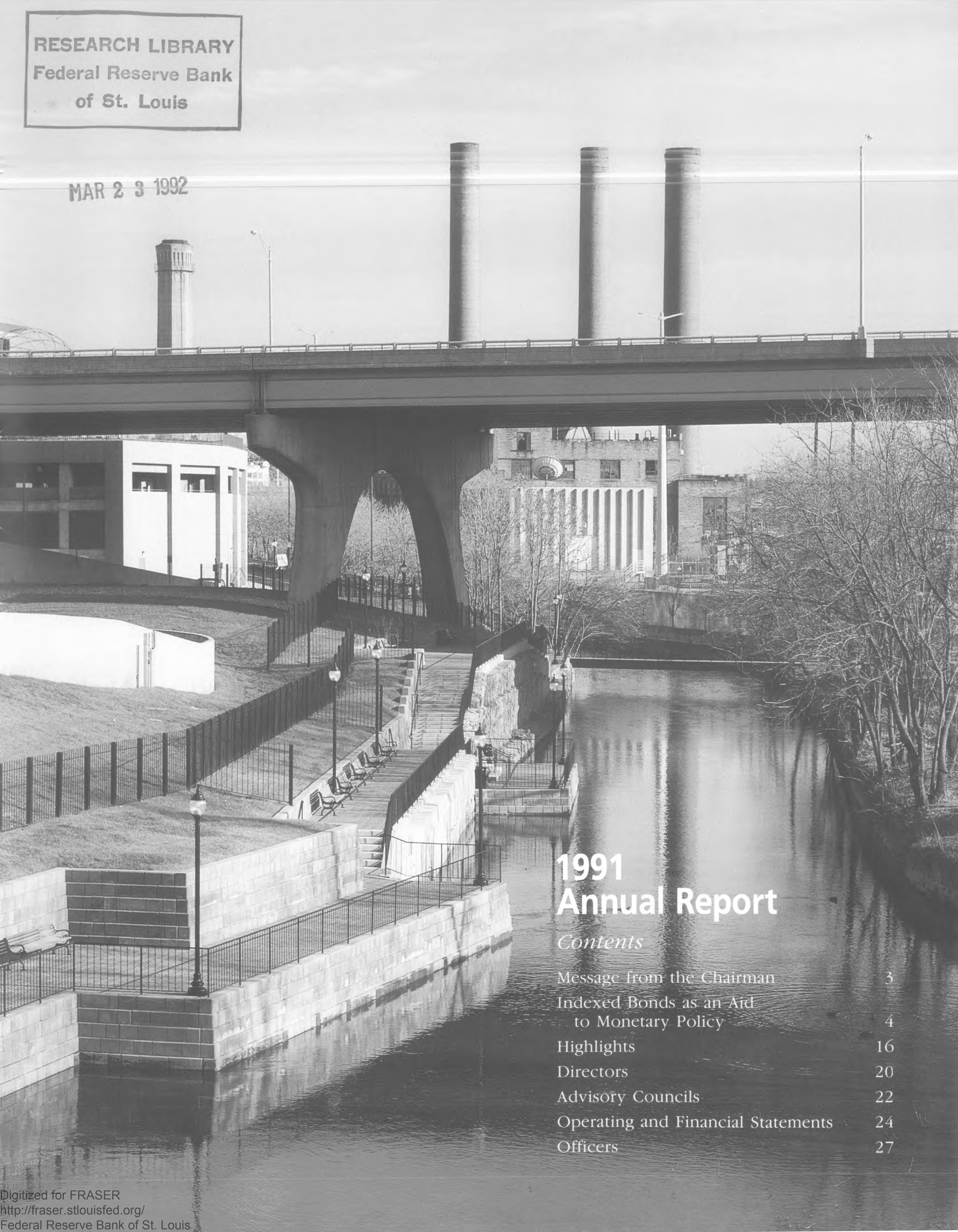
1991 Annual Report

Federal Reserve Bank of Richmond



1991 Annual Report

Contents

ISSN 0164-0798

LIBRARY OF CONGRESS CATALOG CARD NUMBER: 16-7264

Federal Reserve Bank of Richmond Publication Number: P-1

Additional copies of this Annual Report may be obtained without charge from:

Public Services Department Federal Reserve Bank of Richmond P.O. Box 27622 Richmond, Virginia 23261

Message from the Chairman

Henry J. Faison *Deputy Chairman* — *Robert P. Black* *President* — *Anne Marie Whittemore* *Chairman*

1991 was a year of dramatic challenges and changes for the world, our nation and region, and the Federal Reserve System. It was a difficult time for monetary policy and bank supervision, and an important year for Federal Reserve Bank operations. I thank my fellow directors with whom I have had the pleasure of serving for their very thoughtful deliberations, and I extend to the Bank staff congratulations for an excellent performance in responding to the demands of these times in a manner that can only be described as outstanding.

Monetary policy responsibilities presented major issues for the Board of Directors and our president in 1991, a year that saw economic activity start to pull us out of recession in the immediate aftermath of the Persian Gulf War, but subsequently decelerate sharply in the fourth quarter. In this uncertain environment, extensive preparation and especially careful deliberation preceded directors' votes on the discount rate and President Black's votes on monetary policy actions and targets. We are hopeful that we are on a course that will revive economic activity and continue to control inflation.

Consistent with the conviction that monetary policy should focus on long-run price stability, this *Report*'s article by Vice President Robert L. Hetzel proposes a way to measure inflation expectations through the use of indexed bonds and thereby assist monetary policymakers.

The year was a demanding one for the Bank's supervision and regulation staff as the Fifth District, like other regions in the country, experienced an increase in problems at some of its depository institutions. Meanwhile, mergers created three of the nation's largest bank holding companies, which will be headquartered in the District.

Important consolidation decisions were also made within the Federal Reserve Bank of Richmond and the Federal Reserve System as a whole. Within the Bank, the Richmond office began handling all book-entry securities operations for the Fifth District. Within the System, Richmond was selected as the staff headquarters for three computer centers that will eventually consolidate data processing for all twelve Reserve Banks into three sites in Richmond, Dallas, and East Rutherford, New Jersey. Of immediate critical service to the System was the Contingency Processing Center located in the Bank's facility in Culpeper, Virginia, which provided almost four months' backup for the disabled computer system at the Federal Reserve Bank of Minneapolis.

I thank our member banks and our other constituents for helping the Federal Reserve Bank of Richmond perform so well in this challenging but extremely interesting year.

Anne Marie Whittemore

Chairman of the Board

Indexed Bonds as an Aid to Monetary Policy

Robert L. Hetzel

A principal long-term goal of Federal Reserve monetary policy is to restore price stability to the United States economy. In this article, the author suggests that a measure of the public's inflation expectations would assist the Fed in attaining its goal and proposes that, to provide such a measure, the U.S. Treasury issue bonds indexed to eliminate losses resulting from inflation. The article is presented here to stimulate further discussion of issues related to the effort to eliminate inflation. The views expressed are the author's and not necessarily those of the Bank or the Federal Reserve System.

Contracts requiring payment of dollars in the future for future delivery of goods and services are a regular part of economic life. Workers enter into contracts, formal and informal, for a dollar wage for the next year. Colleges set tuition payments once a year. Rents for apartments are set annually and homeowners contract for mortgage payments in dollars. The purchasing power represented by these dollar payments, however, depends upon the rate of inflation realized after the contracts are signed. People must forecast inflation in order to estimate the purchasing power of future dollar payments.

This article argues that it would be helpful to the Federal Reserve System to have a measure of the public's inflation forecast. The Fed, through its control of the money stock, controls the long-run rate of inflation. There is, however, always considerable short-run uncertainty regarding the way in which changes in its policy instrument (reserves or the federal funds rate) will ultimately affect money growth and inflation. A measure of the inflation forecast by the public would offer the Fed a useful "outside" assessment of the inflationary consequences thought likely to follow from its policy actions. This inflation forecast could be inferred from the yield gap between the interest rates paid on conventional bonds and on bonds indexed to the price level.[1] Unfortunately, indexed bonds are not now traded in the United States. This paper proposes that the U.S. Treasury issue indexed bonds to create a measure of the public's inflation forecast.

THE PROPOSAL

A measure of the inflation expected by the public could be created by legislation requiring the Treasury to issue zero-coupon bonds with maturities of one year, two years, and so on out to twenty years. A zero-coupon bond is a promise to make a future one-time payment. Zero-coupon bonds sell at a discount and yield a return through capital appreciation. Under the proposal, half the bonds issued would be conventional (nonindexed) zero-coupon bonds that would offer a principal payment of a given dollar amount. The other half would offer a principal payment in dollars of constant purchasing power achieved by indexing the principal payment to the price level. For example, if the principal payment of the conventional zero-coupon bond were $100 and the price level were to rise by 5 percent in the year after the sale of the bonds, an indexed bond with a maturity of one year would pay $105.[2]

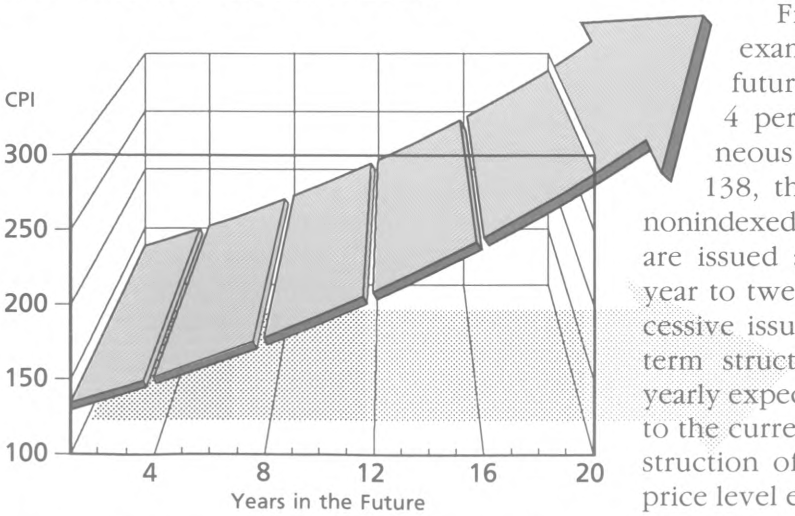
Holders of indexed bonds do not have to worry about the depreciation of the dollars in which they are paid. For a zero-coupon bond sold in, say, 1992, both the amount bid and the purchasing power afforded by the principal payment are measured in 1992 dollars. The discount on the bond, therefore, is a measure of the real yield (real capital appreciation) offered by the bond over its life. The yield on indexed bonds would offer a direct measure of the real (inflation-adjusted) rate of interest. Furthermore, the existence of indexed bonds of different maturities would provide a measure of the term structure of real rates of interest.[3]

Because holders of the indexed bonds are guaranteed payment representing a known amount of purchasing power, they do not have to forecast inflation. In contrast, holders of the nonindexed bonds *would* have to forecast future changes in the value of the dollar. Consequently, the yield on the nonindexed bonds would incorporate an inflation premium to compensate for the expected depreciation in the purchasing power of the dollar, and the difference in yields between the nonindexed and indexed bonds, therefore, would measure the inflation expected by investors over the life of the bond. The existence of bonds of different maturities would offer a term structure of expected future inflation. Given the current price level, this term structure would yield a time profile of the future price level expected by the public.

Figure 1 illustrates a hypothetical example in which the public expects future inflation to remain steady at 4 percent a year. (The contemporaneous price level is also taken to be 138, the current value of the CPI.) If nonindexed and indexed zero-coupon bonds are issued at maturities ranging from one year to twenty years, the yield gap on successive issues would permit inference of a term structure of future inflation. These yearly expected inflation rates, when applied to the current price level, would allow construction of the time profile of the future price level expected by the public shown in Figure 1.

Figure 1

TIME PROFILE OF EXPECTED FUTURE PRICE LEVEL



Note: Hypothetical observations are based on assumed 4 percent rate of inflation.

Consider an indexed one-year-maturity zero-coupon bond that is a promise to pay \$100 in one year, with the \$100 indexed to the consumer price index. If the real rate of interest were 3 percent, the bond would sell for \$97. If the public believed that the one-year inflation rate would be 4 percent, a comparable nonindexed bond would sell for \$93, returning 4 percent in compensation for the expected inflation and a 3 percent expected real yield. The interest rate on the nonindexed bond would then be 7 percent, with a 3 percent real interest rate on the indexed bond. The "yield gap" between these two rates is the 4 percent inflation rate expected by the market.

THE YIELD GAP AS AN INDICATOR OF MONETARY POLICY

In order to achieve its inflation objective, the Fed could, in principle, change its policy instrument in response to discrepancies between the actual price level and a target path for the price level. Because individual policy actions affect prices only with long lags, however, such a straightforward strategy could be destabilizing. In practice, the Fed monitors indicator variables to determine whether the changes in its policy instrument are consistent with the inflation rate it considers acceptable.

Some economists have suggested that the Fed change its policy instrument in response to movements in the prices of actively traded commodities. These prices *do* move freely in response to changes in expenditure produced by monetary policy actions; however, they often move in response to market-specific disturbances. At such times, commodity prices might give misleading signals about the thrust of monetary policy.

Milton Friedman has long advocated a low, stable rate of growth of M2 as the guide to monetary policy. M2 has maintained a reliable relationship to the public's dollar expenditure over long periods of time. In fact, the ratio of dollar GNP to M2, known as M2 velocity, is currently about 1.63, little changed from its value in 1914 when the Federal Reserve was founded. Over periods of time as long as several years, however, M2 velocity fluctuates significantly. Many economists also fear that future financial innovation could alter the long-run relationship between M2 and GNP. It is possible that a consensus will never emerge that a particular monetary aggregate is a reliable indicator of the stance of monetary policy.

In contrast to these alternatives, the yield gap between nonindexed and indexed bonds would offer a direct measure of expected inflation. This measure would offer useful information to monetary policymakers because it would be formed by market participants who have a direct financial interest in forecasting inflation.

AVOIDING INFLATION AND DISINFLATION

The lag between changes in the Federal Reserve's policy instrument and changes in prices means that it is difficult to associate particular policy actions with inflation. This difficulty lowers the cost of exerting political pressure for an inflationary policy; moreover, the quicker impact of stimulative monetary policy on output than on prices generates political pressure to trade off immediate output gains against a delayed rise in inflation. Indexed bonds of the sort proposed here would balance these pressures by threatening an immediate rise in the yield gap between indexed and nonindexed bonds. The Fed would have a clear and more immediate justification for resisting inflationary pressures.

Further, with indexed bonds, public pressure for an inflationary monetary policy that was associated with a rise in the yield gap in itself would produce countervailing pressure. Holders of nonindexed bonds would suffer a capital loss when the yield gap rose. All creditors receiving payment in nonindexed dollars in the future would feel worse off. The yield gap would restrain pressure for inflationary policy by offering an immediate and continuous market assessment of the potential impact of such a policy.

Surprise inflation acts like a capital levy imposed on money and government securities. The essentially fiscal transfer that arises from surprise inflation does not have to be legislated explicitly. Federal Reserve independence is designed to prevent monetary policy from becoming the handmaiden of fiscal policy. Institutional arrangements, like the federal structure of the Fed with its regional bank presidents and long terms for members of the Board of Governors, give substance to central bank independence. The continuous market assessment of the level of future inflation offered by the yield gap between nonindexed and indexed bonds would constitute an additional safeguard against surprise inflation.

POSSIBLE DISTORTIONS IN THE YIELD GAP

The information on expected inflation offered by the yield gap between nonindexed and indexed bonds of equal maturities would be diminished if the gap fluctuated in response to tax and/or risk premium factors. These possibilities are considered in turn.

Tax Distortions

Ideally, for both the nonindexed bond and the indexed bond, income subject to taxation would be indexed for inflation. That is, holders of both types of bonds would pay taxes only on the increase in purchasing power gained from holding the bonds, rather than on any increase in the dollar value of the bond that only compensates for inflation.

In order to illustrate this point, consider the following hypothetical example. Suppose that, for both the indexed and nonindexed bonds, only the return that represents a gain in purchasing power is taxed. As before, if the real rate of return is 3 percent, an indexed bond that promises to pay \$100 of constant purchasing power next year would sell for \$97 in the current year. If, subsequently, inflation turns out to be 4 percent, the holder of the indexed bond will receive \$104. In this case, taxable income would be calculated as the \$7 in total income minus the \$4 inflation adjustment, which is a capital depreciation allowance to maintain the purchasing power of the investor's capital. The holder of the *nonindexed* bond also would be taxed only on the real portion of the bond's yield.[4]

If, alternatively, taxable income were not indexed for inflation, an increase in the inflation rate would increase the taxes paid by the holders of indexed bonds, which would reduce the real after-tax yield on the bonds even if there had been no reduction in the real before-tax yield. Unless the tax code were indexed, the yield on the indexed bond would rise as inflation rose to compensate for the increase in taxes imposed by higher inflation. The yield on the indexed bond would then offer a distorted measure of the economy-wide real rate of interest. With the relatively moderate levels of inflation experienced in the 1980s, however, the distortions caused by the present absence of inflation indexing in the tax code would not greatly impair the usefulness of the indexed bond as a measure of the real rate of interest. Moreover, if the tax treatment for the nonindexed and indexed bond were the same, information about expected inflation contained in the yield gap between the nonindexed and indexed bond would not be distorted by changes in the rate of inflation.

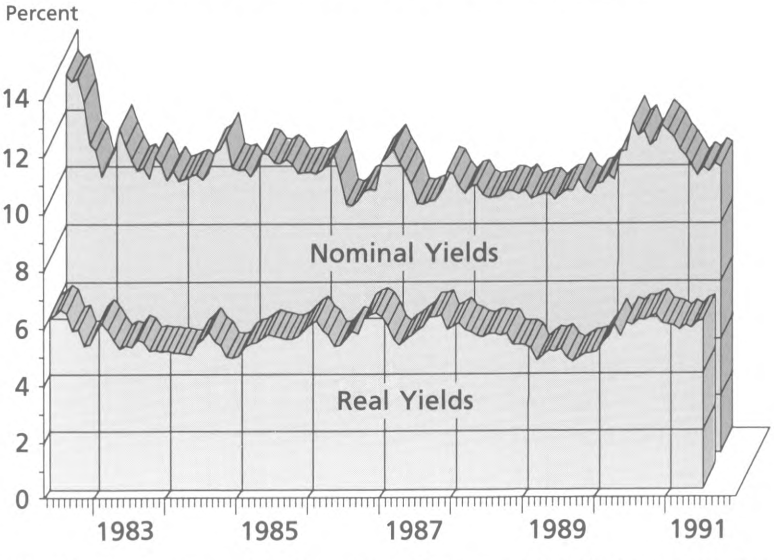
Possible Risk Premium Distortion

Because the public might be willing to pay something to hold an asset whose value is not arbitrarily affected by unanticipated inflation, it is possible that a risk premium might bias the yield gap upward. The yield gap would then overstate expected inflation. Also, the risk premium could vary so that the yield gap would change even with no change in expected inflation. (Note that if the yield gap incorporated a risk premium, the Treasury would have to compensate investors for the inflation risk entailed by holding its nonindexed bonds. Indexed bonds would not carry this cost.)

Whether a risk premium would, in fact, be incorporated in the yield gap is of course an empirical question. Woodward (1990) examined the behavior of the yield gap between nonindexed and indexed British bonds and concluded that any risk premium must have been very small.[5] If the risk premium had been significant, the yield gap between conventional and indexed bonds would have implied implausibly low estimates of expected inflation for Britain for the 1980s. Furthermore, Woodward's measure of real yields (adjusted for preferential tax treatment of indexed bonds) produces surprisingly high values. Because real yields averaged around 5.5 percent, it is implausible that holders of indexed bonds were foregoing much yield as protection against surprise inflation. (See Fig. 2.)

Figure 2

YIELDS ON INDEXED AND NONINDEXED BONDS



Note: Monthly observations of yields on indexed bonds issued in April 1982 and maturing in August 2011 and of yields on conventional bonds maturing in August 2011. Data were furnished by G. Thomas Woodward.

The magnitude of a possible risk premium also would depend upon monetary policy. Suppose that the central bank had made a credible commitment to price stability. With such a policy, random shocks would still cause the central bank to miss its price level target, but these misses subsequently would be offset. Consequently, the price level would fluctuate around a fixed value, and the magnitude of any discrepancy between yields of nonindexed and indexed bonds due to a risk premium would decline as maturities lengthened.

Alternatively, suppose that the central bank allowed contemporaneous price level shocks to be incorporated permanently in the future price level target. Consequently, the price level would wander randomly over time. (The central bank could allow this kind of price-level drift even if it did not introduce a systematic bias in favor of inflation.) The difficulty in predicting the real purchasing power of a promise to pay a fixed dollar amount in the future would increase as the time horizon lengthened. With this policy, the magnitude of any discrepancy between yields of nonindexed and indexed bonds due to a risk premium would not decline as maturities lengthened.

Even if the yield gap between nonindexed and indexed bonds were to incorporate a risk premium, changes in the yield gap would still convey important information to the central bank. Increases in the yield gap would be of concern to the central bank even if they were caused by an increase in the risk premium, rather than by an increase in expected inflation. A central bank must assure markets that its independence is a safeguard against surprise inflation. An increase in the size of the risk premium caused by increased concern for surprise future inflation would indicate to the central bank a need to reinforce the credibility of its commitment to monetary stability.

ISSUES FOR DEBT MANAGEMENT

The idea of indexed bonds has been advanced numerous times in the past. The Treasury possesses the authority to issue indexed bonds, but has always resisted doing so. In congressional hearings on indexed bonds (U.S. Congress, 1985), Francis Cavanaugh, the Director of the Office of Government Finance and Market Analysis of the Treasury, detailed the reasons.

Mr. Cavanaugh argued that the Treasury did not know whether anyone would buy indexed bonds.[6] If there were no demand for them, their issuance would increase the Treasury's cost of funding the government's debt.

> . . . we have yet to see any strong evidence of potential demand for such an indexed bond in this country. . . . An indexed bond, because of its novel features, would not realize the full benefits of the liquidity of the conventional Treasury market, and its relative lack of liquidity would be reflected in the bid price received by the Treasury in an indexed bond auction. . . . Thus a requirement that the U.S. Treasury issue indexed bonds, especially fixed amounts each year, could lead to significant increases in the cost of financing the public debt (U.S. Congress, pp. 17 and 20).[7]

According to this argument, there is uncertainty over whether anyone would value the inflation protection offered by indexing. Because inaccurate inflation forecasts are costly, however, it seems implausible that no savers would be interested in protecting against such risk. Consider, for example, the experience of someone who bought and held a 30-year government bond 30 years ago. In 1961, the long-term government bond yield was 3.9 percent. On average, over the three years 1959, 1960, and 1961, CPI inflation averaged 1.1 percent. Assuming, given this experience, that in 1961 investors believed that the long-term rate of inflation would be 1.1 percent, a purchaser of a 30-year bond would have anticipated a yearly gain in real terms of 2.8 percent (3.9 percent minus 1.1 percent). In fact, over the 30-year period from 1961 to 1991, CPI inflation averaged 5.2 percent. The investor lost 1.3 percent of his capital each year (3.9 percent minus 5.2 percent) because of inflation (not counting taxes paid on coupon payments). Instead of a 30 percent gain in capital from holding the bond for 30 years, the investor lost 30 percent of his capital. Munnell and Grolnic (1986) make a persuasive case that, at a minimum, pension funds and holders of IRAs would be interested in indexed bonds.[8]

BRITISH EXPERIENCE

British Indexed Gilts

Britain has issued indexed bonds (gilts) since 1981. Unfortunately, indexing in Britain is poorly designed for measuring expected inflation. British bonds are indexed to the retail price index (RPI), which is a poor measure of inflation because it includes the cost of mortgage interest payments. Also, coupon and principal payments are indexed with an eight-month lag.[9] This eight-month lag makes real yields on indexed bonds with a maturity even as long as five years sensitive to variations in inflation. The difference between yields on nonindexed and indexed bonds, therefore, cannot reliably be used to measure expected inflation over periods as short as a few years.

The practice of issuing only long-term indexed bonds compounds the difficulty of measuring the public's expected inflation over periods as short as a few years. In order to observe a yield gap on bonds of short maturity, it is necessary to wait until the passage of time reduces the maturity of the long-term bonds. Even though indexed bonds were first issued in 1981, there is still a paucity of indexed bonds with a short period to maturity. As of the end of 1990, the average maturity of indexed bonds outstanding was 18.9 years. There were only £1.05 billion of indexed securities outstanding with maturities of five years or less. Also, for short-term maturities, the absence of nonindexed bonds with exactly the same maturity as indexed bonds becomes more of a problem.

In a personal communication with the author, Alan Walters noted that in Britain the Exchequer varied the relative supplies of nonindexed short-term debt and long-term indexed bonds in response to changes in the yield gap between the two kinds of debt. In order to ensure that the yield gap reflects expectations of inflation, rather than relative supplies, he recommended that in the future indexed and nonindexed debt be issued in fixed proportions.[10]

British Monetary Policy

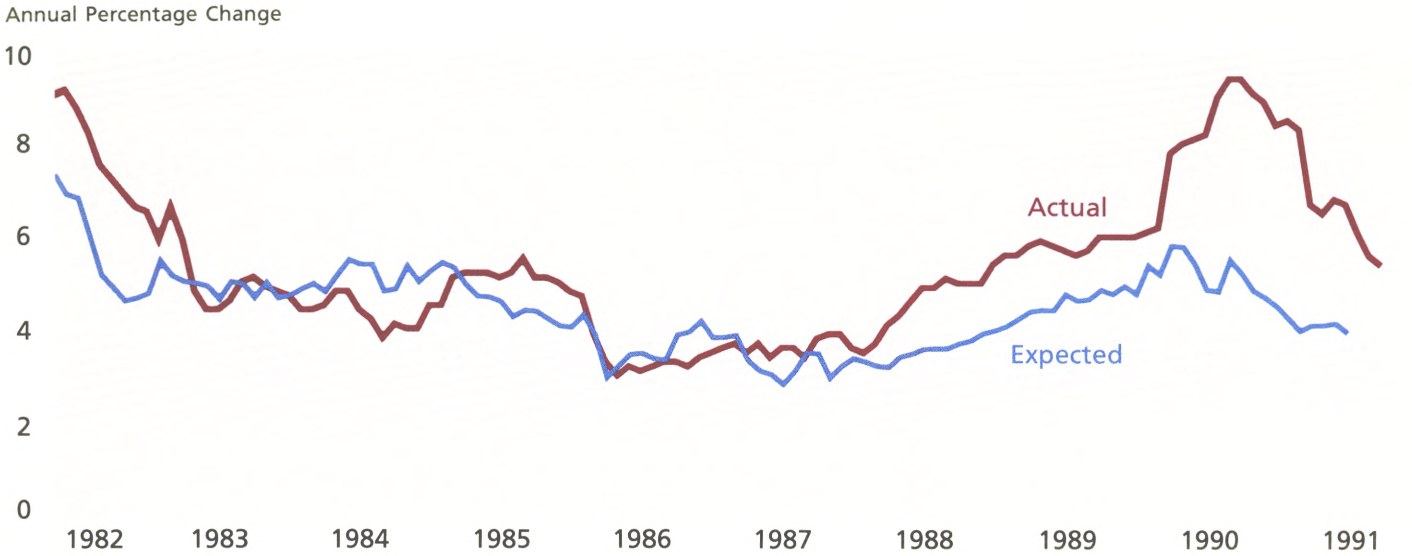
The usefulness of a yield gap between nonindexed and indexed bonds as a measure of expected inflation has been questioned on the basis of the British experience. In an article in the *Financial Times* (April 29, 1991), Anthony Harris stated that the "gap has tracked current inflation faithfully, but has no forecasting value at all. . . . The market forecasts the way a picnicker does—by looking out of the window." Therefore, he concludes, the nonindexed-indexed bond gap cannot "give a valuable steer on monetary policy." Presumably, Mr. Harris has in mind the failure of the yield gap to predict the increase in inflation that occurred in 1988. A brief review of British monetary policy in the latter 1980s proves to be helpful in understanding Mr. Harris' contention that bond markets are not forward-looking.

In Britain, inflation fell from 20 percent in 1980 to an average of about 3.5 percent in 1986 and 1987. (Figures for inflation are for the RPI excluding mortgage interest payments.) Until 1988, actual inflation moved fairly closely with long-term expected inflation, inferred from the yield gap between the indexed bond issued in 1982 and maturing in 2006 and a conventional bond with approximately the same maturity.[11] (See Fig. 3.) Over 1986 and 1987, in particular, the yield gap averaged about 3.5 percent. Actual inflation began to rise in early 1988 and peaked in 1990 somewhat above 9 percent. The yield-gap measure of expected inflation did rise steadily with actual inflation in early 1988, but reached a peak of only about 6 percent in early 1990.

What caused the sharp rise in inflation, which was understated by the yield gap? After the Louvre Accord on February 3, 1987, Nigel Lawson, Chancellor of the Exchequer, began to peg the DM/£ exchange rate informally at 3 to 1. At the same time, the real terms of trade began to appreciate steadily in Britain's favor. That is, British physical assets and commodities became more attractive. This appreciation was prompted by three factors. First, the Conservative electoral victory in 1987 made Britain appear to be a safe haven for foreign capital. Second, the rise in the price of oil after its 1986 trough and a large oil discovery announced on March 8, 1988, raised the value of British exports. Finally, the reduction in marginal tax rates, announced March 15, 1988, increased the attractiveness of investment in Britain and reduced capital outflows.

Figure 3

ACTUAL AND EXPECTED INFLATION IN THE UNITED KINGDOM



Note: Actual inflation is the annual percentage change in the RPI excluding mortgage interest payments over the preceding 12-month period. Expected inflation is inferred from the yield gap between an indexed bond maturing in 2006 and a conventional bond with approximately the same maturity. The yield gap was adjusted for different tax treatment in the two bonds. The expected inflation series was supplied by G. Thomas Woodward.

With a pegged exchange rate, the appreciation in the real terms of trade appeared as a rise in British prices, which was accommodated by high money growth. Growth in the monetary base went from about 4 percent in the middle of 1987 to more than 10 percent toward the end of 1988. In the spring of 1988, Mr. Lawson allowed the DM/£ exchange rate to rise, but only grudgingly. To retard the pound's appreciation, he lowered the UK bank base lending rate to a low of 7.5 percent in May 1988, from a high of 11 percent in early 1987. In June 1988, in response to the sustained rise in inflation that began in early 1988, Mr. Lawson reversed course and began to raise the base rate, which reached 15 percent in October 1989.

In light of this experience, were the holders of British bonds making forward-looking predictions of inflation? In 1987, the holders of bonds maturing in 2006 were predicting inflation of somewhat less than 4 percent over the next 19 years. Can this prediction be defended as forward-looking in light of the increase in British inflation from somewhat less than 4 percent in 1988 to almost 10 percent in 1990? With the pound pegged to the mark, British inflation must equal German inflation plus whatever appreciation (or minus whatever depreciation) occurs in the terms of trade. Historically, German inflation has varied around 3 to 4 percent. If changes in the terms of trade are inherently unpredictable, then a prediction of inflation of 3 to 4 percent was a reasonable estimate.[12]

Ex post, predicted inflation in the 3- to 4-percent range now appears to have been reasonable. Since Britain's formal entry into the EMS in the autumn of 1990, the DM/£ exchange rate has stayed very close to 3 to 1. With the cessation in the appreciation in the British terms of trade, British inflation had to fall to the German level. By autumn 1991, it had been brought roughly into line with German inflation of about 4 percent.[13] In short, there is nothing in the British experience to indicate that bondholders are not forward-looking.

Can Bond Markets Predict Inflation?

On the basis of an examination of the British experience, Gabriel de Kock (1991) concludes that using a yield gap to measure expected inflation as proposed here would not be useful to the Fed. Based on the British experience, he makes two assertions. First, he asserts that the yield on the indexed bond does not offer a measure of the economy's real yield. Second, he claims that the yield gap between nonindexed and indexed bonds possesses no predictive power for future inflation beyond what is furnished by recent, actual inflation. The empirical tests De Kock conducts, however, are not capable of proving or disproving these assertions.[14]

De Kock tests whether the yield gap predicts subsequent inflation rates over 12-, 24-, and 36-month periods, respectively. Apparently, he chooses these rates because they are of "primary concern to policymakers." They were not, however, what bondholders were trying to predict. The author derives his measure of expected inflation from comparing the yield on nonindexed bonds with the yield of indexed bonds of roughly the same maturity issued in March 1982 and maturing in July 1996. For example, the first observation used by the author is dated March 1982. The yield gap between nonindexed and indexed bonds then reflects the market's expectation of inflation from March 1982 to July 1996. The author compares this expectation of inflation with actual inflation over the much shorter periods beginning in March 1982 and ending in March 1983, March 1984, and March 1985. In order to perform the kind of ex post test of predictive power the author wishes to conduct, it will be necessary to wait until 1996 (or close to that date).[15]

Despite the inability of De Kock's tests to bring evidence to bear on the ex post predictive accuracy of the yield gap as a measure of expected inflation, his work does raise the interesting question of how to interpret evidence on ex post predictive accuracy. Would evidence that investors predict inflation poorly affect the value to the central bank of a yield-gap measure of expected inflation? The answer would appear to be no. What matters in determining the real rate of interest is what inflation rate financial markets expect, not whether ex post they predicted inflation accurately. Moreover, evidence from a yield-gap measure of expected inflation demonstrating that the public in practice predicts inflation poorly would provide an incentive to the central bank to alter monetary policy to ensure that at least in the long-term the price level would be easy to predict.

SUMMARY AND CONCLUDING COMMENTS

The yield-gap proposal advanced here differs from earlier proposals for indexed bonds in its recommendation that (1) equal amounts of nonindexed and indexed bonds of the same maturity be issued and (2) the resulting yield gap be used as an indicator of whether particular monetary policy actions are consistent with the Federal Reserve's inflation objective.[16]

The Federal Reserve determines the long-term rate of inflation. The measure of expected inflation proposed here would allow the Fed to observe whether there was a discrepancy between the rate of inflation expected by the public and the rate of inflation it seeks to achieve. Monetary policymakers would then be in a better position to make policy in a way that avoids discrepancies between expected and subsequently realized inflation. The yield-gap measure of expected inflation would allow monetary policy to be evaluated on whether or not it provides a stable monetary environment characterized by moderate fluctuations in expected inflation and the absence of inflationary and disinflationary surprises.

ENDNOTES

[1] See Hetzel (1990 and 1991) and *Bondweek* (1991). The idea of indexed bonds is an old one. In his *Review* article, "The Concept of Indexation in the History of Economic Thought," Humphrey (1974) lists a number of early economists who advocated indexed bonds: John Maynard Keynes in 1924; George Bach and Richard Musgrave in 1941; and Milton Friedman in 1951. Humphrey also notes two early examples of indexed bonds. During the American Revolution, the Massachusetts legislature issued bonds with interest and principal tied to an index of the prices of staple commodities. In 1925 the Rand Kardex Co., at the urging of Irving Fisher, issued a 30-year bond indexed to the wholesale price index. In 1985, Senators Quayle and Trible introduced a bill to index government bonds (S. 1088, the "Price Indexed Bonds Act of 1985") and Representative Lungren introduced a similar bill in the House (H.R. 1773, "The Price Indexed Bonds Act of 1985"). See the U.S. Congress (1985) Hearings, "Inflation Indexing of Government Securities."

[2] The bonds would be issued and retired just after the middle of the month, when the CPI is announced for the preceding month. The dollar principal payment on an indexed bond would then be increased by the percentage increase in the CPI from the month preceding its issue to the month preceding its redemption. Zero-coupon bonds avoid problems of how to index partially accrued coupon payments when a bond is traded before maturity.

[3] Forward rates for individual years would be inferred under the assumption that the yield over the life of the bond is a geometric average of the yields over the successive individual years.

[4] The issue of how to tax capital gains is perennially contentious. There is a consensus among economists, however, that taxing capital gains representing only paper gains that compensate for inflation distorts investment and savings decisions undesirably.

[5] Woodward has published a series on the real yield on indexed bonds and on the implied expected inflation rate. A key feature of his series is an adjustment for different tax treatment of nonindexed and indexed gilts. In Britain, holders of indexed bonds do not pay taxes on that part of the income due to capital appreciation, while holders of nonindexed bonds pay taxes on the inflation premium built into interest payments. This difference in tax treatment increases the size of the yield gap between the two kinds of bonds beyond bondholders' expectation of inflation. Woodward reduces the gap by the estimated amount due to this tax effect. Subtracting this reduced difference from the yield on nonindexed bonds gives a tax-adjusted real yield series. That is, it provides a measure of the real yield that holders of indexed bonds would receive in the absence of favorable tax treatment.

[6] Treasury opposition to the issue of indexed bonds also appears to reflect a general hesitation to innovate in debt management techniques. "A poorly received Treasury issue, because of faulty design or a misreading of a new potential market, could adversely affect Treasury's credibility in the market. So we approach innovation with great care" (U.S. Congress, 1985, p. 20).

[7] Mr. Cavanaugh actually expressed both the concern that there would be no demand for indexed bonds and that there would be too much demand. In the latter case, their issue would be a problem because they would compete with S&Ls for funds (U.S. Congress, p. 23). It is hard to know what to make of the assertion that the market for indexed bonds would be illiquid. If dealers in government securities find it profitable to sell conventional debt, why would they not find it profitable also to sell indexed debt?

[8] Munnell and Grolnic (1986, pp. 4,5) note, "Anyone saving for a specific goal, such as purchasing a house or sending children to college, should welcome the opportunity to ensure that such savings will not be eroded by inflation. . . . Moreover, in the United States there may well be a niche for index bonds that has not been adequately explored—namely, the financing of fully indexed annuities for retirees. These annuities could play an important role in protecting elderly people against the erosion of their pension income during their retirement years." Munnell and Grolnic then document that pension plans have not historically adjusted payments to beneficiaries to compensate fully for inflation.

They also note that there are no financial instruments that can satisfactorily protect purchasing power against inflation. "Common stocks . . . seem to be a particularly unsuitable investment for producing a stable real income. While over the past 30 years stocks have provided a high average real return, this return has been so volatile that investors have experienced significant periods of negative real earnings. Long-term bonds have fared even less well: their average real return has been near zero and in recent years the variability has been almost as great as that for common stocks. Treasury bills do appear to offer a stable real positive return, but this return is very low and these instruments are a less than perfect hedge against inflation" (Munnell and Grolnic, 1986, p. 18).

[9] An eight-month lag was adopted to simplify calculation of accrued interest on bonds with semi-annual coupon payments. With the eight-month lag, immediately after a coupon payment, assuming the most recently available price index is for two months in the past, one can calculate the indexed value of the coupon payment six months in the future.

[10] The Bank of England supplied the author with data on outstanding debt by maturity for both nonindexed and indexed debt. The yield gap between nonindexed and indexed debt did indeed influence relative supplies of the two kinds of debt. Relative supplies, however, did not appear to influence the subsequent yield gap.

[11] Data for expected inflation were supplied by Thomas Woodward. They are derived from the yield gap between conventional and indexed bonds after an adjustment for the favorable tax treatment of indexed bonds. See endnote 5 and Woodward (1990).

[12] In 1990, expected inflation measured by the yield gap rose to about 6 percent, which was higher than the trend rate of German inflation. Investors in British bonds may have believed that Britain would abandon the 3-to-1 DM/£ exchange rate to avoid the costs of a severe disinflation. They may also have believed that the trend rate of German inflation would rise because of fiscal pressures from German reunification.

[13] The DM/£ exchange rate began to fall in 1989. This fall indicated that the terms of trade were no longer appreciating in Britain's favor. A pegged exchange rate then required a convergence of British and German rates of inflation. This convergence in inflation rates required a drastic monetary deceleration in Britain. In 1989 and the first part of 1990, growth in the broad monetary aggregate M4 was around 20 percent, while growth in the monetary base M0 was around 8 percent. By autumn 1991, M4 growth had fallen to around 8 percent and M0 growth had fallen to around 2 percent.

[14] See De Kock (1991). De Kock supports the first assertion by pointing to the absence of a negative relationship between the yield on indexed bonds and future changes in economic activity. Economic theory, however, does not predict a negative (or any predictable) relationship between these two variables. In fact, in any macroeconomic model, the sign of the correlation between the real rate of interest and future economic activity depends upon the kind of shock impinging upon the economy. In a standard IS-LM model, for example, a positive real sector shock (rightward shift in the IS schedule) will lead to a ***higher*** real rate of interest and a ***higher*** level of real GNP.

The author's rationale for his test appears to rely on the assumption that a rise in interest rates necessarily reflects a tightening of monetary policy, and conversely. For example, he argues that the yield gap could not have been an adequate measure of inflation expectations in Britain in the period from early 1988 through mid-1990. Over this period, long-term market rates rose (monetary policy was tightened according to De Kock) and expected inflation (measured by the yield gap) rose, rather than fell. Measured by growth of the monetary aggregates, however, monetary policy was expansionary. Growth in the monetary aggregates M0 and M4 was quite rapid. Monetary deceleration did not begin until mid-1990. Market rates could have risen because expected inflation rose.

[15] The favorable tax treatment accorded indexed bonds widens the size of the yield gap. Because the author fails to correct for this tax effect, he concludes that the yield gap is a biased measure of inflation. That is, he finds that the yield gap, which includes a tax effect, consistently overpredicts inflation. Also, the author uses a theoretically unsatisfactory measure of inflation. He uses the retail price index that includes mortgage interest payments. It would have been better to use the retail price index that excludes these payments.

[16] In a personal communication to the author, Milton Friedman argued for using the yield gap as a *target*. He would instruct the Federal Reserve to eliminate the gap over time.

REFERENCES

Bondweek. "Treasury to Get Proposal for Inflation-Indexed Bonds." November 11, 1991.

De Kock, Gabriel. "Expected Inflation and Real Interest Rates Based on Index-linked Bond Prices: The U.K. Experience." Federal Reserve Bank of New York *Quarterly Review* (Autumn 1991), 47-60.

Hetzel, Robert L. "Maintaining Price Stability: A Proposal." Federal Reserve Bank of Richmond *Economic Review* 76 (March/April 1990), 53-55.

__________. "A Better Way to Fight Inflation." *Wall Street Journal*, April 25, 1991.

Humphrey, Thomas M. "The Concept of Indexation in the History of Economic Thought." Federal Reserve Bank of Richmond *Economic Review* 60 (November/December 1974), 3-16.

Munnell, Alicia H. and Joseph B. Grolnic. "Should the U.S. Government Issue Index Bonds?" Federal Reserve Bank of Boston *New England Economic Review* (September/October 1986), 3-21.

U.S. Congress. "Inflation Indexing of Government Securities." Hearing before the Subcommittee on Trade, Productivity, and Economic Growth of the Joint Economic Committee, 99th Cong., 1st sess., May 14, 1985.

Woodward, G. Thomas. "Should the Treasury Issue Indexed Bonds?" Congressional Research Service Report for Congress, December 31, 1987.

__________. "The Real Thing: A Dynamic Profile of the Term Structure of Real Interest Rates and Inflation Expectations in the United Kingdom, 1982-89." *Journal of Business* 63 (July 1990), 373-98.

__________. "Evidence of the Fisher Effect from U.K. Indexed Bonds." Forthcoming *Review of Economics and Statistics*.

Automation and Operations

The Federal Reserve System's Contingency Processing Center in Culpeper, Virginia, provided its first extensive backup for a Reserve Bank computer when the Minneapolis Fed was forced to vacate its headquarters after a broken water pipe flooded several floors of the building. During the crisis, Minneapolis staff worked alongside Culpeper staff to avert interruptions in service to Ninth District financial institutions.

The Federal Reserve Bank of Richmond was selected as one of three sites and the headquarters for the System's newly created Federal Reserve Automation Services function. The headquarters staff will oversee the consolidation of the 12 Reserve Banks' mainframe computer operations at Richmond, Dallas, and East Rutherford, New Jersey. Carl E. Powell, formerly first vice president at the San Francisco Fed, was chosen to head the new System function, which will reduce the costs and improve the reliability of many Reserve Bank products such as wire transfer, automated clearinghouse (ACH), and securities services.

Senior management group for Federal Reserve Automation Services: Sharon Reisdorf and Doug Fleming, senior vice presidents; Carl Powell, director; Donna Kelley and Jim Allen, senior vice presidents.

To free space appropriate for Federal Reserve Automation Services, the Bank relocated Business Applications Services to new quarters within the tower and made plans to move check operations from the tower to underground floors. The move to belowgrade levels will place check operations close to the loading docks and eliminate the need to use elevators to transport checks to and from processing floors.

The Richmond office participated in a pilot program of image technology for processing large-dollar check returns. In the pilot program, the Richmond Fed sent facsimiles of the return items to the participating banks of first deposit, which helped evaluate improvements in information flows and timing.

All offices in the District completely implemented check-processing software that was developed at the Baltimore office to improve on-line settlement of checks and returns. The new software reduced costs in software maintenance and improved quality and productivity in check operations. Atlanta Fed offices are scheduled to adopt the software in 1992, and other Reserve Banks have expressed interest in this innovation.

The Bank's new segment of the Richmond Canal Walk.

The Bank added several new electronic payment services. These included the electronic delivery of ACH statements, a database for converting paper ACH returns to electronic media, and a Fed Online Exchange (FOX) network feature that allows institutions to submit and receive Treasury tax and loan (TT&L) information electronically. Also, a new reporting option allows institutions in the FOX communications network to file their weekly reports of deposits electronically.

To reduce costs and improve efficiency, the Fifth District consolidated all book-entry securities functions in the Richmond office.

The Baltimore office was chosen as the System's pilot site for testing second-generation currency processing machines. When these tests are successfully completed in 1992, other Reserve Banks plan to begin installing similar machines.

Many Fifth District financial institutions chose to participate in the System's improved Functional Cost and Profit Analysis Program, a cost-accounting program designed to help institutions increase their earnings and improve their efficiency.

Meetings and Other Activities

The Bank and the three Richmond universities co-sponsored a seminar by Dr. Edward J. Kane, the Everett D. Reese Professor of Banking and Monetary Economics at Ohio State University and a noted authority on financial regulatory matters, who spoke on the deposit insurance problem. Dr. Kane's presentation, given in the Bank's auditorium in Richmond to a large group of business, community, and academic leaders, was one in an ongoing series on business and financial topics featuring well-known speakers.

For the second consecutive year, Don Patinkin, a world-renowned monetary economist and professor at the Israel Academy of Sciences and Humanities, spent several days at the Bank as a visiting scholar. During his two-week visit, Professor Patinkin conferred with Bank economists and presented three seminars—one at the Bank and one at each of the two local universities that helped sponsor his visit.

The Bank sponsored two conferences on the Community Reinvestment Act. Deputy Chairman Henry Faison participated in a conference in Richmond for senior bank officers. The conference featured experts who focused on the opportunities for bank participation in community revitalization and the problems involved. The other conference, which was co-sponsored by the South Carolina Banking Association and held in Columbia, focused on community reinvestment training.

The Bank helped further improve the Richmond riverfront by constructing a terrace and public walkway as part of the Canal Walk. The project was initiated to reduce soil erosion into the canal, ease the maintenance on the portion of the Bank's property near the canal, and create a more aesthetically pleasing environment.

A new Bank publication, *An Economic Profile of North Carolina and Its Counties*, was distributed to all financial institutions and libraries in that state. This *Profile* was the second in a series on Fifth District states.

In cooperation with the Councils on Economic Education in the Fifth District, the Bank began issuing a new newsletter, *FOCUS ON 5*, for teachers of economics in secondary schools.

System Responsibilities

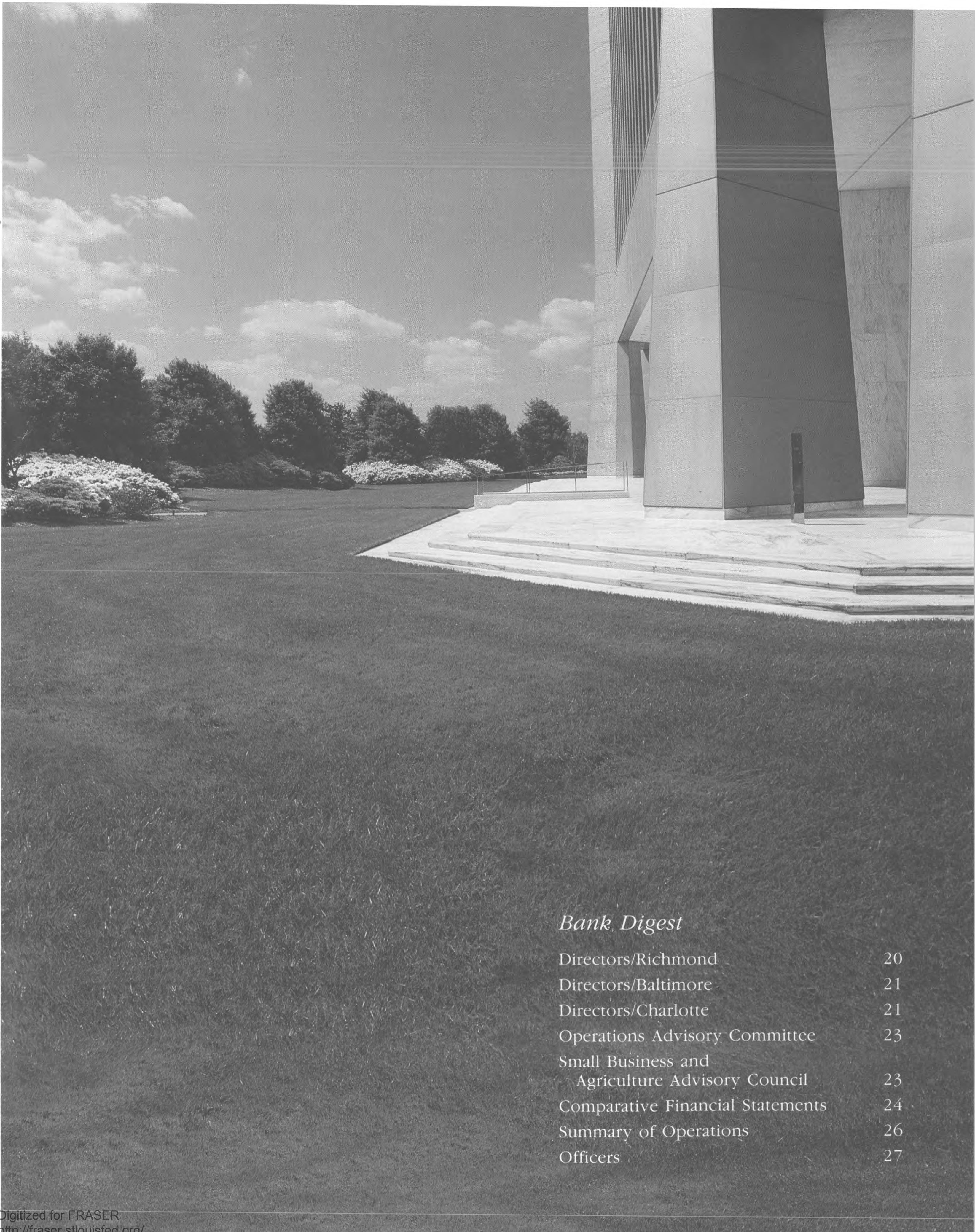
Board Chairman Anne Marie Whittemore was elected by her Reserve Bank counterparts to lead the Conference of Chairmen.

President Robert P. Black was a voting member of the Federal Open Market Committee. Mr. Black began attending FOMC meetings in 1960 when he was an economist at the Bank.

First Vice President Jimmie R. Monhollon was chairman of the Conference of First Vice Presidents and product director for the System's Functional Cost and Profit Analysis Program.

The Director of Research, J. Alfred Broaddus, Jr., chaired the System Committee on Financial Analysis.

H. Lewis Garrett, General Auditor, was appointed Chairman of the Subcommittee on Audit Automation Consolidation. This subcommittee and its parent, the System's Conference of General Auditors, will develop a detailed plan to provide audit coverage during and after the consolidation process.



Bank Digest

Directors *(December 31, 1991)*

(Standing) A. Pierce Stone; Paul A. DelaCourt; C. R. Hill, Jr.; Stephen Brobeck; R. E. Atkinson, Jr.; James G. Lindley
(Seated) Henry J. Faison; Anne Marie Whittemore; Edward H. Covell

Richmond

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

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
Executive Director
Consumer Federation of America
Washington, D.C.

Edward H. Covell
President
The Covell Company
Easton, Maryland

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

C. R. Hill, Jr.
Executive Vice President
Beckley National Bank
Oak Hill, West Virginia

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

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

Member Federal Advisory Council

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

(Standing) Richard M. Adams; F. Levi Ruark; Thomas R. Shelton; John R. Hardesty, Jr.
(Seated) Joseph W. Mosmiller; Daniel P. Henson, III; William H. Wynn

Baltimore

CHAIRMAN
John R. Hardesty, Jr.
President
Preston Energy, Inc.
Kingwood, West Virginia

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

Joseph W. Mosmiller
Chairman of the Board
Loyola Federal Savings and Loan Association
Baltimore, Maryland

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

Thomas R. Shelton
President
Case Foods, Inc.
Salisbury, Maryland

William H. Wynn
International President
United Food & Commercial Workers International Union, AFL-CIO & CLC
Washington, D.C.

Charlotte

CHAIRMAN
Anne M. Allen
President
Anne Allen & Associates, Inc.
Greensboro, North Carolina

Crandall C. Bowles
President
The Springs Company
Lancaster, South Carolina

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

David B. Jordan
President, Chief Executive Officer, and Director
Omni Capital Group, Inc. and OMNIBANK
Salisbury, North Carolina

Harold D. Kingsmore
President and Chief Operating Officer
Graniteville Company
Graniteville, South Carolina

William E. Masters
President
Perception, Inc.
Easley, South Carolina

L. Glenn Orr, Jr.
Chairman, President, and Chief Executive Officer
Southern National Corporation
Lumberton, North Carolina

(Standing) David B. Jordan; L. Glenn Orr, Jr.; Crandall C. Bowles; Harold D. Kingsmore
(Seated) William E. Masters; Anne M. Allen; Jim M. Cherry, Jr.

Advisory Councils *(December 31, 1991)*

Operations Advisory Committee

(Standing) Gazelle, BeHage, Baldwin, Schmitt, Pillow, Nicks, Albert, Denton, Wilson
(Seated) Smith, Lanier, Monhollon, Bunting, Greear, Shearer, Purvis, Thomas

Small Business and Agriculture Advisory Council

(Standing) Dickson, Hagans, Jefferds, Auman, Hane, Clark, Quicke
(Seated) Lynch, Reeves, Zimmerman, Blackshear, Stewart

Operations Advisory Committee

CHAIRMAN
William V. Bunting
Executive Vice President
Crestar Bank
Richmond, Virginia

William E. Albert
Vice President and Cashier
The First National Bank of Bluefield
Bluefield, West Virginia

Sunil F. Antani
Executive Vice President
Maryland National Bank
Baltimore, Maryland

Robert Baldwin
Senior Vice President
Crestar Bank, N.A.
Washington, D.C.

George E. Beckham
Senior Vice President
South Carolina Federal Savings Bank
Columbia, South Carolina

Robert L. BeHage
Operations Executive Officer
Sovran Bank, N.A.
Richmond, Virginia

Vernon D. Conway
Vice President
Mercantile-Safe Deposit & Trust Company
Baltimore, Maryland

David A. Denton
Vice President
Investors Savings Bank
Richmond, Virginia

Raymond L. Gazelle
Senior Vice President
Citizens Bank of Maryland
Laurel, Maryland

Harrison Giles
Executive Vice President
NCNB National Bank of North Carolina
Charlotte, North Carolina

Kenneth L. Greear
Vice President
United National Bank
Charleston, West Virginia

D. C. Hastings
President and Chief Executive Officer
Virginia Bank and Trust Company
Danville, Virginia

Walter A. Howell
Executive Vice President
The Riggs National Bank of Washington, D.C.
Washington, D.C.

Daniel E. Lanier, Sr.
Vice President
One Valley Bank
Charleston, West Virginia

Ashpy P. Lowrimore
Senior Vice President—City Executive
Southern National Bank of South Carolina
Florence, South Carolina

Clement E. Medley, Jr.
President and Chief Executive Officer
First Federal Savings and
Loan Association of Dunn
Dunn, North Carolina

Ricky B. Nicks
Senior Vice President
Wachovia Operational Services Corporation
Winston-Salem, North Carolina

Richard D. Pillow
Vice President
Virginia Credit Union League
Lynchburg, Virginia

Charles M. Purvis
Vice President
First Carolina Corporate Credit Union
Greensboro, North Carolina

James W. Ricci
President
Educational Systems Employees
Federal Credit Union
Bladensburg, Maryland

Kenneth L. Richey
Executive Vice President
Citizens & Southern National Bank
of South Carolina
Columbia, South Carolina

Charles C. Schmitt
Executive Vice President
Loyola Federal Savings and Loan Association
Glen Burnie, Maryland

H. Jerry Shearer
Executive Vice President and Cashier
Bank of Charleston, N.A.
Charleston, South Carolina

Rita A. Smith
Executive Vice President
West Virginia Savings League
Charleston, West Virginia

Thomas J. Strange
Vice President
South Carolina Credit Union League, Inc.
Columbia, South Carolina

Charles E. Thomas
Vice President
West Virginia Credit Union League, Inc.
Parkersburg, West Virginia

Rick A. Wieczorek
President
District of Columbia Credit Union League
Washington, D.C.

C. L. Wilson III
Senior Vice President
Branch Banking and Trust Company
Wilson, North Carolina

Small Business and Agriculture Advisory Council

CHAIRMAN
Joan H. Zimmerman
President
Southern Shows, Inc.
Charlotte, North Carolina

VICE CHAIRMAN
John W. Hane
Partner/Manager
Blackwoods Farm
Fort Motte, South Carolina

Watts Auman
Manager
Auman Farm
West End, North Carolina

Leonard A. Blackshear
President
Associated Enterprises, Inc.
Annapolis, Maryland

C. Champ Clark
Owner
C. C. Clark Farm
Chilhowie, Virginia

William M. Dickson
Owner
Spring Valley Farm
Ronceverte, West Virginia

Michele V. Hagans
President
Fort Lincoln New Town Corporation
Washington, D.C.

Joseph C. Jefferds, Jr.
Chairman
Jefferds Corporation
St. Albans, West Virginia

Louise Lynch
President and Chief Executive Officer
Courtesy Associates, Inc.
Washington, D.C.

Robert A. Quicke
President and General Manager
Southside Transportation Co. Inc.
Blackstone, Virginia

George B. Reeves
President
Reeves Agricultural Enterprises, Inc.
Chaptico, Maryland

Robert W. Stewart, Jr.
Retired Chairman and CEO
Engineered Custom Plastics Corporation
Easley, South Carolina

Comparative Financial Statements

CONDITION

	December 31, 1991	December 31, 1990
Assets		
Gold certificate account	$ 948,000,000.00	$ 1,008,000,000.00
Special Drawing Rights certificate account	961,000,000.00	961,000,000.00
Coin	98,795,794.25	105,399,370.81
Loans to depository institutions	105,000,000.00	5,500,000.00
Federal agency obligations	478,120,549.04	590,231,351.74
U.S. government securities		
Bills	10,491,442,040.07	10,472,630,017.39
Notes	8,030,219,833.90	8,507,532,420.48
Bonds	2,557,422,797.59	2,900,468,325.79
Total U.S. government securities	21,079,084,671.56	21,880,630,763.66
Cash items in process of collection	608,084,027.83	341,348,225.88
Bank premises	122,786,026.17	122,201,413.95
Furniture and equipment (net)	32,169,642.12	31,064,976.72
Other assets	2,025,123,541.59	2,892,933,948.51
Interdistrict settlement account	321,133,485.56	– 5,673,760,517.80
Accrued service income	5,006,657.05	5,122,043.92
TOTAL ASSETS	$26,784,304,395.17	$22,269,671,577.39
Liabilities		
Federal Reserve notes	$23,425,486,317.00	$18,904,361,212.00
Deposits		
Depository institutions	2,210,349,620.36	2,653,964,940.55
Foreign	9,165,000.00	9,300,000.00
Other	65,775,164.96	15,557,083.89
Total deposits	2,285,289,785.32	2,678,822,024.44
Deferred availability cash items	541,202,140.88	118,955,637.30
Other liabilities	191,311,951.97	271,411,903.65
TOTAL LIABILITIES	$26,443,290,195.17	$21,973,550,777.39
Capital Accounts		
Capital paid in	170,507,100.00	148,060,400.00
Surplus	170,507,100.00	148,060,400.00
TOTAL LIABILITIES AND CAPITAL ACCOUNTS	$26,784,304,395.17	$22,269,671,577.39

EARNINGS AND EXPENSES

	1991	1990
Earnings		
Loans to depository institutions	$ 1,088,903.10	$ 5,208,025.73
FDIC assumed indebtedness	4,352,731.95	14,830,154.07
Interest on U.S. government securities	1,600,439,604.86	1,791,699,651.19
Foreign currencies	152,907,455.51	160,792,748.66
Income from services	64,150,968.36	64,590,429.92
Other earnings	838,712.89	757,144.90
Total current earnings	$1,823,778,376.67	$2,037,878,154.47
Expenses		
Operating expenses	107,354,220.08	100,263,888.19
Cost of earnings credits	14,382,148.18	12,372,510.49
Net expenses	121,736,368.26	112,636,398.68
CURRENT NET EARNINGS	$1,702,042,008.41	$1,925,241,755.79
Additions to current net earnings		
Profit on sales of U.S. government securities (net)	11,254,136.75	5,866,671.72
Profit on foreign exchange transactions	23,177,649.40	132,642,248.68
All other	5,911.71	13,033.49
Total additions	34,437,697.86	138,521,953.89
Deductions from current net earnings		
Losses on foreign exchange transactions	0	0
All other	61,619.22	16,063.89
Total deductions	61,619.22	16,063.89
Net additions or deductions	+34,376,078.64	+138,505,890.00
Cost of unreimbursed Treasury services	6,210,205.74	6,766,914.72
Assessment for expenses of Board of Governors	6,947,500.00	6,446,700.00
Federal Reserve currency costs	18,464,922.00	18,507,249.00
NET EARNINGS BEFORE PAYMENTS TO U.S. TREASURY	$1,704,795,459.31	$2,032,026,782.07
Distribution of Net Earnings		
Dividends paid	$ 9,770,118.63	$ 8,693,666.59
Payments to U.S. Treasury (interest on Federal Reserve notes)	1,672,578,640.68	2,014,703,415.48
Transferred to surplus	22,446,700.00	8,629,700.00
TOTAL	$1,704,795,459.31	$2,032,026,782.07
Surplus Account		
Balance at close of previous year	$ 148,060,400.00	$ 139,430,700.00
Addition of profits for year	22,446,700.00	8,629,700.00
BALANCE AT CLOSE OF CURRENT YEAR	$ 170,507,100.00	$ 148,060,400.00
Capital Stock Account (Representing amount paid in, which is 50% of amount subscribed)		
Balance at close of previous year	$ 148,060,400.00	$ 139,430,700.00
Issued during the year	26,331,050.00	12,172,000.00
	174,391,450.00	151,602,700.00
Cancelled during the year	3,884,350.00	3,542,300.00
BALANCE AT CLOSE OF CURRENT YEAR	$ 170,507,100.00	$ 148,060,400.00

Summary of Operations

Operation	Number		Amount ($thousands)	
	1991	1990	1991	1990
Currency and coin processed				
Currency received and verified	1,959,126,000	1,983,165,000	25,000,656	24,016,852
Currency verified and destroyed	740,139,000	652,908,000	7,719,990	5,302,701
Coin bags received and verified	261,876	271,156	194,359	203,200
Checks handled				
Commercial—processed*	1,550,648,000	1,526,891,000	1,019,044,000	1,039,571,000
Commercial—packaged items	367,468,000	339,774,000	121,636,000	119,968,000
U.S. government	60,422,000	66,707,000	129,200,000	128,155,000
Collections items handled				
U.S. government coupons paid	24,358	32,859	55,108	10,603
Noncash items	106,172	126,268	278,960	278,658
Commercial book-entry transfers originated	284,110	247,973	2,309,359,000	1,824,636,000
Funds transfers sent and received	5,652,028	5,471,584	8,818,391,000	9,782,720,000
Food stamps redeemed	282,818,000	238,973,000	1,448,377	1,129,760
Loans advanced	454	463	4,635,089	16,025,063

**Excluding checks on this Bank.*

Officers (December 31, 1991)

Richmond

Robert P. Black, *President*

Jimmie R. Monhollon, *First Vice President*

Lloyd W. Bostian, Jr., *Senior Vice President*
J. Alfred Broaddus, 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*
John W. Scott, *Vice President*
Andrew L. Tilton, *Vice President*
Walter A. Varvel, *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. Morrissette, *Assistant Vice President*
Virginius H. Rosson, Jr., *Assistant Vice President*
G. Ronald Scharr, *Assistant Vice President*
Gary W. Schemmel, *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*
Whitley K. Crane, *Information Systems Officer*
Floyd M. Dickinson, Jr., *Examining Officer*
A. Linwood Gill III, *Examining Officer*
Jeffrey S. Kane, *Examining Officer*
Jeffrey M. Lacker, *Associate Research Officer*
Lawrence P. Nuckols, *Examining Officer*
Virginia W. Shelor, *Information Systems Officer*
Charlotte L. Waldrop, *Examining Officer*

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

Baltimore

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*
John I. Turnbull II, *Assistant Vice President*

R. William Ahern, *Automation Officer*
Patricia S. Tunstall, *Operations Officer*

Charlotte

Albert D. Tinkelenberg, *Senior Vice President*

Samuel W. Powell, Jr., *Vice President*
Robert F. Stratton, *Vice President*
Jeff A. Walker, *Vice President*

Marsha H. Malarz, *Assistant Vice President*

Lyle C. DeVane, *Operations Officer*
Ronald D. Steele, *Check Operations Officer*

Culpeper

John G. Stoides, *Senior Vice President*

James J. Florin III, *Assistant Vice President*
Thomas C. Judd, *Assistant Vice President*

Julius Malinowski, Jr., *Operations Officer*

Charleston

Richard L. Hopkins, *Vice President*

Columbia

Woody Y. Cain, *Vice President*

*On leave of absence.

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

Photo Identifications

Cover: View across Kanawha Plaza
Contents page: The Bank's new public walkway and terrace along the Haxall Canal
Digest page: Southeast corner of the Bank's building and grounds