sighs of relief. The SNB was pleased about the U.S. policy switch for two reasons. First, the Fed's unwillingness to take decisive action against inflation had complicated considerably the conduct of Swiss monetary policy. In particular, accelerating U.S. inflation had prompted worried international investors to sell dollar-denominated assets in exchange for other currencies such as Swiss francs. The ensuing sharp drop in the exchange rate of the U.S. dollar had upset the SNB's calculations and had undermined its efforts to achieve price stability without jeopardizing real growth of the domestic economy. Second, the SNB hoped that the Fed's conversion to monetary discipline would help to convince other monetary authorities of the need to achieve low inflation. As a matter of fact, the 1979 policy switch, combined with similar developments in Europe and other parts of the world, thoroughly transformed the global monetary landscape. Most central banks now regard low inflation as the primordial objective of monetary policy. The beneficial effect of this change in attitude has been a dramatic fall in inflation in most parts of the world. In what follows, I will examine the international consequences of the Fed's policy switch in light of Swiss experience.

ACHIEVING PRICE STABILITY IN THE FACE OF A WEAK U.S. DOLLAR

In the second half of the 1960s, Swiss inflation began to accelerate in line with the worldwide surge in prices. Despite a strong desire to stabilize prices, the SNB was powerless in curbing inflation as long as Switzerland insisted on maintaining a fixed exchange rate. Furthermore, as the postwar system of fixed exchange rates began to collapse, Switzerland faced massive inflows of speculative capital triggered by expectations about a substantial revaluation of the Swiss franc and other European currencies against the U.S. dollar. Since the SNB could sterilize at best a small portion of the attendant increase in its foreign exchange reserve, the capital inflows led to an excessive expansion in the money supply, adding fuel to the already serious inflation problem. Notably in 1971, the Swiss monetary base expanded enormously.[1] Not surprisingly, the year-on-year inflation rate, measured in terms of consumer prices, shot up to a peak of 11.9 percent in December 1973. The Swiss public regarded this development as a major calamity. In the past, persistently high inflation had never arisen during peace-time.

A realignment of exchange rates in 1971 provided only temporary relief to Swiss authorities. Another incipient speculative assault at the beginning of 1973 forced the authorities to float the exchange rate of the Swiss franc. As a result, the SNB acquired the ability to combat inflation through a tight monetary policy. Under the

[1] On average, it exceeded its previous year's level by 27.4 percent. See the appendix for the sources of the data used in this paper.

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influence of Karl Brunner and other leading monetarists, it opted for a policy strategy of strictly controlling the money supply. The SNB was convinced that inflation was due largely to excessive money growth. For this reason, it decided to stabilize the monetary base at the level attained at the beginning of 1973. Toward the end of 1974, it adopted monetary targeting and allowed the money supply to increase again. At first, it announced annual growth targets for the money stock M1 and subsequently for the monetary base.

Since inflation remained at relatively high levels until 1975, keeping the monetary base more or less constant for over a year amounted to a very restrictive policy indeed. As monetarists would have predicted, inflation began to abate in due course and fell to a low of about 1 percent in 1977 and 1978. However, price stability could be restored only at the cost of a sharp temporary contraction in real activity, which was magnified by the negative effects of the first oil price shock on aggregate demand.

The fight against inflation, at first, was facilitated by a strong appreciation of the Swiss franc, in both nominal and real terms. Considering the relatively low Swiss inflation rate, the SNB was not surprised about the nominal appreciation. On the contrary, it argued that a nominal appreciation of the Swiss franc was essential to insulate the domestic economy from foreign inflationary impulses.[2] However, the significant real appreciation of the Swiss franc was puzzling. Initially, it probably served to correct distortions accumulated during the period of fixed exchange rates, but as time wore on it increasingly defied economic fundamentals. While the real appreciation supported the SNB's fight against inflation by lowering the prices of traded goods, it undermined the competitive position of domestic industry on the global market. The SNB reacted to the real appreciation of the Swiss franc by relaxing successively monetary policy, especially in 1977 and 1978. As a result, short-term interest rates dropped and approached zero toward the end of 1978. Nevertheless, the real exchange rate continued to increase unabatedly.

At the beginning of October 1978, Swiss authorities decided to abandon monetary targeting temporarily and to adopt an exchange rate objective, expressed as a floor on the Swiss franc price of the Deutsche mark. They were compelled to take this course of action because of a looming sharp slump in domestic output.[3] The interventions that were required to halt the appreciation of the Swiss franc caused a massive expansion in the money supply. Although the SNB switched back to monetary targeting and to a restrictive policy course once calm had returned to the foreign exchange market, it could not help accepting another temporary increase in inflation, to over 7 percent in 1981. Thus, contrary to Friedman's conjecture, the SNB was unable to insulate the domestic economy fully from foreign inflationary shocks.[4]

SNB officials attributed the disastrous real appreciation of the Swiss franc to the willingness of most foreign monetary authorities to tolerate high inflation. In the SNB's view, the Fed's inflationary monetary policy, in particular, served to destabilize the world economy. It prompted private and official international investors to flee U.S. dollar–denominated assets and to shift their funds into stable currencies such as the Swiss franc and the Deutsche mark. If the excessive real appreciation of the Swiss franc had been restricted to the U.S. dollar, however, the SNB would not have been greatly concerned. The really pernicious aspect of dollar weakness lay in the fact that the capital flight also caused a substantial real appreciation of the Swiss franc against the Deutsche mark, the currency of Switzerland's main competitor. For this reason, SNB officials were grateful and relieved when the Fed in October 1979 announced its policy shift.[5] There is little doubt that the Fed's decision to attack inflation decisively had a salutary effect on the

[2] The SNB was certainly aware of Milton Friedman's (1953, especially pp. 180-82) seminal article on the operation of a floating exchange rate system.

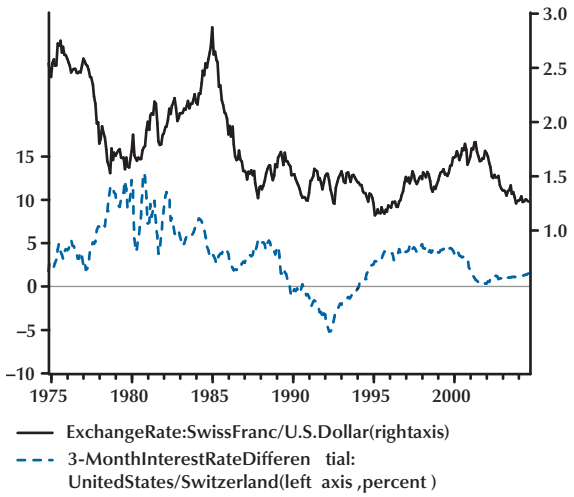
[3] By September 1978, the trade-weighted real exchange rate had risen by 50.7 percent above its level of January 1973.

[4] See Kugler and Rich (2002) and Rich (2003) for more detailed discussions of this episode. They also explore the question of whether the SNB could have avoided the renewed surge in inflation by following a different policy strategy.

[5] Fritz Leutwiler, president of the SNB at that time, gave several speeches on these issues (notably Leutwiler, 1978 and 1979).

Figure 1

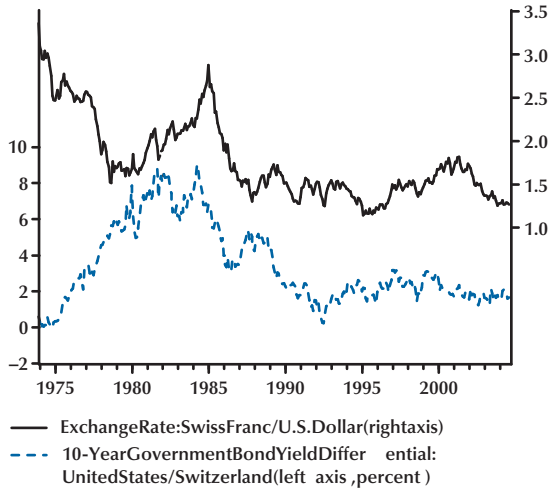
Exchange Rate and Short-Term Interest Rate Differential



SOURCE: Swiss National Bank. Interest rates quoted on the London euromarket. The data refer to the end of each month.

Figure 2

Exchange Rate and Bond-Yield Differential



SOURCE: Swiss National Bank. Until the end of 1981, the data refer to the last Monday of each month. If a Monday falls on a holiday, the data for Tuesday are chosen. Thereafter, the data refer to the end of the month.

world economy. Coupled with analogous developments in Europe and other parts of the world, the U.S. policy shift contributed to convincing central banks, governments, and the general public that price stability was essential if an economy was to generate adequate real growth. Thanks to the more stable international monetary environment, central banks, including the SNB, now face a less vexing task of maintaining price stability than they did in the turbulent 1970s.

DOLLAR WEAKNESS AND MONETARY POLICY TRANSMISSION

Figures 1 and 2 illustrate how the slump in the external value of the U.S. dollar complicated the conduct of Swiss monetary policy. When the SNB adopted monetary targeting, U.S. and Swiss interest rates were more or less identical. However, from 1975 onward, both U.S. short-term interest rates and bond yields rose far above their Swiss counterparts. Therefore, the differentials for the three-month interest rates and ten-year government bond yields widened considerably. Early in the 1980s, they reached peaks of about 13 percentage points and 8 percentage points, respectively. As may be seen in Figure 3, Swiss short-term interest rates declined quickly after 1975. Since the cyclical contraction in real growth and the moderation of inflation caused the growth in the demand for money to slow significantly, the SNB's efforts to expand the money supply at a steady pace in line with its targets pushed down short-term interest rates. The relaxation of monetary policy in 1977 and the adoption of a temporary exchange rate target led to a further drop in short-term interest rates. In the U.S., by contrast, short-term interest rates remained stable until 1977 and subsequently began to rise, with the increase gathering speed after the policy switch of October 1979 (Figure 4). Even though the interest rate differentials became wider and wider, the Swiss franc price of the U.S. dollar continued to fall. The inverse relationship between the exchange rate and the interest rate differentials persisted until the first half of the 1980s, but thereafter it

Figure 3

Swiss Term Structure of Interest Rates

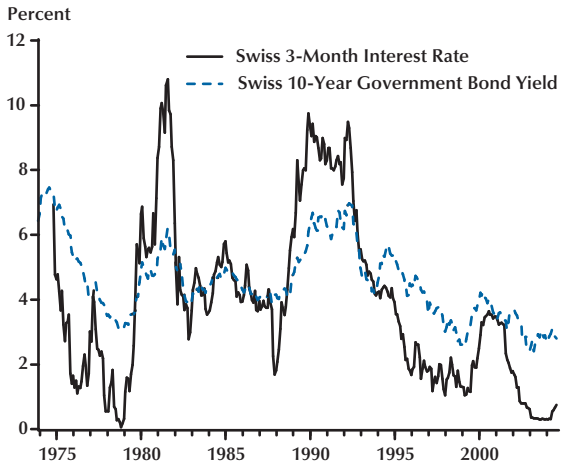
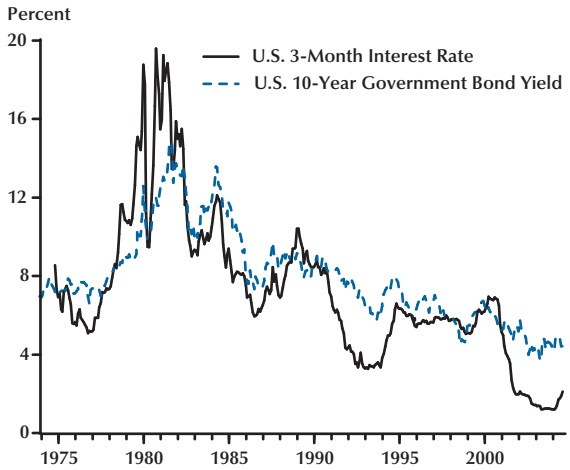


Figure 4

U.S. Term Structure of Interest Rates



became positive. This relationship—though not very close—has remained positive since, with the exchange rate tending to lag movements in the interest rate differentials. Consequently, the Fed's policy switch altered fundamentally the relationship between the exchange rate and the differentials for short- and long-term interest rates.

The patterns revealed by Figures 1 and 2 are consistent with the SNB's conjecture that in the 1970s a loss of confidence in the Fed caused a flight from the U.S dollar. Since such a shock is associated with a decline in demand for dollar-denominated assets and an increase in demand for foreign currency–denominated assets, it should lead to a drop in the exchange rate of the U.S. dollar, as well as a rise in U.S. and a fall in foreign interest rates. Thus, the exchange rate should be negatively correlated with the difference between U.S. and foreign interest rates. However, after 1979, the Fed restored its credibility, and portfolio shifts induced by lack of confidence gradually subsided. As a result, the relationship between the exchange rate and interest rate differentials turned positive and began to look like the patterns predicted by standard macroeconomic models.

The significance of monetary policy credibility is also borne out by Figures 3 and 4. Suppose that a central bank raises short-term interest rates in response to an actual or anticipated increase in inflation. If the anti-inflationary policy is credible, the public will expect the increase in short-term interest rates to be temporary. Therefore, long-term interest rates will not go up much. However, if the public is afraid that the future will feature high and persistent inflation, it will demand significantly higher nominal long-term interest rates to protect itself against losses in the real value of its assets. For this reason, long-term interest rates will rise strongly in response to the increase in short-term rates. The Swiss evidence reveals a consistently muted reaction of long-term interest rates to movements in short rates, indicating that monetary policy credibility was never a major problem in Switzerland, not even in the 1970s. In the United States, by contrast, the variance of short- and long-term interest rates was similar until the second half of the 1980s, but thereafter long rates also began to fluctuate less than their counterparts at the short end. Consequently, a comparison of movements in short- and long-term interest rates confirms the earlier conclusion that the Fed gained credibility after the policy switch of 1979.[6]

[6] A similar point is made by Goodfriend (2005, p. 247).

CONCLUDING REMARKS

In this paper I show that the inflationary monetary policy pursued by the Fed up to 1979 exerted destabilizing effects on the rest of the world. In light of Swiss experience, I conclude that the slump in the exchange rate of the U.S. dollar, in particular, complicated considerably the conduct of domestic monetary policy. Despite the adoption of a floating exchange rate, the SNB was unable to insulate the domestic economy completely from foreign inflationary shocks. Only after the U.S. monetary policy switch did the international environment become more conducive to the SNB's efforts of maintaining price stability. My paper also suggests that the restoration of the Fed's credibility impinged on key macroeconomic relationships such as the link between the exchange rate and international interest rate differentials.

REFERENCES

Friedman, Milton. "The Case for Flexible Exchange Rates," in Milton Freedman, ed., *Essays in Positive Economics*. Chicago: University of Chicago Press, 1953, pp. 157-203.

Goodfriend, Marvin. "The Monetary Policy Debate Since October 1979: Lessons for Theory and Practice." Federal Reserve Bank of St. Louis *Review*, March/April 2005, *87*(2, Part 2), pp. 243-62.

Kugler, Peter and Rich, Georg. "Monetary Policy under Low Interest Rates: The Experience of Switzerland in the late 1970s." *Swiss Journal of Economics and Statistics*, September 2002, *138*(3), pp. 241-69.

Leutwiler, Fritz. "Inflation, Exchange Rates and Monetary Policy." Address to the American-Swiss Association, New York, September 27, 1978.

Leutwiler, Fritz. "The Effects of the Reserve Status of a Currency on its Domestic Economy," in *Reserve Currencies and other Reserve Assets in International Financial Relations*. Luxemburg: Institut Universitaire International (Journées d'Etudes), 1979, pp. 85-103.

Rich, Georg. "Swiss Monetary Targeting 1974-1996: The Role of Internal Policy Analysis." Working Paper Series No. 236, European Central Bank, June 2003.

Swiss National Bank. Data and Statistics, *Monthly Statistical Bulletin*. December 2004; www.snb.ch.

APPENDIX

DATA SOURCES

Swiss monetary base: Swiss National Bank, 2004, Series B1.
Swiss CPI inflation: Swiss National Bank, 2004, Series O11.
Swiss and U.S. 3-month interest rate: Swiss National Bank, 2004, Series E1 and internal SNB sources.
Swiss federal government and U.S. Treasury 10-year bond yields: Swiss National Bank, 2004, Series E3, and internal SNB sources.
Exchange rate: Swiss National Bank, 2004, Series G1.

The Changing Role of the Federal Reserve

Frederick H. Schultz

When I went to Washington in 1979, most people thought the Federal Reserve was either a bonded bourbon or a branch of the National Guard. In those days, stabilization theory, which is an economist's way of saying steady growth, was based on changeable fiscal policy and steady monetary policy. The Fed was a low-profile institution. Milton Friedman was the most visible of the monetarists, and he went so far as to say that we might even be able to do away with the Federal Reserve. He wanted to put monetary policy on autopilot, and he regarded fine-tuning as the worst possible option. Now we have a system in which there is almost universal agreement that we ought to have a budget that is in surplus and a Federal Reserve that should be flexible in monetary policy in order to respond to changes in the economy. To Milton Friedman's consternation, Alan Greenspan is the greatest fine-tuner in history. We have come a full 180 degrees in the past 20 years.

Why did that happen and what kind of an organization is the Federal Reserve? A little history. In 1913 the Federal Reserve was created, primarily to respond to financial panics. In rural areas, the agricultural banks would be fully committed to commodity loans. Sometimes there would be a sharp drop in prices and people would want to take their deposits out of the banks. The banks would call their loans, farmers would fail, there would be a run on the banks, and both farmers and bankers would be bankrupt. The Federal Reserve was created as a lender of last resort so that the banks could borrow from the Fed until prices stabilized. In the urban centers, excessive speculation in financial markets sometimes caused short-term distress. Again, the Federal Reserve could provide the banks with liquidity until prices stabilized. The system worked reasonably well for several years, including 1921, when we had a sharp drop in commodities.

But when the Great Depression hit in 1929, a combination of errors in judgment and structural flaws prevented the Fed from adequately responding. Structural problems were threefold. First, the Treasury Secretary sat on the Federal Reserve Board, so decisions were politicized. Second, the nation was on the gold standard, which required the Federal Reserve to be shrinking the money supply during a time when it should have been increasing it to fight deflation. Third, the Federal Reserve did not have authorization to buy and sell in the open market, a capability used to steady the money supply. I remember that one of the first shocks that I had after getting on the Board was related to open market operations. Every Monday the staff at the New York Fed and the staff in Washington did (and still do) their calculations to come up with an agreement on how much money needed to be injected into or removed from the system. I had been on the job for a week when they made the request to pump $3 billion into the market. That was the first $3 billion decision I ever had to make.

The National Banking Act of 1935 fixed the structural problems but still required the Federal Reserve to buy any bonds that were issued by the federal government, with the result of monetizing the debt. This inflationary threat was changed by the Treasury Accord of 1951. Since that time, the Fed has had a high degree of independence.

What kind of organization is the Federal Reserve? There are about 25,000 employees.

Frederick H. Schultz was Vice Chairman of the Board of Governors of the Federal Reserve System from 1979 to 1982.

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Policymaking is the exclusive domain of the seven members of the Board of Governors in Washington. They are all appointed by the President and confirmed by the Senate. The Chairman and Vice Chairman are confirmed separately, first as Governor and then as Chairman or Vice Chairman. There are about 1,500 employees in Washington. One of my responsibilities was as the administrative governor in charge of the Washington staff.

There are 12 Federal Reserve Banks and more than 40 branches. Most activity at these institutions involves clearing checks and acting as the fiscal agent for the government, primarily selling bonds and accepting various kinds of government deposits. Although the Federal Reserve Banks can request changes in the discount rate, they don't have any policymaking duties other than those delegated to them by the Board of Governors in the area of bank supervision and regulation.

However, they are the eyes and ears of the Fed. There are 300 economists at the Board in Washington and an equal number in the Federal Reserve Banks. The governor of the Bank of England once told me that compared with the Federal Reserve, the Bank of England is a Toonerville Trolley. You may read newspaper reports about the "Beige Book," which is made up of reports from the economic staff of each of the Federal Reserve Banks. It is used as an important source of information in setting monetary policy. When I went to the Board, we were shorthanded and Chairman Paul Volcker asked me to be not only the administrative governor but also chairman of bank activities, which meant that I had oversight for all of the Federal Reserve Banks. This required me to visit each of the Banks on a regular basis to meet with their president and board of directors, which helped me to understand what was happening in each section of the country.

Monetary policy is decided at meetings of the Federal Open Market Committee (FOMC), composed of the seven governors and five of the twelve Federal Reserve Bank presidents, who rotate their service on the FOMC. The FOMC meets about every six weeks. During the time I was there, Volcker and I often had dinner the night before each meeting. As Vice Chairman, I had decided that I would never vote in opposition to Paul on matters of monetary policy, although he and I were on opposite sides in a number of regulatory and supervisory matters. During dinner I would express my views on the economy and monetary policy. We would debate those views, and Paul would outline the direction he wanted to take. The next morning the meeting would begin with staff reports on the domestic economy, the international economy, and various monetary options. Then we would go around the board table and each governor and Federal Reserve Bank president would give his views. We would then have a recess and the president of the Federal Reserve Bank of New York, the staff director for Monetary Policy, and I would join Paul in his office to discuss what we had heard. When we reconvened, Paul would do a masterful job of pulling everything together and proposing a course of action. Debate would ensue and a vote would be taken. If there were not at least ten affirmatives, Paul would propose an alternative. This would continue until there was substantial agreement.

What's it like to be a governor of the Federal Reserve? In my case, I was appointed because no one else wanted the job. For two years I had been on the board of the National Institute of Education. When Congress created the new Department of Education, I was on the list to be considered for secretary. In those days, Charles Kirbo, the senior partner of King and Spalding in Atlanta, was Jimmy Carter's closest advisor. He vetted all the major appointments. We had a meeting, and after about 45 minutes he asked me if I would come to Washington for anything else. When I replied in the negative, he asked about the Federal Reserve, which I found interesting. I found out later that they had been trying to find a banker from the South to put on the Board. They talked to a couple of the CEOs of major banks who turned them down because of the requirement to sell all bank stocks.

My conversation with Kirbo was on a Monday. On Wednesday I got a call from Bill Miller, who was Chairman of the Federal Reserve Board, asking me to come to Washington for lunch on Friday. I flew up and we talked for about two hours. At the end of our discussion, he asked if I would accept

an appointment if offered. I told him that I could give him an answer on Monday after discussing it with my wife over the weekend. When I called Monday to tell him that I would be willing to accept, he indicated that I needed to be interviewed by the Vice President and the Secretary of the Treasury. He set up an appointment for the next day, and I flew back up for meetings with Vice President Mondale and Secretary Blumenthal. Wednesday morning Chairman Miller called to say that, after their approval, my name had been submitted to the President. At this point I thought the process would slow down, but on Friday I was informed that the President had sent my name to the Senate. On Monday I called a press conference for that afternoon, only to be informed that morning that the President had also decided to nominate me as Vice Chairman. Obviously, I was a little breathless from the speed of events.

When the confirmation process began, I understood that it would take some weeks, so I decided to accelerate my learning curve. When I had been a Kennedy Fellow at Harvard, I had audited a graduate course on macro-economics. I called the professor and asked him if he could put together a group of outstanding economists for a meeting. When I arrived in Cambridge, he had seven economists for lunch. Four of them were Nobel Laureates—Bob Solow, Ken Arrow, Paul Samuelson, and Franco Modigliani. We had lunch and spent the afternoon talking. I was trying to get their advice on what steps we should be taking in handling monetary policy. It was a wonderful afternoon and I learned a lot, but I also heard many comments that on the one hand we should do this and on the other hand we should do that. I remembered that Harry Truman once said, "For God's sake, give me a one-armed economist." After the meeting, Franco said that he would drive me back to the hotel. As we raced down city streets at 70 m.p.h. in his Italian sports car, Franco was gesticulating not just with one hand but with both, so I also learned that afternoon never to ride in a sports car with an Italian economist.

I then decided to try to meet with the major bankers in New York, since the Federal Reserve has regulatory responsibility for bank holding companies. After meeting with Walter Wriston at CitiCorp and John McGillicuddy at Manufacturers Hanover, I went in to see David Rockefeller at Chase. He came bounding out of his office, grabbed me by the hand, and said, "Governor, it's nice to meet my new boss." When I got to know him better later on, and when I learned more about my new job, I understood he wasn't just blowing smoke.

My confirmation was difficult. Senator William Proxmire, chairman of the Senate banking committee, felt that I was not qualified to be Vice Chairman and preferred that one of the older, more experienced members of the Board be chosen for that office. I met with each member of the Senate banking committee, with the exception of the chairman, who chose not to see me. Several of the Democratic senators were opposed to me because of my business background. The issue remained in doubt until the day of the Committee vote. I finally prevailed 12 to 10, with all Republican senators voting for me. Two and a half years later, when I was planning to leave the Board, Senator Proxmire took the floor of the Senate to comment, "Fred Schultz has done a fine job in a very difficult time."

I was sworn in on a Wednesday. On Friday, Bill Miller called to say that he was resigning as Chairman of the Board to accept the position of Secretary of the Treasury. My reply was "Well, thanks a hell of a lot." Over the weekend the rumor went around that I was to be the next Fed Chairman. Monday morning was the most humbling experience of my life. The currency markets opened in Europe and the dollar dropped like a rock. That afternoon the President announced that Paul Volcker was going to be the next Chairman, and the dollar shot right back up again.

During this time, the economy was really beginning to deteriorate. The summer of 1979 was certainly the most difficult economic crisis this country has experienced since the Great Depression. There was a growing flight from the dollar. Everybody was getting out of intangibles and into tangibles. They were selling stocks and buying real estate or gold or jewels or stamps or anything to protect them against inflation. One of the members of the Board was a great international economist named Henry Wallich. He had been a young boy in Germany in 1923. He used to tell a story that

he would go down to the community swimming pool where the nominal charge for an eight-year-old boy was 5 billion marks. He had to get a large basket and fill it with currency in order to go swimming. In those days people in Germany were paid twice a day. They were paid at noon and took their check and spent it immediately because between noon and the time they got paid again at 5:00 the value of the currency would have already dropped dramatically. Wallich used to say that he never, never thought these things could occur in the United States. But in the summer of 1979, he used only one *never*.

Chairman Volcker recognized that he needed to do something dramatic, so he proposed that we adopt a strict monetary rule based on movements of the money supply. We understood that interest rates would have to go up very sharply, but none of us believed that they would go as high as they did. We rather thought that 15 percent would do the job, but the prime actually went as high as 20.5 percent. It was a very difficult period, with enormous pressure on the Board. My day began at the office at 7:30 in the morning and lasted until 7 or 7:30 at night. I took home a briefcase with a sandwich and reading material, ran for about three miles, and got into bed to work until midnight. About 350 pages of reading material came across our desks everyday. Even with assistants and an excellent staff, it was still necessary to work every night. Volcker would come in at about 9:00 in the morning but seldom left before 9:00 at night. He lived in a little one-bedroom apartment about three blocks away, cooked his own dinner on a hot plate and worked until 1:00 or 2:00 at night. That was the way we lived for one solid year. I didn't read a book or watch a movie. I didn't turn on the TV except to watch the Super Bowl.

Unfortunately, things continued to get worse. In January the Carter administration submitted a budget that widened the deficit. The markets reacted dramatically, thinking that inflation was going to get out of control. There was a law on the books, which had been put in under President Nixon's administration, allowing credit controls. It was invoked by the President but administered by the Federal Reserve. When President Carter invoked credit controls, Volcker put me in charge. That was the worst job I have ever had. I had a staff of about 80 economists, but you cannot imagine how enormously complex our economy is. Every time we put out a regulation to try to take care of one problem, we would find that we had created two or three others in the process. This economy is a remarkable invention. It works amazingly well, but when you interfere with it, myriad unanticipated problems are created. In the final analysis, people were reacting by cutting up their credit cards and restricting most of their borrowing. The economy dropped precipitously, and we removed the credit controls as quickly as we thought we could. We misjudged. The economy quickly overheated again, and we were put into the difficult position of having to raise interest rates in August, just prior to the election.

The Federal Reserve is a thoroughly nonpolitical institution. I never heard politics discussed at the Board table while I was there, but we did try to make any moves as far away from an election as possible. We were anxious not to be seen as trying to influence the outcome one way or the other. I don't think any Federal Reserve Board has ever increased rates as close to an election as we did. I got a call from a friend of mine at the White House who said, "What in the hell do you think you're doing?" I explained that we really didn't have a choice. If we didn't raise rates, the inflation problem would get worse and it would mean that we would have to raise them even more at a later time. He replied, "Well, you've got to do what you've got to do," and that was the end of it.

Jimmy Carter may have had his problems as President, but in certain settings he was as sharp as anybody I have ever seen. One Saturday night when we were working on credit controls, I was called to the cabinet room of the White House to meet with the President, Vice President, Secretary of the Treasury, and head of the Office of Management and Budget. President Carter's questions came like a machine gun. He was superbly knowledgeable and very much in charge.

During this period, we had a lot of international pressure as well. While I was there I can't remember a head of state who came to Washington without seeing Paul Volcker. I saw a lot of finance ministers and foreign ministers. The Fed was very

much the focus of what was going on in the world. We were trying to explain to them what we were trying to do. I remember one meeting in Basel, Switzerland, of the Bank for International Settlements, which is a kind of central bankers' central bank. There are some 80 countries that are members, with 11 on the executive committee. The meeting begins on a Monday afternoon with a so-called "tour d'horizon," tour of the horizon, where each country on the executive committee reports on how they see the economy of the world. I was representing the United States, and the Governor of the Bank of England turned to me and said, "Well, I think we should first hear from the Federal Reserve because they're the elephant in the lifeboat."

The Vice Chancellor of Austria once came to my office to ask if I would be willing to do an interview with him, which he would use in his reelection campaign. I agreed on the condition that we just talk economics. Evidently he used the interview on television to explain Austria's economic problems. It must have worked, because he got reelected.

In January 1981, the Reagan administration took office. They were committed to the supply-side approach, which required a big cut in taxes. At the Federal Reserve we thought a tax cut would be helpful. Unfortunately, Congress commandeered the bill and the logrolling began. The special interests had a field day: wood stoves in Vermont, racehorses in Kentucky, peanuts in Alabama. It got so bad that in June the Reagan administration seriously questioned whether they should try to pass the bill. The Federal Reserve opposed it. Volcker had a number of meetings with members of the Senate and I with members of the House. About two weeks after the bill was passed, I saw Bob Dole in the elevator of the apartment house where we both lived. Even though he had helped pass the bill, he said, "I think you were right." He then put in a bill to rescind many of its most egregious provisions.

During the early years of the Reagan administration, there was a battle between the Treasury and the Fed. Don Regan was Secretary of the Treasury, and he had assembled an economic team of committed supply-siders who were concerned primarily with supporting their theory. When the economy didn't work in sync with their theories, they were quick to blame the Federal Reserve. After enduring this criticism from every direction, I finally bought a large child's top with a plunger to make it spin. I had it painted four different colors labeled "supply side," "Keynesianism," "monetarism," and "gold standard." I sent it to Don Regan with a note that he could have any kind of monetary policy he wanted if he just pushed the plunger up and down. Don was not a very good economist, but he had a quick wit. Three days later I received a box with a yo-yo in it and a note saying that everything would be all right if the Fed would stop yo-yoing the money supply. When Jim Baker came in as Treasury Secretary, he adopted a much more pragmatic approach and relationships with the Fed improved considerably.

Throughout the 1980s, problems were created by budget deficits and tight monetary policy. In 1990, President Bush recognized that this was not the optimum way to run economic policy. He proposed a tax increase. From an economic point of view, I think this was very right and very courageous, but it was politically devastating. When people are assessing credit for the extraordinary good times of the late 1990s, George Bush deserves some of the credit. When the Clinton administration took office, they raised taxes further to create a balanced budget. That enabled the Fed to lower interest rates. When combined with advances in technology, this encouraged businesses to dramatically increase their capital expenditures. The result was a surge of productivity that has enabled us to have a strong economy without inflation.

Now we are in a period where we have totally reversed the economic policies of the 70s. I don't know of any responsible Republican or Democrat who argues that we ought to have an unbalanced budget at this point in time. They may argue about the level of taxes or the level of spending, but no one espouses anything other than a tight fiscal policy with any necessary adjustments accomplished by a flexible monetary policy. The Achilles heel of the system is that it is deeply dependent upon the Chairman of the Federal Reserve. We have had the two greatest Federal Reserve Chairmen in history: Paul Volcker and Alan Greenspan.

Alan told me two years ago that "the people of the United States will never understand how much they owe to Paul Volcker." Paul had the intellect and the courage to handle the difficult crisis of the late 1970s and early 1980s. On the other hand, Alan Greenspan is the best I have ever seen in sensing where we are in the business cycle.

When I first got on the Board, I called former Chairman Arthur Burns and asked him to have lunch. I wanted to ask him what characteristics of a governor of the Federal Reserve were, in his opinion, the most important. He puffed on his pipe and in his gravelly voice replied, "Common sense and good judgment." The President of the United States will appoint a new Chairman of the Federal Reserve. He needs to find someone who is a brilliant and experienced economist, but more than anything else, he needs to find someone with common sense and good judgment.

Aftermath of the Monetarist Clash with the Federal Reserve Before and During the Volcker Era

Anna J. Schwartz

Monetarists 40 years ago had a double objective. They sought to persuade the economics profession that (i) monetary policy, not fiscal policy, was the key to economic stability and (ii) the control of inflation required limiting money balances, not incomes policies and wage controls. Monetarists also sought to persuade the Federal Reserve to alter the way it conducted monetary policy to conform to monetarist doctrines. In the three years (1979-82) under Volcker, disinflationary monetary policy, announced as being designed to contain growth in money aggregates, brought down the U.S. inflation rate from 10 percent to 4 percent. Since then the inflation rate has remarkably declined even more. A victory for monetarism? During the Volcker era monetarists did not think so.

Missing from the retrospective on the Volcker era at the special conference held at the Federal Reserve Bank of St. Louis was a consideration of the complaints against the Federal Reserve expressed by monetarists. The conference papers celebrated Volcker's achievement and deemed the changes in monetary theory and practice since his time as virtually unqualifiedly successful.

I propose to review past monetarist strictures (Shadow Open Market Committee, 1974-1982) and ask whether current Federal Reserve practice provides a satisfactory response to them. Twenty-five years after the Volcker era, has the contest between the U.S. central bank and its critics been resolved?

THE MONETARIST CRITIQUE BEFORE THE VOLCKER ERA

The critique centered on alleged faulty procedures by the Federal Open Market Committee (FOMC) in conducting monetary policy and on the undesirable outcomes of these procedures. The litany of faults included the following examples and prescriptions for changes in procedure.

- Fed monetary policy is based on a nominal short-term interest rate, which is an unreliable guide. The Fed interprets a low rate as indicating monetary ease, a high rate as indicating monetary tightening. A low rate, however, may in fact be consistent with contraction if the growth rate of the quantity of money has been declining, and a high rate may be consistent with expansion if the growth rate of the quantity of money has been rising. Moreover, monetary authorities who rely on an interest rate instrument are prone to delay a needed increase to combat inflation because they believe that it will produce a rise in the unemployment rate. Action is often late and excessive.
  Prescription: Monetary policy should be based on a credible, pre-announced, long-run stable growth rate of a monetary aggregate, preferably the monetary base or M2.
- The Fed instructs the Manager of open market operations at the Federal Reserve Bank of New York to maintain money market conditions that it specifies in its directive to him, with a proviso that credit does not unduly expand. The directive leaves open to the Manager the interpretation to be placed on money market conditions and therefore makes it impossible to hold him accountable for the open market operations that he chooses to execute.
  Prescription: The Fed should not conduct

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monetary policy using money market conditions, which have no precise definition, as their rationale.

- The horizon of the Fed is the short interval between FOMC meetings. The short horizon is inconsistent with forward-looking forecasting. Policy is directed to transitory events that it cannot influence. **Prescription**: The Fed horizon should extend beyond several quarters ahead. It should aim at a long-run target, and that target should be the rate of monetary growth that is expected to produce price stability.
- The Fed engages in fine-tuning, attempting to promote economic growth and employment by lowering interest rates until inflation looms, whereupon it reacts by raising interest rates and slowing economic growth and employment. The policy creates a go-stop economy. **Prescription**: The Fed should abjure fine-tuning. It destabilizes the economy. Properly designed monetary policy can achieve price stability, not real economic activity.
- The Fed asserts that its exercise of discretion in moving the short-term nominal interest rate enables it to offset short-term fluctuations in real economic activity. Monetarists, however, argue that discretion is destabilizing. **Prescription**: Fed policy should embody the view that monetary policy stabilizes real economic activity when it is based on a rule that requires low, stable money growth.

THE MONETARIST CRITIQUE DURING THE VOLCKER ERA

I begin with a brief review of the disinflationary monetary policy that Volcker presided over. I then note monetarist criticisms.

In 1975, Congress passed Joint Congressional Resolution 133 requiring the Fed to adopt one-year money growth targets. In October 1979, the Fed described the reason for the new procedures that Chairman Volcker introduced as more precise control of monetary growth. The Fed announced the target growth rate each year on a base equal to the actual level of the money stock in the fourth quarter of the preceding year. In the late 1970s, the above-target money growth in one year was built into the next year's target. In 1981, the below-target money growth was built into the 1982 target. The resulting base drift contributed to instability of money growth.

In advance of the new procedures, in the early 1970s, the Fed began direct targeting of the federal funds rate within a narrow band specified by the FOMC each time it met. If the Fed was slow in raising the target and, when it did raise the target, did not raise it enough, as total nominal spending rose, rapid money growth resulted and, accordingly, higher inflation growth.

The new procedures, adopted on October 6, 1979, replaced direct federal funds rate targeting with nonborrowed-reserves targeting. The new procedure was intended to supply banks with the average level of total reserves (the combination of discount window borrowing and open-market provision of nonborrowed reserves) that would produce the rate of monetary growth the FOMC desired over the period from a month before a meeting to some future month, without regard for the accompanying possible movement of the federal funds rate outside a widened range of 400 basis points.

At the October 5, 1982, meeting, the FOMC abandoned nonborrowed-reserves targeting. It concluded that short-run control of monetary aggregates was inferior to interest rate control. The Fed's difficulty with nonborrowed-reserves targeting was attributed to the unreliability of the demand function for discount window borrowing on which its operating procedure depended.

Observers who were not monetarists described the Fed's new procedure as a subterfuge. It permitted the Fed to raise the federal funds rate to unprecedented heights while alleging that it was not itself acting on the rate. It was containment of the M1 aggregate (as then defined) that produced the interest rate result.

For monetarists, the Fed's new procedure was a travesty of their prescription of a pre-announced steady and predictable rate of growth of a monetary aggregate. The Fed missed its monetary

growth target more often than it hit it. Monetary growth fluctuated over a wide range. The volatility of quarter-to-quarter rates of monetary growth during the three-year period was three times as high as earlier (Friedman, 1984). Two recessions punctuated the three-year period: January 1980–July 1980 (produced by Carter administration credit controls); and July 1981–November 1982 (produced by the new Volcker procedures).

The Fed at bottom probably remained unconvinced that it was desirable to base monetary policy on control of a monetary aggregate. That is why in 1968 it shifted from contemporaneous to lagged reserve requirements despite the fact that lagged reserve requirements impaired control of the quantity of money. That was simply not a Fed priority.

Nevertheless, as noted, the inflation rate subsided under the new procedure.

THE AFTERMATH

Twenty-five years have elapsed since the Volcker era. How have the monetarists fared on the two fronts on which they promoted views that neither the academic community nor the Fed initially accepted?

The monetarist debate with the economics profession is in abeyance, but monetarist tenets are now incorporated in mainstream economics. Indeed, the profession now embraces the beliefs that money matters, that inflation can be controlled by monetary policy, that there is no long-run trade-off between inflation and unemployment, that there is a distinction between nominal and real interest rates, and that policy rules help anchor stable monetary policy.

The monetarist battle with the Fed was also not fought in vain. Whatever the shortcomings of the Volcker procedure, it marked the onset of central bank acknowledgment that their key responsibility was to control inflation. By 2004, central banks in all advanced countries have adopted implicit or explicit targets for future inflation. Their success in meeting their inflation targets has gained them credibility. The target has become the public's expected inflation rate. Growth rates of monetary aggregates tend to be moderate and stable. Although central banks, with the exception of the European Central Bank, ignore money aggregates in their theoretical frameworks and their practice, a possibly unintended result of their success in controlling inflation is that money aggregates currently have no predictive power with respect to prices. Before the Volcker era, money aggregates swelled as economic activity expanded and grew less as economic activity faltered, forecasting higher and then lower prices. This pattern is no longer observable.

What does this development teach us about monetarism's past disagreements with the Fed? Monetarism lost the battle for a monetary aggregate to replace the federal funds rate as the Fed's target, but it won the real goal that it sought, namely, long-run stable growth of an aggregate with no predictive power for prices.

Will this happy outcome endure? Time will tell.

REFERENCES

Friedman, Milton. "Lessons from the 1979-82 Monetary Policy Experiment." *American Economic Review*, May 1984, *74*(2), pp. 397-400.

Shadow Open Market Committee. *Semi-annual Policy Statement*. Unpublished manuscripts. Rochester, NY: University of Rochester, 1974-1982.

Reflections

Edwin M. Truman

My reflections on the new operating procedures that were adopted by the Federal Open Market Committee (FOMC) on October 6, 1979, derive from my responsibilities at the Federal Reserve Board at the time. Those responsibilities included preparation of the international component of the staff forecast, analysis of economic and financial developments in other countries, and assisting the Chairman and members of the Board (primarily Henry C. Wallich) with international responsibilities in connection with their attendance at international meetings. Therefore, mine was and is an international perspective. I was not involved in the design of the new operating procedures, although I was informed that the project was under way.

The decision on October 6, 1979, was very much part of an international policy coordination process that played out with our partners abroad, principally in Europe, as well as within the U.S. government, in the late 1970s. In thinking about such episodes of policy coordination, I find it useful to try to answer a sequence of questions: (i) Was the diagnosis of a need for policy action correct? (ii) Was there agreement on the model or framework used to analyze the situation? (iii) Were the right policy choices made? My reflections are organized around those three questions. My answers are as follows: (i) Eventually the correct diagnosis was made. (ii) Agreement on the analytic framework was loose at best. (iii) The right choices were made, but in retrospect at a high price that probably would be higher today.

CORRECT DIAGNOSIS?

The Carter administration came into office dissatisfied about U.S. economic growth and determined to lead an international effort to promote U.S. and global expansion—the locomotive theory. Economic activity did accelerate in the United States in 1977, and so did the price level, but most of the rise was in increases in prices of food and energy. The U.S. current account deficit also widened, which was seen as sapping the U.S. expansion. This situation prompted Treasury Secretary Blumenthal in June 1977 to make his comments on the unsustainable U.S. deficit at the Organisation for Economic Co-operation and Development (OECD). These comments established his reputation for "talking down" the dollar.

By the fall of 1977, the Federal Reserve was intervening quite heavily (by the standards of the time) in foreign exchange markets to resist the dollar's decline. That decline was seen at the Federal Reserve and in other policy circles as adding to U.S. inflation. We on the international side of the Federal Reserve at this time used to joke that the view at the Federal Reserve seemed to be that inflation was caused by rising prices; Federal Reserve policy had nothing to do with it.

With the transition from Arthur F. Burns to G. William Miller as Chairman, the situation did not improve, though Miller was more effective in dealing with the administration. He succeeded where Burns had failed—in convincing the U.S. Treasury that the Treasury could absorb the potential financial costs of issuing foreign currency–denominated debt (what came to be known as Carter bonds) as a cost of issuance.

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The dollar continued to decline after the Bonn Summit in July 1978, at which the grand bargain was struck to stimulate growth abroad in return for a U.S. pledge to reduce its dependence on imported oil. The decline turned into more of a free-fall in October in reaction to the announcement of President Carter's program of budget restraint and voluntary wage and price guidelines.

The Federal Reserve under Chairman Miller anticipated this reaction, and a plan was developed to correct "the excessive exchange rate movements" that followed the announcement. The plan called for a cooperative $30 billion package of foreign currency resources to finance Treasury and Federal Reserve intervention. However, it was noteworthy that the Bundesbank would not agree to the package, which included doubling the Federal Reserve's swap line with it and cooperation on the issuance of Carter bonds, until the Federal Reserve agreed to a decisive monetary policy move that took the form of an unprecedented 1-percentage-point increase in the discount rate to 9$^1/_2$ percent.

The President's announcement of the overall package tightly linked the decline in the dollar to U.S. inflation. However, there was little recognition at the time in Washington that the United States had a serious underlying inflation problem. One of my least pleasant experiences at the Federal Reserve was in July 1978, when I represented the Federal Reserve on the U.S. delegation for the OECD's review of the U.S. economy. Lyle Gramley, who had moved to the Council of Economic Advisers (CEA), argued that if the Federal Reserve raised interest rates another 25 basis points, it would plunge the U.S. economy into recession.[1] I said the Federal Reserve would act "appropriately."

The November 1, 1978, package boosted the dollar for a while. However, in June 1979 it began to decline again, in particular in terms of the Deutsche mark. Petroleum prices were also rising along with U.S. headline and core inflation. During the summer of 1979, the principal response both inside and outside the Federal Reserve was to call for stepped-up U.S. intervention in foreign exchange markets. It was felt that the economy was headed for recession, so the scope for raising interest rates was limited.[2]

During that summer, the FOMC did push up the federal funds rate at the same time it was participating in foreign exchange market intervention. By September, it was becoming increasingly clear that we were behind the curve. The new operating procedure was under development in-house.

Paul Volcker, who was appointed as Federal Reserve Chairman in 1979, traveled to the International Monetary Fund/World Bank annual meetings in Belgrade on the Treasury plane. On the way, they stopped in Hamburg for conversations with their German counterparts. One interpretation of that stop was that Treasury officials were trying to drum up German support for a new rescue package for the dollar. In fact, they received a harangue from the German authorities about getting the U.S. economic house in order. It was on this trip that Volcker informed the Treasury and the CEA about his thinking. My impression at the time was that the Treasury (Secretary Miller and Under Secretary Solomon) was broadly supportive of Volcker's plans. My impression was that the CEA (Chairman Schultze) was more skeptical about the technique but not about the need to do something. Most were convinced that everything else had been tried and had failed; it was necessary to have done so in order to bring them around to accepting the need for fundamental monetary policy action.

Volcker also shared some of his thinking in general terms with Bundesbank president Otmar Emminger. Emminger relied heavily for advice on my good friend and counterpart at the Bundesbank, Wolfgang Rieke. Consequently, during our walks around Belgrade, Wolfgang and I had several long conversations about the proposals and the chances of their success. We thought we understood how the new procedure would work, but we were uncertain about how successful it would be.

Volcker left Belgrade early to return to

[1] By the time Lyle Gramley came back to the Federal Reserve in May 1980 as a governor, he was one of the strongest anti-inflation hawks.

[2] At the time, real GDP recorded a decline during the second quarter of 1979, but the data today show no decline until the second quarter of 1980.

Washington to finalize plans for the October 6 meeting of the FOMC. Henry Wallich and I flew back the afternoon of October 5 and immediately went into a conference call to cover recent economic and financial developments, getting them out of the way before the FOMC meeting the next day. It was noted that the Pope would be in Washington at the same time, which might give the Reserve Bank presidents and their colleagues some cover as they slipped into town.

By October 6, 1979, the FOMC had become convinced that the United States had an inflation problem that could be addressed only at home through monetary policy, and the U.S. administration, some very reluctantly, did not object. The inflation problem had its origins inside the United States and inside the Federal Reserve, not in foreign exchange or petroleum markets. Eventually the correct diagnosis was made.

AGREEMENT ON THE ANALYTICAL FRAMEWORK?

In Belgrade, Arthur F. Burns delivered the Per Jacobsson lecture, named after a former managing director of the International Monetary Fund. His title was "The Anguish of Central Banking." He argued implicitly that the fault for high U.S. inflation lay not primarily with the Federal Reserve but in policy decisions made elsewhere in the U.S. government that limited the central bank's capacity to bring down inflation, especially once it had risen.

Burns presented a four-part proposal for how the U.S. government should deal with its inflation problem: (i) revision of the budget process, (ii) a comprehensive plan for dismantling regulations impeding the competitive process and modifications where regulations were driving up prices and costs, (iii) scheduled reductions in business taxes to stimulate the supply side of the economy, and (iv) "a binding endorsement of restrictive monetary policies until the rate of inflation has become substantially lower." Volcker arrived late at the lecture, sat on the floor leaning against a wall, picked up a copy of Burns's speech, skimmed through it, and tossed it back on the floor with the comment, "I'm doing it all wrong." I was sitting a few feet away and was one of the few who heard him and understood what he really meant.

However, Arthur Burns was not the only person who did not embrace the unilateral approach to monetary policy that the Federal Reserve was about to unveil. The members of the FOMC only gradually arrived at a common diagnosis of the problem. They were concerned about inflation, but they were also concerned about the real economy. There was less than full agreement that a greater focus on the monetary aggregates was appropriate in the context of ongoing changes in the financial system. The Federal Reserve had embraced the framework of monetary targeting, and it was enshrined in the Humphrey-Hawkins Act, but the embrace was far from warm or universal.

Even for those who embraced the monetarist framework, there was considerable dissatisfaction with the current operating procedures and doubts about whether they could achieve the monetary targets. Of course, considerable attention was paid to interest rates. However, my memory is that the term "real short-term interest rates" was rarely used at the time. Through the third quarter of 1979, the real federal funds rate (adjusted for headline consumer price index [CPI] inflation over the following four quarters) had been positive for only 2 of the 19 quarters starting in the first quarter of 1975. This experience has led me, for example, in the context of the Mexican program in 1995, to favor use of the real short-term interest rate as an indicator of monetary restraint.

The new operating procedures were regarded generally as a monetarist framework, but many monetarists disowned it either immediately or soon thereafter. Moreover, during the period through the middle of 1982, in which the new operating procedures were more or less operational, there were discussions at every meeting about how wide or binding the federal funds constraint should be, though it was generally not binding. Of course, during the second quarter of 1980, the entire program was disrupted by the imposition of credit controls along with the negotiation of a new package of budget cuts.

On balance, there was more agreement in 1979 that "something" should be done about U.S. infla-

tion than about "what" should be done or "why" it should be done. Thus, I conclude that agreement on the analytic framework underlying the new operating procedure was loose at best. While the disinflation objective was clear, substantial uncertainty remained about how best to achieve that objective, which itself was unspecified.

THE RIGHT POLICY CHOICES?

The Federal Reserve was right to turn its attention directly to the underlying inflation problem in the U.S. economy rather than treat its symptoms (via exchange market intervention) or complaining about them (oil prices). The device of the new operating procedures, with its focus on nonborrowed reserves, was widely viewed at the time as a smokescreen for pushing up real short-term interest rates. Even if that was not the motivation, high interest rates were the result. It might have been preferable to announce an explicit inflation goal, but that was not among the central banker's bag of tricks at the time. Moreover, it was pretty clear that substantial disinflation was the Federal Reserve's broad objective.

The cost of that disinflation was very high—certainly higher than expected by those who argued that choosing a tough monetary target and sticking to it would magically lead to an adaptation of expectations of inflation, with no loss in output. It was even higher than others, such as myself, who suspected that it would be a long and painful process, thought it would be. Of course, other developments messed up the experiment: the continued rise in oil prices, the credit controls, and the fiscal policy of the Reagan administration, for example.

Criticism of Federal Reserve policy from Treasury Secretary Regan and Treasury Under Secretary Sprinkel helped to foster the most harmonious period within the Federal Reserve that I experienced in my 26-plus years. It is noteworthy, however, that the new operating procedure and associated actions were intended to increase confidence abroad as well as home in the System's determination to curb inflation by moderating expectations of inflation; this was expected to strengthen the dollar. Yet, the foreign exchange value of the dollar did not really turn around until the end of 1980, both on the G-10 average that we were then using and against the Deutsche mark; the dollar hit new lows in January 1980 and came close to those lows again in July. The foreign exchange markets remained skeptical, although to some extent pressures for the dollar to appreciate were resisted by other countries who were worried about "importing inflation" in the context of the surge in global energy prices.

I recall that, at a Congressional hearing shortly before the end of his tenure at the Federal Reserve, Paul Volcker was asked whether he would have done it—that is, tried to persuade the FOMC to adopt something like the new operating procedures—if he had known how long and painful it would be to get the process of disinflation going in the U.S. economy. His answer, as I recall, was a rather crisp "I am not sure." At the same time, he left no doubt that action was necessary and inevitable. The only issue was the timing.

Coming back to the international perspective, one consequence of the sequence of the Federal Reserve's decisions, which had the effect of pushing up real interest rates to very high positive levels after a long period of negative real rates, was the international debt crisis that started in 1982 and lasted through the decade of the 1980s. One can properly argue that the 1982 crisis was also a consequence of lax U.S. monetary policy in the late 1970s as well as a number of other institutional factors. However, some of us felt an obligation to help manage the adjustment process that Federal Reserve policy and its failures had helped to necessitate. It was, perhaps, prophetic that at the August 1979 FOMC meeting the Committee authorized an increase in the Federal Reserve swap line with the Bank of Mexico from $360 million to $700 million.

I have my doubts whether today, when the Federal Reserve is even more the central bank to the world and despite the more widespread adoption of floating exchange rate regimes, the Federal Reserve could "get away with" imposing such a draconian policy on the global economy without more consultation, or at least warning. Thus, in broad terms, the right policy choice was made in 1980, given the circumstances, but the price was

higher than anyone expected at the time. To delay any longer would have raised the price, but greater knowledge of how high the price was likely to be might well have contributed to further delay.

In conclusion I offer three comments about the relevance of that experience for the world today. First, I observe that the real short-term federal funds rate (again, adjusted for headline CPI inflation over the following four quarters) has been negative since the fourth quarter of 2001. On the present trajectory it is not likely to turn positive until the second half of 2005 or later. Second, it is important that the Federal Reserve never again promotes or experiences such an inflation process. Through the end of 1998, when I left the Federal Reserve, I felt that the FOMC continued to internalize the painful lessons of the 1977-82 period of inflation and disinflation; I hope that is still true. Third, in this spirit, I support the adoption of inflation targeting as a framework for the management and evaluation of U.S. monetary policy, not only to help prevent a replay of the experience of 25 years ago but also as a communication device that would alert the rest of the world if we should go off course and warn them that ultimately the return to price stability would be painful not only for us but for them.

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