Special Issue

The Region

Federal Reserve Bank of Minneapolis
1995 Annual Report

Formulating a Consistent Approach to Monetary Policy

Special Issue

The Region

Volume 10 Number 1
March 1996
ISSN 1045-3369

Federal Reserve Bank of Minneapolis
1995 Annual Report

Formulating a Consistent Approach to Monetary Policy

By Gary H. Stern, *President*
Federal Reserve Bank of Minneapolis

The views expressed herein are those of the author and not necessarily those of the Federal Reserve System.

President's Message

Recently, I was prompted to reflect anew about one of the Federal Reserve System's most important responsibilities — monetary policy — because I am a voting member of the Federal Open Market Committee (FOMC) again in 1996, and this tends to sharpen one's focus on policy.

For the FOMC, the goal of monetary policy is to achieve maximum economic performance over time, and the best way to achieve this goal is to maintain low inflation. There is little debate about the merits of a low inflation policy; however, as to how and why low inflation is best for the economy, there is disagreement and misunderstanding. In this essay, I offer some explanations for the benefits of long-run low inflation, with emphasis on resource allocation.

While a strong case can be made for a low inflation strategy in the long run, that strategy is often required to accommodate a belief that monetary policy can, and should, be used to soften the ups and downs in the short-run cyclical economy. This requirement presents a challenge in making short-run decisions that address immediate concerns, but that are also consistent with long-run price stability. For reasons that I explain in this essay, currently we don't have an adequate method to ensure that short-run monetary policy decisions are consistent with long-run objectives; clearly, this gap in knowledge demands further study.

I would like to thank colleagues from the Minneapolis Fed for their assistance with this paper: Mel Burstein, Ed Green, Art Rolnick, Warren Weber and, especially, Preston Miller.

Finally, although a disclaimer appears elsewhere in this Annual Report, allow me to emphasize the point: Any views expressed in this essay are my own and are not intended to speak for the Federal Reserve System.

Gary H. Stern
President

In the Federal Reserve, our working objective is to reduce inflation to the point where it no longer is a factor in economic decision making. As we succeed, resource allocation moves closer to optimal, with attendant benefits in growth and living standards.

Federal Reserve Bank of Minneapolis
1995 Annual Report

Formulating a Consistent Approach to Monetary Policy

Monetary policy is one of the principal responsibilities of the Federal Reserve, and certainly the one which receives the most attention. Simply stated, the goal of monetary policy is to achieve maximum economic performance over time. There is considerable agreement that the most significant contribution the Federal Reserve can make to this goal, characterized by sustained economic growth and improved living standards, is to achieve and maintain low inflation. However, the channels through which inflation influences growth are not clear, nor is it universally accepted that inflation even influences growth.

In addition to long-run emphasis on low inflation, there is a belief that monetary policy can improve economic performance by decreasing volatility in business activity — that is, by smoothing the business cycle. However, given the greatly diminished importance of the monetary aggregates in the policy process, a major challenge currently confronting the Federal Open Market Committee (FOMC) is to guarantee that short-run decisions designed to address cyclical concerns are consistent with the long-run low inflation objective. Formerly, the monetary aggregates helped to assure that monetary policy was anchored to low inflation and was "time consistent," but these roles have not as yet been filled by other variables or changes in procedures. Several proposals address these gaps in our practices, but our knowledge is insufficient to make a selection. In my view, it is imperative that we address these issues promptly.

As suggested above, the commitment to low inflation is widely shared among the members of the FOMC. Nevertheless, a host of questions arise associated with the focus on

low inflation: Will the low inflation environment contribute over time to growth and to higher standards of living? If so, how? How does low inflation contribute to financial stability? Can the Federal Reserve achieve and maintain low inflation? What weight, if any, should be given to cyclical fluctuations in unemployment and economic activity in policy determination? How should the Federal Reserve implement a low inflation policy?

Inflation and Growth

Evidence has accumulated suggesting that economies perform better, in terms of growth, employment and living standards, in low inflation environments than they do when inflation is persistently high. This evidence is principally a comparison — across countries and over long periods — of the association between economic performance, measured by, say, growth of output or growth of productivity, and inflation. The correlations indicate a negative relation; that is, the higher the inflation, the lower the rate of real growth. This evidence is neatly summarized in several recent academic papers.[1]

Evidence suggesting that low inflation promotes growth has motivated recent decisions by a number of central banks and governments, most notably New Zealand. Canada, the United Kingdom and Sweden also have moved in recent years to establish monetary policy regimes with official low inflation targets. Such actions indicate the preeminence of this goal and frequently signify increased independence for the central bank in pursuit of its policies as well. Decisions to adopt a policy objective of low inflation suggest that other policy-makers are reading the evidence pertaining to inflation and growth as we are.

An issue logical to consider next is: Why is low inflation relatively favorable for growth? After all, association does not prove causality; the relation between growth and inflation reported above may simply be fortuitous, or the causality may run the other way. This is indeed a difficult question, in part because until recently there were not well-articulated theories to explain the relationship. However, basic economic reasoning suggests that there are at least two channels through which inflation influences real economic perfor-

Given the greatly diminished importance of the monetary aggregates in the policy process, a major challenge currently confronting the Federal Open Market Committee (FOMC) is to guarantee that short-run decisions designed to address cyclical concerns are consistent with the long-run low inflation objective.

mance. First, in contrast to high inflation, low inflation leads to improved resource allocation because price signals are more easily and more accurately interpreted. Second, low inflation contributes to financial stability.[2] Let me explain.

Resource Allocation

Relative prices provide a guide in the allocation of resources. For example, a change in relative prices resulting from a change in demand patterns should shift resources and production from the activity whose price has fallen (relatively) to that whose price has risen, while a general rise in the price level—inflation—should not alter resource allocation in this way. But in an inflationary environment it may be difficult for individual decision makers to distinguish between inflation on the one hand and a change in relative prices on the other, and such confusion is especially likely if high inflation is correlated with variable inflation (inflation rates which fluctuate substantially from period to period), as it appears to be. Thus, resources may be seriously misallocated during inflationary periods.

In addition, inflation creates a problem in estimating the real interest rate. The real (that is, inflation-adjusted) interest rate—the relative price of current to future goods—is not explicitly given as a market price, but rather people deduce it from the nominal (that is, unadjusted) interest rate by taking inflation into account. When inflation becomes variable, this task of determining the true relative price becomes more difficult. The resulting misallocation of resources will adversely affect growth and living standards, because resources are not being put to their best use. Further, if the tax system is not indexed, inflation may adversely affect incentives to work and to invest. In the extreme, considerable resources may be devoted to efforts to avoid or to offset the ravages of inflation. And, without widespread indexation, inflation may well result in capricious transfers of wealth.

All of these effects diminish when inflation is persistently low. Indeed, in the Federal Reserve, our working objective is to reduce inflation to the point where it no longer is a factor in economic decision making. As we succeed, resource allocation moves closer to optimal, with attendant benefits in growth and living standards.

There is widespread agreement that the supply of money is determined by the central bank in the long run. Thus, with appropriate policy, the Federal Reserve can achieve and maintain low inflation — it should be expected to do so and can be held accountable for doing so.

Financial Stability

The second broad reason why low inflation favors growth is that it contributes, in my judgment, to financial stability. A low inflation economy is less likely to engender the sharp swings in asset prices and in expectations about such prices that have been so devastating to the financial system from time to time. Consider, for example, the damage wreaked by inflation on the savings and loan industry and some of its customers 15 or so years ago. Similarly, the "credit crunch" which inhibited the U.S. economy just a few years ago can be traced in part to capital pressures at commercial banks stemming from earlier misjudgments about inflation and asset values.

In a fundamental sense, problems associated with misjudgment of asset prices and their prospects are no different than the confusion about relative and general price changes described earlier. Investors and creditors misjudge price signals and draw incorrect conclusions, financial resources are then misallocated, and disruptions occur.

Financial stability is vital to a prosperous economy in a number of ways. Implicit in the preceding discussion, credit decisions, which determine the allocation of financial resources, are likely to be closer to optimal in a low inflation economy. This follows from the common sense notion that bankers and their customers will on average do a better job of assessing business prospects in an atmosphere of relatively stable prices.

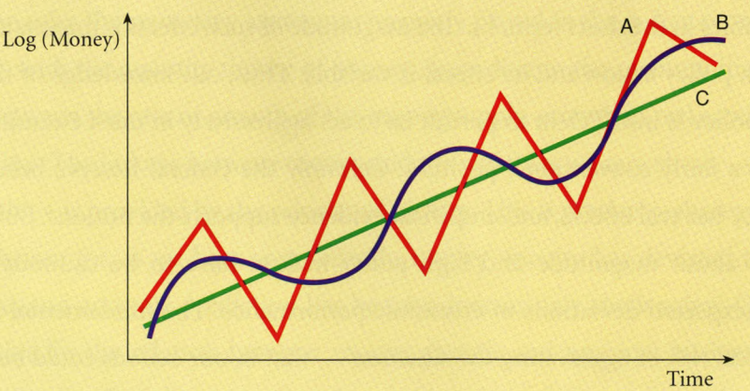
Financial stability also enhances an economy's ability to weather shocks — run-ups in energy prices, significant technological changes, unforeseen developments in the economies of major trading partners, and so forth — the bane of policy-makers and forecasters alike. Such events will cause dislocations, to be sure, but a financial system which can absorb them without significant feedback to economic activity helps to limit the extent and duration of the disruption. In these circumstances, real growth will be affected less than it would be under conditions in which the financial sector magnifies and spreads the effects of the shock. Furthermore, it is likely to be easier to identify the effects of shocks and the proper responses to them in a noninflationary environment.

Policy and Inflation

To this point, I have suggested that low inflation can make significant contributions to growth and prosperity through its effects on real resource allocation and on financial stability. This suggestion is not of much moment, however, if monetary policy cannot achieve, and maintain, low inflation. On this subject, fortunately, evidence and opinion are largely of one mind.

One of the few topics about which most macroeconomists agree is that inflation is first and foremost a monetary phenomenon.[3] It results from a long-term pattern of money creation which is excessive relative to the economy's ability to produce real goods and services. Further, there is widespread agreement that the supply of money is determined by the central bank in the long run. Thus, with appropriate policy, the Federal Reserve can achieve and maintain low inflation — it should be expected to do so and can be held accountable for doing so. In a general sense, then, the operational responsibility of the Federal Reserve is to provide for long-run growth in money consistent with low inflation. And, as I emphasized earlier, there should be significant economic benefits to the extent the Federal Reserve achieves this objective.

Long-run monetary growth of 4 percent, for example, could be consistent with 4 percent growth in each and every period, as illustrated by the straight line, C, or 4 percent growth in the long-run could also be consistent with a number of different patterns, as illustrated by lines A and B.



The preceding policy "prescription" glosses over at least one difficult issue, namely: The mandate to avoid excessive long-term money creation permits considerable latitude in how the stock of money moves in the short term and, therefore, is not necessarily useful for short-run policy determination. [*See graph on page 7.*] In the past, monetary aggregates were used to tie the short run to the long run, but the short-run relation between money and the economy has seriously deteriorated. Likewise, confidence in the use of monetary aggregates in practical policy setting has understandably been undermined.[4] Experience has convinced me that the aggregates are now of little value in short-term decision making. This leaves a significant gap in our procedures, especially when we want to calibrate a response to business cycle developments.

Business Cycle Considerations

Indeed, a critical question is: How can the Federal Reserve achieve low inflation and effectively respond to business cycle excesses in an environment in which the money supply is not a useful short-term guide to policy? Having previously addressed the money-inflation issue, I will turn to two other aspects of this question: (1) Can monetary policy influence real activity in the short run? and (2) If it can, should it?

These questions have long been debated in academia and in the Federal Reserve, and a consensus has not emerged. My position is that monetary policy has effects on real economic variables in the short term, but the magnitude of such effects is uncertain and the timing between policy action and its effects is variable. Thus, our knowledge of the short-run effects of policy is insufficient to permit us to act aggressively in most circumstances.

This is a fairly conventional position. Certainly the Federal Reserve behaves as if monetary policy has real effects, and empirical evidence supports the notion.[5] But because of uncertainty about magnitude and lags, policy-makers have to be cautious in their response to unexpected deviations in economic performance. The fundamental reason is that there is a real risk of aggravating the situation — that is, our actions could be destabilizing rather than constructive.

If not carefully implemented and explained, countercyclical policy might create confusion about the long-run objective of the FOMC, could disrupt private sector planning and decision making, and could add uncertainty and inflation premiums to market interest rates.

Some would go further and would maintain that even a cautious response to business cycle fluctuations is unwise, given all the reservations expressed over the years about fine tuning. But in my view it is not too difficult to argue in favor of some response. Given that monetary policy has real effects, it is only necessary to observe that short-run volatility inhibits long-run real growth. Put more forcefully, boom-bust cycles damage the economy, and therefore policy should be employed countercyclically to moderate, if possible, the tops of booms and the bottoms of contractions.[6]

Countercyclical policy to avoid or at least to moderate boom-bust cycles thus seems defensible but, as already suggested, such a policy should be pursued cautiously. It could be destabilizing if policy-makers are wrong about the size and timing of the effects of their actions, and thus it conceivably could inadvertently deepen a recession or stimulate inflation. Moreover, if not carefully implemented and explained, countercyclical policy might create confusion about the long-run objective of the FOMC, could disrupt private sector planning and decision making, and could add uncertainty and inflation premiums to market interest rates.

An Anchor for Policy

Money growth ranges provided a framework that reconciled the long-run commitment to low inflation with short-run reactions to economic developments. To see how, let me explain the roles the monetary aggregates formerly played in the policy process. The place to begin is with the quantity theory of money. According to the quantity theory, there is a relation between the rate of growth of the money supply, growth in real economic activity, and inflation. The linkage between money and the variables we care about — inflation and real growth — is provided by the velocity of money. This is precisely where recent difficulties have arisen for, as we have seen recently, money velocity has deviated from previous experience, and accurate prediction has become increasingly challenging. Over time, this deterioration in the relation between money growth and nominal business activity has afflicted virtually all of the conventional measures of money.

The quantity theory in its crude form would suggest a strict, mechanical pursuit of a precise target for money-stock growth. Although such a policy regime was approximated briefly to re-establish monetary policy credibility after the inflationary episode at the end of the 1970s, monetary aggregates have been used in a looser, more discretionary way in policy determination since that time. But it seems to me that the deteriorating relation between money growth and nominal business activity has undermined the advisability of even this looser policy regime.

To see why, consider how this regime worked. When the monetary aggregates were useful in policy determination, a rate of growth for an aggregate could be specified consistent with the FOMC's inflation objective and its understanding of the relations in question. For example, if the trend rate of growth in real GDP was estimated at 2.5 percent per annum, money velocity constant, and 3 percent an acceptable inflation outcome for the period in question, then money should expand at 5.5 percent per year. In practice, the Committee not only selected a midpoint for money growth — 5.5 percent in this example — but also established a range around the midpoint, recognizing both that these relations do not hold precisely on an annual basis and that flexibility to respond to unanticipated developments is desirable. When conditions turned out as expected, open market operations were conducted to keep the path of bank reserves or the federal funds rate, depending upon the short-run operating rule, consistent with desired money growth and, ultimately, inflation.

In this setup, the range for money supply growth fulfilled several functions. The midpoint of the range was typically established consistent with the Committee's inflation objective. When the aggregates were employed successfully, midpoints were reduced gradually over time, in keeping with the FOMC's desire to bring inflation down. The money supply was thus the "anchor" of policy — the variable on which the FOMC focused in order to pursue a low inflation policy.

The upper and lower bounds of the ranges served as the limits within which the Committee was prepared to see money growth deviate from its midpoint. That is, the

ranges defined acceptable short-run deviations in money growth — perhaps for cyclical reasons — which nevertheless were viewed as consistent with the Committee's commitment to low inflation. Because the ranges were relatively narrow, policy remained disciplined and, even if in error, was unlikely to be highly destabilizing.[7]

Consistent Policy Over Time

With the monetary aggregates no longer of significant value in the policy process, we find ourselves without an effective policy anchor — that is, without a quantitative way of indicating the FOMC's long-run objective and of guiding open market operations toward that objective — and without a means to define acceptable countercyclical action, whereby acceptable I mean an effective response to incipient booms or busts which does not compromise our long-run objective. What I am striving for is the concept of policy consistency over time: a countercyclical response which is consistent with, or can be reconciled with, the FOMC's long-run goal and which, furthermore, is seen as consistent by the public. To be sure, policy has been implemented effectively and largely successfully in recent years, in my view, without an explicit anchor and a method to assure time consistency. Nevertheless, the FOMC's judgment may not always be adequate, and hence it is desirable to find a more

systematic way to conduct policy so as to achieve and maintain low inflation and to moderate business cycle extremes.[8]

There are several ways we might go about establishing a framework for a more systematic policy capable of addressing these two matters. But before describing specific proposals, we need criteria by which to evaluate the options. Based on the preceding discussion of the roles formerly played by measures of the money supply, important criteria are:

(1) Does the proposal contain a clear and appropriate policy anchor which guides monetary policy to the low inflation objective?

More formally, is there a variable that bears a close and unchanging relationship with inflation that the FOMC can influence in a predictable way?

(2) Does the proposal have an effective way of delimiting the policy response to business cycle fluctuations?

Again, more formally, is there a way of putting a range around the anchor that allows responses to fluctuations, but limits those responses to ensure consistency with the FOMC's low inflation goal?

Of the three following proposals, none is especially original, and none is entirely satisfactory. Nevertheless, they are offered to illustrate a range of available approaches and to stimulate further thought about how we can best establish an anchor for, and assure time consistency in, monetary policy.

One approach to a more systematic framework for policy implementation is to resurrect the monetary aggregates, based on the following considerations. We would acknowledge that the aggregates have lost value as short-term guides to policy, but at the same time we would reaffirm that inflation remains a long-term monetary phenomenon. The responsibility of the central bank, thus, would not change: It is to keep money supply growth within bounds over long periods — say 10 years — so as to keep inflation low.

This proposal effectively satisfies the first criterion specified above. Money growth would once again become the anchor of policy, with exclusive emphasis on its long-run performance in view of its shortcomings as a short-term guide. Assuming past relations

There is only limited agreement at the moment about the systematic conduct of policy, in view of the diminution of the role of the money supply measures. I have offered several suggestions to address this issue, including exclusive focus on the long-run growth in money, on the inflation objective itself and on a real short-term interest rate.

hold, long-run monetary control should result in long-run inflation control. The evidence as to which aggregate to select is mixed, but it appears to be a "horse race" between M2 and the monetary base; either would probably do.

The proposal to concern ourselves only with the long-run performance of a monetary aggregate fares less well against the second criterion of disciplining the response of monetary policy to changes in business conditions. On one interpretation, in the single-minded pursuit of moderate money growth and low inflation, the proposal would permit no reaction to significant deviations in business activity from what was anticipated. This is a potentially costly policy stance if earlier observations about the desirability of containing instability — that is, smoothing boom-bust cycles — are accurate. But another interpretation of the proposal suggests that "anything goes." This is because the proposal simply leaves open the questions of when or how to respond to unanticipated or undesired developments in the economy.

A second alternative to enhance systematic policy implementation is to focus directly on the policy objective, the rate of inflation, and adjust the instrument, say the federal funds rate, to influence the objective as desired. Intuitively, this approach is appealing, for it does not involve "extraneous" variables like intermediate policy targets. Presumably, an empirical model of the economy would be used to solve for the path of the federal funds rate consistent with the FOMC's inflation goal, and the Committee would authorize open market operations to achieve the funds rate path.

Arrayed against the two criteria specified above, the virtues and shortcomings of this proposal are evident. Since it focuses directly on inflation, it would seem to satisfy the first criterion of providing an appropriate anchor for policy. One has to be cautious, however, because our goal is optimal long-run economic performance and, as discussed above, the evidence suggests that low inflation over the long run is favorable for growth; but I am aware of no evidence which indicates that inflation control period by period is conducive to real growth. Indeed, even proposals to maintain constant growth in the money supply have recognized that there could well be a lot of period-by-period price volatility.

What I am striving for is the concept of policy consistency over time: a countercyclical response which is consistent with, or can be reconciled with, the FOMC's long-run goal and which, furthermore, is seen as consistent by the public.

Although a multiperiod inflation targeting procedure would seem to ameliorate this problem, it also has problems. With a short-period horizon, the instability problems associated with a single-period horizon remain. But with a long-period horizon, there is basically no policy discipline in the short run.

A third approach to the issue of the systematic implementation of policy is for the Federal Reserve to focus on a short-term market interest rate. One question is whether the interest rate should be nominal or real. Based on stability considerations, a real interest rate seems preferable. The argument that pegging a nominal interest rate can be destabilizing is now familiar: Normally, high interest rates are associated with restrictive monetary policy, but if expected inflation rises for some reason and the Federal Reserve pegs the nominal rate, then policy actually becomes increasingly expansive. A symmetric problem occurs with nominal rate pegging when inflation expectations diminish or when deflation sets in. This problem does not apply to a real short-term interest rate, as I argue below.

Another question, then, is how to implement a real interest rate proposal. One way would be to use an empirical macro model to solve for the real rate, or the path of the real rate, consistent with the Federal Reserve's low inflation objective. Given its best estimate, or best judgment, of inflation expectations, the FOMC would then establish the nominal rate that produced the desired real rate. Presumably, the more actual and prospective inflation are above the goal, the higher the nominal rate a given real-rate target would imply. If one believes that this pattern of nominal rate setting is what the FOMC ought to be doing, then a virtue of real-rate targeting is that the FOMC would implement it in a stable and self-regulating way. Adjustment of the real-rate target would be justified when the environment of the economy changes in some fundamental way, such as an increase in the rate of return to capital investment. Advocates of a real-rate target believe that it would thus lead the FOMC to focus its deliberations appropriately on long-term considerations, without sacrificing responsiveness to short-term disturbances in the economy.

An advantage of this approach is that economic theory suggests that real rather than nominal interest rates matter for spending decisions, so the Federal Reserve would in

fact be emphasizing a variable that can be expected to affect economic performance. This observation implies that this proposal could fare relatively well against the second criterion of defining the policy response to cyclical disturbances in activity.

Since there could well be a long-run correlation between real rates and inflation,[9] the proposal would seem to have the potential to achieve the Federal Reserve's low inflation objective. However, the first criterion specified above calls for a clear and appropriate policy anchor; a real rate may be appropriate but its clarity is another matter. There is not agreement on measurement of the real rate nor on its controllability.

Indeed, critics of the real rate proposal assert that the Federal Reserve cannot hope to control a real rate of interest, which they view as ground out by interactions in the real economy independent of monetary policy. I hold a somewhat different view. In a world with interest-bearing and noninterest-bearing government fiat debt — bonds and money — there must be frictions in the marketplace which induce the public to hold them both, since bonds dominate on a rate of return basis. An implication of this observation is that monetary policy actions which alter the relative supplies of money and bonds held by the public affect real interest rates.

Conclusion

The Federal Reserve is committed to achieving and maintaining low inflation. This is an objective the central bank can legitimately be expected to accomplish and for which it can be held accountable.

Although important, accountability is not the reason to focus on low inflation, however. Rather, a sustained environment of low inflation should contribute over time to economic growth and to improvement of living standards. The way in which low inflation contributes to these outcomes is not entirely understood, and I have suggested in this essay that positive effects on real resource allocation and on financial stability are key.

There is only limited agreement at the moment about the systematic conduct of policy, in view of the diminution of the role of the money supply measures. I have offered

Recent policy successes notwithstanding, establishing a method for the systematic conduct of policy is worthy of serious consideration and debate going forward. It is imperative that we identify an anchor for policy and a procedure which assures time consistency, so that short-term decisions are related appropriately to the long-term commitment to low inflation.

several suggestions to address this issue, including exclusive focus on the long-run growth in money, on the inflation objective itself and on a real short-term interest rate. Each of these proposals has its flaws, and I do not think that we possess sufficient knowledge at present to make a selection with confidence. However, recent policy successes notwithstanding, establishing a method for the systematic conduct of policy is worthy of serious consideration and debate going forward. It is imperative that we identify an anchor for policy and a procedure which assures time consistency, so that short-term decisions are related appropriately to the long-term commitment to low inflation.

ENDNOTES

[1]I am referring to "The Growth Effects of Monetary Policy," by V. V. Chari, Larry E. Jones and Rodolfo E. Manuelli, *Quarterly Review*, Federal Reserve Bank of Minneapolis, Fall 1995 (http://res.mpls.frb.fed.us/research/qr/qr19/qr19-4-2.html); "Private Information, Money, and Growth: Indeterminacy, Fluctuations and the Mundell-Tobin Effect," by Costas Azariadis and Bruce D. Smith, forthcoming in the *Journal of Economic Growth*, 1996; and "Inflation and Economic Growth," by Robert J. Barro, National Bureau of Economic Research, Working Paper 5326, 1995.

[2]A third channel related to distortions stemming from the interactions between inflation and financial regulations is discussed in Chari, Jones and Manuelli, 1995.

[3]A recent study shows a high correlation between the rate of growth of the money supply and the rate of inflation; this correlation holds across three definitions of money and in a sampling of 110 countries. "Some Monetary Facts," by George T. McCandless Jr. and Warren E. Weber, *Quarterly Review*, Federal Reserve Bank of Minneapolis, Summer 1995 (http://res.mpls.frb.fed.us/research/qr/qr19/qr19-3-1.html).

[4]In "The Rise and Fall of Money Growth Targets as Guidelines for U.S. Monetary Policy," 1995, Benjamin Friedman writes: "In 1987 the Federal Reserve gave up setting a target for the narrow money stock but continued to do so for broader measures of money. In 1993 the Federal Reserve publicly acknowledged that it had 'downgraded' even its broad money growth targets — a change that most observers of U.S. monetary policy had already noticed long before."

When Lawrence J. Christiano investigated the supposed change in the relationship between money and the economy, he examined two types of models — the first showed a break in the relationship, and the second revealed no break. However, in the second model the link between monetary aggregates and inflation was so weak that it would be of no practical use for short-term policy-making anyway. "Money and the U.S. Economy in the 1980s: A Break from the Past?" *Quarterly Review*, Federal Reserve Bank of Minneapolis, Summer 1986 (http://res.mpls.frb.fed.us/research/qr/qr10/qr10-3-1.html).

[5]John H. Cochrane, in "Identifying the Output Effects of Monetary Policy," National Bureau of Economic Research, Working Paper 5154, 1995, cites a large amount of recent work which concludes that anticipated monetary policy changes can have real effects on the economy. For example, Cochrane cites David H. Romer and Christina D. Romer, "What Ends Recessions?" in *NBER Macroeconomics Annual* (1994), Cambridge: MIT Press; and Lawrence J. Christiano et. al., "Liquidity Effects and the Monetary Transmission Mechanism," *American Economic Review* 82, 346-53.

[6]A recently published study marshals considerable evidence that economic growth is inversely related to volatility (Garey Ramey and Valerie A. Ramey, "Cross-Country Evidence on the Link Between Volatility and Growth," *American Economic Review*, 85, 1138-1151).

[7]Although the ranges occasionally were violated, the FOMC had to explain the errors to Congress. The FOMC generally preferred to abide by the ranges.

[8]Interestingly enough, in his recent Nobel prize acceptance speech, Robert E. Lucas Jr. grapples with similar issues. Lucas concludes that, absent a better understanding of monetary non-neutralities, it does not seem possible "to determine whether an optimal monetary policy should react in some way to the state of the economy or should be fixed on some pre-assigned objective ... In the meantime, policy must be made, nevertheless, and existing theory, empirically well-tested, offers much useful guidance."

[9]The legal restrictions theory implies a long-run relationship connecting monetary policy, real interest rates and inflation (see Wallace). The broad implications of this theory seem consistent with observations (see Miller-Todd and Chin-Miller).

Neil Wallace, "A Legal Restrictions Theory of the Demand for 'Money' and the Role of Monetary Policy," *The Rational Expectations Revolution* (1994), Cambridge: MIT Press.

Preston J. Miller and Richard M. Todd, "Real Effects of Monetary Policy in a World Economy," *Journal of Economic Dynamics & Control* 19, 1995 (http://res.mpls.frb.fed.us/research/sr/group3/sr154.html).

Dan Chin and Preston J. Miller, "Fixed vs. Floating Exchange Rates: A Dynamic General Equilibrium Analysis," Staff Report 194, Federal Reserve Bank of Minneapolis, 1995 (http://res.mpls.frb.fed.us/research/sr/group3/sr194.html).

STATEMENT OF CONDITION (in thousands)

	December 31, 1995	December 31, 1994
Assets		
Gold Certificate Account	$203,000	$230,000
Special Drawing Rights	180,000	186,000
Coin	20,333	20,776
Loans to Depository Institutions	3,620	10,922
Securities:		
Federal Agency Obligations	47,553	80,091
U.S. Government Securities	6,827,773	8,027,738
Cash Items in Process of Collection	450,153	380,107
Bank Premises and Equipment		
Less Depreciation of $40,889 and $39,393	61,766	54,224
Foreign Currencies	562,996	588,722
Other Assets	172,658	187,716
Interdistrict Settlement Fund	(1,081,961)	(1,896,665)
Total Assets	$7,447,891	$7,869,631
Liabilities		
Federal Reserve Notes	$5,989,724	$6,552,810
Deposits:		
Depository Institutions	740,546	611,857
Foreign, Official Accounts	3,762	3,766
Other Deposits	2,137	15,235
Total Deposits	746,445	630,858
Deferred Credit Items	411,674	379,599
Other Liabilities	102,142	109,840
Total Liabilities	7,249,985	7,673,107
Capital Accounts		
Capital Paid In	98,953	98,262
Surplus	98,953	98,262
Total Capital Accounts	197,906	196,524
Total Liabilities and Capital Accounts	$7,447,891	$7,869,631

Notes to Financial Statements

A. Accounting Changes

Effective January 1, 1995, the Bank began using the accrual method of accounting to recognize the obligation to provide benefits to former or inactive employees consistent with the requirements of Statement of Financial Accounting Standards (SFAS) No. 112, "Employers' Accounting for Postemployment Benefits." Prior to 1995, the Bank recognized costs for postemployment benefits when paid. The cumulative effect of this change in accounting for benefits was recognized by the Bank as a one-time deduction from income of $2.8 million. Additionally, the Bank recognized an increase in 1995 operating expenses of approximately $.4 million as a result of the change in accounting for these costs.

Effective January 1, 1995, the Bank also began accruing a liability for employees' rights to receive compensation for future absences consistent with SFAS No. 43, "Accounting for Compensated Absences." Prior to 1995, the Bank recognized these costs when paid. The cumulative effect of this change in accounting for compensated absences was recognized by the Bank as a one-time charge to expense of $2.5 million. Ongoing operating expenses for the year ended December 31, 1995, were not materially impacted by the change in accounting for these costs.

B. Bank Premises and Commitments

Based on current facility impairments of the Federal Reserve Bank premises located at 250 Marquette Avenue, a write-down within Net Deductions was taken in the amount of $14.5 million. When the building is vacated in mid-1997, the residual book value of $1.0 million will have been totally depreciated. In addition, contracts and related expenditures totaling approximately $138 million have been committed, or are expected, through 1997 for land, construction, relocation and other costs related to the new head office building at 90 Hennepin Avenue. As of December 31, 1995, $43.1 million of the $138 million was recognized.

INCOME AND EXPENSES (in thousands)

For the Year Ended December 31,	1995	1994
Current Income		
Interest on U.S. Government Securities and Federal Agency Obligations	$454,145	$425,703
Interest on Foreign Currency Investments	20,913	23,864
Interest on Loans to Depository Institutions	3,550	4,162
Revenue from Priced Services	41,885	42,443
All Other Income	569	313
Total Current Income	521,062	496,485
Current Expenses		
Salaries and Other Personnel Expenses	47,920	45,521
Retirement and Other Benefits	12,532	11,224
Travel	2,703	2,784
Postage and Shipping	4,145	5,830
Communications	606	573
Software	1,436	1,465
Materials and Supplies	2,495	2,226
Building Expenses:		
Real Estate Taxes	884	1,143
Depreciation—Bank Premises	894	868
Utilities	930	965
Rent and Other Building Expenses	1,470	1,523
Furniture and Operating Equipment:		
Rentals	285	1,003
Depreciation and Miscellaneous Purchases	3,584	4,194
Repairs and Maintenance	2,735	2,873
Cost of Earnings Credits	6,147	5,389
Net Costs Distributed/Received from Other FR Banks	7,646	4,840
Other Operating Expenses	2,462	1,888
Total Current Expenses	98,874	94,309
Reimbursed Expenses	(11,591)	(10,886)
Net Expenses	87,283	83,423
Current Net Income	433,779	413,062
Net (Deductions) or Additions	7,014	64,171
Less:		
Assessment by Board of Governors:		
Board Expenditures	4,262	3,925
Federal Reserve Currency Costs	6,356	7,545
Dividends Paid	5,863	5,684
Payments to U.S. Treasury	423,621	452,661
Transferred to Surplus	$ 691	$ 7,418
Surplus Account		
Surplus, January 1	$ 98,262	$ 90,844
Transferred to Surplus—as above	691	7,418
Surplus, December 31	$ 98,953	$ 98,262

DIRECTORS FEDERAL RESERVE BANK OF MINNEAPOLIS HELENA BRANCH *December 31, 1995*

Gerald A. Rauenhorst
Chairman and Federal Reserve Agent

Jean D. Kinsey
Deputy Chair

CLASS A ELECTED BY MEMBER BANKS

Susanne V. Boxer
President
MFC First National Bank
Houghton, Michigan

Jerry B. Melby
President
First National Bank
Bowbells, North Dakota

William S. Pickerign
President
The Northwestern Bank
Chippewa Falls, Wisconsin

CLASS B ELECTED BY MEMBER BANKS

Dennis W. Johnson
President
TMI Systems Design Corp.
Dickinson, North Dakota

Clarence D. Mortenson
President
M/C Professional Associates Inc.
Pierre, South Dakota

Kathryn L. Ogren
Owner
Bitterroot Motors Inc.
Missoula, Montana

CLASS C APPOINTED BY THE BOARD OF GOVERNORS

Jean D. Kinsey
Professor of Consumption and Consumer Economics
University of Minnesota
St. Paul, Minnesota

David A. Koch
Chairman and Chief Executive Officer
Graco Inc.
Golden Valley, Minnesota

Gerald A. Rauenhorst
Chairman and Chief Executive Officer
Opus Corporation
Minneapolis, Minnesota

Matthew J. Quinn
Chair

Lane W. Basso
Vice Chair

APPOINTED BY THE BOARD OF GOVERNORS

Lane W. Basso
President
Deaconess Research Institute
Billings, Montana

Matthew J. Quinn
President
Carroll College
Helena, Montana

APPOINTED BY THE BOARD OF DIRECTORS FEDERAL RESERVE BANK OF MINNEAPOLIS

Donald E. Olsson, Jr.
President
Ronan State Bank
Ronan, Montana

Ronald D. Scott
President and Chief Executive Officer
First State Bank
Malta, Montana

Sandra M. Stash
Montana Facilities Manager
ARCO
Anaconda, Montana

FEDERAL ADVISORY COUNCIL MEMBER

Richard M. Kovacevich
President and Chief Executive Officer
Norwest Corporation
Minneapolis, Minnesota

MINNEAPOLIS BOARD OF DIRECTORS

Seated *(from left)*: William S. Pickerign, Gerald A. Rauenhorst, David A. Koch, Jean D. Kinsey; standing *(from left)*: Clarence D. Mortenson, Susanne V. Boxer, Kathryn L. Ogren, Dennis W. Johnson, Jerry B. Melby

FEDERAL ADVISORY COUNCIL MEMBER

Richard M. Kovacevich

HELENA BRANCH DIRECTORS

Seated *(from left)*: Lane W. Basso, Ronald D. Scott; standing *(from left)*: Matthew J. Quinn, Sandra M. Stash, Donald E. Olsson, Jr.

Advisory Council on Small Business, Agriculture and Labor

December 31, 1995

Gary L. Brown
President
Best Western Town 'N Country Inn
Rapid City, South Dakota

Jeanne Davison
Owner
Butterfield Farms
Hokah, Minnesota

Clarence R. Fisher
Chairman and President
Upper Peninsula Energy Corp.
Upper Peninsula Power Co.
Houghton, Michigan

Thomas Gates
President and Chief Executive Officer
Hilex Corp.
Eagan, Minnesota

William N. Goldaris
Vice President
Globe Inc.
Minneapolis, Minnesota

Howard Hedstrom
Partner
Hedstrom Lumber Co.
Grand Marais, Minnesota

Ronald Isaacson
President
Mid-Wisconsin Bank
Medford, Wisconsin

Dennis W. Johnson, Chairman
President
TMI Systems Design Corp.
Dickinson, North Dakota

Dominik Luond
Owner
Country Pride Meats
Ipswich, South Dakota

Sandra Peterson
President
Minnesota Federation of Teachers
St. Paul, Minnesota

Virginia Tranel
Rancher
Billings, Montana

Harry Wood
President
H.A. & J.L. Wood Inc.
Pembina, North Dakota

Advisory Council on Small Business, Agriculture and Labor

Seated *(from left)*: Thomas Gates, Virginia Tranel, Ronald Isaacson, Clarence R. Fisher, William N. Goldaris; standing *(from left)*: Gary L. Brown, Dennis W. Johnson, Jeanne Davison

OFFICERS FEDERAL RESERVE BANK OF MINNEAPOLIS *December 31, 1995*

Gary H. Stern	*President*
Colleen K. Strand	*First Vice President*
Melvin L. Burstein	*Executive Vice President, Senior Advisor, General Counsel and E.E.O. Officer*
Sheldon L. Azine	*Senior Vice President*
James M. Lyon	*Senior Vice President*
Arthur J. Rolnick	*Senior Vice President and Director of Research*
Theodore E. Umhoefer, Jr.	*Senior Vice President*
S. Rao Aiyagari	*Senior Research Officer*
John H. Boyd	*Senior Research Officer*
Scott H. Dake	*Vice President*
Kathleen J. Erickson	*Vice President*
Creighton R. Fricek	*Vice President and Corporate Secretary*
Karen L. Grandstrand	*Vice President*
Edward J. Green	*Senior Research Officer*
Caryl W. Hayward	*Vice President*
William B. Holm	*Vice President*
Ronald O. Hostad	*Vice President*
Bruce H. Johnson	*Vice President*
Thomas E. Kleinschmit	*Vice President*
Richard L. Kuxhausen	*Vice President*
David Levy	*Vice President and Director of Public Affairs*
Susan J. Manchester	*Vice President*
Preston J. Miller	*Vice President and Monetary Advisor*
Susan K. Rossbach	*Vice President and Deputy General Counsel*
Charles L. Shromoff	*General Auditor*
Thomas M. Supel	*Vice President*
Warren E. Weber	*Senior Research Officer*
Robert C. Brandt	*Assistant Vice President*
Jacquelyn K. Brunmeier	*Assistant Vice President*
James T. Deusterhoff	*Assistant Vice President*
Debra A. Ganske	*Assistant General Auditor*
Michael Garrett	*Assistant Vice President*
Jean C. Garrick	*Assistant Vice President*
Peter J. Gavin	*Assistant Vice President*
Linda M. Gilligan	*Assistant Vice President*
JoAnne F. Lewellen	*Assistant Vice President*
Kinney G. Misterek	*Assistant Vice President*
H. Fay Peters	*Assistant General Counsel*
Richard W. Puttin	*Assistant Vice President*
Paul D. Rimmereid	*Assistant Vice President*
David E. Runkle	*Research Officer*
James A. Schmitz	*Research Officer*
Claudia S. Swendseid	*Assistant Vice President*
Kenneth C. Theisen	*Assistant Vice President*
Richard M. Todd	*Assistant Vice President*
Thomas H. Turner	*Assistant Vice President*
Niel D. Willardson	*Assistant Vice President*
Marvin L. Knoff	*Supervision Officer*
Robert E. Teetshorn	*Supervision Officer*

HELENA BRANCH

John D. Johnson	*Vice President and Branch Manager*
Samuel H. Gane	*Assistant Vice President and Assistant Branch Manager*

The Region

Public Affairs
Federal Reserve Bank of Minneapolis
P.O. Box 291
Minneapolis, Minnesota 55480-0291

Coming in the next issue of The Region

The Economic War Among the States:
A special issue devoted to a national multimedia symposium on questions related to states' use of incentives to attract business.

The symposium includes several forums:

- A May conference in Washington, D.C., with national experts in business, labor, government and academia
- On-line discussions with national experts through live chat rooms and bulletin boards; also, an on-line case study for public participation from Harvard University's Kennedy School of Government
- A series of reports, including a live call-in program, from public radio stations; also, major keynote speeches from the conference on many public radio stations

The Region's report on the symposium will include conference proceedings, papers, and information from the on-line discussions.

The symposium is produced by Minnesota Public Radio, with a grant from the Ford Foundation.

Further information is available on the Internet at:
http://www.mnonline.org/mpr/econwar.htm