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Quick-Fix Economics: A Look at the Issues

By Roger Guffey

The need for a clear public understanding of economic policy is more critical than ever in the face of continuing debates about the nation's basic strategy for wringing out inflation and bringing about sustainable economic growth. The cornerstones of this strategy, as you know, are reduced taxes, reduced government spending, reduced regulation, and slower growth in money and credit. In my judgement, this program is generally on track. Taxes are being reduced, regulations are being pared, and growth in the supply of money and credit is being reduced by the Federal Reserve.

However, our current economic concerns reflect the fact that a major element of the program—reduced government spending—has not been fully implemented. As a result, large budget deficits are now being projected for years to come. These deficits, in turn, are fueling inflationary expectations, keeping interest rates high, and thereby casting a pall over the economic outlook.

In periods of economic weakness, such as we are now experiencing, there are always calls for quick-fix economic solutions and proposals for tinkering with economic policy procedures or market forces.

Roger Guffey is president of the Federal Reserve Bank of Kansas City. This article is taken from his remarks May 3, 1982, in Kansas City, Missouri, before the annual meeting of the Society of American Business and Economic Writers.

In evaluating quick-fix solutions for reducing high interest rates, we must remember that the Federal Reserve has adopted and is adhering to a policy of reducing the growth of money over time to a rate consistent with sustainable noninflationary economic growth. It is well accepted that moderate growth in money and credit translates into a reduced pace of inflation. And, in my judgement, the Federal Reserve's long-run targets are absolutely appropriate and consistent with the nation's overall economic strategy. The record is quite clear. The Federal Reserve has established its credibility by achieving slower growth in money over time and, by doing so, has contributed importantly to a welcome reduction in the rate of inflation.

Despite this credible record of Federal Reserve monetary policy, proposals for quick fixes to bring down interest rates continue to be heard. Some of these proposals are, indeed, very beguiling.

One proposal receiving attention these days is a suggestion that the Federal Reserve be made a part of the U.S. Treasury. Such a change would bring the Federal Reserve under the control of the administration, making it easier, some believe, to "coordinate" the tools of monetary and fiscal policy and, therefore, to meet our nation's desired economic goals.

There is no question that the Federal Reserve is a public institution and that it must be

responsive to political input in the broad sense. We in the Federal Reserve recognize that the central bank must take into account both the wishes and the long-run best interests of the American public. Our steady anti-inflation course of recent years is evidence, I believe, of that accountability.

But the proposals to fold the Federal Reserve into the Treasury are not, in my view, consistent with this broader interpretation of political responsiveness. Rather, these proposals would subject the monetary policy process to the short-run influences of political expediency. Moreover, mechanisms are already in place—through the Full Employment and Balanced Growth Act—to require the Federal Reserve to establish periodic monetary targets and then report to Congress on progress toward meeting those targets.

When Congress designed the Federal Reserve System and delegated to it the responsibility for managing the money supply, the central bank's independence was clearly established. Congress has observed an independent Federal Reserve for nearly 70 years and has continued to reaffirm the separation of monetary policy implementation from partisan politics. The reason for doing so is abundantly clear. World economic history is full of lessons of what happens when politicians become involved in managing money. Inevitably too much money is created. This is followed by rampant inflation and a deterioration of the nation's economic and political framework.

Therefore, we should be particularly wary of attempts to weaken the independence and the resolve of the central bank to keep monetary policy on a proper course no matter how the winds of political expediency may blow at a given time.

Most rational observers would agree that tampering with Federal Reserve independence is fundamentally unwise. But other ideas are being proposed which appear to be less far-

reaching in impact. These proposals make specific suggestions about how the Federal Reserve should *conduct* monetary policy. The most vocal ideas come from some of those whom I view as extreme monetarists, who believe that the growth of money should and can be controlled with absolute precision, with predictable economic growth and stability the natural result.

It's true that because of the link between money and economic activity, the Federal Reserve has adopted procedures and is currently formulating policy within a generalized monetarist framework, such as by using the monetary targeting approach. And the adoption of this targeting approach has helped the Federal Reserve contribute importantly to the declining inflation rate. Nevertheless, our monetarist critics continue to be unhappy. If only the Federal Reserve would smooth out short-run money growth, they say, interest rates would then come down. Or, they say, if the Federal Reserve would focus on just one measure of money, erratic money growth behavior would then be avoided. Let's look at these two issues.

First, what about the proposition that the Federal Reserve should closely control the short-run growth of money? If this were done, it is contended, the money growth path would be smooth, uncertainty would vanish, and interest rates would fall.

In my view, however, the Federal Reserve simply cannot control the monetary growth rate precisely on a weekly, monthly, or even a quarterly basis. Most of the nation's money stock consists of deposits at depository institutions, and the public's use of these deposits are not and should not be controlled by the Federal Reserve. We do have the ability to influence the money supply over the longer term by affecting the volume of reserves available, which in turn, influences the lending and investing activities of depository institutions.

Furthermore, and more important to the issue, the Federal Reserve has no control over the public's demand for money, which we know to be quite volatile in the short run. This volatility frequently causes wide short-run swings in the growth rate of money. Thus, the Federal Reserve can do little about short-run swings in money growth, and no tinkering with monetary control procedures will allow the Federal Reserve to closely control the weekly, monthly, or quarterly growth rate of money. I should also note that those who advocate procedures for greater short-run control completely ignore or discount the greater interest rate volatility that would accompany such procedures.

Next, what about the proposal that erratic short-term money growth could be avoided if the Federal Reserve would simply focus on one definition of money? In my view, such tunnel vision would be risky, primarily because of the rapid financial innovation now taking place.

The recent growth of money market funds, cash sweep accounts, and other new financial techniques is a troubling issue for monetary policy at the present time. Innovation is having an important impact on the public's demand for money balances, complicating our understanding of what constitutes money and, as a result, the relationship of money to economic activity.

For example, financial innovation has led to some reduction in the public's demand for traditional transaction balances. This shift affected the closely watched M1 measure of money in 1981 and is probably continuing this year. For other, not fully understood reasons, M1 has been surprisingly strong this year, making interpretation of its behavior more difficult. The broader measures of money have also been difficult to interpret, because of financial innovation. For example, M2 has been affected by the public's shifts to money

market funds and other funds included in this broad measure. In view of these problems of interpretation, it seems clear to me that it would be a mistake for the Federal Reserve to focus on only one of the current measures of the money supply.

Thus, the Federal Reserve must retain its flexibility in the face of financial innovation. If the monetary aggregates are made less reliable guides by innovation, then the risk of errant policy can only be compounded by limiting the Federal Reserve's flexibility to watch various aggregates.

Some of our monetarist friends have put forward other proposals of a technical nature. For example, they suggest that imposing a system of contemporaneous reserve requirements on depository institutions would improve our short-run monetary control. A companion proposal calls for the Federal Reserve to adopt a penalty discount rate. Our research indicates that a penalty rate would help monetary control *only* if contemporaneous reserve accounting were implemented. And if we did implement CRA, such procedures would be costly for financial institutions to implement and, our research shows, would produce little meaningful benefit in achieving firmer monetary control. More importantly, these two changes would likely increase interest rate volatility substantially, and lead to undesirable disruptions in the financial and real sectors of the economy.

Aside from these proposals by monetarists, others who are concerned about high interest rates have suggested that the Federal Reserve simply take action to increase the money supply now. After all, their argument goes, an increased supply surely will bring down the price. While the appeal of this view is understandable, I believe that an attempt to increase the money supply beyond the current targets would be dangerous and ill-advised given the current environment.

To understand why such a simple proposal would be ill-advised, it is useful to examine why interest rates are so high in the current environment. We all know, for example, that interest rates should fall as economic activity declines. Unfortunately, downward pressure on rates because of economic weakness is being largely offset by other factors—primarily the public's perception of the effects of very large federal budget deficits. These large deficits remain the most important factor, in my judgement, in explaining the persistence of high interest rates. Because budget deficits must be financed by borrowing in the nation's capital markets, this heavy demand is helping keep rates high. Many investors also apparently believe that the large projected deficits will lead to a renewal of strong inflationary pressures and sharply higher interest rates as soon as the economy recovers from the recession. It is obvious to me that because of these uncertainties, investors are reluctant to make long-term commitments. By avoiding the bond markets and staying short, investor psychology is contributing to the high levels of interest rates.

However, assume for a moment that the Federal Reserve did take action to increase the supply of money and credit. What would be likely to happen? First, there might, indeed, be some temporary reductions in short-term interest rates. But as concerns about a rekindling of inflation spread, lenders would seek to protect themselves against inflation by incorporating a higher inflation premium into their rates. Because of these inflationary fears, long-term rates would not move down, but would likely move even higher. As a result, users of long-term credit, such as housing and the corporate business sector, would be left high and dry. And corporations would continue to find it difficult to restructure their balance sheets.

Thus, in my judgement, interest rates can only be brought down by a resolution of the federal budget stalemate. So long as that im-

passé persists, any Federal Reserve action to add monetary fuel to the economy will have a perverse effect. Furthermore, lower interest rates will not result from the application of monetary gimmickry or by taking away the independence of the Federal Reserve. In fact, such proposals do a disservice because they divert the attention of policymakers and the public through claims that simplistic solutions are at hand for complex problems.

While there are no easy solutions to our near-term economic problems, I think it is a mistake to be a gloomy pessimist. Despite our problems, I reject the notion that a 1930s-style economic depression is in the wings. Rather, I see economic recovery beginning about midyear, spurred by increases in consumer spending. With continued progress on the inflation front, consumers will be in a more confident mood when the midyear tax cut takes effect. Their spending will encourage business to build inventories, and the process of recovery should be under way.

Whether the recovery is robust or modest in 1982 will depend largely upon the course of interest rates. Continued high rates will dampen recovery, while lower rates will have a more positive effect. As I have noted, the key to lower rates and the trigger for renewed economic growth is to resolve the stalemate over fiscal policy by making significant reductions in the projected budget deficits. Reduced deficit projections will restore investor and consumer confidence that the nation is willing to deal with its problems. In addition, less deficit financing will tend to relieve pressure in financial markets and reinforce downward influences on interest rates coming from moderating inflation.

Looking beyond the economic problems of 1982, I am optimistic. The nation's broad economic strategy, which incorporates deregulation and incentives for savings, investment, and productivity, shows real potential as

a path to a bright economic future. From my perspective, the Federal Reserve's commitment to a monetary policy which seeks to foster noninflationary economic growth fits perfectly with these other objectives.

There is a strong economic future ahead of us. I am confident that the recovery will occur

and that an extended period of economic growth is out there waiting to begin. There is no reason we cannot achieve this potential if we have patience, if we act firmly now to achieve an accord over the deficit issue, and if we resist the tempting sirens of economic quick-fix solutions.

The Federal Reserve's Operating Procedures and Interest Rate Fluctuations

By Carl E. Walsh

On October 6, 1979, the Federal Reserve announced a major change in its monetary policy operating procedures. While leaving the basic goals of monetary policy unchanged, the new procedures were designed to achieve these goals by focusing on reserve aggregates rather than the federal funds rate as a guide for the conduct of monetary policy.¹ Before October 1979, the Federal Reserve had acted between meetings of the Federal Open Market Committee (FOMC) to keep movements in the federal funds rate within narrow bounds. By widening the range of permissible variation for the federal funds

rate, the new operating procedures were expected to lead to some increase in interest rate volatility. While the Federal Reserve's change in its operating procedures has not ended controversy over the best method of conducting monetary policy,² there has been a large increase in interest rate volatility in the period since October 6, 1979.

The purpose of this article is twofold. The first is to show why the shift to a reserve aggregates operating procedure would be expected, in the absence of any structural change in the behavior of financial markets, to produce greater fluctuations in interest rates. The second purpose is to suggest that the shift in operating procedures may have resulted in structural changes in behavior that have made interest rates more responsive to financial market shocks, thereby contributing to greater interest rate volatility. These changes in the behavior of the public help explain why interest rates have been more volatile since October 1979 than was generally expected.

In the first section of the article, measures of interest rate volatility are presented to docu-

¹ Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin*, October 1979, p. 830. For a discussion of the new operating procedures, see J. A. Cacy, "Monetary Policy in 1980 and 1981," *Economic Review*, Federal Reserve Bank of Kansas City, December 1980, pp. 18-25; and Stephen H. Axilrod and David E. Lindsey, "Federal Reserve System Implementation of Monetary Policy: Analytical Foundations of the New Approach," *American Economic Review*, May 1981, pp. 246-52.

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² See, for example, the debate between Robert H. Rasche, Allan H. Meltzer, Stephen H. Axilrod, and Peter D. Sternlight, *Journal of Money, Credit, and Banking*, February 1982, pp. 119-47.

ment the change in interest rate behavior that has occurred since October 1979. This is followed by a discussion of some of the views concerning expected interest rate movements under a reserve aggregates operating procedure expressed by economists prior to the Federal Reserve's procedural shift. This section also presents some evidence to suggest that the change in the Federal Reserve's operating procedures was accompanied by structural changes in financial markets. The third section presents a model of interest rate determination to illustrate why interest rates would be expected to fluctuate over a wider range after October 1979. The fourth section suggests that the induced structural adjustments by the public have added to the increase in interest rate volatility which accompanied the change to an aggregates operating procedure.

MEASURES OF INTEREST RATE VOLATILITY

The greatly increased volatility of interest rates of all maturity lengths which followed the Federal Reserve's October 1979 shift to a reserve aggregates operating procedure is evident from Chart 1. The chart plots weekly average levels of the federal funds rate, the 3-month U.S. Treasury bill rate, and the rate on 20-year U.S. government bonds. Tables 1 and 2 present alternative measures of pre- and post-October 1979 volatility for various interest rates. Table 1 gives the standard deviations for five different interest rates for weekly observations for the year immediately before and for the year immediately following the announced policy shift. The large increase in interest rate volatility is evident in the roughly four- to

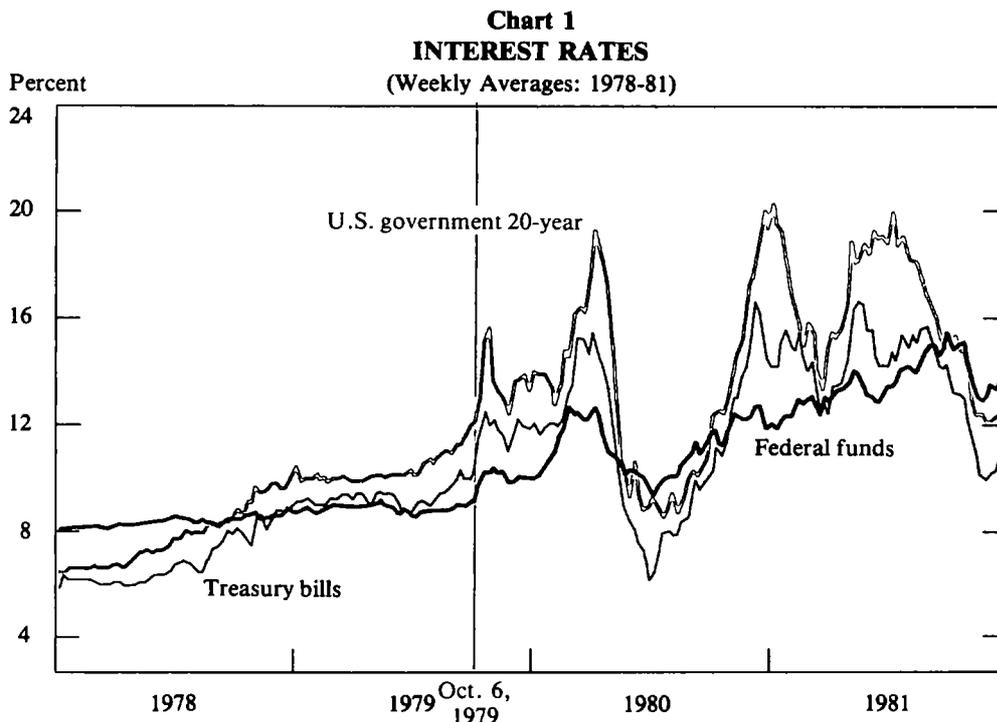


Table 1
STANDARD DEVIATIONS
OF INTEREST RATES*
(Weekly)

Interest Rate	Sample Period	
	1978:41- 1979:40†	1979:41- 1980:40
Federal funds rate	60.90‡	291.54
3-month Treasury bills	55.59	240.03
6-month Treasury bills	38.47	227.73
12-month commercial paper	61.99	276.64
20-year U.S. government bonds	17.08	86.09

*The standard deviation for an interest rate r_t is equal to

$$\left\{ \frac{1}{51} \sum_{t=1}^{52} (r_t - \bar{r})^2 \right\}^{1/2}$$

where $\bar{r} = \frac{1}{52} \sum_{t=1}^{52} r_t$ is the mean.

†The sample period runs from the 41st week of 1978 to the 40th week of 1979, which is equal to the year immediately prior to the week of October 6, 1979.

‡Measured in basis points.

fivefold increase in the standard deviations of all five interest rates in the year after the Federal Reserve changed its operating procedures.

While the standard deviations in Table 1 measure the gross volatility of actual interest rates, another approach would be to focus on the volatility of unpredictable changes in interest rates. Such an approach would measure the extent to which increased interest rate volatility contributes to uncertainty.³ One such measure would be the standard deviation of the

³ This argument is made by Peter A. Tinsley et al., "Money Market Impacts of Alternative Operating Procedures," *New Monetary Control Procedures*, Federal Reserve Staff Study, Vol. II, Board of Governors of the Federal Reserve System, February 1981.

Table 2
UNPREDICTABLE INTEREST RATE
VOLATILITY*
(Weekly)

Interest Rates	Sample Period†	
	1978:1- 1979:40	1980:1- 1981:40
Federal funds rate	15.19‡	83.57
3-month Treasury bills	19.78	64.96
6-month Treasury bills	14.53	53.18
12-month commercial paper	13.01	74.86
20-year U.S. government bonds	6.20	29.59

*Root-mean-squared errors from a regression of each interest rate on 12 past values of itself.

†The sample period runs from the first week of either 1978 or 1980 to the 40th week of the following year.

‡Measured in basis points.

difference between the weekly average of an interest rate and the value of that interest rate that would have been predicted based upon the information contained in past values of the interest rate. This measure of interest rate volatility is reported in Table 2.⁴ According to Table 2, the proportionate increase in unpredictable volatility has been even greater than the rise in gross volatility for the federal funds rate and the 12-month commercial paper rate. Both Tables 1 and 2 reflect the large rise in volatility which was apparent from Chart 1.

PRE-OCTOBER 1979 VIEWS ON POTENTIAL INTEREST RATE VOLATILITY

In the years before the Federal Reserve changed its operating procedures, many

⁴ The sample periods differ in Tables 1 and 2 since for Table 2 the first week of the post-October 6, 1979, period that could be predicted using 12 lagged values, all from the reserve aggregates operating procedure period, was 1980:1.

economists argued that interest rates might actually be less volatile under operating procedures that focused on reserve aggregates rather than the federal funds rate. Others held that interest rate fluctuations would increase under a reserve aggregates operating procedure but argued that the increase in volatility would be small.⁵ There seem to have been two explanations offered for these views.

The first explanation was that interest rate instability was due to the use by the Federal Reserve of a federal funds operating target. It was argued that using an interest rate target leads to instability in the growth rate of the money supply. Fluctuations in the monetary growth rate produce instability in the economy, which in turn causes interest rate volatility.⁶ Thus, according to this view, procedures that allow the federal funds rate to vary but stabilize the monetary aggregates would lead to more stable interest rates.⁷ Regardless of the validity of this view, it is not relevant for understanding the likely effects on short-term volatility (weekly or monthly, for example) of a change to a reserve aggregates operating procedure. Such a change could lead to more stable interest rates when measured by changes in yearly averages but could simultaneously lead to the

very large weekly interest rate volatility observed in Chart 1. This article deals only with this short-run volatility.

The second explanation for the view that a reserve aggregates operating procedure would not lead to a large increase in interest rate volatility relied on the possibility of structural change occurring in financial markets that would tend to dampen interest rate fluctuations.⁸ The term structure relationship linking short-term and long-term interest rates was the most commonly mentioned possibility for structural change.⁹ Because long-term interest rates are, according to the expectations theory of the term structure, equal to an average of expected future short-term rates, any change in short-term interest rates that causes the expected future short-term rate to change will lead to a change in long-term interest rates.¹⁰ Under the old operating procedure, changes in short-term interest rates had a relatively large impact on longer term rates. This was because most changes in short-term interest rates signaled a basic change in monetary policy and were viewed as permanent. Such changes therefore had a large impact on expected future short-term rates. Under the new operating pro-

⁵ For a discussion of alternative views concerning potential interest rate volatility, see Raymond Lombra and Frederick Struble, "Monetary Aggregate Targets and the Volatility of Interest Rates: A Taxonomic Discussion," *Journal of Money, Credit, and Banking*, August 1979, pp. 284-300.

⁶ This is the view argued in Robert E. Weintraub, "Review of Monetary Aggregates and Monetary Policy," *Journal of Money, Credit, and Banking*, August 1976, pp. 401-05.

⁷ Weintraub's optimism is still shared by those who feel that, if the Federal Reserve controlled aggregates more closely, interest rate volatility would decline. In a recent debate on monetary policy, Robert Rasche said, "I might say that to the extent we have a well-defined monetary target, and thus the markets understand what the Federal Reserve is trying to do, there is a good chance that we would in fact see reduced interest rate volatility below the kind of thing we have seen in the last year" (*Journal of Money, Credit, and Banking*, February 1982, p. 137).

⁸ This argument was made by Richard G. Davis, "Short-Run Targets for Open Market Operations," *Open Market Policies and Operating Procedures—Staff Studies*, Board of Governors of the Federal Reserve System, July 1971, pp. 37-69; and by James L. Pierce and Thomas D. Thomson, "Some Issues in Controlling the Stock of Money," *Controlling Monetary Aggregates II: The Implementation*, Conference Series No. 9, Federal Reserve Bank of Boston, September 1972, pp. 115-36.

⁹ For examples of this view, see Davis, Lombra, and Struble; and Pierce and Thomson as cited above; and John P. Judd and John L. Scadding, "Conducting Effective Monetary Policy: The Role of Operating Instruments," *Economic Review*, Federal Reserve Bank of San Francisco, Fall 1979, pp. 23-37.

¹⁰ For a discussion of theories of the term structure of interest rates, see Burton G. Malkiel, *The Term Structure of Interest Rates: Expectations and Behavior Patterns*, Princeton, N.J.: Princeton University Press, 1966.

cedures, changes in short-term rates signal basic policy actions less often and are therefore more likely to be quickly reversed. Hence, under an aggregates policy, changes in short-term interest rates will have a smaller effect on expected future short-term rates. This means that long-term interest rates will respond less to a change in short-term rates than they did under the pre-October 1979 operating procedures. According to this argument, while an aggregates operating procedure would cause short-term rates to become more volatile, it would not necessarily cause greater volatility for long-term interest rates. The evidence from Tables 1 and 2, however, indicates that interest rates of all maturity lengths have been much more volatile since the change in operating procedures.

Besides these theoretical arguments, some empirical attempts were made to assess the likely interest rate volatility that would result if the Federal Reserve changed its operating procedures.¹¹ One such attempt, using 1967-68 data, estimated that a hypothetical policy producing steady increments in nonborrowed reserves would increase the absolute weekly change in the federal funds rate by a factor of from 3 to 4.¹² This figure was obtained by using an estimate of the empirical relationship between the federal funds rate and free reserves to calculate the value of the funds rate implied by the hypothetical policy. Free reserves are equal to total reserves minus required reserves and

borrowed reserves. Free reserves and the federal funds rate are empirically related because an increase in the federal funds rate increases the opportunity cost of holding free reserves. This causes banks to reduce their free reserves.

The accuracy of this estimate of interest rate volatility can be judged by comparing the actual average absolute weekly change in the federal funds rate in the year prior to October 6, 1979—14 basis points—to the actual figure for the year after the policy shift—70 basis points. This was a fivefold increase compared to the three- to fourfold increase predicted. The earlier estimate therefore understated the actual rise in interest rate volatility. However, it is not valid to make inferences about the results of the 1979 policy shift based on the free reserves-federal funds rate relationship that existed in the 1967-68 period. This is because the change in September 1968 from current to lagged reserve accounting affected the linkage between free reserves and the funds rate. To make valid inferences, the relationship must be reestimated using post-1968 data. A reestimation using data for the period immediately prior to the October 6, 1979, change in operating procedures produces an even greater understatement of the post-October 1979 rise in interest rate volatility than did the earlier estimate.¹³ Moreover, a further reestimation of the free reserves-federal funds rate relationship using post-October 1979 data discloses a large structural shift in the rela-

¹¹ Besides the paper by Davis, see John H. Ciccolo, "Is Short-Run Monetary Control Feasible?" *Monetary Aggregates and Monetary Policy*, Federal Reserve Bank of New York, October 1974; and Robert S. Pindyck and Steven M. Roberts, "Optimal Policies for Monetary Control," *Annals of Economic and Social Measurement*, January 1974, pp. 207-37.

¹² See Davis. The actual average absolute weekly change for the period studied by Davis was 15 basis points, while under the reserve aggregates policy this measure of volatility was estimated to increase to 55 basis points.

¹³ Davis estimated the equation $r_{ff} = b_0 + b_1 R_f + b_2 r_{dis}$, where r_{ff} is the federal funds rate, R_f is free reserves, and r_{dis} is the discount rate. The estimated value of b_1 plays the key role in Davis' analysis. Large values of b_1 produce large estimates of interest rate volatility. Davis' estimate of b_1 was -0.002 . Reestimating this equation for 1978:1-1979:4Q produced a value for b_1 of -0.0003 . Using this value to estimate potential interest rate volatility under a hypothetical policy of steady increments in nonborrowed reserves would indicate that a reserve aggregates policy would produce little increase in interest rate volatility.

tionship.¹⁴ The shift is in the direction of producing greater interest rate volatility.

The possibility of such structural change was recognized by most economists considering the potential effects of a reserve aggregates procedure. They generally cautioned against using empirical models estimated during a period in which the Federal Reserve followed a federal funds procedure to draw inferences about how the economy would behave under a reserve aggregates procedure.¹⁵ Further evidence of structural change has been found by V. Vance Roley in a study of interest rates and money supply announcements.¹⁶ He found that interest rates are much more responsive to unanticipated money supply changes in the post-October 1979 period than they were in the pre-October 1979 period. Roley attributes almost 30 percent of the increase in interest rate volatility to the change in the market's response to money surprises.¹⁷ Such structural change in financial markets as has occurred since the Federal Reserve changed its operating procedures appears to have worked to increase interest rate volatility, not to dampen it, as some economists expected.¹⁸ In the next two sections of the article, the impact on interest rate volatility of the

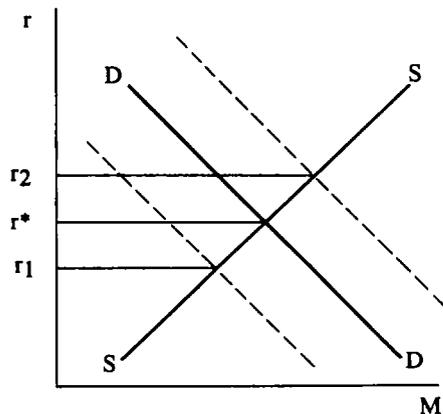
change in the Federal Reserve's operating procedures is analyzed.

INTEREST RATE MOVEMENTS UNDER ALTERNATIVE OPERATING PROCEDURES

This section shows that, in the absence of any structural change, the shift in operating procedures would be expected to increase the volatility of interest rates. The next section shows that the shift in procedures may have caused a structural change that has added further to interest rate volatility.

Figure 1 is a graphical presentation of the model of interest rate determination that will be used in the analysis. The line labeled DD represents the demand for money, giving for each value of the interest rate the amount of money the public wishes to hold. DD is drawn with a downward slope, indicating that higher interest rates are associated with a lower demand for money. There are two mutually reinforcing theoretical reasons for expecting DD to be downward sloping. The first focuses on the need to hold money to facilitate day-to-day transactions. Deciding how much money to

Figure 1
INTEREST RATE FLUCTUATIONS AND SHIFTS IN MONEY DEMAND



¹⁴ The estimated value of b_1 (see footnote 13) jumped from -0.0003 to -0.0013 when data from 1979:41 to 1981:28 were used. The actual volatility of interest rates, which reflected the high value of -0.0013 , was much greater than Davis' methodology would have predicted using the preshift value of -0.0003 .

¹⁵ See, for example, Davis, pp. 57-58; Lombra and Struble, p. 292; and Benjamin M. Friedman, "Empirical Issues in Monetary Policy: A Review of Monetary Aggregates and Monetary Policy," *Journal of Monetary Economics*, January 1977, pp. 87-101.

¹⁶ V. Vance Roley, "The Response of Short-Term Interest Rates to Weekly Money Announcements," mimeo, Federal Reserve Bank of Kansas City, April 1982.

¹⁷ Approximately 26 percent of the increased volatility was attributed to the greater volatility of unanticipated money, and 44 percent was unexplained. See Roley.

¹⁸ See footnote 8.

hold for such purposes is a type of an inventory problem. As with other types of inventories, the interest rate represents an important component of the cost of holding money. When this cost goes up as the interest rate rises, the public desires to reduce its money holdings.¹⁹

The second reason focuses on money as one among various financial assets. Investors allocate their wealth among the various assets, each of which differs in terms of expected return, maturity, risk, and marketability, with the objective of maximizing the expected holding period return on their portfolio consistent with their attitudes toward risk. The return on any asset whose maturity exceeds an investor's holding period is subject to risk because of the possibility of unanticipated changes in market interest rates. When interest rates change, investors adjust their assessments of the expected holding period rates of return on the various assets and reallocate their portfolios. As the interest rates and expected rates of return on nonmoney assets rise, the public will respond by reducing its holdings of money.²⁰ Again, the result is a negative relationship such as DD between money holdings and interest rates.

Also drawn in Figure 1 is an upward sloping short-run money supply curve, labeled SS. Such a relationship results because, as interest rates rise, banks attempt to reduce their holdings of free reserves, either by reducing excess reserves

or increasing their borrowings from the Federal Reserve. This in turn tends to increase the amount of money supplied to the public.²¹

Given both the quantity of money demanded and supplied as functions of the interest rate, the equilibrium interest rate is determined so that demand equals supply. This occurs at the interest rate denoted r^* in Figure 1.

Changes in income, which affect money demand, or changes in Federal Reserve policy instruments (such as nonborrowed reserves or the discount rate), which affect the money supply, produce systematic shifts in either DD or SS. These shifts, in turn, result in movements in the equilibrium interest rate. In addition, random disturbances may cause short-run shifts in the demand for money. Such disturbances, if the supply of money remains unchanged, lead to movements in the short-term interest rate. This is illustrated in Figure 1, where the dashed lines represent bounds for the shifting position of the money demand function for any particular short period such as a week. Given these bounds, the short-term interest rate will fluctuate within the range r_1 to r_2 .

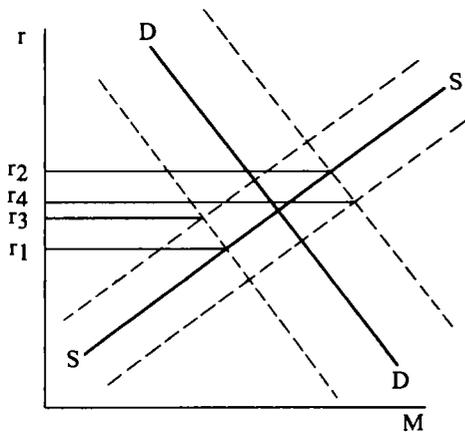
When the Federal Reserve is using an interest rate operating target, however, interest rate movements may not span the entire range from r_1 to r_2 because the Federal Reserve engages in open market operations to prevent wide interest rate fluctuations. For example, when a random disturbance shifts money demand to the right, putting upward pressure on interest rates, the Federal Reserve increases nonborrowed reserves, shifting the money supply curve also to the right, thereby partly offsetting the fluctuation in money demand. Thus, the interest rate will tend to move within a narrow range such as r_3 to r_4 in Figure 2.

¹⁹ The inventory approach to the demand for money is developed in W. Baumol, "The Transactions Demand for Cash—An Inventory Theoretic Approach," *Quarterly Journal of Economics*, November 1952, pp. 545-56; and J. Tobin, "The Interest Elasticity of the Transactions Demand for Cash," *Review of Economics and Statistics*, August 1956, pp. 241-47. For a modern treatment, see Anthony M. Santomero and John J. Seater, "Partial Adjustment in the Demand for Money: Theory and Empirics," *American Economic Review*, September 1981, pp. 566-78.

²⁰ This view is discussed in J. Tobin, "Liquidity Preference as Behavior Towards Risk," *Review of Economic Studies*, February 1958, pp. 65-86.

²¹ Models of bank behavior are surveyed in E. Balten-sperger, "Alternative Approaches to the Theory of the Banking Firm," *Journal of Monetary Economics*, January 1980, pp. 1-37.

Figure 2
INTEREST RATE FLUCTUATIONS
PARTIALLY OFFSET BY OPEN
MARKET OPERATIONS



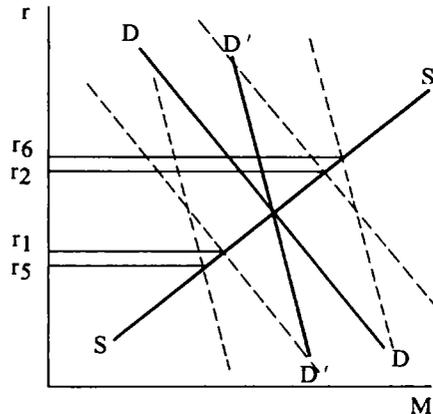
Under a reserve aggregates operating procedure, the Federal Reserve does not intervene to offset money demand shifts, and the interest rate tends to move within the wider range from r_1 to r_2 .²² In the absence of any structural change in the money market, therefore, the October 1979 shift to a reserve aggregates procedure would tend to result in greater interest rate volatility.

EFFECTS OF THE CHANGE IN
OPERATING PROCEDURES ON THE
DEMAND FOR MONEY

This section shows that the change in operating procedures may have caused a structural change in the money market. The analysis first explains how the degree of money market volatility depends in part on the slope of the demand for money function. Then it is shown how the procedures may have affected this slope.

²² If there also were weekly shifts in money supply around the average money supply curve, SS, the total range within which interest rates might be expected to move would be wider still.

Figure 3
EFFECTS OF A STEEPER MONEY
DEMAND FUNCTION



In general, the degree of interest rate volatility depends upon two aspects of the money market: the frequency and magnitude of the shocks to money demand (i.e., the width of the dashed lines around DD),²³ and the relative slopes of DD and SS, because the slopes will determine how much interest rates must adjust in response to a given shock. The role of this second factor is illustrated in Figure 3. The black lines in that figure reproduce Figure 1, which shows that the interest rate tends to fluctuate within the range r_1 to r_2 . The blue line D'D' in Figure 3 shows a steeper demand curve. With money demand shocks the same

²³ The extent to which interest rate fluctuations in recent months can be attributed to the Federal Reserve's new operating procedures was one issue examined by the Federal Reserve staff in its two volume study, *New Monetary Control Procedures*. See the review of this study by Stephen M. Goldfeld, *Journal of Money, Credit, and Banking*, February 1982, pp. 148-55. The conclusion reached in that study was that the first year after the introduction of the new procedures was atypical, subject to larger than normal shocks (for example, the credit controls of 1980). The greater volatility of interest rates could therefore at least partially be attributed to nonpolicy sources.

size as before,²⁴ the interest rate tends to move over a wider range, r5 to r6. A steeper money demand curve, therefore, leads to greater interest rate volatility. A relatively steep money demand curve indicates that changes in the interest rate cause relatively small changes in the quantity of money demanded. Thus, the interest rate will have to make relatively large changes to equilibrate money demand to money supply.

An examination of the determinants of the money demand curve's slope indicates that the change in the Federal Reserve's operating procedures may have caused it to become steeper, thereby contributing to interest rate volatility. The demand for money is a function of the expected rate of return on nonmoney assets. Thus, a relationship such as DD in Figure 1 between the rate of interest and the quantity of money demanded reflects two underlying linkages. First, changes in the market rate of interest provide information to investors on the basis of which they may revise their forecast of the expected rate of return. Second, any revision in the expected rate of return produces a change in the demand for money. In Figure 1, DD graphically summarizes the combination of these two relationships. Structural changes either in the link between the market interest rate and the expected rate of return or in the link between the expected rate of return and the quantity of money demanded will affect the slope of the money demand curve. It is likely that the alteration in operating procedures has led to structural change in both these relationships.

With regard to the relationship between the market interest rate and the expected rate of return, when the Federal Reserve acted to stabilize interest rates, changes in market rates of interest tended to be relatively small and in-

frequent. Any changes in the federal funds rate that did occur reflected policy changes and were permanent. That is, investors did not expect changes in interest rates to be quickly reversed. In this environment, any changes in the market rate would have a large effect on investors' assessment of the expected rate of return.

Under the new reserve aggregates operating procedure, the market interest rate varies over a wider range than formerly. Changes in the market rate are more likely to be due to random shocks to money supply or demand and, hence, to be temporary. Investors expect changes in the interest rate to be quickly reversed. Under these conditions, changes in the interest rate will cause relatively small revisions in the expected rate of return, smaller revisions than under an interest rate operating procedure.²⁵ This structural change in the relationship between the rate of interest and the expected return has caused the money demand curve to become steeper. In other words, as the expected return becomes less responsive to interest rate changes due to a shift in the Federal Reserve's operating procedures, money demand responds less to changes in the market interest rate.

Economic theory suggests that the October 1979 shift in procedures also affect the second part of the linkage between the interest rate and money demand—the relationship between the expected rate of return and the demand for money. Money demand is likely to have become less sensitive to changes in the expected rate of return because the change in procedures has increased the riskiness of interest-earning assets.

To understand why the change in the second linkage has occurred, it is useful to analyze an example involving only two financial assets,

²⁴ That is, they lead to the same horizontal displacement of the demand curve.

²⁵ This is similar to the argument discussed earlier for a structural shift in the term structure of interest rates. See the references in footnote 9.

money and a Treasury bill whose maturity length is greater than the typical investor's holding period. Investing in the bill involves risk since the actual holding period return is unknown. The demand for money depends not only on the expected holding period return on the bill but also on the risk involved in holding it as reflected in the likelihood of unanticipated interest rate movements.²⁶ As holding bills becomes more risky, an investor will react more cautiously to changes in the expected return on bills and make smaller portfolio adjustments. An increase in the riskiness of bills because of greater interest rate volatility causes the demand for money to become less responsive to changes in the expected return on bills.²⁷

This result remains valid in a situation involving many financial assets. In general, an increase in the riskiness of interest-bearing financial assets tends to reduce the portfolio response induced by a change in expected rates of return. When holding interest-earning assets is subject to greater risk, a larger increase in the expected rate of return is required to induce investors to hold larger amounts of such assets as they must be compensated for the greater risk.

Increased interest rate volatility is likely, therefore, to produce a fall in both the responsiveness of the quantity of money demanded to changes in the expected rate of return and the responsiveness of the expected rate of return to changes in the market rate of interest. Hence, changes in the market interest rate will have smaller effects on the demand for money under the new operating procedure than was true under the federal funds operating procedure. Since money demand is less sensitive to interest rate changes, larger movements in interest rates

will be required to produce a given change in money demand—i.e., the money demand curve has become steeper.

By changing its operating procedures to allow greater fluctuations in interest rates, the Federal Reserve has induced a structural change that has made interest rates more sensitive to money market shocks. This structural change has tended to amplify the increase in interest rate volatility that might have been expected under a reserve aggregates operating procedure.

This argument is consistent with the possibility, as discussed earlier, that the term structure relationship may also have undergone a structural change so that long-term interest rates are now less volatile for a given degree of short-term interest rate volatility.²⁸ However, the rise in short-term interest rate fluctuations has been so large that it has, as was shown in Tables 1 and 2, resulted in an absolute increase in the volatility of long-term interest rates.

SUMMARY AND CONCLUSIONS

Despite the expectations of many economists, the Federal Reserve's October 1979 change in its operating procedures has been followed by a large increase in interest rate volatility. This article has argued that the rise in interest rate volatility was underestimated because economists failed to anticipate that the change in procedures would give rise to structural changes in financial market behavior. A consideration of economic theory suggests that interest rate volatility was increased by these structural changes.

The article's argument is a specific example

²⁶ The demand for money will also depend upon the level of wealth.

²⁷ See Carl E. Walsh, "Interest Rate Volatility and Monetary Policy," Research Working Paper 82-03, Federal Reserve Bank of Kansas City.

²⁸ There is some evidence that long-term interest rates are now less responsive to changes in the federal funds rate. Interest rates of various maturities were regressed on a constant and the federal funds rate for the period 1978:41 to 1979:40 and for the period 1980:41 to 1981:40. For every interest rate, the coefficient on the federal funds rate was smaller in the second period.

of a recent, fundamental criticism which has been directed at the use of empirical relationships to evaluate economic policy.²⁹ The observed relationships captured by empirical models depend, in part, on the behavior of policymakers. The response of individuals to a change in interest rates, for example, depends in part on their expectations about future interest rates. These expectations, in turn, depend on the way the Federal Reserve is expected to act in the future. A change in the Federal Reserve's operating procedures, by affecting these expectations, will change the response of

individuals to current interest rates. Empirical estimates of economic behavior obtained during a period in which the Federal Reserve followed certain procedures may not accurately reflect the way individuals behave during a period in which the Federal Reserve follows different procedures.

This criticism directed at the use of empirical models for policy evaluation has continued relevance since some economists have proposed further changes in the Federal Reserve's conduct of monetary policy, such as returning to contemporaneous reserve accounting or establishing the discount rate as a penalty rate. To correctly evaluate alternative operating procedures or other policy changes, and to assess the likely effects on the Federal Reserve's ability to control monetary aggregates or to stabilize interest rates, it is necessary to recognize that the public adjusts its behavior in response to changes in the behavior of the Federal Reserve.

²⁹ This criticism is commonly called the Lucas critique, after Robert E. Lucas, Jr., "Econometric Policy Evaluation: A Critique," *The Phillips Curve and Labor Markets*, ed. by K. Brunner and A. H. Meltzer, Amsterdam: North Holland, 1976. See also the editors' introduction in *Rational Expectations and Econometric Practices*, ed. by Robert E. Lucas, Jr., and Thomas J. Sargent, Minneapolis: University of Minnesota Press, 1981.

The Impact of Financial Futures on Agricultural Banks

By Mark Drabenstott and Anne O'Mara McDonley

Financial futures have emerged as the most rapidly growing segment of futures trading. Financial institutions are increasingly turning to this developing futures market as a means of reducing interest rate risk brought about by volatile financial markets. To better understand the impact that financial futures are having on agricultural banks, the Federal Reserve Bank of Kansas City has conducted a national survey of agricultural banks.

Agricultural banks traditionally have enjoyed a high degree of insulation from movements in national interest rates due to their localized deposit structure and the stable operating environment that has characterized the entire banking industry since the 1930s. However, agricultural banks face new challenges today that transcend the increased risk that all banks are encountering in today's more volatile interest rate environment.

Rural financial markets have been transformed in recent years by a combination of two factors. First, the deregulation of the banking industry through the Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) has placed rural agricultural

banks in more direct competition for funds with urban banks and other depository institutions. Second, rural savers have gained access to a wider assortment of savings instruments since the late 1970s. As a result, rural community banks have been under increasing pressure to replace their noninterest bearing demand deposits with higher yielding deposit accounts, such as money market certificates. Consequently, these banks no longer hold a large pool of demand deposits with which to insulate themselves against adverse movements in national interest rates. Agricultural banks, therefore, faced with increased competition and the integration of rural financial markets, are being significantly affected by volatile interest rates.

Financial futures are a relatively new and potentially effective risk management tool that agricultural banks may use in dealing with the new operating environment. This article examines the impact financial futures may have on agricultural banks. The first section provides a brief overview of financial futures markets and how they relate to interest rate risk management by banking institutions. Section two employs the results of a recent national survey of agricultural banks to analyze the extent to which these banks are using financial futures and their accompanying reasons. The

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third section reviews some of the major issues relevant to the use of financial futures that are of concern to the banking industry and discusses current opinions of agricultural banks on these issues as recorded in the survey. The final section examines the question of the suitability of using financial futures as a risk management tool by agricultural banks.

FINANCIAL FUTURES AS A RISK MANAGEMENT TOOL

Financial futures have their roots in agricultural commodity futures markets. These markets evolved because of the need to reduce the risk associated with uncertain prices for the future purchase or sale of a particular commodity. An agricultural producer can reduce the risk of price fluctuations by hedging, which is the establishment of a position in the commodity futures market opposite from that held in the cash market. Similarly, a bank may reduce the risk of adverse interest rate fluctuations by hedging in the financial futures market.

Banks automatically are exposed to interest rate risk when they have a mismatch in the maturities of interest-sensitive assets and liabilities. For example, a bank that holds a portfolio consisting of predominantly long-term fixed rate assets and short-term variable rate liabilities faces the risk of rising interest rates. Should interest rates rise, the spread—that is, the difference between the rate earned on assets and the rate paid on liabilities—would narrow, which would reduce expected earnings, or it could turn negative, resulting in a loss. Moreover, the market value of its assets would decline. The savings and loan industry, in recent years, is a prime example of the devastating effects of narrowing spreads.

For many years, banks have employed a number of risk management techniques, such as matching the maturities of interest-sensitive

assets and liabilities and using variable interest rate loans. While these management techniques have served to reduce risk, it is becoming increasingly difficult for banks to rely on these traditional tools to assure an adequate profit margin. Financial futures offer a potentially more effective method of reducing interest rate risk.

A financial futures contract, in effect, is a vehicle for transferring cash market interest rate risk to the futures market, where it is assumed by other market participants. Such a contract is an agreement between two parties whereby one party, the seller, agrees to deliver a specific financial instrument to the other party, the buyer, at a predetermined date in the future. The buyer of the contract holds a “long” position, while the seller holds a “short” position. Because the futures contract is based on a financial instrument whose value will fluctuate according to movements in interest rates, the value of the futures contract will fluctuate in conjunction with it.

Parallel price movements in a cash market financial instrument and its futures market counterpart make it possible for banks to transfer cash market risk by assuming a position in the futures market. For example, a bank that holds a fixed-rate asset and faces the risk of rising interest rates can hedge this risk by selling a closely correlated futures contract of equivalent value. If interest rates rise, a profit is incurred in the futures market equal to the eroded value of the cash market asset. The hedge is lifted when the futures market position is offset by purchasing the same futures contract at a price lower than it was sold. This results in a gain in the futures market equal to the loss in the cash market, which amounts to a perfect hedge of interest rate risk. This illustrates a theoretical hedge. In actual practice, a bank must also be aware of the effects that a futures position will have on its overall risk exposure.

The perfect hedge, however, is rarely executed in the real world of financial futures markets. Hedging interest rate risk implies that basis risk is being substituted for cash market risk. The basis is defined as the difference in price between a futures contract and the cash market value of the financial instrument upon which the contract is based. In theory, there is minimal basis risk because the basis is constant, since the movement of the futures contract price and the value of the cash market instrument should be perfectly parallel. In practice, however, the basis fluctuates in response to several market stimuli, including market expectations concerning the future course of interest rates. Nonetheless, basis risk is typically less than cash market risk because, on balance, changes in the basis tend to be more stable and predictable than the risk of changing interest rates and resulting price fluctuations of financial instruments in the cash market. Thus, financial futures are a viable risk transferral mechanism for banks.

The rapid development of financial futures contracts on a number of commodity exchanges has made hedging a readily accessible and efficient risk management tool for banks. Financial futures contracts have grown very quickly in a short period of time. The first financial futures contract, a contract in GNMA mortgage-backed certificates, was introduced on the Chicago Board of Trade in 1975. Since that time, several other contracts have been added and trading volume for financial futures has increased at an impressive rate. Currently, a total of nine financial futures contracts are traded on three different exchanges. Trading volume on the Chicago Board of Trade has grown from less than 100,000 contracts in 1975 to more than 16 million in 1981. The International Monetary Market of the Chicago Mercantile Exchange has witnessed a similar explosive growth as 110,000 contracts traded in 1976, compared to nearly 15 million in 1981.

The development of new financial futures contracts allows banks to more effectively match cash market risk with a futures contract, thereby minimizing basis risk. In theory, the perfect hedge matches a cash market instrument with a futures contract based upon the same instrument. In practice, banks often hold assets or liabilities which can be hedged only by choosing a futures contract based upon a *similar* instrument, a strategy known as cross hedging. The prices of the two different instruments should have a high degree of correlation in order for cross hedging to be effective. The need for cross hedging is minimized as a broader mix of futures contracts develops.

Increased trading volume as well as the central location of commodity exchanges has provided more efficiency and liquidity in financial futures markets. Efficiency improves with trading volume because market participants are all aware of price changes at the same time and in the same location. Moreover, increased volume and competition tend to result in a narrower bid/ask spread. As market efficiency improves, the transaction costs also decline. Additionally, as financial futures markets become more liquid through greater trading volume, banks tend to face less uncertainty in entering and exiting from a hedge.

SURVEY OF AGRICULTURAL BANKS

As a result of the volatile economic conditions that have prevailed since the beginning of the 1980s, there has been increasing interest in the use of financial futures by the banking industry. However, data are scarce that indicate the extent to which banks currently use financial futures. The only published information available originate from surveys performed by the Commodity Futures Trading Commission and Arthur Anderson & Co., neither of which exclusively addressed the banking industry. These studies suggest that a very small fraction of all commercial banks are regular users of

futures markets.¹

To more accurately assess the degree to which agricultural banks use financial futures as a risk management tool, a national survey was recently conducted by the Federal Reserve Bank of Kansas City. A total of 460 agricultural banks were surveyed, representing approximately 10 percent of the total agricultural banks in the United States.² The number of respondents to the survey totaled 332 banks, a 72 percent response rate.

The purpose of the survey was to determine the extent that agricultural banks use financial futures and their reasons for using or not using them as a risk management tool. The survey also sought information on two key issues—regulation and accounting—relevant to the use of futures by the banking industry.

¹ A survey conducted by the CFTC in 1979 gathered information concerning the commitments of traders for several financial futures contracts categorized by trader occupation. Commercial banks accounted for 2.3 percent of total traders tabulated. A study conducted by Arthur Anderson & Co. in 1981, commissioned by the research foundation of the Financial Executives Institute, was targeted toward the use of interest rate futures by commercial companies in the United States and Canada. Its purpose was to examine the accounting, reporting, internal control, and tax implications of using financial futures. The results of the study, however, have not yet been published. Another research study conducted jointly by the Treasury Department and the Federal Reserve System addressed the following issues: 1) impact of futures trading on the cash market, 2) possible constraints on the Treasury's debt management, 3) assessment of CFTC's ability to effectively maintain surveillance of futures markets, and 4) adequacy of safeguards for unsophisticated investors. Other surveys of a specialized nature exist, but they are for private interests and have not been published.

² The survey was conducted in January of 1982. The survey sample consisted of the 100 largest commercial banks in agricultural lending and the top 10 percent in terms of farm loan volume, as defined by the American Bankers Association (ABA). For purposes of the survey, an agricultural bank is defined as a bank with at least \$2.5 million in farm loans and/or 50 percent of its total loans in agricultural loans. The sample was divided into five geographical regions: 1) Corn Belt, 2) Northeast, 3) Plains, 4) South, and 5) West. These regions correspond to those used in the ABA's annual agricultural credit survey.

The results of the survey indicate that only 7 percent of the responding banks are currently using financial futures. However, 15 percent of the respondents indicated that they were planning to use futures at a later time. Banks not currently using financial futures represented 77 percent of the total respondents, while banks which previously used futures but no longer do comprised only 1 percent.

According to the survey, financial futures are the least used tool for managing interest rate risk, even among user banks. Instead of using financial futures, the majority of the agricultural banks surveyed have responded to increased interest rate volatility by employing traditional risk-reducing techniques. The two most common methods used are variable interest rate loans as an alternative to fixed rate loans and shortening the maturity of assets to more nearly match that of liabilities. Another method frequently employed is the use of market interest rates other than the national prime as benchmarks for adjusting loan rates.

The survey results are analyzed and divided under three main categories: 1) banks currently using financial futures, 2) banks planning to use futures, and 3) banks not currently or no longer using them. A tabulation of some balance sheet characteristics of the responding banks is contained in Table 1.

Current Users

Banks currently using financial futures are generally large, with adequate resources and manpower to commit to a hedging program. Deposits averaged \$7.9 billion for this group, compared with average deposits of \$1.1 billion for banks planning to use futures. The number of people involved averaged 4.5, with an estimated time commitment of 92.3 manhours per month. Vice presidents and investment officers were the primary people responsible for the administration of their financial futures program.

Table 1
BALANCE SHEET CHARACTERISTICS OF AGRICULTURAL BANKS
RESPONDING TO FINANCIAL FUTURES SURVEY
(Millions of dollars)

	Number of Respondents	Assets	Deposits	Total Loans	Total Agricultural Loans	Percentage of Agricultural Loans
Currently Using						
Total:	23					
Average Value		11,434	7,862	6,357	175	2.8
Range		49-62,085	43-48,158	29-38,779	1-1,676	—
Tenth District:	2					
Average Value		1,529	1,111	744	83	11.2
Range		979-2,079	719-1,502	509-980	34-132	—
Planning To Use						
Total:	51					
Average Value		1,499	1,119	849	45	5.3
Range		30-15,668	25-11,406	21-10,312	8-483	—
Tenth District:	11					
Average Value		648	465	300	28	9.3
Range		68-1,887	56-1,371	46-960	15-49	—
Not Using						
Total:	254					
Average Value		199	161	107	19	17.8
Range		22-4,711	19-3,537	14-2,539	1-139	—
Tenth District:	59					
Average Value		117	92	58	20	34.5
Range		26-903	22-660	18-384	12-46	—
No Longer Using						
Total:	4					
Average Value		2,215	1,731	1,286	57	4.4
Range		38-4,233	34-3,235	28-2,558	12-144	—

A number of the banks surveyed that are currently using or plan to use financial futures have some familiarity with commodity futures. Specifically, of the responding banks currently using financial futures, 39 percent have a working knowledge of the commodity futures market. This knowledge is derived from their

long-standing experience with farm and ranch borrowers—advising customers on the use of commodity futures, loaning funds for customer margin requirements, and occasionally requiring customers to hedge commodities as a form of loan security. Of those banks planning to use financial futures, 69 percent have ex-

perience with commodity futures. If these two groups of respondents are combined as being representative of agricultural banks understanding the potential role of financial futures for risk management, a total of 59 percent of the total banks surveyed have experience with commodity futures.³ This experience may provide an advantage to agricultural banks over nonagricultural banks in implementing a financial futures program.

Banks using financial futures, as well as banks planning to use them, were asked to rank selected sources of information about futures in the order of their usefulness in instituting and administering their financial futures program. Banks responded that the most beneficial sources, in the order of perceived usefulness, were commodity brokers/dealers, professional seminars, commodity exchanges, accountants, market researchers, economists, and financial consultants. The survey revealed that when developing hedging strategies, banks relied most heavily on internal bank management for their expertise. However, of the banks that lacked expertise, 43 percent indicated that the establishment of a financial futures advisory service would encourage their involvement in financial futures.

The survey showed that financial futures are used by banks to hedge interest rate exposure in a variety of situations. The most common use for a hedge is protection against an increase in the cost of a bank's funds and for anticipated borrowings.⁴ Hedges also are used to protect

³ While the survey was directed at agricultural banks, results might be applied to a broader range of commercial banks. This is true for two reasons. First, the survey sample included large money center banks as well as smaller rural community banks. Second, the definition of an agricultural bank used in this survey was more liberal than the standard banking industry definition.

⁴ From the regulator's perspective, anticipated borrowings may be speculative in nature. Care should be exercised in the construction and documentation of such hedging strategies in order to comply with regulators' guidelines.

existing and anticipated investments from losses due to fluctuating interest rates.

The survey further revealed that 74 percent of the banks currently using financial futures take an active role in managing their hedge positions. The management of a hedge involves the use of futures market contracts to control the cyclical interest rate risks of a mismatch of asset and liability maturities. Managed hedges generally require an interest rate forecast or the ability to judge the most favorable timing for the placement or removal of a hedge. Using an interest rate forecast to gain a better understanding of the direction of interest rates for a hedging decision is sometimes considered speculative. According to the survey, fluctuations in the basis and revisions in interest rate expectations are factors considered most critical in monitoring hedge positions. Yield fluctuations and changes in economic conditions play a secondary role in hedge management decisions. Of the responding banks, 58 percent depend primarily on their own market judgment regarding the movement of interest rates rather than on a formal forecast in developing hedging strategies. In cases where such a forecast is utilized, it is normally generated by internal bank management rather than by outside consultants.

An increasing number of banks are incorporating financial futures into their overall asset-liability management program to better manage net interest rate exposure. Of the responding banks, 85 percent determine their interest rate exposure primarily through the use of interest rate sensitivity analysis. The mismatch between the maturities of assets and liabilities, when quantified by the calculation of the gap, provides a bank with a measure of total interest rate exposure.⁵ Other methods

⁵ The term "gap" has become associated with such phrases as "gap management" and "hedging the gap." A gap

used in determining interest rate exposure are spread analysis and asset-liability management modeling.

Planning to Use

Banks planning to use financial futures tend to be medium to large in size, with deposits averaging \$1.1 billion, in comparison to average deposits of \$161 million for nonusers.⁶ Banks not currently using financial futures but planning to use them at some point were asked to specify the preparatory steps they have taken toward initiating a risk management program utilizing financial futures. They noted the following, in order of preference: initiation of more detailed asset/liability management, careful consideration of the accounting aspects, education of more people within the bank about financial futures, strategy discussions with senior bank management, and consultation with other professional users.

NonUsers

Most banks not currently using financial futures are small in size, with limited resources, holding average deposits of \$161 million. There are several reasons these banks do not use financial futures. Lack of adequately trained personnel was cited as the main deterrent. Also cited was the lack of useful or easily understood information on financial futures with commer-

simply denotes the discontinuity that exists when the maturities of assets and liabilities are not perfectly matched. Asset/liability management techniques have evolved from spread management and have expanded to the determination of a net interest-sensitive asset or liability position at individual maturity layers. This net exposure, or gap, is then hedged in the financial futures market.

⁶ Besides answering questions in their section of the survey, the respondents also were asked to answer as many questions in the user's section of the survey questionnaire as they thought applicable. Those responses were incorporated in the current user's section.

cial banking applications. In addition, they found the inherent market risks that exist with financial futures difficult to comprehend as well as control. Some banks reported that they believed the matching of assets and liabilities in the cash market was sufficient and that they had no need for financial futures.

The boards of directors at some banks are reluctant to use financial futures because of problems associated with current regulatory and accounting guidelines. This reluctance often takes the form of bank policy which discourages a bank from implementing a financial futures program. The small number of banks that have had previous experience with financial futures but that have discontinued their use cite the lack of experienced personnel and financial losses resulting from the improper use of futures as the major reasons for this decision.

Factors that would motivate nonuser banks to seriously consider the use of financial futures consist of a better understanding of the applied uses of financial futures, the continued existence of interest rate volatility, and more consistent and clearly defined regulatory tax and accounting treatment. Some banks indicated that the availability of a financial futures advisory service from correspondent banks would encourage the use of futures.

MAJOR FINANCIAL FUTURES ISSUES

The two key issues that face the banking industry with regard to financial futures are regulation and accounting. Each remains a controversial and unresolved issue, in part because financial futures have developed rapidly over a brief period of time. How each is resolved will have a lasting impact on the degree to which banks adopt financial futures as a risk management tool. This section analyzes the regulatory and accounting issues relevant to use of financial futures by banks as indicated by survey responses of both user and nonuser banks.

Regulation of Financial Futures

Many user as well as nonuser banks responded that current regulatory guidelines, apart from the accounting issue, inhibit their use of financial futures. Approximately 44 percent of the user banks indicated that current banking regulations "somewhat" discourage their use of futures, while 13 percent said they "significantly" discourage their use. Slightly over a third of the user banks responded that current regulations do not affect their involvement in financial futures. Among nonuser banks, 38 percent said that more clearly defined regulatory, tax, and accounting guidelines would motivate them to seriously consider using financial futures. Hence, current banking regulations concerning financial futures appear too restrictive to many user banks and ill-defined to some nonuser banks.

Since the introduction of financial futures into the banking industry, bank regulators have become increasingly aware of the potential risks that financial institutions may incur as a result of the use of futures. The purpose of bank regulation is to monitor the soundness of a bank's overall financial condition as well as to deter activities associated with unacceptable levels of risk. The earliest and most all-inclusive set of regulations for financial futures and forward contracts were issued by the Comptroller of the Currency in 1976. In 1979, an inter-agency task force issued uniform guidelines for futures contract trading in the form of a joint Federal Reserve-Federal Deposit Insurance Corporation-Comptroller of the Currency policy statement. The guidelines of the three banking regulatory agencies, which were revised in March 1980, are similar in content and have comparable rules. For simplicity of discussion, direct reference will be made to the guidelines issued by the Comptroller of the Currency.⁷

The Comptroller, by its issuance of Banking

Circular No. 79, has recognized the legality of using financial futures as a hedging mechanism by banks. The Comptroller noted, however, that their use must be conducted "in accordance with safe and sound banking practices and with levels of activity reasonably related to the bank's business needs." While recognizing the appropriateness of using futures in investment portfolio operations, asset-liability management, and dealer-banking trading activities, the details for regulating futures trading are not specific. The regulations are of a generalized nature because a single set of rules governing the appropriate use of financial futures would not effectively apply to the numerous individual banking situations that could arise. However, one overriding guideline is that the use of financial futures should reduce the net interest rate exposure for the balance sheet as a whole.

Banking regulators have indicated that the responsibility for establishing a sound financial futures trading program lies with the board of directors of each individual bank. The directors are required to establish and implement written policies and procedures which will outline specific objectives that detail each hedging strategy, maintain an adequate record-keeping system, set and enforce contract position limitation, implement a system for monitoring and analyzing credit risk exposure, and establish appropriate internal controls. The objectives must detail strategies involving the use of financial futures contracts and their relationship to proper banking activities. Also, the

⁷ Banking Circular No. 79, issued by the Comptroller of the Currency, is applicable to all national banks. The circular was originally issued in November of 1979 and was subsequently revised and reissued on March 19, 1980. The purpose of the revision was to include the majority of activities relating to the hedging of interest rate risk under one set of regulations. This modification combines the previous guidelines covering forward placements, standby contracts, and GNMA contracts with financial futures.

records must be adequate to indicate how contract positions contribute to the attainment of the objectives.

The Comptroller's regulations contain a provision for the proper accounting treatment of financial futures. It is required that "all futures and forward contracts (with certain exceptions)...should be valued by a consistent method of either mark-to-market or mark to the lower of cost or market...[and] all losses resulting from monthly contract value determination should be recognized as a current expense item." The rationale behind the Comptroller's stand on the accounting treatment is that a mark-to-market approach is considered a deterrent to speculation. An in-depth discussion of the accounting issue is presented in the next section.

Regulatory policy is explicit in its allowance of hedging and its disapproval of speculating. However, the distinction between the two remains nebulous. Non-speculative transactions are contract positions that are defined as reasonable in terms of such factors as the size of the financial institution, its capital structure, its sources and uses of funds, and its capacity to fulfill outstanding obligations. Cash market as well as futures market transactions require some degree of interest rate forecasting and exposure to interest rate risk, which suggests that the potential for speculation always exists. The success of these transactions depends upon how actual interest rates move relative to expectations. It is inevitable that banks will be exposed to some variability in interest rates, but when properly managed, this risk is acceptable and is not considered speculative.

The Comptroller's basic philosophy is that if the futures markets are used to protect the difference between the cost of a bank's funds and the return on its assets, then such activities are considered "incidental to banking" and therefore an appropriate risk management tool. The development of a precise definition of

hedging and speculating for regulatory purposes would not be feasible because of the numerous situations it would have to address. Some observers have suggested that it might be more effective from the regulators standpoint to specify acceptable levels of risk that would be appropriate for the banking industry. Before such risk levels can be analyzed and defined for regulatory use, though, some actual experience in the use of financial futures by a variety of banks will be needed.

When a bank establishes its own self-regulatory guidelines for the prudent use of financial futures, the need for detailed regulatory requirements are greatly reduced. The success of any new technique to control risk depends upon the quality of bank management and its ability to adapt to a changing environment. Also, the market trading requirements imposed by the commodity exchanges and compliance with these regulatory guidelines help to insure proper usage of financial futures. Regulators might fulfill their function more effectively by providing information which educates banks about the proper methods of utilizing financial futures.

Banking regulators have established guidelines that are strict in the sense that contract positions must relate to prudent banking activities. At the same time, the guidelines are liberal in allowing individual banks to administer their own financial futures program. It is proper to expect regulators to require detailed documentation from banks justifying their implementation, administration, and working knowledge of financial futures. For many banks that have the appropriate expertise available to manage the use of futures, bank regulation fulfills the function of assuring compliance with safe and sound banking activities. On the other hand, for banks that are lured into a false sense of security by financial futures, regulation is necessary to prevent increased risk-taking.

Financial Futures Accounting

The accounting issue revolves around the manner in which banks should recognize futures contract positions in their financial statements. Current attitudes by regulators and banks reflect two different philosophical approaches to this issue. Bank regulators support lower-of-cost-or-market value accounting, also referred to as mark-to-market, which basically forces banks to recognize futures gains and losses in current income.⁸ Regulatory guidelines also require hedging strategies to be directed toward the overall net balance sheet exposure, a concept referred to as macro hedging, rather than hedging specific assets and liabilities.

According to the survey, banks favor deferring recognition of gains and losses until the futures position is offset or the underlying cash market position is altered.⁹ Survey results reflect dissatisfaction with market value accounting by both user and nonuser banks. Of those user banks surveyed, 40 percent said that current accounting guidelines "significantly" discourage involvement, while 36 percent

responded that involvement was "somewhat" discouraged. Of the nonuser banks surveyed, 16 percent reported current accounting guidelines as a factor that influenced their decision not to use financial futures. Furthermore, 38 percent of nonuser banks indicated that more clearly defined regulatory, tax, and accounting treatments would encourage them to use financial futures.

Banks dislike market value accounting because of its disruptive effects on their financial statements. If interest rates behave in a volatile fashion, the resulting futures contract price fluctuations, and especially losses, will be reflected immediately in a bank's financial statement. This will occur even though assets and liabilities often continue to reflect their book value. A number of banks which now use financial futures have attempted to avoid the adverse effects of financial statement disruptions by maintaining two different sets of records. The official set of records meets the regulator's approval by using market value accounting. The other set of records, which is made public to stockholders, uses deferral accounting to minimize earnings variations resulting from futures trading.

Deferral accounting offers banks the opportunity to hedge against interest rate risk without inflicting frequent financial statement disruptions. Based on the survey results, the adoption of deferral accounting would stimulate more intense and widespread use of financial futures. The accounting treatment would be comparable to the way that banks presently account for their investment portfolio transactions. Deferral accounting does not, however, eliminate the effects of adverse interest rate fluctuations on individual assets. Rather, it postpones any consequences to a future period in time. This means that improperly managed hedges could go unnoticed to bank management until the hedge position is offset.

The resolution of the market versus deferral

⁸ Market value proponents argue that gains and losses on futures contracts should be recognized currently to associate them with their effect on the net interest rate exposure. This group believes that hedging may be accomplished only by the matching of interest-sensitive assets and liabilities. Any other type of hedging would be considered speculation by market value proponents. Financial futures as hedges, therefore, must be directed to net interest rate exposure. Since a mismatch of interest-sensitive assets and liabilities is currently accounted for in the income statement, gains and losses on futures contracts likewise should be currently recognized.

⁹ Deferral accounting advocates contend that in circumstances which constitute a hedge, it is appropriate to defer futures contract gains or losses until either the cash position is altered and/or the futures contract is offset. They believe that financial futures legitimately can be used to hedge net interest rate exposure. Because the cash market asset or liability which is being hedged against is normally carried at book value, deferral method proponents argue that financial futures contracts should similarly be carried at book value with realization of gains and losses when the contract is offset.

accounting issue likely will come about later this year when the Financial Accounting Standards Board (FASB) is expected to rule on a proposal put forward by the American Institute of Certified Public Accountants (AICPA). The AICPA proposal suggests criteria by which to distinguish a hedge from a speculative position and advocates deferred accounting in situations that are clearly hedges.¹⁰ Bank regulatory agencies are expected to review their present guidelines after the FASB decision.

The AICPA proposal, in its original form, is becoming somewhat outdated as the controversy surrounding the accounting issue broadens to include the macro versus micro hedging concept. A macro hedge is a hedge against overall net interest rate exposure, as determined by the interest-sensitivity characteristics of a bank's balance sheet. A micro hedge, on the other hand, is a hedge placed on specific assets or liabilities irrespective of the overall interest rate exposure. While the meaning of these terms is not debated, the question remains as to the proper use of macro and micro hedging by financial institutions.

The Comptroller takes the position that macro hedging is the most efficient method of protecting a bank's interest rate exposure. Micro hedging, on the other hand, may entail some risk because of the narrow perspective from which the exposure is analyzed. The contention is made that hedging specific balance sheet items gives no assurance of reducing interest rate risk and may in fact increase net risk exposure. Recent literature has suggested that the Comptroller would favor deferral treatment

¹⁰ Three criteria to distinguish a hedge from a speculative hedge are suggested. The purpose of the hedge and the asset or liability being hedged against should be documented when a futures position is entered into. The price of the futures contract should have a high degree of positive correlation with the price of the hedged asset or liability. An anticipated hedge should reasonably be expected to be offset in the ordinary course of business.

of gains and losses when banks utilize the macro hedging approach. In following this approach, however, banks should be careful to consider the underlying characteristics of the assets and liabilities that make up the total net interest rate exposure.

The accounting profession takes the opposite position. They contend that a careful analysis should be made of the components of the net interest exposure in order to evaluate a hedging decision. When a hedge is initiated for a specific asset or liability, it would then be considered a micro hedge and qualify for deferred accounting treatment. Examples of balance sheet items qualifying for micro hedges are anticipated purchase of fixed interest rate assets, anticipated issuance of fixed-rate debt, and existing investment security or fixed-rate asset.

A blending of the macro and micro hedging approach might allow banks more flexibility in using financial futures. The identification of micro interest rate exposures allows better overall risk protection when coupled with an analysis of overall net risk exposure. Whether or not these two distinct hedging concepts can be intertwined for practical purposes depends upon the conclusions reached by the regulators and accountants. Only then can the issue of deferral accounting with regard to hedging be appropriately addressed.

IMPLICATIONS FOR THE USE OF FINANCIAL FUTURES

Because current users of financial futures tend to be large banks, the question arises as to whether financial futures are a suitable tool for rural agricultural banks. Survey responses indicate that despite their size, smaller agricultural banks may become regular users of financial futures. Nearly three-fourths of nonuser banks replied that a better understanding of the uses of financial futures markets would motivate them to seriously consider their use. This suggests that many small banks con-

sider financial futures a viable tool, but simply lack the expertise to become involved. The large number of small rural banks that are attending informational seminars on financial futures further demonstrates an attitude of developing interest by these banks.

Survey responses by nonusers suggest that despite the wealth of information available, it is difficult to gain a perspective on the viability of financial futures as a risk management tool as well as the specifics of implementing a hedging program. It is a difficult task to read and understand all the available material and to discern which information will be useful and accurate when applied to a particular bank's situation. This indicates that as more practical and useful information about financial futures is made available to the banking industry, the use of financial futures may grow.

In determining whether or not financial futures will be a suitable tool in managing interest rate risk, a bank must carefully analyze their potential use. A bank must first compare the use of financial futures against the effectiveness of traditional risk management tools. If a decision is made to use futures, an appraisal then must be made of the bank's capability to implement and manage their use. A bank may find that a financial futures program will place excessive time demands on personnel or that expertise is lacking to effectively carry it out. In this case, a smaller bank may find the employment of outside consulting services to be a more efficient means of directing a hedging program. However, it will still be incumbent upon the board of directors to take final responsibility for the hedging program.

Some banks distrust financial futures because of adverse publicity focused upon banks that have used futures in the past and incurred substantial losses. Such losses sometimes have been blamed on the inherent risks

associated with financial futures markets rather than on human error. Other banks have approached the use of futures with an overly optimistic attitude by utilizing advice in making trades that overstate the potential effectiveness of financial futures in hedging risk.

SUMMARY AND CONCLUSION

Financial futures offer agricultural banks a potentially effective tool to deal with interest rate risk in the new financial environment. Based upon a national survey of agricultural banks conducted by the Federal Reserve Bank of Kansas City, it was found that financial futures currently are used primarily by large banks with deposits of \$2 billion or more. Notwithstanding, a few small banks with deposits less than \$100 million were also found to be employing this tool. The vast majority of small rural agricultural banks do not currently use financial futures. However, the survey results also suggest that these banks may become regular users if their understanding of financial futures markets and banking applications is improved.

Banks that lack experience in financial futures need to exercise caution in implementing a hedging program. Improper and indiscriminant use of financial futures may lead to more rather than less risk exposure for a bank. On the other hand, careful planning and monitoring of hedging strategies in conjunction with overall asset-liability management can lead to more effective risk management.

Currently, financial futures are not being extensively employed by agricultural banks. In view of the changing and uncertain financial environment, it is likely that agricultural banks, with their background in commodity futures, may increasingly turn to financial futures as an appropriate risk management tool.

Issues in Monetary Policy: II

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