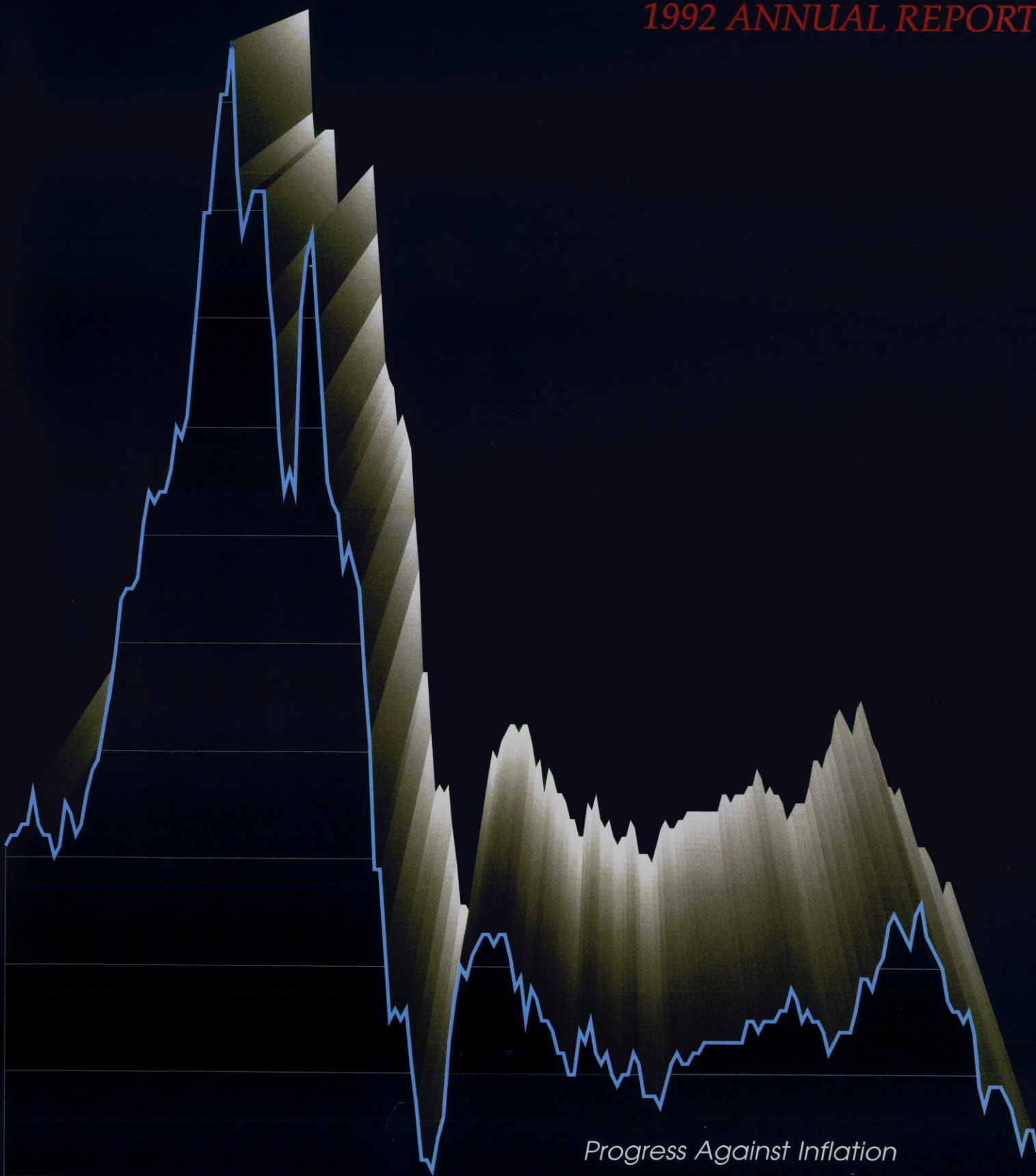


FEDERAL RESERVE BANK OF RICHMOND

*1992 ANNUAL REPORT*



Cover: 12-month percentage changes in the Consumer Price Index less food and energy ("core inflation"), 1977-1992. The bottom line of the scale represents a 2 percent annual rate, with each higher line showing a one percentage point increment.

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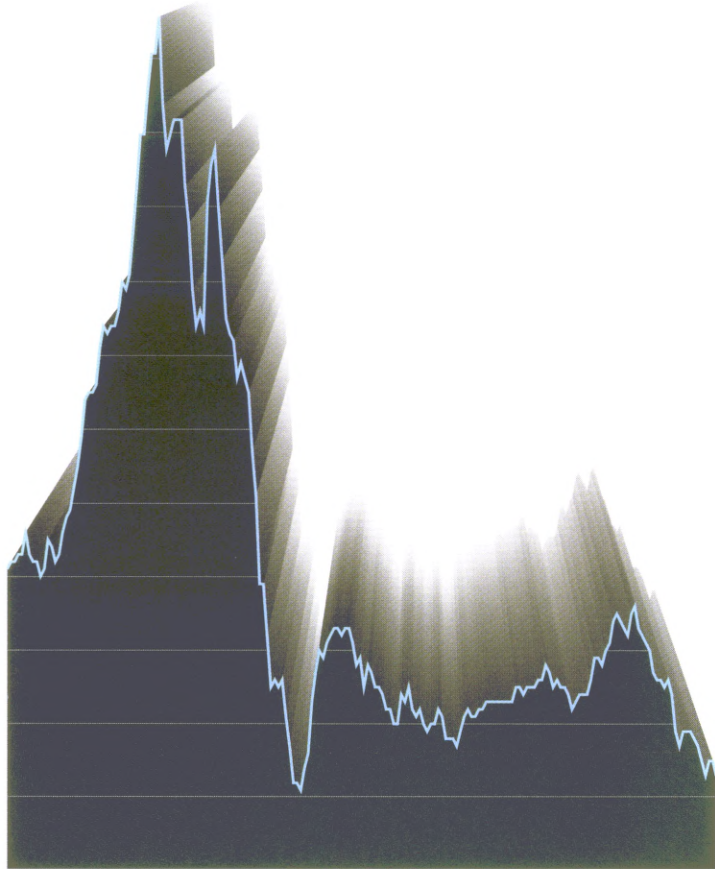
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# 1992 Annual Report

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## *Message from the Chairman*

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*Henry J. Faison  
Deputy Chairman*

*Anne Marie Whittemore  
Chairman*



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Even though 1992 was a year of uneven recovery, economic growth accelerated and inflation declined. These positive developments were appropriate tributes to the Bank's president, Robert P. Black, who retired at the end of the year. Throughout his 19-year tenure as president, Bob Black championed monetary policies aimed at promoting economic growth through price stability. The other directors and I take pride in our support of Bob's efforts and in knowing that in 1992 the economy moved closer to price stability than at any time in the last 20 years.

This year's feature article, by incoming Director of Research Marvin Goodfriend, reviews and analyzes the Federal Reserve's actions to reduce inflation during the 1980s and early 1990s. It, too, is a fitting tribute to Bob Black's unwavering resistance to inflation.

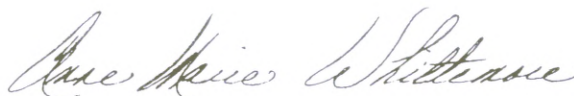
We are also proud of the Bank's many accomplishments during 1992. In particular, the Bank successfully met several momentous challenges in accommodating within our Richmond Office the headquarters of Federal Reserve Automation Services that will serve the mainframe computer needs of all 12 Federal Reserve Banks.

In light of these and many other internal and external changes during the year, we directors have been especially impressed by the dedication and hard work of the Bank's employees, who have adjusted well and who have performed, as always, with integrity, mutual respect, service, and excellence as their guiding standards.

During my service on the Bank's board, I have been privileged to work with an extraordinary group of directors who have been astute in assessing economic and financial developments and in providing valuable contributions to the quality of the Bank's work in all areas of its responsibility. I thank them particularly for the time and effort they devoted to the important task of selecting a new Bank president. I am quite grateful, too, for their personal friendship and support.

I also thank our member banks and our other constituents. With their cooperation and support, the Federal Reserve Bank of Richmond achieved high levels of service despite the problems in financial markets and in the economy as a whole.

In closing, the directors join me in offering Al Broadus, who has succeeded Bob as president, and his fellow staff members at the Bank our best wishes for 1993. We are confident that their judgment, experience, and energy will serve the Bank and the public well in the year ahead.



*Chairman of the Board*



## *Message from the President*

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*Robert P. Black*  
*President*

*Jimmie R. Monhollon*  
*First Vice President*



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As I ended my career as a central banker, I was encouraged by the economy's upward movement against a background of low and declining inflation. The continued improvement in business and financial conditions and the favorable economic outlook were largely a result of a monetary policy that had been aimed at making progress toward price-level stability as a means of promoting economic growth. I am confident that the Bank will continue to support this objective under the capable leadership of Al Broaddus.

During 1992, the combination of progress against inflation, unused productive capacity, slack labor markets, and slower-than-expected growth in the broader measures of the money supply caused the Federal Reserve to act several times to expand reserves in the banking system to support additional economic activity. As a result of these open market actions and a reduction of the discount rate to 3 percent in July, short-term interest rates declined by over a full percentage point during the year.

As the national economy improved in 1992 in response to these and earlier stimulative monetary policy actions so, too, did economic activity and the health of financial institutions in the Fifth District. Even so, our supervisory workload increased as new banking laws and regulations took effect and changes in the structure of District financial institutions continued at a rapid pace.

Our volume and types of operations also increased. In 1992, electronic services were extended to additional institutions, and electronic transmission of Treasury auction orders and billing statements were implemented. The Bank's Fed Online Exchange with depository institutions was also expanded to handle bank holding company reports and reports required by the Home Mortgage Disclosure Act.

The Bank continued to figure importantly in the Federal Reserve System's move toward greater consolidation of its operations. In Richmond, which is the headquarters site for the planned consolidation of the mainframe computer applications for all Federal Reserve Banks, progress proceeded ahead of schedule. In addition, in 1992 the Treasury selected Richmond as one of five Federal Reserve sites to process savings bonds. Our staff also developed an automated system located in Richmond to replace the manual processing of U.S. Treasury letters of credit at all Reserve Banks.

During the year, the Bank was active in helping the countries of the former Soviet Union develop the infrastructures of their banking and financial markets, both by lending expert technical advice and by inviting central bankers to study our operations.

It is impossible for me to express adequately my thanks to the many individuals and groups with whom I have worked over the years. I owe much to Al Broaddus; Jimmie Monhollon, our first vice president; and our other staff members, past and present, for their dedication and support. I am particularly grateful to the directors, the members of the Federal Reserve Board, and the District's financial institutions for the support they provided me throughout the more than 37 years I was associated with the Bank.



*President*

## *Robert P. Black: An Inflation Fighter Departs*

As the highlights elsewhere in this annual report indicate, 1992 was an excellent year for the Federal Reserve Bank of Richmond marked by significant achievements in a number of areas. All of these achievements reflect the strong leadership of the Bank's president, Robert P. Black, who retired at the end of the year. Bob Black first came to the Bank on a temporary assignment in 1954 while completing the requirements for his doctorate in economics at the University of Virginia. He left to teach for several months in 1955 and 1956 and then returned permanently to the Bank in 1956 as an associate economist. Following several earlier promotions, he was named first vice president—the Bank's chief operating officer—in 1968, and was appointed the Bank's fifth president on August 6, 1973.

During his 37 years at the Bank—and especially over his nearly 20 years as president—Bob made genuinely extraordinary contributions to the Federal Reserve System, to the Bank's employees, to the banking and financial industries, and to Richmond and other communities in the Fifth Federal Reserve District. Among the most important and—in all likelihood—durable of these contributions was his tireless effort to improve the conduct of Federal Reserve monetary policy: in particular to insure that monetary policy provides a firm foundation for sustained real economic growth by achieving and maintaining stability of the price level. Indeed, the defining characteristic of Bob's career as a monetary policymaker was his unshakable conviction that the Fed can make its *maximum* contribution to growth by maintaining a stable price level, and he argued eloquently and relentlessly for a congressional mandate that would designate price level stability clearly and unambiguously as the pre-eminent objective of monetary policy.

Given his convictions regarding monetary policy and price stability, it is of more than passing interest that Bob Black's tenure as president of the Bank coincided closely with a notable longer-term rise and subsequent decline in U.S. inflation. As pointed out above, Bob took office in August 1973, just prior to the first of the two oil price "shocks" of the 1970s. These oil shocks contributed to sharp increases in the inflation rate, which were reinforced by excessive growth in the nation's money supply. This increase in the actual rate of inflation, which—as measured by the Consumer Price Index—peaked at 13.5 percent in 1980, was accompanied by a corresponding increase in the public's expectations of future inflation and a marked reduction in the credibility of the Federal Reserve's strategy of resisting inflation through monetary policy. The latter half of Bob's tenure, in contrast, witnessed a substantial reduction in the inflation rate and at least a partial restoration of the credibility of monetary policy as a weapon against inflation. Although pleased by this significant progress against inflation, Bob regrets that the inflationary pressures that remain were not eliminated from the economy prior to his retirement, and he looks forward to their early demise.

Against this background, this year's feature article by Marvin Goodfriend, the Bank's incoming director of research, reviews and interprets the Federal Reserve's use of monetary policy to resist and, ultimately, to help reduce inflation over the period since 1979. The article emphasizes, in particular, the substantial economic cost of re-establishing the System's credibility as an inflation fighter once it has been compromised. The article and the policy lessons it underscores are especially appropriate ways to salute the achievements of one of the Federal Reserve's and the nation's most dedicated and persistent opponents of inflation—Bob Black.



# *Interest Rate Policy and the Inflation Scare Problem: 1979-1992*

*Marvin Goodfriend*

U.S. monetary policy since the late 1970s is unique in the post-Korean War era in that rising inflation has been reversed and stabilized at a lower rate for almost a decade. The current inflation rate of 3 to 4 percent per year, representing a reduction of 6 percent or so from its 1981 peak, is the result of a disinflationary effort that has been long and difficult.

This article analyzes the disinflation by reviewing the interaction between Federal Reserve policy actions and economic variables such as the long-term bond rate, real GDP growth, and inflation. The period breaks naturally into a number of phases, with the broad contour of events as follows. A period of rising inflation was followed by disinflation which, strictly speaking, was largely completed in 1983 when inflation stabilized at around 4 percent per year. But there were two more "inflation scares" later in the decade when rising long-term rates reflected expectations that the Fed might once more allow inflation to rise. Confidence in the Fed was still relatively low in 1983, but the central bank has acquired more credibility since then by successfully resisting the inflation scares.

I analyze the conduct of monetary policy using a narrative approach that pays close attention to monthly movements of long- and short-term interest rates. My approach is intended to complement existing studies such as the VAR-based analyses by Bernanke and Blinder (1992) and Sims (1992), and the more conventional studies of the period by Friedman (1988) and Poole (1988). The goal is to distill observations to guide future analysis of monetary policy with the ultimate objective of improving macroeconomic performance. Based on a familiarity with the Fed and the work of Fed economists, I interpret policy actions in terms of the federal funds rate rather than a measure of money. I view the article as a case study of the Federal Reserve's interest rate policy.

The Fed's primary policy problem during the period under study was the acquisition and maintenance of credibility for its commitment to low inflation.<sup>1</sup> I measure credibility by movements of inflation expectations reflected in the long-term interest rate. For much of the period the Fed's policy actions were directed at resisting inflation scares signaled by large sustained increases in the long rate. A scare could take well over a year of high real short-term interest rates to contain. Moreover, just the threat of a scare appears to have made the Fed tighten aggressively in one instance and probably made it more cautious when pushing the funds rate down to encourage real growth on a number of occasions.

Inflation scares are costly because resisting them requires the Fed to raise real short rates with potentially depressing effects on business conditions. Hesitating to react is also costly, however, because by revealing its indifference to higher expected inflation the Fed actually encourages workers and firms to ask for wage and price increases to protect themselves from higher expected costs. The Fed is then inclined to accommodate the higher inflation with faster money growth.

Inflation scares present the Fed with a fundamental dilemma the resolution of which has decided the course of monetary policy in the post-war period. Prior to the 1980s, the Fed generated an upward trend in the inflation rate by reacting to inflation scares with a delay. The more prompt and even preemptive reactions since the late 1970s have been a hallmark of the recent disinflation.

The plan of the article is as follows. First, I discuss the premises that underlie my interpretation of monetary policy. A chronological analysis of policy follows. Finally, I summarize the main empirical findings in a series of observations that sharpen our understanding of the conduct of monetary policy. A brief summary concludes the article.

*The author is senior vice president and director of research at the Federal Reserve Bank of Richmond. The article benefited greatly from discussions with Timothy Cook and Robert King as well as from presentations at the Bank of Canada, the Bank of England, the Bank of Italy, the Board of Governors of the Federal Reserve System, the Federal Reserve Bank of St. Louis, the Graduate School of Business at the University of Chicago, the 1992 National Bureau of Economic Research Summer Institute, the Swedish Riksbank, the Swiss National Bank, and the University of Notre Dame. Comments by John Boschen, Michael Dotsey, Robert Hersh, Peter Ireland, and George Moore were also very helpful. The analyses and conclusions are those of the author and do not necessarily reflect the views of the Federal Reserve Bank of Richmond or the Federal Reserve System.*



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## PREMISES UNDERLYING THE INTERPRETATION OF POLICY

The first step in any study of monetary history is to choose an indicator of the stance of policy. For example, in their study of U.S. monetary history Friedman and Schwartz (1963) focus on the monetary base (currency plus bank reserves) because it summarizes monetary conditions whether or not a country is on the gold standard and whether or not it has a central bank. Focusing on the base allowed them to tie together a long period marked by many institutional changes, making possible their famous empirical findings about money, prices, and business conditions.

For my purposes, however, the base is not a useful indicator. Although the Fed could have used the base as its instrument by controlling it closely in the short run, it has not chosen to do so. Instead, the Fed has chosen to use the federal funds rate as its policy instrument. Hence this study, which seeks to investigate the short-run interactions between Fed policy and other economic variables, interprets policy actions as changes in the funds rate. The remainder of this section discusses the premises underlying my interpretation of policy.

### Interest Rate Targeting

Throughout its history the Fed's policy instrument has been the federal funds rate or its equivalent. At times, notably from the mid to late 1970s, it has targeted the funds rate in a narrow band commonly 25 basis points wide (Cook and Hahn 1989). More often, it has targeted the funds rate indirectly, using the discount rate and borrowed reserve targets. Although the funds rate appears noisier under borrowed reserve targeting than under direct funds rate targeting, it is nevertheless tied relatively closely to a chosen funds rate target (Goodfriend 1983). Since a borrowing target tends to be associated with a particular spread between the funds rate and the discount rate, targeting borrowed reserves lets a discount rate adjustment feed through one-for-one to the funds rate. Forcing banks to borrow more reserves at a given discount rate also raises the funds rate (Goodfriend and Whelpley 1986). The Fed has used the borrowed reserve procedure to help manage the funds rate since October 1982 (Wallich 1984, Thornton 1988). Significant funds rate movements since then should be viewed as deliberate target changes.

It is less obvious that federal funds rate changes in the period of the New Operating Procedures from October 1979 to October 1982 should be interpreted as deliberate. Under those procedures, the Fed was to fix the path of nonborrowed reserves available to depository institutions so that increases in the money stock would force banks to borrow more reserves at the discount window and thereby automatically drive up the funds rate and other short-term interest rates.

Despite the widespread emphasis on automatic adjustment in the description of the post-October 1979 procedures, however, it was well-recognized at the time that movements in the funds rate would also result from purely judgmental actions of the Federal Reserve (Levin and Meek 1981, Annual Reports of Open Market Operations 1981-83). These actions included: (1) judgmental adjustments to the nonborrowed reserve path taken at FOMC meetings that changed the initially expected reserves banks would be forced to borrow at the discount window (in effect, a funds rate target change by the FOMC), (2) judgmental adjustments to the nonborrowed reserve path between FOMC meetings, (3) changes in the discount rate, and (4) changes in the surcharge that at times during the period was added to the basic discount rate charged to large banks.

Cook (1989) presents a detailed breakdown of policy actions affecting the funds rate during this period showing that two-thirds of funds rate changes were due to judgmental actions of the Fed and only one-third resulted from automatic adjustment. Moreover, as we shall see below, the large funds rate movements in the nonborrowed reserve targeting period are overwhelmingly attributable to deliberate discretionary actions taken by the Fed to manage short-term interest rates. Therefore, it is more accurate to refer to the period from October 1979 to October 1982 as one of aggressive federal funds rate targeting than one of nonborrowed reserve targeting.

### The Role of Money

The Federal Reserve was established with a mandate to cushion short-term interest rates from liquidity disturbances. Between the Civil War and the creation of the Fed, such disturbances caused short rates to rise suddenly and sharply from time to time. While generally trading in a range between 4 and 7 percent, the monthly average call loan rate reported by Macaulay (1938)



rose roughly 5 percentage points in one month on 26 occasions between 1865 and 1914. Moreover, as a result of banking crises, sudden changes of over 10 percentage points occurred 8 times during the same period. These episodes were distinctly temporary, ranging from one to four months, with many lasting for no more than one month. Such extreme temporary spikes are absent from interest rates since the founding of the Fed (Miron 1986, Mankiw, Miron, and Weil 1987).

In line with its original mandate, the Fed has routinely accommodated liquidity disturbances at a given targeted level of short-term interest rates. Furthermore, by giving banks access to the discount window, the Fed has been careful not to exert excessively disruptive liquidity disturbances when changing its interest rate target.<sup>2</sup> It follows that easing or tightening has mainly been accomplished by changing the level of short rates to set in motion forces slowing the growth of money demand in order to allow a future reduction in money growth and inflation.

To view the Federal Reserve's policy instrument as the federal funds rate is thus to set money to the side, since at any point in time money demand is accommodated at the going interest rate. This does not say, however, that money can be left out of account altogether. The Fed, the markets, and economists alike recognize that trend inflation is closely connected to trend money growth, and that achieving and maintaining price stability requires controlling money. During the period under study, money growth was often viewed as an important indicator of future inflation or disinflation by both the Fed and the markets.

Furthermore, we know from the work of McCallum (1981) and others that an interest rate policy just describes how changes in interest rates correspond to changes in the money stock. At a deeper level, then, there is an equivalence between talking in terms of interest rates or money. The important difference is that simple interest rate rules descriptive of policy have implications for how money and prices actually evolve over time (Goodfriend 1987, Barro 1989). We should keep this in mind when reviewing the current period for clues about how policy influences the inflation rate. Ultimately we seek to understand what it is about interest rate policy that turns one-time macroeconomic shocks into highly persistent changes in the growth of money and prices.

## Interpreting Co-movements Between Short and Long Rates

The Fed targets the funds rate in order to stabilize inflation and real economic growth as best it can. Output and prices, however, do not respond directly to weekly federal funds rate movements but only to longer-term rates of perhaps six months or more. Hence, the Fed targets the funds rate with the aim of managing longer-term money market rates. It exercises its leverage as follows. The market determines longer-term rates as the average expected level of the funds rate over the relevant horizon (abstracting from a time varying term premium and default risk). To see why, consider the pricing of a three-month bank loan. A bank could fund the loan with a three-month CD, or it could plan to borrow federal funds overnight for the next three months. Cost minimization and competition among banks keep the CD rate in line with the average expected future funds rate; competition in the loan market links loan rates to the CD rate and expected future funds rates. Finally, arbitrage among holders of money market securities links Treasury bill and commercial paper rates to CD rates of similar maturity.

Since simplicity is crucial in communicating policy intentions, the Fed tries to manage its funds rate target to maintain an expected constancy over the near-term future. Target changes are highly persistent and seldom quickly reversed, so that a target change carries the expected level of the funds rate with it and thus longer-term money market rates too.<sup>3</sup> In this way, interest rate policy as practiced by the Fed anchors the short end of the term structure of interest rates to the current federal funds rate.

By the above argument, the interest rate on long bonds also must be determined as an average of expected future short rates. At best, the Fed affects short-term real interest rates temporarily, so average future short rates over the horizon of a 30-year bond should sum to a real interest rate that varies in a range perhaps 1 or 2 percentage points around 3 percent per year plus the expected trend rate of inflation.<sup>4</sup> From this perspective, we can view fluctuations in the long-term rate as driven by: (1) a component connected with the current funds rate target that anchors short maturity rates and (2) a component driven by expectations of inflation. Because the present discounted value of coupon payments far out in the future is smaller at higher interest rates, we should expect



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a given funds rate target change to exert a greater effect on the long bond at higher rates of interest.<sup>5</sup>

It is useful to distinguish three sources of interaction between the federal funds rate and the long-term rate:

***Purely Cyclical Funds Rate Policy Actions.*** The Fed routinely lowers the funds rate in response to cyclical downturns and raises it in cyclical expansions. I call such policy actions purely cyclical if they maintain the going trend rate of inflation. Even purely cyclical policy actions exert a pull on longer rates, however, so they are a source of positive co-movement between the funds rate and the long rate. But because cyclical actions strongly influence only the first few years of expected future short-term interest rates, only a relatively small fraction of purely cyclical funds rate changes are transmitted to the long rate.

***Long-Run Inflation.*** Changes in the trend rate of inflation are a second source of positive co-movement between the funds rate and the long rate. The long rate moves automatically with inflation expectations. The funds rate does not, however, unless the Fed makes it do so. Nevertheless, the Fed often chooses to hold short-term real rates relatively steady in the presence of rising or falling inflation by moving the funds rate up or down to allow for a rising or falling inflation premium. Doing so causes short and long rates to move together.

***Aggressive Funds Rate Policy Actions.*** The Fed occasionally takes particularly aggressive funds rate policy actions to encourage real growth or to stop and reverse a rising rate of inflation. Aggressive actions combine an effect on the long-term real rate with a potential change in the long-run rate of inflation. The real rate effect moves the long rate in the same direction as the funds rate, while the inflation effect moves the long rate in the opposite direction. Thus the net effect of aggressive actions on the long rate is somewhat complex.

Consider an aggressive reduction in the funds rate to encourage real growth. Initially, funds rate actions taken to fight recession pull the long rate down too. However, excessive easing that raises expected inflation can cause the long rate to reverse direction and begin to rise, even as the Fed continues to push short rates down. Thus we might expect to see the long rate move in the opposite direction from the funds rate near cyclical troughs. A funds rate tightening during the

ensuing recovery exerts two conflicting forces. It tends to raise the long rate by reversing the cyclical funds rate decline, but it also reverses somewhat the expected rise in inflation, tending to lower the long rate. For a relatively brief recession with little excessive easing, the cyclical funds rate effect would dominate the inflation effect, so the long rate would tend to rise with the funds rate during the recovery. Thus, the long rate would move opposite from the funds rate for only a few months near a recession trough.

Now consider an aggressive increase in the funds rate intended to bring down the trend rate of inflation. Such a tightening potentially shifts both components of the long rate since short rates rise and expected long-run inflation may fall. One expects the first effect to dominate initially, however, because a large aggressive increase in short rates exerts an immediate significant upward pull on the long rate, while the public may not yet have confidence in the disinflation. If the Fed persists with sufficiently high short-term real rates, however, inflation and real growth eventually slow and the Fed can tentatively bring rates down somewhat. A declining long rate, at this point, would suggest that the Fed's disinflation has acquired some credibility.

## **Inflation Scares**

I call a significant long rate rise in the absence of an aggressive funds rate tightening an inflation scare since it reflects rising expected long-run inflation.<sup>6</sup> Inflation scares are of concern because higher inflation, if realized, would reduce the efficiency of the payments system, with negative consequences for employment, productivity, and economic growth. Moreover, scares are costly because they present the Fed with a difficult dilemma. Resisting them requires the Fed to raise real short rates with potentially depressing effects on business conditions. Failing to respond promptly, however, can create a crisis of confidence that encourages the higher inflation to materialize: workers and firms ask for wage and price increases to protect themselves from higher expected costs. In short, by hesitating, the Fed sets in motion higher inflation that it is then inclined to accommodate with faster money growth. The record of rising inflation and disinflation reviewed below contains examples of scares followed by higher money growth and inflation, as well as scares successfully resisted by the Fed.<sup>7</sup>



## A REVIEW OF INTEREST RATE POLICY

This study focuses on the period of inflation fighting beginning in October 1979. Nevertheless, I begin my review by briefly describing conditions in the immediately preceding years. For the most part, data discussed throughout are shown in the chart and are given in the tables included at the end of the article.

### Rising Inflation: the Late 1970s

Inflation was rising gradually in the late 1970s, with rates of 7.3 percent, 8.4 percent, and 8.7 percent in 1977, 1978, and 1979 as measured by fourth quarter over fourth quarter changes in the GDP deflator. The corresponding real GDP growth rates were 4.4 percent, 6.0 percent, and 0.9 percent. Rising inflation throughout the late 1970s carried the 30-year government bond rate from 7.8 percent in early 1977 to 9.2 percent by

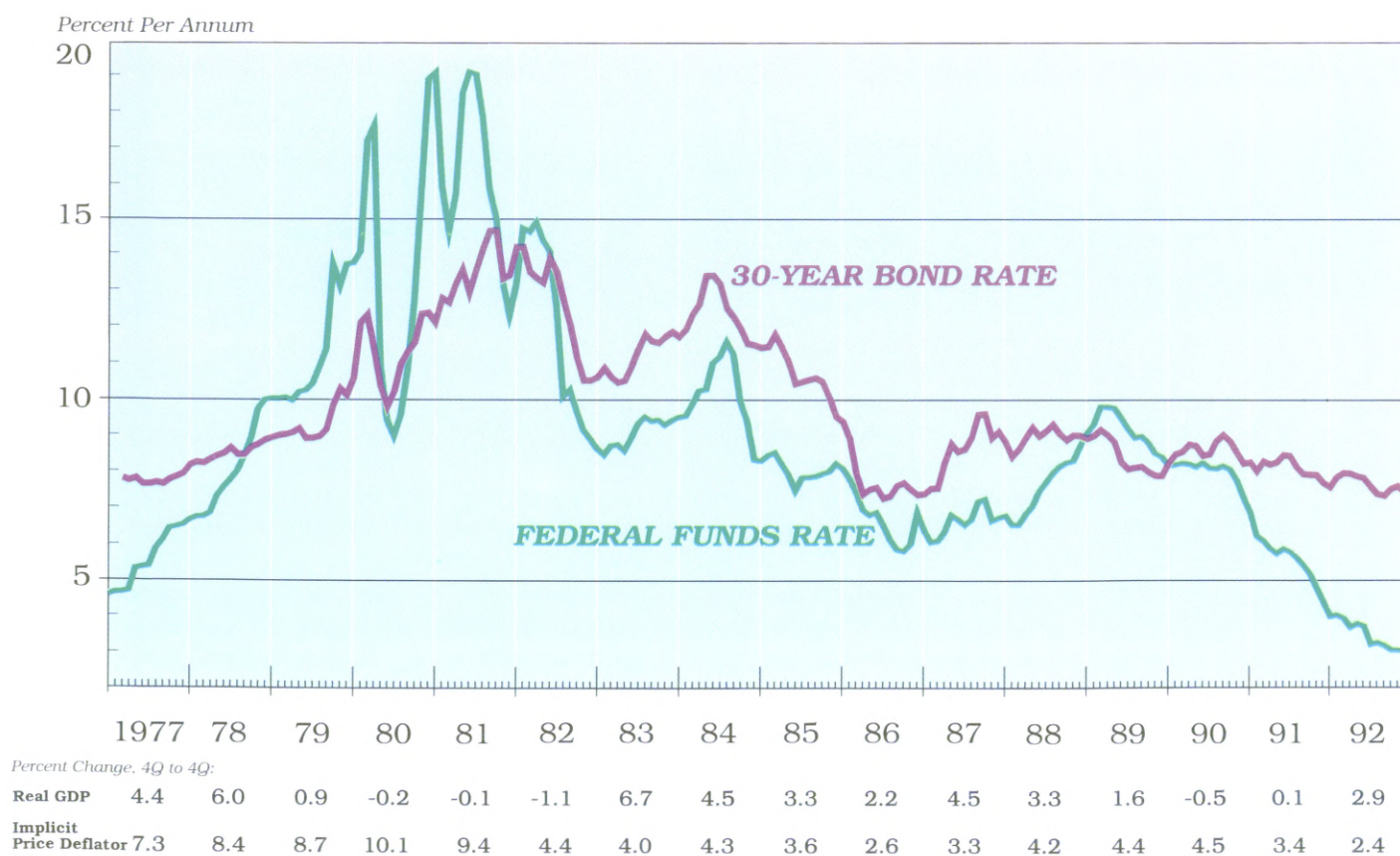
September 1979. Over the same period, the Fed steadily increased the federal funds rate from around 4.7 percent to 11.4 percent, raising short-term real rates from a range between 0 to -2 percent to between 0 and +2 percent. The negative short-term real rates at the beginning of the period suggest that initially the Fed was stimulating real growth, though the steady increase in real short rates represented a modest effort to resist inflation.

### Aborted Inflation Fighting: October 1979 to July 1980

By the time Paul Volcker became Fed Chairman in August 1979, oil price increases following the Iranian revolution in November 1978 greatly worsened the inflation outlook. Oil prices were to double by early 1980 and triple by early 1981 from November 1978 levels, and by the fall of 1979 the Fed felt that more drastic action was

## FEDERAL FUNDS RATE AND 30-YEAR BOND RATE

January 1977 - December 1992





needed to fight inflation. The announcement on October 6, 1979, of the switch to nonborrowed reserve targeting officially opened the inflation fighting period.

The first aggressive policy actions in this period took the monthly average funds rate from 11.4 percent in September 1979 to 17.6 percent in April 1980. Cook (1989) reports that only 1 percentage point of this 6 point rise can be attributed to automatic adjustment. Virtually all of it represented deliberate policy actions taken by the Fed to increase short-term interest rates. It was the most aggressive series of actions the Fed had taken in the post-war period over so short a time, although the 5 percentage point increase from January to September of 1973 was almost as large.

For its part, the 30-year rate rose sharply from 9.2 percent in September to a temporary peak of 12.3 percent in March after which it fell back to 11.4 percent in April. A closer look reveals the sources of this sharp rise in the long rate. The 2.3 percentage point funds rate jump from September to October raised the long rate by 0.7 percentage points. The funds rate then held in a range between 13.2 percent and 14.1 percent through February. January 1980 later turned out to be an NBER business cycle peak, and evidence of a weakening economy caused the Fed to pause in its aggressive tightening. But with the funds rate relatively steady, the long rate jumped sharply by around 2 percentage points between December and February, signaling a serious inflation scare.

The scare was probably caused in part by the ongoing oil price rises, with the Soviet invasion of Afghanistan in December also playing a role. The Fed's hesitation to proceed with its tightening, however, probably contributed to the collapse of confidence. In any case, the Fed reacted with an enormous 3 percentage point increase of the monthly average funds rate in March, only 1 percentage point of which was due to the automatic adjustment. The long rate hardly moved in response, suggesting that the positive effect on the long rate of the aggressive tightening was offset by a decline in expected inflation. Moreover, the long rate actually came down by 0.9 percentage points in April even as the Fed pushed the funds rate up another 0.4 percentage points, suggesting that the Fed had already begun to win credibility for its disinflationary policy.

When one considers that business peaked in January, there is reason to believe that inflation

would have come down as the recession ran its course in 1980 if the Fed had then sustained its high interest rate policy. The imposition of credit controls in March, however, forced the Fed to abort that policy. Schreft (1990) argues persuasively that by encouraging a decline in consumer spending, the credit control program was largely responsible for the extremely sharp -9.9 percent annualized decline in real GDP in the second quarter of 1980. Supporting her view is the fact that personal consumption expenditures accounted for about 80 percent of the decline in real output, more than twice its average 35 percent contribution in post-war U.S. recessions.

Accompanying the downturn in economic activity was a sharp fall in the demand for money and bank reserves that, according to Cook (1989), caused a 4.2 percentage point automatic decline of the funds rate from April to July. The Fed enhanced the automatic easing with judgmental actions, e.g., reducing the discount surcharge, that reduced the funds rate by an additional 4.3 percentage points over this period.

The sharp interest rate decline coupled with the lifting of credit controls in July led to strong 8.4 percent annualized real GDP growth in the fourth quarter of 1980. Because the credit controls caused the Fed to interrupt its inflation-fighting effort, inflation rose through the year from an annual rate of 9.8 percent in the first quarter to 10.9 percent in the fourth quarter as measured by the GDP deflator.

### **Aggressive Disinflationary Policy: August 1980 to October 1982**

It was clear in late summer and early fall of 1980 that inflationary pressures were as strong as ever. After being pulled down about 1.6 percentage points by the aggressive funds rate easing from April to June, the 30-year rate rose by about 40 basis points between June and July as the Fed continued to push the funds rate down another 40 basis points. The reversal signaled an inflation scare induced by the excessively aggressive easing, and the Fed began an unprecedented aggressive tightening. Of the roughly 10 percentage point rise in the monthly average funds rate from July to December 1980, Cook (1989) attributes only about 3 percentage points to the automatic adjustment. Thus, the run-up of the funds rate to its 19 percent peak in January 1981 marked a deliberate return to the high interest rate



policy. As measured by the GDP deflator, which was rising at nearly a 12 percent annual rate in the first quarter of 1981, real short-term rates were a high 7 percent at that point.

As soon as the funds rate peak had been established, however, very slow growth in M1 and bank reserves automatically put downward pressure on the funds rate. According to Cook (1989), about 3.4 percentage points of the 4 percentage point drop in the funds rate between January and March was attributable to the automatic adjustment. Since the automatic adjustment had correctly signaled weakness in the economy in the second quarter of 1980, the Fed was initially inclined to let rates fall in early 1981. However, real GDP actually grew at a 5.6 percent annual rate in the first quarter, and when the strength of the economy became clear, the Fed took deliberate actions to override what it took to be a false signal that disinflation had taken hold. Reversing field, it ran the funds rate back up to 19 percent by June, using a series of deliberate tightening actions to supplement what Cook (1989) reports would only have been a 0.8 percentage point automatic funds rate rise.

It was not long before the aggressive disinflationary policy began to take hold. Annualized real GDP growth was -1.7 percent in the second quarter of 1981. The third quarter posted 2.1 percent real growth, but an NBER business cycle peak was reached in July and real growth fell to -6.2 percent in the fourth quarter of 1981 and -4.9 percent in the first quarter of 1982. Meanwhile, the quarterly inflation rate as measured by the GDP deflator fell from 11.8 percent in the first quarter of 1981 to the 4.5 percent range by early 1982.

The Fed brought the funds rate down from 19 percent at the business cycle peak in July to 13.3 percent in November and held the funds rate in the 13 to 15 percent range until the summer of 1982, when it brought short rates down another 4 percentage points to around 10 percent. The funds rate reduction through November 1981 was large in nominal terms, but when one considers that inflation had declined to the 4.5 percent range by early 1982, the funds rate decline actually represented a 1 or 2 percentage point rise in short-term real rates. Thus, one should still view policy as aggressively disinflationary in early 1982. As calculated by Cook (1989), automatic adjustments accounted for only 1 percentage point of the final

9 percentage point funds rate decline in the non-borrowed reserve targeting period, which ended formally in October of 1982. This last great decline should be seen as a deliberate funds rate easing calculated to achieve a sustained reduction in inflation without excessive harm to real growth.

The long rate provides a picture of the Fed's progress in reducing the trend rate of inflation. The 30-year rate rose about 5 percentage points from a trough in June of 1980 to its 14.7 percent peak in October 1981. About 2 percentage points of that rise represented a reversal of the decline in the second quarter of 1980. The remaining 3 point gain through October 1981 reflected a continuing inflation scare. The sharp rise in the long rate after the funds rate had reached its peak in early 1981 probably contributed to the Fed's inclination to persist with its 19 percent funds rate until August 1981. Moreover, the discernable declining trend in the long rate from October 1981 to August 1982 indicated that the policy was still exerting disinflationary pressure. When the Fed finally decided to relax its disinflationary policy by dropping the funds rate by over 4 percentage points in the summer of 1982, the long rate also fell by around 3.5 percentage points.

We can decompose this last decline in the long rate into a real component and an inflation expectations component using evidence from earlier in the aggressive funds rate targeting period. The sharp 2.3 percentage point funds rate rise from September to October 1979 pulled the long rate up 0.7 percentage points; and the sharp 8.6 percentage point funds rate reduction between April and June 1980 pulled the long rate down 1.6 percentage points. Taking 25 percent as the fraction of aggressive funds rate policy actions transmitted to the long real rate, about 2.5 percentage points of the 3.5 percentage point fall in the long rate in the summer of 1982 reflected a reduction of inflation expectations.

### **Establishing Credibility: November 1982 to Spring 1986**

Real GDP growth was still poor in the second half of 1982, running -1.8 percent and 0.6 percent in the third and fourth quarters, respectively. Consequently, the Fed continued to ease after relaxing its disinflationary policy, pushing the monthly average funds rate down to 8.5 percent by February 1983. November 1982 turned out to be an NBER business cycle trough, and real



GDP growth was 2.6 percent in the first quarter of 1983. But the Fed kept the funds rate around 8.6 percent through May while the long rate remained steady at around 10.5 percent. It gradually became clear, however, that a strong recovery had begun. Real GDP grew at a spectacular 11.3 percent annual rate in the second quarter of 1983 and at rates of 6.1 percent, 7.0 percent, 7.9 percent, and 5.4 percent in the following four quarters.

The long rate rose from 10.5 percent in May 1983 to 11.8 percent in August, initiating an inflation scare only a year after the Fed had relaxed its disinflationary policy. The Fed reacted by raising the funds rate from 8.6 percent in May to 9.6 percent by August. Annualized quarterly inflation as measured by the GDP deflator was 4.8 percent or below throughout 1983 and 1984 with the exception of the first quarter of 1984, when it was 6 percent. Nevertheless, the long rate continued its rise in early 1984, moving up from the 11.8 percent level it had maintained since the previous summer to a 13.4 percent peak in June 1984. Amazingly, this was only about a percentage point short of its October 1981 peak, even though by 1984 inflation was 4 or 5 percentage points lower than in 1981.

The Fed tightened in an effort to resist the ongoing inflation scare, raising the funds rate to an 11.6 percent peak in August of 1984. The long rate began to decline in June 1984, indicating that the scare had been contained. The 7 percent real short rates needed to contain the scare ultimately brought quarterly real GDP growth down to the more normal 2 to 3 percent range in the second half of 1984. The Fed then lowered the funds rate rapidly by 3.2 percentage points from August to December and held it around 8 percent through 1985.

Meanwhile, the long rate fell about 6 percentage points from its June 1984 peak to the mid-7 percent range by the spring of 1986. By then, the long rate was 3 percentage points below where it had been at the start of the 1983 scare. The Fed's containment of the scare apparently made the public confident of another 3 percentage point reduction in the trend rate of inflation.

#### **Maintaining Credibility: Spring 1986 to Summer 1990**

Real GDP growth weakened considerably in the second quarter of 1986 to -0.3 percent from the

strong 5.4 percent rate in the first quarter. With inflation appearing to have settled down in the 4 percent range, the Fed moved to encourage real growth by dropping the funds rate to the mid-6 percent range. Strong real growth in 1987 was accompanied by still another inflation scare in which the long rate rose 2 full percentage points from around 7.6 percent in March to 9.6 percent in October.

Although real GDP growth was very strong throughout the year, this time the Fed responded to the scare with only a relatively modest increase in the funds rate. As it happened, the scare eased somewhat after the October stock market crash, although the long rate remained above 8 percent. With real growth still reasonably strong in 1988, the Fed proceeded to raise the funds rate sharply from the 6 to 7 percent range in early 1988 to a peak of 9.9 percent in March 1989.

Though there was some evidence of a modest rise in inflation in 1988, the sustained funds rate tightening during the year is unique in that it was undertaken without a rise in the long rate. A preemptive tightening may have been needed to reverse the perception that policy had eased permanently following the stock market crash. At any rate, the result was an increase in credibility reflected in a further decline in the long rate in 1989. Though that fall was partially reversed in early 1990, a gently declining trend in the long rate was discernable by then, indicating growing confidence on the part of the public in the Fed's commitment to low inflation.

#### **The 1990-91 Recession**

The period of weak real growth in 1989 ending in an NBER business cycle peak in July 1990 may have been partly due to the high real short rates. Temporary oil price increases following the invasion of Kuwait, however, also helped account for the -1.6 percent real growth in the third quarter of 1990, -3.9 percent real growth in the fourth quarter, and -3.0 percent in the first quarter of 1991.

The Fed responded to the recession by bringing the funds rate down from slightly above 8 percent in the fall of 1990 to around 3 percent by the fall of 1992. It is remarkable that this sustained easing has not yet caused the long rate to rise, even though real short rates are now around zero. Real short rates were also about zero when excessive easing sparked the inflation scare in the



summer of 1980, but they were around 4 percent when excessive easing triggered the summer 1983 scare, and around 3 percent at the time of the scare in the spring of 1987. The real short rate floor at which easy monetary policy becomes excessive depends on such factors as the unemployment rate, government fiscal policy, and the strength of investment and consumption demand.<sup>8</sup> For example, the depressing effect of the credit control program on consumer spending may help account for the real rate getting as low as it did in 1980 before triggering a scare. Long rates, however, may also be more tolerant of aggressive funds rate easing when the public is more confident of the Fed's commitment to maintain a low trend rate of inflation.

### OBSERVATIONS

The record of interest rate policy reviewed above contains a number of empirical findings that are important for interpreting and evaluating monetary policy. This section summarizes the main findings in a series of observations.

1) Inflation scares appear to be central to understanding the Fed's management of short-term interest rates. The gradual funds rate rise from January 1977 to October 1979 was undertaken in an environment of slowly rising long rates. The sharp long rate rise in early 1980, during a 4-month pause in the funds rate tightening, was probably an important factor inducing the Fed to undertake its enormous 3 percentage point tightening in March. Sharply rising long rates in the first nine months of 1981 indicated that the Fed had yet to win credibility for its disinflationary policy, and probably contributed to the Fed's maintaining very high real short rates for as long as it did. On the other hand, the declining long rate from October 1981 to October 1982 encouraged the Fed to ease policy by indicating the public's growing confidence in the disinflation.

The serious inflation scare set off in the summer of 1983 largely accounts for the run-up of the funds rate to August 1984. The credibility acquired by the Fed in containing that scare yielded a 3 percentage point reduction in the long rate that allowed the funds rate to come down too. There was no inflation scare per se when the Fed raised the funds rate in 1988. Nevertheless, that series of actions may be understood as preemptive, taken to reverse a public perception that policy had permanently eased following the stock

market crash. The current funds rate easing has yet to trigger a rise in the long rate, but the possibility of an inflation scare has probably limited the funds rate decline somewhat.

2) One might reasonably have expected the aggressive disinflationary policy actions taken in late 1979 to reduce long-term interest rate volatility by quickly stabilizing long-term inflation expectations at a low rate. Yet the reverse was true initially. Long rates turned out to be surprisingly volatile due to a combination of particularly aggressive funds rate movements and inflation scares. Amazingly, it took until 1988 for the unusual long-rate volatility to disappear.

3) One might also have expected the aggressive funds rate actions beginning in October 1979 to be accompanied by opposite movements in the long rate. Again, the result was just the reverse. The aggressive actions moved the long rate in the same direction, apparently influencing the long rate primarily through their effect on shorter maturity rates. Only at funds rate peaks and troughs did the long rate move in the opposite direction from the funds rate. The long rate appeared to be influenced by a change in expected inflation only after sustained aggressive funds rate actions.

4) The long rate reached its peak in October 1981, indicating that it took two years for policy to reverse the rise in the trend rate of inflation. It would be a mistake, however, to conclude that acquiring credibility necessarily takes so long. On the contrary, a close look reveals that the long rate had already turned down in April 1980 while the funds rate was still rising, suggesting that some credibility had been won by then. Credibility might even have been achieved sooner if the Fed had not hesitated temporarily between December 1979 and February 1980 to continue the aggressive funds rate tightening begun in October. In any case, the credit control program interrupted the disinflationary policy actions in May 1980 and high interest rates were restored fully only in early 1981. The automatic adjustment feature of the nonborrowed reserve operating procedure then caused a sharp decline in the funds rate between January and March of 1981 that was only fully reversed by June. Thus, three unfortunate interruptions account for the delay in the Fed's acquisition of credibility for its disinflationary policy.

5) Interestingly enough, the long rate was roughly in the same 8 percent range in the early



1990s as it was in the late 1970s, in spite of the 4 or 5 percentage point reduction in the inflation rate. Apparently, investors then perceived the 7 to 9 percent inflation rate as temporarily high, while, if anything, they perceive the current 3 to 4 percent rate as a bit below trend. The slowly declining long rate in the current period is indicative of the steady acquisition of credibility, but the high long rate indicates a lingering lack of confidence in the Fed.

6) The Fed appears to have had remarkable latitude to push the federal funds rate down in the recent recession and recovery without triggering a rise in the long rate. On three occasions when trying to encourage real growth in the 1980s (summer 1980, summer 1983, and spring 1987) it could not push the funds rate more than 1 or 2 percentage points below the long rate before triggering an inflation scare; yet it pushed the funds rate 4 percentage points below the long rate in 1992.

The greater flexibility to reduce short rates evident in the current recession is reminiscent of that in early post-war recessions when the Fed presumably had more credibility. The funds rate was pushed almost 3 percentage points below the long rate during the August 1957–April 1958 recession before the long rate began to rise. It was pushed more than 2 percentage points below the long rate in the April 1960–February 1961 recession without much of a rise in the long rate.<sup>9</sup>

7) The preceding observation suggests an attractive argument in favor of a congressional mandate for price stability. By reducing the risk of inflation scares, such a mandate would free the funds rate to react more aggressively to unemployment in the short run. Thus, a mandate for price stability would not only help eliminate inefficiencies associated with long-run inflation, it would add flexibility to the funds rate that might improve countercyclical stabilization policy as well.<sup>10</sup>

### CONCLUSION

The article used institutional knowledge of Fed policy procedures, simple economic theory, and the inflation scare concept to analyze and interpret interest rate policy as practiced by the Fed

since 1979. It focused on the primary policy problem during the period: the acquisition and maintenance of credibility for the commitment to low inflation. We saw that the Fed might have acquired credibility for its disinflation relatively quickly in early 1980 had it been able to sustain high interest rates then. After all, long-term rates were roughly equal to the inflation rate in 1979, indicating that the public believed inflation was only temporarily high at the time. Unfortunately, a series of interruptions delayed the actual disinflation for two years, probably raising the cost in terms of lost output of acquiring credibility.

Only a year after relaxing its disinflationary policy in 1982, the Fed's credibility was again challenged with a serious inflation scare that carried the long rate up from 10.5 percent to 13.4 percent. It took 11 months and 7 percent real short rates to contain the scare, indicating how fragile the Fed's credibility was in 1983 and 1984. The long rate decline to the 7.5 percent range by the spring of 1986 reflected a big gain in credibility. Yet the Fed was tested by another scare in 1987 that ended with the stock market crash. The crash itself, however, then set in motion expectations of excessive easing that the Fed resisted with a 3 percentage point funds rate rise in 1988 and 1989, a tightening that probably weakened real growth somewhat in 1989 and 1990.

Reviewing the policy record makes one understand how fragile the Fed's credibility is and how potentially costly it is to maintain. Even after inflation had stabilized at around 4 percent in 1983, inflation scares and the Fed's reaction to them were associated with significant fluctuations in real growth. With that in mind, one cannot help but appreciate the potential value of a congressional mandate for price stability that would help the Fed establish a credible commitment to low inflation. In fact, there is evidence that an interest rate policy assisted by such a mandate would work well. The Bundesbank and the Bank of Japan follow interest rate policies resembling the Fed's and yet, for the most part, they have achieved better macroeconomic performance. Perhaps it is because they each enjoy a stronger mandate for price stability than does the Fed.



## ENDNOTES

<sup>1</sup> See Rogoff (1987) for a discussion of credibility, reputation, and monetary policy.

<sup>2</sup> Total reserve demand is not very sensitive to interest rates in the short run. So whenever the Fed cuts nonborrowed reserves to support a higher federal funds rate target, it allows banks to satisfy a roughly unchanged reserve demand by borrowing the difference at the discount window. The negative relation between nonborrowed reserves and the funds rate in part reflects the administration of the discount window, which creates a positive relation between bank borrowing and the spread between the funds rate and the discount rate. Christiano and Eichenbaum (1991) emphasize the importance of this mechanism in understanding the liquidity effect.

<sup>3</sup> Goodfriend (1991) discusses evidence consistent with this view found in Fama (1984), Fama and Bliss (1987), Mankiw, Miron, and Weil (1987), Hardouvelis (1988), and Cook and Hahn (1989).

<sup>4</sup> Consider a bond paying nominal interest ( $i$ ) taxable at rate ( $\tau$ ) when the expected inflation rate is ( $\pi^e$ ). The real after-tax ex ante return on such a bond is then  $r = (1 - \tau)i - \pi^e$ , so the expected inflation rate over the life of the bond may be expressed as  $\pi^e = [i - r/(1 - \tau)]/(1 - \tau)$ .

Woodward (1990) reports market expectations of the after-tax real rate of interest on long-term bonds using quarterly data on British index-linked gilt-edged securities from 1982:2 to 1989:1. The ex ante post-tax real rate ranged from 1.5 percent to 3.2 percent per annum with a mean of 2.6 percent.

Assuming investors keep after-tax ex ante rates on long-term government bonds in the United States and United Kingdom roughly equal, we can set  $r = 2.6$  in the above expression to infer long-term expected inflation in the United States. A tax rate in the United States of 0.2, for example, yields  $\pi^e = [i - 3.2]/(.8)$ . If we take  $i$  as the yield to maturity on a 30-year U.S. government bond, then  $\pi^e$  is the average per annum inflation rate expected over the 30-year horizon.

The tax rate in the above expression is the marginal rate that applies to the relevant marginal investor, e.g., individual, corporate, or foreign. The rate is difficult to determine. Its exact value, however, is not important for the analysis in the text. The analysis relies on

the view that significant *changes* in the long-term nominal rate primarily reflect movements in inflation expectations, a view supported by the relatively narrow range of ex ante post-tax real rates reported by Woodward.

<sup>5</sup> A given federal funds rate target change will exert a greater effect on the long-term bond rate the shorter the average life of the security as measured by its duration. The duration of a coupon bond may be thought of as the term to maturity of an equivalent zero coupon bond that makes the same total payments and has the same yield. The duration of a 30-year coupon bond selling at par is approximately  $1/r$ , where  $r$  is the yield to maturity. See Moore (1989). Thus, the duration of the 30-year government (coupon) bond discussed in the text is only about 12.5 years at an interest rate of 8 percent and 7.1 years at a 14 percent interest rate.

<sup>6</sup> Since short maturity rates are anchored to the federal funds rate target, they cannot convey as clear a signal of inflation expectations as the long rate. See Dotsey and King (1986) for an analysis of the informational implications of interest rate rules.

<sup>7</sup> An inflation scare may be consistent with either a positive or a negative association between money or prices, on one hand, and unemployment or real growth on the other, depending on the nature of the underlying macroshock that sets it off. For example, an investment boom tends to generate a positive association, and an oil price rise, a negative one.

<sup>8</sup> See, for example, the discussions in Campbell and Clarida (1987) and Poole (1988).

<sup>9</sup> Kessel (1965) contains a good description and analysis of the historical relation between long and short rates over the business cycle.

<sup>10</sup> Black (1990) discusses the benefits of price stability. Hetzel (1990 and 1992) discusses a proposal that the U.S. Treasury issue indexed bonds to provide a better indicator of long-run inflation expectations.

## QUARTERLY CHANGES IN REAL GDP AND GDP IMPLICIT PRICE DEFLATOR

(Seasonally Adjusted Compound Annual Rates)

1Q 1977–4Q 1992

(Percent)

	Real GDP	Implicit Price Deflator		Real GDP	Implicit Price Deflator		Real GDP	Implicit Price Deflator		Real GDP	Implicit Price Deflator
1977			1981			1985			1989		
1	6.0	6.1	1	5.6	11.8	1	2.7	4.9	1	3.2	5.4
2	6.9	8.4	2	-1.7	7.5	2	3.2	3.0	2	1.8	4.6
3	5.7	7.4	3	2.1	9.6	3	5.2	2.6	3	0.0	3.8
4	-0.8	7.3	4	-6.2	8.8	4	2.3	3.9	4	1.5	3.7
1978			1982			1986			1990		
1	2.8	5.7	1	-4.9	4.5	1	5.4	2.1	1	2.8	4.4
2	13.5	10.7	2	1.6	5.5	2	-0.3	2.1	2	1.0	4.8
3	3.1	8.3	3	-1.8	4.4	3	2.3	2.9	3	-1.6	4.7
4	4.8	8.8	4	0.6	3.4	4	1.3	3.3	4	-3.9	3.9
1979			1983			1987			1991		
1	0.1	8.6	1	2.6	4.8	1	3.0	3.3	1	-3.0	5.3
2	0.4	8.4	2	11.3	2.8	2	5.1	2.9	2	1.7	3.5
3	2.5	9.6	3	6.1	4.2	3	4.0	3.3	3	1.2	2.4
4	0.7	8.1	4	7.0	4.2	4	5.9	3.6	4	0.6	2.4
1980			1984			1988			1992		
1	1.7	9.8	1	7.9	6.0	1	2.6	3.6	1	2.9	3.1
2	-9.9	9.6	2	5.4	4.1	2	4.3	4.4	2	1.5	2.7
3	0.1	10.0	3	2.2	4.5	3	2.5	5.1	3	3.4	2.0
4	8.3	10.9	4	2.7	2.6	4	3.9	3.9	4	3.8	1.7

Source: Bureau of Economic Analysis.



# FEDERAL FUNDS RATE AND 30-YEAR GOVERNMENT BOND RATE

January 1977–December 1992

(Percent per Annum)

	Federal Funds Rate	30-Year Govt. Bond Rate		Federal Funds Rate	30-Year Govt. Bond Rate		Federal Funds Rate	30-Year Govt. Bond Rate		Federal Funds Rate	30-Year Govt. Bond Rate
1977			1981			1985			1989		
J	4.61	—	J	19.08	12.14	J	8.35	11.45	J	9.12	8.93
F	4.68	—	F	15.93	12.80	F	8.50	11.47	F	9.36	9.01
M	4.69	7.80	M	14.70	12.69	M	8.58	11.81	M	9.85	9.17
A	4.73	7.73	A	15.72	13.20	A	8.27	11.47	A	9.84	9.03
M	5.35	7.80	M	18.52	13.60	M	7.97	11.05	M	9.81	8.83
J	5.39	7.64	J	19.10	12.96	J	7.53	10.45	J	9.53	8.27
J	5.42	7.64	J	19.04	13.59	J	7.88	10.50	J	9.24	8.08
A	5.90	7.68	A	17.82	14.17	A	7.90	10.56	A	8.99	8.12
S	6.14	7.64	S	15.87	14.67	S	7.92	10.61	S	9.02	8.15
O	6.47	7.77	O	15.08	14.68	O	7.99	10.50	O	8.84	8.00
N	6.51	7.85	N	13.31	13.35	N	8.05	10.06	N	8.55	7.90
D	6.56	7.94	D	12.37	13.45	D	8.27	9.54	D	8.45	7.90
1978			1982			1986			1990		
J	6.70	8.18	J	13.22	14.22	J	8.14	9.40	J	8.23	8.26
F	6.78	8.25	F	14.78	14.22	F	7.86	8.93	F	8.24	8.50
M	6.79	8.23	M	14.68	13.53	M	7.48	7.96	M	8.28	8.56
A	6.89	8.34	A	14.94	13.37	A	6.99	7.39	A	8.26	8.76
M	7.36	8.43	M	14.45	13.24	M	6.85	7.52	M	8.18	8.73
J	7.60	8.50	J	14.15	13.92	J	6.92	7.57	J	8.29	8.46
J	7.81	8.65	J	12.59	13.55	J	6.56	7.27	J	8.15	8.50
A	8.04	8.47	A	10.12	12.77	A	6.17	7.33	A	8.13	8.86
S	8.45	8.47	S	10.31	12.07	S	5.89	7.62	S	8.20	9.03
O	8.96	8.67	O	9.71	11.17	O	5.85	7.70	O	8.11	8.86
N	9.76	8.75	N	9.20	10.54	N	6.04	7.52	N	7.81	8.54
D	10.03	8.88	D	8.95	10.54	D	6.91	7.37	D	7.31	8.24
1979			1983			1987			1991		
J	10.07	8.94	J	8.68	10.63	J	6.43	7.39	J	6.91	8.27
F	10.06	9.00	F	8.51	10.88	F	6.10	7.54	F	6.25	8.03
M	10.09	9.03	M	8.77	10.63	M	6.13	7.55	M	6.12	8.29
A	10.01	9.08	A	8.80	10.48	A	6.37	8.25	A	5.91	8.21
M	10.24	9.19	M	8.63	10.53	M	6.85	8.78	M	5.78	8.27
J	10.29	8.92	J	8.98	10.93	J	6.73	8.57	J	5.90	8.47
J	10.47	8.93	J	9.37	11.40	J	6.58	8.64	J	5.82	8.45
A	10.94	8.98	A	9.56	11.82	A	6.73	8.97	A	5.66	8.14
S	11.43	9.17	S	9.45	11.63	S	7.22	9.59	S	5.45	7.95
O	13.77	9.85	O	9.48	11.58	O	7.29	9.61	O	5.21	7.93
N	13.18	10.30	N	9.34	11.75	N	6.69	8.95	N	4.81	7.92
D	13.78	10.12	D	9.47	11.88	D	6.77	9.12	D	4.43	7.70
1980			1984			1988			1992		
J	13.82	10.60	J	9.56	11.75	J	6.83	8.83	J	4.03	7.58
F	14.13	12.13	F	9.59	11.95	F	6.58	8.43	F	4.06	7.85
M	17.19	12.34	M	9.91	12.38	M	6.58	8.63	M	3.98	7.97
A	17.61	11.40	A	10.29	12.65	A	6.87	8.95	A	3.73	7.96
M	10.98	10.36	M	10.32	13.43	M	7.09	9.23	M	3.82	7.89
J	9.47	9.81	J	11.06	13.44	J	7.51	9.00	J	3.76	7.84
J	9.03	10.24	J	11.23	13.21	J	7.75	9.14	J	3.25	7.60
A	9.61	11.00	A	11.64	12.54	A	8.01	9.32	A	3.30	7.39
S	10.87	11.34	S	11.30	12.29	S	8.19	9.06	S	3.22	7.34
O	12.81	11.59	O	9.99	11.98	O	8.30	8.89	O	3.10	7.53
N	15.85	12.37	N	9.43	11.56	N	8.35	9.02	N	3.09	7.61
D	18.90	12.40	D	8.38	11.52	D	8.76	9.01	D	2.92	7.44

Source: The Board of Governors of the Federal Reserve System.



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## Highlights

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### Automation and Operations

Over the course of the year, the Bank introduced several new electronic services, including Treasury auction orders and billing statement transmission, and expanded the electronic reporting option on its Fed Online Exchange network to accommodate electronic submission of bank holding company reports and data required by the Home Mortgage Disclosure Act. A new voice-response system gives institutions access to information about their check activity and account balances and handles their cash order requests and originations of automated clearinghouse returns.

The Richmond Office moved its check operations to refurbished quarters below ground. The move improved efficiency by eliminating the need to use elevators to move checks to and from the processing floors.

The Baltimore staff, which had developed new check-processing software for the Fifth District, prepared the software for installation in four other Federal Reserve districts. The software automates and standardizes most of the "back-end" functions of check processing, such as settlement, accounting, and billing.

The Culpeper staff worked closely with the System's Subcommittee on Cash Services on an automation project designed to accelerate currency verification. The project team supported 37 cash departments at Reserve Bank offices around the country in their purchase and installation of second-generation currency-verification equipment.

The Baltimore Office, which is the System's pilot site for second-generation currency-processing equipment, conducted many tests of this equipment and hosted several training sessions for Reserve Bank staff from around the System to prepare them for the installation of this equipment at their offices.

The Bank developed a system that, when implemented, will convert the manual processing of U.S. Treasury letters of credit at all Reserve Banks to a centralized automated operation located in Richmond. In addition, the Treasury selected the Richmond Office as a regional processing site for

the nation's savings bonds. Richmond was one of five Federal Reserve sites selected for this purpose.

The Bank provided crucial personnel services, including the coordination of staff recruitment, relocation, and payroll processing to the Richmond headquarters office of Federal Reserve Automation Services, which has responsibility for consolidating the mainframe computer applications of the Federal Reserve Banks.

To accommodate Automation Services staff and the additional electrical and mechanical support for the new mainframe computers, the Bank made major renovations to office space and began construction of an underground structure behind the Richmond building. The below-grade structure will house emergency diesel generators, uninterruptible power supply equipment and related batteries, and air conditioning equipment.

### Meetings and Other Activities

The Bank and the three Richmond universities cosponsored a lecture by Dr. Alice M. Rivlin of the Brookings Institution. Dr. Rivlin spoke on "The Budget and the Economy: A Post-Election View," in the Bank's auditorium to a large group of business and community leaders, and representatives of area colleges and universities. Dr. Rivlin, who has since become deputy director of the Office of Management and Budget, is well known for her work in the areas of budget policy, income distribution, inflation, and public finance.

More than 300 representatives of District financial institutions and community-based organizations attended workshops that focused on community development finance and the Community Reinvestment Act. The Federal Reserve cosponsored these workshops with bankers' associations and state agencies.

The Bank conducted seminars on Regulation DD, which implements the recent truth-in-savings legislation. The seminars for executives of depository institutions were held at four locations in the District as part of the Bank's wider educational efforts concerning the Federal Deposit Insurance Corporation Improvement Act of 1991.



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For the third time in four years, the Baltimore Office was the site of a week-long Community Reinvestment Act training program sponsored by the Board of Governors. Attendees from across the nation included community affairs and examination staff from the Federal Reserve and other agencies that supervise financial institutions.

Governor Lindsey visited Richmond to discuss small business development needs with representatives of community groups, banks, housing associations, and local governments. Before the meeting, Governor Lindsey visited several low- and moderate-income areas with the Bank's staff.

The Richmond Office cooperated with the Russian-American Exchange Foundation and the School of Business of Virginia Commonwealth University to sponsor extended visits by an economist and a banking supervisor from the Central Bank of Russia. They were attached to the Bank's Research and Banking Supervision Departments so that they could gain practical knowledge and experience of use to the Central Bank of Russia. Further, the Baltimore Office conducted two programs on central bank operations for officials of the central banks of the former Soviet Union. The first program was for the Central Bank of Russia. In the second program, the Baltimore Office received a delegation of central bankers from 11 of the 12 former Soviet republics that comprise the Commonwealth of Independent States.

The Fifth District hosted the seventh biennial Federal Reserve System Management Conference in Williamsburg, Virginia. The conference was attended by officers from each Federal Reserve Bank and the Board of Governors and featured presentations on supervision and regulation in the global economy, the future of the payments system, the changing structure of the financial industry, the Federal Reserve's role in the world economy, System automation consolidation, and the leadership required to address these challenges.

The Charlotte Office hosted its twentieth annual Operations and Policy Seminar in September. One hundred and seventy-two representatives of

North and South Carolina depository institutions attended the two-day program.

The Bank produced *An Economic Profile of South Carolina and Its Counties* and distributed it to all financial institutions and libraries in that state. This *Profile* was the third in a series on Fifth District states.

### Personnel Changes

Robert P. Black retired at the end of 1992 after almost 20 years as president of the Federal Reserve Bank of Richmond. During his 37-year career as a central banker, Mr. Black helped guide the System toward more emphasis on monetary control as a means of attaining price stability and thereby promoting stronger economic growth.

On November 23, Chairman Anne Marie Whittemore announced that the Bank's Board of Directors had appointed J. Alfred Broaddus, Jr., to succeed Mr. Black as president on January 1, 1993. Mr. Broaddus, who joined the Bank as an economist in 1970, had been senior vice president and director of research since 1985.



*Al Broaddus is congratulated by Bob Black.*



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Marvin S. Goodfriend was chosen to succeed Mr. Broaddus as senior vice president and director of research. Mr. Goodfriend, who joined the Bank as an economist in 1978, had been a vice president since 1984. He had also served as a senior staff economist for the President's Council of Economic Advisors, and had taught at the Graduate School of Business at the University of Chicago.

Bruce J. Summers, senior vice president, returned to the Bank following a three-and-one-half-year leave of absence during which he served on the staff of the Board of Governors of the Federal Reserve System in Washington, D.C. Upon his return to the Bank, Mr. Summers assumed responsibility for guiding the development of the Bank's strategic plan.

Albert D. Tinkelenberg retired as senior vice president on May 1 after almost 21 years of service to the Bank. Mr. Tinkelenberg was the officer in charge of the Charlotte Office since 1983 and had been in charge of the Culpeper Office for several years before that.

Walter A. Varvel succeeded Mr. Tinkelenberg as senior vice president in charge of the Charlotte Office. Mr. Varvel was the vice president in charge of the Public Services and Customer Support Departments in Richmond before he transferred to Charlotte.

## System Responsibility

Jimmie R. Monhollon, first vice president, was chairman of the System Committee on Cash Services. James D. Reese, senior vice president, chaired its subcommittee.

J. Alfred Broaddus, Jr., senior vice president and director of research, chaired the System Committee on Financial Analysis. The System group gave special attention to Federal Open Market Committee operating procedures and policy objectives.

Walter A. Varvel, senior vice president in charge of the Charlotte Office, chaired the System Subcommittee on Business Development and was National Product Manager for the Federal Reserve's Functional Cost and Profit Analysis Program.

H. Lewis Garrett, senior vice president and general auditor, continued as chairman of the Audit Automation Consolidation Committee of the Conference of General Auditors. This committee and its subcommittee, chaired by B. Wayne Deal, audit officer, developed a detailed plan, for use throughout the Federal Reserve System, for providing audit coverage during and after the consolidation process.



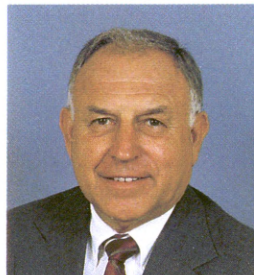
## FEDERAL RESERVE BANK OF RICHMOND



**CHAIRMAN**  
**Anne Marie Whittemore**  
*Partner*  
McGuire, Woods,  
Battle & Boothe  
Richmond, Virginia



**DEPUTY CHAIRMAN**  
**Henry J. Faison**



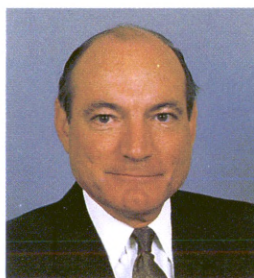
**R. E. Atkinson, Jr.**

**DEPUTY CHAIRMAN**  
**Henry J. Faison**  
*President*  
Faison Associates  
Charlotte, North Carolina

**R. E. Atkinson, Jr.**  
*Chairman*  
Dilmar Oil Company, Inc.  
Florence, South Carolina



**Stephen Brobeck**



**Paul A. DelaCourt**

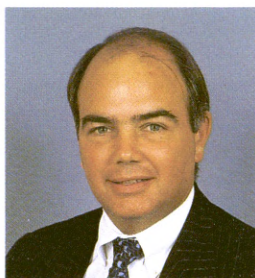
**Stephen Brobeck**  
*Executive Director*  
Consumer Federation of America  
Washington, D.C.

**Paul A. DelaCourt**  
*Chairman*  
The North Carolina Enterprise  
Corporation  
Raleigh, North Carolina

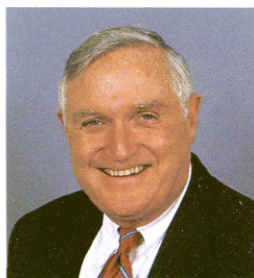
### Member, Federal Advisory Council



**Edward E. Crutchfield, Jr.**  
*Chairman and*  
*Chief Executive Officer*  
First Union Corporation  
Charlotte, North Carolina



**Webb C. Hayes IV**



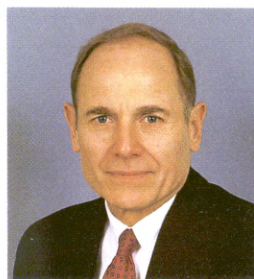
**James G. Lindley**

**Webb C. Hayes IV**  
*Chairman of the Board*  
Palmer National Bancorp, Inc.  
*President*  
The Palmer National Bank  
Washington, D.C.

**James G. Lindley**  
*Chairman and Chief Executive Officer*  
South Carolina National Corporation  
*Chairman*  
South Carolina National Bank  
Columbia, South Carolina



**A. Pierce Stone**



**L. Newton Thomas, Jr.**

**A. Pierce Stone**  
*Chairman, President, and*  
*Chief Executive Officer*  
Virginia Community Bank  
Louisa, Virginia

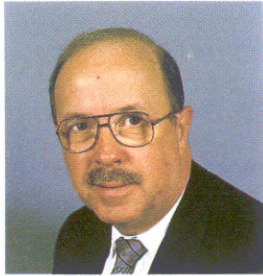
**L. Newton Thomas, Jr.**  
*Retired, Senior Vice President*  
ITT/Carbon Industries, Inc.  
Charleston, West Virginia



## Directors

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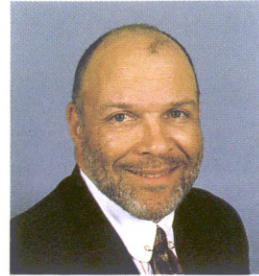
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*President*  
Preston Energy, Inc.  
Kingwood, West Virginia



*Richard M. Adams*



*Daniel P. Henson, III*

**Richard M. Adams**  
*Chairman and Chief Executive Officer*  
United Bankshares, Inc.  
Parkersburg, West Virginia

**Daniel P. Henson, III**  
*Senior Development Director*  
Struever Bros. Eccles & Rouse, Inc.  
Baltimore, Maryland



*Thomas J. Hughes*



*F. Levi Ruark*

**Thomas J. Hughes**  
*President/CEO*  
Navy Federal Credit Union  
Merrifield, Virginia

**F. Levi Ruark**  
*Chairman of the Board and President*  
The National Bank of Cambridge  
Cambridge, Maryland



*Michael R. Watson*



*Rebecca Hahn Windsor*

**Michael R. Watson**  
*President*  
Association of Maryland Pilots  
Baltimore, Maryland

**Rebecca Hahn Windsor**  
*Chairman and CEO*  
Hahn Transportation, Inc.  
New Market, Maryland



## Directors

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Greensboro, North Carolina



*Dorothy H. Aranda*



*Jim M. Cherry, Jr.*

**Dorothy H. Aranda**  
*President*  
Dohara Associates, Inc.  
Hilton Head Island, South Carolina

**Jim M. Cherry, Jr.**  
*President and Chief Executive Officer*  
Williamsburg First National Bank  
Kingstree, South Carolina



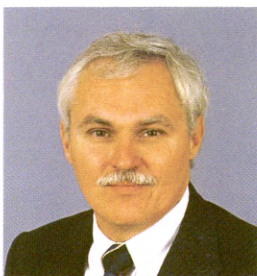
*David B. Jordan*



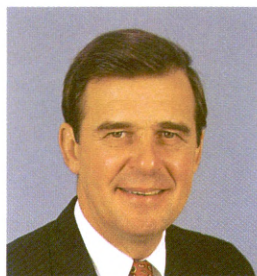
*Harold D. Kingsmore*

**David B. Jordan**  
*Vice-Chairman, CEO and Director*  
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Salisbury, North Carolina

**Harold D. Kingsmore**  
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*L. Glenn Orr, Jr.*

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**L. Glenn Orr, Jr.**  
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West Virginia Credit Union League, Inc.  
Parkersburg, West Virginia

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District of Columbia Credit Union League  
Washington, D.C.

**Stanley E. Wright**  
*President, Chief Executive Officer, and Treasurer*  
Raleigh Federal Savings Bank  
Raleigh, North Carolina



# Comparative Financial Statements

## CONDITION

Assets	December 31, 1992	December 31, 1991
Gold certificate account	\$ 941,000,000.00	\$ 948,000,000.00
Special Drawing Rights certificate account	652,000,000.00	961,000,000.00
Coin	94,595,854.14	98,795,794.25
Loans to depository institutions	0	105,000,000.00
Federal agency obligations	423,239,907.33	478,120,549.04
U.S. government securities		
Bills	11,087,595,746.37	10,491,442,040.07
Notes	9,241,012,297.60	8,030,219,833.90
Bonds	2,739,729,693.16	2,557,422,797.59
Total U.S. government securities	23,068,337,737.13	21,079,084,671.56
Cash items in process of collection	759,696,580.42	608,084,027.83
Bank premises	127,741,167.29	122,786,026.17
Furniture and equipment (net)	111,542,026.25†	32,169,642.12
Other assets	2,140,972,905.43	2,025,123,541.59
Interdistrict settlement account	-219,493,926.60	321,133,485.56
Accrued service income	5,977,509.78	5,006,657.05
<b>TOTAL ASSETS</b>	<b>\$28,105,609,761.17</b>	<b>\$26,784,304,395.17</b>
<b>Liabilities</b>		
Federal Reserve notes	\$25,083,024,408.00	\$23,425,486,317.00
Deposits		
Depository institutions	2,025,420,207.92	2,210,349,620.36
Foreign	8,937,700.00	9,165,000.00
Other	32,359,845.17	65,775,164.96
Total deposits	2,066,717,753.09	2,285,289,785.32
Deferred availability cash items	391,600,862.50	541,202,140.88
Other liabilities	144,142,737.58	191,311,951.97
<b>TOTAL LIABILITIES</b>	<b>\$27,685,485,761.17</b>	<b>\$26,443,290,195.17</b>
<b>Capital Accounts</b>		
Capital paid in	210,062,000.00	170,507,100.00
Surplus	210,062,000.00	170,507,100.00
<b>TOTAL LIABILITIES AND CAPITAL ACCOUNTS</b>	<b>\$28,105,609,761.17</b>	<b>\$26,784,304,395.17</b>

† Includes furniture and equipment (net) for Federal Reserve Automation Services in the amount of \$83,447,193.14.



## EARNINGS AND EXPENSES

	1992	1991
<b>Earnings</b>		
Loans to depository institutions	\$ 336,934.17	\$ 1,088,903.10
FDIC assumed indebtedness	0	4,352,731.95
Interest on U.S. government securities	1,353,341,162.52	1,600,439,604.86
Foreign currencies	136,035,262.50	152,907,455.51
Income from services	65,425,788.97	64,150,968.36
Other earnings	312,603.70	838,712.89
Total current earnings	\$1,555,451,751.86	\$1,823,778,376.67
<b>Expenses</b>		
Operating expenses	137,199,484.55†	107,354,220.08
Cost of earnings credits	11,456,444.50	14,382,148.18
Net expenses	148,655,929.05	121,736,368.26
<b>CURRENT NET EARNINGS</b>	<b>\$1,406,795,822.81</b>	<b>\$1,702,042,008.41</b>
Additions to current net earnings		
Profit on sales of U.S. government securities (net)	9,514,181.85	11,254,136.75
Profit on foreign exchange transactions	0	23,177,649.40
All other	11,215.24	5,911.71
Total additions	9,525,397.09	34,437,697.86
Deductions from current net earnings		
Losses on foreign exchange transactions	69,361,025.17	0
All other	120,020.32	61,619.22
Total deductions	69,481,045.49	61,619.22
Net additions or deductions	-59,955,648.40	+34,376,078.64
Cost of unreimbursed Treasury services	2,891,350.66	6,210,205.74
Assessment for expenses of Board of Governors	8,474,000.00	6,947,500.00
Federal Reserve currency costs	25,527,479.00	18,464,922.00
<b>NET EARNINGS BEFORE PAYMENTS TO U.S. TREASURY</b>	<b>\$1,309,947,344.75</b>	<b>\$1,704,795,459.31</b>
<b>Distribution of Net Earnings</b>		
Dividends paid	\$ 11,464,752.08	\$ 9,770,118.63
Payments to U.S. Treasury (interest on Federal Reserve notes)	1,258,927,692.67	1,672,578,640.68
Transferred to surplus	39,554,900.00	22,446,700.00
<b>TOTAL</b>	<b>\$1,309,947,344.75</b>	<b>\$1,704,795,459.31</b>
<b>Surplus Account</b>		
Balance at close of previous year	\$ 170,507,100.00	\$ 148,060,400.00
Addition of profits for year	39,554,900.00	22,446,700.00
<b>BALANCE AT CLOSE OF CURRENT YEAR</b>	<b>\$ 210,062,000.00</b>	<b>\$ 170,507,100.00</b>
<b>Capital Stock Account</b> (representing amount paid in, which is 50% of amount subscribed)		
Balance at close of previous year	\$ 170,507,100.00	\$ 148,060,400.00
Issued during the year	45,416,850.00	26,331,050.00
	215,923,950.00	174,391,450.00
Canceled during the year	5,861,950.00	3,884,350.00
<b>BALANCE AT CLOSE OF CURRENT YEAR</b>	<b>\$ 210,062,000.00</b>	<b>\$ 170,507,100.00</b>

† Includes operating expenses for Federal Reserve Automation Services in the amount of \$18,954,789.00.

## Summary of Operations

Operation	Number		Amount (\$thousands)	
	1992	1991	1992	1991
Currency and coin processed				
Currency received and verified	2,082,143,000	1,959,126,000	26,873,914	25,000,656
Currency verified and destroyed	804,601,000	740,139,000	9,137,511	7,719,990
Coin bags received and verified	268,068	261,876	204,914	194,359
Checks handled				
Commercial—processed*	1,566,529,000	1,550,648,000	1,083,768,000	1,019,044,000
Commercial—packaged items	396,730,000	367,468,000	140,396,000	121,636,000
U.S. government	58,289,000	60,422,000	116,857,000	129,200,000
Collections items handled				
U.S. government coupons paid	20,369	24,538	15,241	55,108
Noncash items	58,626	106,172	128,768	278,960
Commercial book-entry transfers originated	280,808	284,110	2,618,241,000	2,309,359,000
Funds transfers sent and received	5,902,670	5,652,028	8,814,639,000	8,818,391,000
Food stamps redeemed	324,018,000	282,818,000	1,659,451	1,448,377
Loans advanced	432	454	3,444,742	4,635,089

\*Excluding checks on this Bank.



# Officers

(December 31, 1992)

## RICHMOND



Robert P. Black



Jimmie R. Monhollon

Robert P. Black, *President*  
Jimmie R. Monhollon, *First Vice President*  
Lloyd W. Bostian, Jr., *Senior Vice President*  
J. Alfred Broadus, Jr., *Senior Vice President and  
Director of Research*  
Roy L. Fauber, *Senior Vice President*  
James McAfee, *Senior Vice President and  
General Counsel*  
Joseph C. Ramage, *Senior Vice President*  
James D. Reese, *Senior Vice President*  
Bruce J. Summers, *Senior Vice President*  
Fred L. Bagwell, *Vice President*  
Dan M. Bechter, *Vice President*  
William H. Benner, Jr., *Vice President*  
Timothy Q. Cook, *Vice President*  
William E. Cullison, *Vice President*  
Wyatt F. Davis, *Vice President*  
Michael Dotsey, *Vice President*  
George B. Evans, *Vice President*  
William C. Fitzgerald, *Associate General Counsel*  
Marvin S. Goodfriend, *Vice President and  
Associate Director of Research*  
Robert L. Hetzel, *Vice President*  
Thomas M. Humphrey, *Vice President*  
Yash P. Mehra, *Vice President*  
Michael W. Newton, *Vice President*  
G. Ronald Scharr, *Vice President*  
John W. Scott, *Vice President*  
Andrew L. Tilton, *Vice President*  
Roy H. Webb, *Vice President*

Kemper W. Baker, Jr., *Assistant Vice President*  
Jackson L. Blanton, *Assistant Vice President*  
William A. Bridenstine, Jr., *Assistant General Counsel*  
Bradford N. Carden, *Assistant Vice President*  
Betty M. Fahed, *Assistant Vice President*  
Sharon M. Haley, *Assistant Vice President and Secretary*  
Eugene W. Johnson, Jr., *Assistant Vice President*  
Thomas P. Kellam, *Assistant Vice President*  
Anatoli Kuprianov, *Research Officer*  
Harold T. Lipscomb, *Assistant Vice President*  
Susan Q. Moore, *Assistant Vice President*  
Joseph F. Morrisette, *Assistant Vice President*  
Virginius H. Rosson, Jr., *Assistant Vice President*  
Marsha S. Shuler, *Assistant Vice President*  
James R. Slate, *Assistant General Counsel*  
Robert E. Wetzel, Jr., *Assistant Vice President*  
William F. White, *Assistant Vice President*  
Howard S. Whitehead, *Assistant Vice President*  
Bobby D. Wynn, *Assistant Vice President*  
Arthur J. Zohab, Jr., *Assistant Vice President*

Malcolm C. Alfriend, *Examining Officer*  
Floyd M. Dickinson, Jr., *Examining Officer*  
A. Linwood Gill III, *Examining Officer*  
Janice E. Haase, *Information Systems Officer*  
Jeffrey S. Kane, *Examining Officer*  
Jeffrey M. Lacker, *Associate Research Officer*  
Lawrence P. Nuckols, *Examining Officer*  
Ruth S. Pratt, *Information Systems Officer*  
Arlene S. Saunders, *Personnel Officer*  
Charlotte L. Waldrop, *Examining Officer*

H. Lewis Garrett, *Senior Vice President and General Auditor*  
Edgar A. Martindale III, *Assistant General Auditor*  
B. Wayne Deal, *Audit Officer*  
Susan A. Saavedra, *Audit Officer*

## BALTIMORE



Ronald B. Duncan

Ronald B. Duncan, *Senior Vice President*  
William E. Pascoe III, *Vice President*  
John S. Frain, *Assistant Vice President*  
Margaret M. Murphy, *Assistant Vice President*  
William J. Tignanelli, *Assistant Vice President*  
Patricia S. Tunstall, *Assistant Vice President*  
John I. Turnbull II, *Assistant Vice President*  
R. William Ahern, *Automation Officer*

## CHARLOTTE



Walter A. Varvel

Walter A. Varvel, *Senior Vice President*  
Samuel W. Powell, Jr., *Vice President*  
Robert F. Stratton, *Vice President*  
Jeff A. Walker, *Vice President*  
Lyle C. DeVane, *Assistant Vice President*  
Marsha H. Malarz, *Assistant Vice President*  
Ronald D. Steele, *Assistant Vice President*

## CULPEPER

John G. Stoides, *Senior Vice President*  
James J. Florin III, *Assistant Vice President*  
Thomas C. Judd, *Assistant Vice President*  
Julius Malinowski, Jr., *Assistant Vice President*

## CHARLESTON

Richard L. Hopkins, *Vice President*

## COLUMBIA

Woody Y. Cain, *Vice President*

## FIFTH FEDERAL RESERVE DISTRICT OFFICES

### Richmond

701 East Byrd Street  
Richmond, Virginia 23219  
(804) 697-8000

### Baltimore

502 South Sharp Street  
Baltimore, Maryland 21201  
(410) 576-3300

### Charlotte

530 East Trade Street  
Charlotte, North Carolina 28202  
(704) 358-2100

### Charleston

1200 Airport Road  
Charleston, West Virginia 25311  
(304) 345-8020

### Columbia

1624 Browning Road  
Columbia, South Carolina 29210  
(803) 772-1940

### Culpeper

Mount Pony Road, State Route 658  
Culpeper, Virginia 22701  
(703) 829-1600





