

EDITOR'S NOTE:

The following is a paper presented by Allan H. Meltzer, Professor of Economics at Carnegie-Mellon University, at a seminar at this bank. Along with several other well-known economists, Professor Meltzer has been a leading proponent of the monetary view of economic stabilization.

This paper considers the question of the appropriate definition of money and discusses the ways that the Federal Reserve can control the money stock consistent with achieving its short-term money market objectives. Professor Meltzer advocates the use of the growth of the money stock as an indicator of the influence of monetary actions on economic activity, and then describes the manner in which the desired growth rate of money can be achieved through the Federal Reserve's control of the monetary base.

Professor Meltzer and others have been critical of monetary management because they have found little evidence that monetary authorities have recognized the importance of money in carrying out their responsibility for economic stabilization.

Controlling Money

by ALLAN H. MELTZER*

THREE QUESTIONS recur frequently in current discussions of monetary policy: (1) Can the Federal Reserve control the stock of money if it chooses to do so? (2) What are some main consequences of choosing the stock of money as opposed to some other variable as the focus of control? (3) Which stock of money can be controlled best; or stated in another way, how should we define and measure the stock of money that is to be controlled?

These questions are distinct from the larger question: Should the stock of money, somehow defined, receive the main attention of policymakers when they seek to translate some broad national or international objective, or combination of objectives — such as balance-of-payments equilibrium, reduced inflation, high level employment of resources — into an operating monetary policy? Although I do not bypass this question completely, in most of my discussion I assume that the larger question has been answered affirma-

tively and that there is general agreement on the following four propositions.

First, the stock of money is a main — indeed *the* main — objective of monetary policy operations. This statement means either that directives are written or monetary policy actions are judged in terms of some level, change or rate of change of one or another monetary aggregate.

Second, control of the stock of “money” is a means and not an end. Given our limited and uncertain knowledge of the timing and magnitude of the effects of policy changes, the growth rate of the stock of money is used to indicate the effects that are likely to be achieved, at some sequence of dates in the future, as a result of monetary policy operations that have been taken up to the present.

Third, monetary policy is not the only means of achieving the broad national or international objectives mentioned above, although it may be the most important means. Other policy operations (tax and spending decisions or changes in the size of the government deficit, and changes in tastes and opportunities for example) have short- or long-term effects

*I am as always indebted to Karl Brunner for the benefits derived from years of joint research, which provided the background for this paper and most of what I know about money.

on output, employment, prices and interest rates that are independent of the effects on these variables of changes in one or another measure of the stock of money.

Fourth, "money" is used to assess the relative and not the absolute effects of monetary policy. A maintained increase in the growth rate of money is interpreted as a more expansive action; a maintained decrease is interpreted as contractive. The terms "expansive" and "contractive," however, compare the size of monetary changes to the changes that have gone before and not to some absolute or ideal rate of monetary expansion.

The questions posed at the outset, though more narrow and technical, are no less important than the larger question. If the term "money" cannot be defined, money cannot be controlled. Even if there is an acceptable or accepted definition, the decision to control money is said to have unacceptable consequences. Two types of objections to controlling money are generally raised, one broad, the other more narrow and technical. Separating the two permits a far more meaningful discussion of the short-term consequences of monetary policy and gives more precision to the role that money can play and the various ways in which the stock of money can be used as an instrument of monetary policy. In the next section, I comment on several of the issues briefly. Then I discuss some of the more technical problems and in the process, define money and suggest an appropriate role.

Sorting Out The Issues

Many, if not most, of the criticisms of assigning money a more important role either rest on a misconception or attack a "straw man." The misconception is that any decision to assign a larger role to money means that discretionary monetary policy must be abandoned and replaced by a monetary rule. The attack on the monetary rule—a law of constant monetary growth—is an attack on a straw man because the critics of the rule generally fail to deal with any of the relevant issues. Choices need not be limited to decisions between extreme points. Abandoning the present policy of high variability does not require a move to the other extreme: a constant growth rate.

In this section, I distinguish three separable issues. One is the role assigned to money. A second is the ability to control the stock of money. A third is the ever-important, but often neglected, distinction between nominal and real changes in money and interest rates.

The Role of Money in Monetary Policy

Money may be used as an *indicator*, as a *target*, or as both *indicator* and *target*. Broadly speaking, when money is used as an indicator, changes in the growth rate of the stock of money become the principal means of deciding whether monetary policy is more or less expansive. When money is used as a target, policy decisions are directed toward providing a particular stock or growth rate of money, or perhaps maintaining the growth rate of money within certain limits. The limits within which such policies may be carried out are set by the extent to which money or its growth rate can be controlled. For short-term movements, the degree of control depends very much on the definition of money.

The same problem exists, of course, for any variable chosen as a target. Neither the level of free reserves nor the Treasury bill rate are now controlled completely. The relevant issues here are not whether money or some other variable can be completely controlled, but whether the degree of control exercised by the Federal Reserve is increased or decreased, and the effectiveness of monetary policy in carrying out its assigned tasks enhanced or weakened, by the substitution of some money stock target for some money market target. I return to this subject in a later section, where I suggest an appropriate target and discuss the degree of control.

The use of money as an *indicator* of monetary policy does not presuppose and does not require *any* reduction in the variability of the growth rate of money. In principal and in practice, money can be used as an indicator while the Manager of the System Open Market Account conducts his daily operations in precisely the same way he does now. He can continue to use free reserves, interest rates or money market conditions as his targets. He can offset, or fail to offset, any of the changes in float, currency, or Treasury deposits, that he wishes. Discussion of the appropriate amount of variability in the growth rate of money can and should be separated from the decision to accept money as a reliable indicator of changes in the size of policy operations and of the future effect of policy. Here, the relevant choice is not between a rule and complete discretion but between various indicators that provide more rather than less accurate information about the future effects of policy.

The reason that choosing money as an indicator has no necessary consequence for the variability of

the stock of money is recognized in the distinction between so-called defensive and dynamic operations. The Manager can continue to offset money market changes, conduct defensive operations while the Open Market Committee or its staff uses some monetary aggregate to judge the direction in which monetary policy has changed and the future effects of policy operations. If the Open Market Committee decides to make policy less inflationary, the growth rate of the stock of money is reduced. While carrying out the defensive operations, the Manager sells more on balance, and both the Committee and the Manager determine how much to sell by comparing the maintained and desired average growth rates of money.

The question arises as to whether this minimal step is feasible. Can money be used as an indicator even if daily operations are conducted with as much variability as in the recent past? The answer seems obvious. Those who used money as an indicator in recent years correctly predicted the inflation of 1966, the slowing of economic activity in 1967, the renewed inflation in 1967 and the increased rate of inflation in 1968. Despite the high variability of the monetary growth rate, it was possible to predict the longer-term consequences of monetary policy with reasonable accuracy. Since some of the predictions were made at meetings with the Board of Governors and rejected, it seems reasonable to conclude that the Open Market Committee and its staff relied on less accurate indicators. It is hard to avoid the conclusion that monetary policy would have achieved more of the policymakers' announced and frequently repeated aims, if changes in the maintained growth rate of money had been used as an indicator in recent years and in earlier periods as well.

The Ability to Control Money

Critics of the use of money as an indicator of monetary policy delight in pointing out that there is less than unanimous agreement on the most appropriate definition of money. The critics hardly ever mention that there are very few times when it would have made much difference whether one or another of the commonly accepted definitions had been used. The maintained growth rates of currency plus demand deposits and currency plus total deposits—the most common definitions—are almost always in the same direction, and changes in the growth rates generally occur at about the same time. There are very few periods in which the qualitative judgment reached

about the future effect of monetary policy depended importantly on the definition chosen. Among the exceptions are several recent periods in which changes in market rates relative to Regulation Q ceiling rates caused large, temporary changes in time deposits and in the relative growth rates of time and demand deposits. In these periods, I believe the narrower definition—currency and demand deposits—generally provided the more accurate indicator.

If policy operations retain their short-term focus and some measure of money replaces market rates or free reserves as a target of the Manager's operations, it becomes important to choose between the various measures. One difficulty in using money (currency and demand deposits) or money plus time deposits as a target of monetary policy is that reliable information is not available daily or even weekly. Another difficulty is that when information becomes available, it is imprecise.

Both of these objections apply to the use of money as a target of monetary policy; neither applies with much force to the use of money as an indicator. Both objections are overcome by choosing the monetary base as a target. The monetary base can be measured, weekly, with greater reliability than some of the operating targets now in use, such as the level of free reserves. Weekly data on the base are now available from the Federal Reserve Bank of St. Louis. If the Manager of the Open Market Committee wishes to combine control of money with defensive operations, the directives written to the Manager should specify a desired change or level of the monetary base.¹

Evidence from past periods suggests that the monetary base is the most important determinant of the money supply and that there is a high degree of association between the base and the money stock. The degree of association and the extent to which money can be controlled by controlling the base varies with the length of the period. Our analysis suggests that even if policy retains its short-term focus, month to month changes in money can still be kept within a very narrow range. In the past, 85 per cent of the variance of the monthly change in money—currency and demand deposits—resulted from changes in the monetary base and changes in Treasury deposits at commercial banks in the current and previous month.

¹In a later section and in Table II, I compare the information required to control the monetary base to the information now collected daily at the Federal Reserve Bank of New York.

Table 1

CORRELATIONS BETWEEN MONTHLY CHANGES IN "MONEY"
AND SOME EXPLANATORY VARIABLES

Time Period	Definition of Money	Explanatory Variables and Their Coefficients (Constant Term Omitted)				R ²
March 1947 to March 1965	ΔM_1	2.38 ΔB_t	-.85 ΔD_t			.80
		(24.6)	(-18.0)			
	ΔM_1	2.23 ΔB_t	-.74 ΔD_t	+ .78 ΔB_{t-1}	-.02 ΔD_{t-1}	.86
		(26.0)	(-17.3)	(8.84)	(-.58)	
	ΔM_2	2.15 ΔB_t	-.82 ΔD_t			.70
		(17.7)	(-14.2)			
	ΔM_2	1.98 ΔB_t	-.70 ΔD_t	+ .91 ΔB_{t-1}	-.05 ΔD_{t-1}	.77
		(18.3)	(-13.0)	(8.15)	(-.86)	
Feb. 1947 to Dec. 1964	ΔM_1	1.39 ΔB_t	and 11 dummy variables to adjust for seasonal variation			.80
		(5.88)				

Note: "t" statistics are in parentheses.
None of the data were seasonally adjusted.

Explanation of Symbols

ΔM_1 = Monthly Change in Currency and Demand Deposits.
 ΔM_2 = Monthly Change in Currency and Total Deposits.
 ΔB_t = Monthly Change in Monetary Base.
 ΔD_t = Monthly Change in Deposits of the Treasury at Commercial Banks.

Even in periods of substantial variability in the growth rate of money and sizable defensive operations, monthly changes in money were dominated by current and past changes in the base. The relation between monthly changes in the monetary base and money plus time deposits is not as good. Nevertheless, more than 75 per cent of the variance of the monthly changes in this monetary aggregate can be controlled by using the base as a target and estimating Treasury deposits as accurately as in the past. Table 1 shows some of the evidence on which these conclusions are based, giving the correlations between money and some explanatory variables.

A related but very different argument raised against the use of any monetary aggregate is that, even if these variables can be measured accurately and promptly, they cannot be controlled. Changes in the composition of deposits between demand and time account, changes in the composition of money between currency and deposits, gold flows and changes in the proportion of deposits held by foreigners are cited as sources of changes in the monetary base or the stock of money that are not controlled and are said to be outside the control of the Federal Reserve. Since the evidence cited above (and a substantial body of additional evidence) makes clear that if the Federal Reserve controls the size of changes in the monetary base, it controls by far the larger portion of the changes in the stock of money,

I shall discuss this argument with reference to the monetary base and compare the degree of control over the base to the control of short-term market rates or free reserves.

To a very large extent, arguments suggesting that the base cannot be controlled are a play on the use of the word "control" that fail to separate short- and long-term changes and do not distinguish between the sources and the uses of the base. The problem of controlling short-term changes arises whether the Committee uses free reserves or the monetary base (or almost any variable worth mentioning) as the target of monetary policy. The reason is that monthly or weekly changes in both free reserves and the monetary base are the result of (1) actions taken by the Manager, for example, purchases and sales of securities (2) changes resulting from market forces

that the Manager observes, but chooses not to offset, and (3) changes that are unforeseen because of errors in reporting or errors of measurement. I see no point in describing the changes that the Manager makes as "controlled" and the changes he permits as "uncontrolled." The more relevant question is the extent to which the Manager has more accurate and reliable information, within a given time span following the change, about one target variable rather than another. As I indicated, the weekly change in the monetary base can be known more reliably than the weekly change in free reserves. This is one important reason for choosing the base as a target. I return to this point below.

Whether the target variable is the level of free reserves, the short-term market interest rate or the monetary base, changes in the target during any period are the result of both current and past policy and nonpolicy changes. Suppose a policy of reducing the rate of inflation is translated into a policy target of forcing or permitting higher market interest rates or a lower growth rate of the monetary base. If the policy is maintained and begins to take effect, weeks or months after the policy is initiated the inflow of gold or foreign exchange rises, and with fixed ceiling rates of interest paid on time deposits, time deposits decline relative to demand deposits. Gold is a source of base money, so the inflow of gold raises the base and lowers market interest rates; the redistribution

of deposits from time to demand accounts raises the weighted average reserve requirement ratio, lowers the base, and raises interest rates. There is no reason to expect these effects to occur at the same time, to be offsetting on any particular day or over any particular span, or to cancel the effects of changes in tastes, opportunities, and actual or expected rates of inflation. Nor is cancellation essential for the conduct of monetary policy.

The Committee and the Manager require: (1) an accurate estimate of the size of the current change in the target variable (the base or interest rates, or free reserves); (2) a clear idea of the desired value of the target variable; and (3) an ability to translate the longer-term goals of monetary policy into a desired current value of the target and to translate changes in the target into changes in the rate of inflation, level of employment, or balance of payments.

The crucial problem in the example, as in practice, is not one of measuring the so-called noncontrolled changes in the target but of deciding how large the change in the target should be to achieve longer-term objectives. The Federal Reserve can observe and record current changes in the base, free reserves, or short-term interest rates shortly after they occur. If they could translate these changes into future levels of employment and rates of inflation, they could decide how much to buy or sell to achieve the level of interest rates, free reserves or base that are consistent with the long-term aims of economic policy. The difficult problem is not the measurement of short-term changes but the interpretation of these changes—for example, knowing whether a given level or change in market interest rates is too low or too high, too large or too small, to prevent inflation or unemployment.

I see no way of resolving this problem, given the present or foreseeable future state of knowledge, other than by choosing a reliable and readily available *indicator* of the future effect of policy. The reason is well known: the effect of current changes in policy on output, prices and the balance of payments are not observable for months and in some cases are not recognized for years. Equally important, errors generally cannot be offset or reversed without forcing large and sudden changes in policy that have destabilizing effects. There is, perhaps, little reason to dwell on this point. Too many of the current problems of monetary policy are now recognized as the result of errors in judging the expected effects of past policies or justifiable fears of the consequences of suddenly reversing previous policies.

The above discussion should not suggest that the choice of the target is a subsidiary and unimportant matter. The choice depends very much on the information reliably possessed and the ability to measure, control and interpret short-term changes. My remarks are misread if they appear to downgrade the problem or to suggest that one target is as useful as another. They should be read instead as an attempt to sort out some of the meanings of "controlling money."

In discussing the meaning of "control," I found it useful to make three distinctions. One is the degree to which monetary aggregates can be measured and manipulated during a particular time span. The monetary base can be controlled weekly and perhaps daily with as much accuracy as other variables now used as targets. In the past, we have found that most of the monthly changes in money can be controlled by controlling the monetary base. The base is, therefore, a more useful target than the stock of money (or other monetary aggregates) if policy retains its short-term focus. A second distinction is between controlled and noncontrolled changes in a target variable (such as the base) and the degree to which controlled changes can be used to offset the changes resulting from past policy and nonpolicy decisions. A third is the distinction between measuring the change in a target variable and interpreting the change. By controlling the growth rate of the base the Federal Reserve can contain the short-term growth rate of money within narrow limits. Since the stock of money is a useful and reliable indicator of changes in the thrust of monetary policy, I believe the Federal Reserve should use the stock of money—currency and demand deposits—as an indicator.

To this point, I have discussed the ability of the central bank to use monetary aggregates as useful targets and reliable indicators of monetary policy and to offset the effects of past policy changes and non-controlled changes on current nominal values of the monetary base, money, market interest rates or free reserves. The Federal Reserve, and any other modern central bank, can offset and hence control the size of current changes in free reserves, short-term market interest rates or the monetary base, and to a very large extent can determine the size of changes in money if it chooses to do so. However, there is a very important sense in which a central bank cannot control either money or interest rates. To discuss this meaning of control, we need an additional distinction—the distinction between nominal and real changes in money and interest rates.

Nominal and Real Changes

Perhaps the oldest and best established proposition in monetary theory states that the government or central bank controls the nominal stock of money while the public decides on the price level at which it willingly holds the nominal stock. In our day, the nominal stock is the amount of currency and demand deposits issued by commercial banks and Federal Reserve banks. The real stock of money is the nominal amount deflated by some representative index of prices.

The distinction between nominal and real applies with equal force to every monetary aggregate and to interest rates as well. To compute the real rate of interest from the nominal or market rate, we have to subtract the *anticipated* rate of price change. One major problem in interpreting changes in market interest rates and using levels or changes in market rates as indicators of monetary policy is separating the effects of anticipations from other forces affecting market rates. Without reliable estimates of the anticipated rate of price change, it is impossible to interpret changes in market rates or to use market rates as indicators of monetary policy. Recent monetary history suggests the type of error that is likely to be made if high or rising market interest rates are interpreted as a sign of restrictive, anti-inflationary policy. The same or opposite error has been repeated throughout monetary history.

Just as the Federal Reserve cannot control the value of real money balances, it cannot control the long-run market rate of interest. A brief description of some links between money, interest rates, actual and anticipated price changes may explain the reasons.

Let the Federal Reserve increase the growth rate of the nominal stock of money. Initially market interest rates fall, but the initial reduction is temporary and is followed by a rise in market interest rates as consumers and business attempt to borrow more so as to accumulate inventories and increase expenditures. The Federal Reserve can, if it chooses, increase the amount of open market purchases and more than offset the rise in market rates resulting from the increased demand for loans and increased expenditures. However, with technology and real resources fixed or changing more slowly than the quantity of money, the continued expansion in the public's expenditures causes prices to rise.

If the higher growth rate of money is maintained, eventually consumers and businessmen are confronted

with frequent announcements of price increases. They are led to examine the prices they charge for the goods or services they sell and to consider whether their prices should be adjusted upward. Gradually, they learn to anticipate price increases.

Individuals and businessmen attempt to protect themselves against the consequences of inflation or to profit from those consequences. They sell bonds and spend money to reduce their holdings of claims fixed in nominal value. They seek to borrow to increase liabilities with fixed nominal values. They switch, at the margin, from assets with fixed nominal value to assets that rise in price during inflation.

All these responses can be summarized by saying that if the Federal Reserve maintains the higher rate of increase in the nominal stock of money, market interest rates rise with the spreading anticipation of future inflation. To maintain the previously prevailing market rate, the Federal Reserve must supply an ever-increasing amount of base money and permit the money supply to increase at an increasing rate. Attempts to lower or maintain the market rate however, implant the anticipation of inflation more firmly and force still higher actual and anticipated rates of inflation.

The process I have described as an adjustment of nominal rates could be described just as well as an attempt by moneyholders to reduce the amount of money they hold. As before, the attempt causes prices to rise and, as prices rise, the real amount of money corresponding to any nominal stock falls. Attempts to maintain the higher growth rate of money eventually produce a higher actual and anticipated rate of inflation and a higher market rate of interest. If tastes and productive opportunities remain unchanged, equilibrium is restored when the public is willing to hold an unchanged real amount of money at the higher market rate of interest.

One frequently repeated form of the argument just made confuses the Federal Reserve's inability to control the long-run real value of the stock of money with an inability to control the nominal amount of money if exchange rates are fixed. This line of reasoning starts by showing that among the consequences of the inflationary increase in the nominal stock of money (or reduction in market interest rates) are increases in imports and declines in exports, an increased deficit in the balance of payments. The (increased) deficit on current account causes an outflow of gold that reduces the nominal stock of money and raises market interest rates. This portion of the

argument is correct. However, the Federal Reserve can offset or more than offset the effect of the gold outflow on money and interest rates, if it chooses to do so. In the past decade, we have elected to raise the growth rate of the stock of money in an attempt to hold market interest rates below the level they would have reached in the absence of inflationary monetary policies. Gold outflows have not prevented the Federal Reserve from maintaining one of the highest rates of monetary expansion in United States history.

If foreign countries inflate at a slower rate than the U. S., one ultimate consequence of our higher rate of inflation is a change in the dollar price of gold or in the fixed exchange rate system. Neither these consequences nor the outflow of gold should suggest that the Federal Reserve is unable to control the nominal stock of money. On the contrary, inflation and the balance of payments deficit are consequences of the system of fixed exchange rates and of an over-production of nominal money — production of more nominal money than the public is willing to absorb at the anticipated rate of price change. The public's ability to reduce its holdings of real money balances, not the inability of the Federal Reserve to control the nominal stock, should be seen as the means by which excessive expansion of nominal money is translated into inflation and a balance-of-payments deficit.

A related argument is used to suggest that the stock of money cannot be controlled because an increase in money or its growth rate reduces interest rates and causes a short-term capital outflow. I have dealt with one part of the argument above and suggested that the Account Manager can observe the outflow and offset the effect on interest rates or money, if the Committee desires to do so. Public policy may dictate that open market operations be used to offset the gold outflow or prevent it. The latter decision should not be confused, however, with an inability to control the nominal stock of money since the identical problem arises whether the Federal Reserve uses money, interest rates or some other variable as an indicator or target of monetary policy. The core of the problem is a conflict between a relatively high rate of inflation (or deflation) and a fixed exchange rate. At the present time, conflicts of this kind are of little practical importance, since policies designed to reduce the rate of inflation would help to maintain the prevailing exchange rate.

Technicalities and Techniques

Several of the arguments I discussed in the previous section reflect a lack of understanding of the means by which the monetary base can be manipulated to control the stock of money. In this section, I first discuss the sources and uses of the base, pointing out the information available to the Manager and comparing the available information on sources of the base to the information now collected on the sources of free reserves. Then I discuss, briefly, the validity of some of the criticisms of the use of money in monetary control.

Data on Sources and Uses

The data for computing the monetary base is obtained from the table "Member Bank Reserves, Re-

Table II

SOURCES AND USES OF FREE RESERVES AND THE MONETARY BASE

(Illustrative Calculation — Billions of dollars)

SOURCES		
	Monetary Base	Free Reserves
Factors Supplying Sources		
Reserve Bank Credit net of Discounts and Advances	55.0	55.0
Reserve Adjustment (cumulated sum of Reserves liberated by Reserve Requirement Changes)	4.8	—
Discounts & Advances	0.8	—
Gold Stock	10.4	10.4
Treasury Currency Outstanding	6.8	6.8
Total Factors Supplying Sources	77.8	72.2
Factors Absorbing Sources		
Treasury Cash	0.8	0.8
Treasury Deposits at Federal Reserve	0.6	0.6
Foreign and other Deposits	0.6	0.6
Other Federal Reserve Accounts	—0.8	—0.9
Required Reserves	—	27.1
Currency in Circulation	—	49.2
Less Currency held as Reserve	—	—4.6
Total Factors Absorbing Sources	1.2	72.8
Total Sources (Factors Supplying Sources minus Factors Absorbing Sources)	76.6	—0.6
USES		
	Monetary Base	Free Reserves
Reserve Adjustment (cumulated sum of Reserves liberated by Reserve Requirement Changes)	4.8	—
Total Reserves	22.6	—
Currency in Circulation	49.2	—
Excess Reserves	—	0.2
Less Discounts and Advances	—	—0.8
Total Uses	76.6	—0.6

serve Bank Credit, and Related Items" in the Federal Reserve *Bulletin*. The table also serves as the basis for computing free reserves and other reserve measures. There is, therefore, a similarity about the basic input data used for the computation of the base and other measures of reserves. Many of the computational differences result from the way items are grouped or classified. Table II compares the components of the base to the components of free reserves.

The *uses* of the base are bank reserves plus total currency held by the public and by nonmember banks plus the amount of reserves liberated or impounded by changes in reserve requirements or redistributions of deposits between classes of banks. Accurate weekly estimates of each of these uses are not available directly. A more reliable method is to compute the sum of the *sources* of base money; the sum of the sources is, of course, equal to the uses and can be computed daily or weekly from the information now collected at the Federal Reserve Bank of New York. As Table II shows, there are two main differences between the computations now prepared and the data required to compute the base. One is the way in which the items are combined. The other is that the estimates of a few items such as excess reserves and vault cash held by banks are not required for the computation of the base. Computation of these two important sources of error can be eliminated.

Instability of Interest Rates

One of the main arguments against controlling the stock of money is that the variability of interest rates would increase—that interest rates would be "unstable." This is not a necessary consequence of the use of money as an indicator or the use of the monetary base as a target. As I noted earlier, the use of money as an indicator of monetary policy and the use of the base as a target should not be confused with acceptance of a monetary rule.

There are several strands to the argument and I attempt to deal with the most common versions. One version concerns the usefulness of defensive operations. This is an issue that is best resolved by measuring, or attempting to assess, the cost and benefits of more rather than less variability in money. However, the decision about variability is independent of the decision to control money. Any of the defensive operations that the Manager now undertakes to smooth market interest rates can be carried out just as effec-

tively if the base is the target and the stock of money is the indicator.²

A second version concerns the level around which interest rates fluctuate. Again, this has little to do with the decision to control money rather than interest rates. The level of market interest rates, or the average around which rates fluctuate during any three- or six-month period, is determined—in the one case as in the other—by a combination of market forces and policy decisions.

However, there is one important reason to expect a change in the average level of market interest rates if money replaces interest rates as an indicator of monetary policy. Since money is a more accurate indicator, the Federal Reserve obtains a more accurate assessment of the thrust of current policy. It avoids misinterpretations of policy that cause acceleration or deceleration of prices and eventually large changes in the anticipated rate of inflation or deflation. Recent policy provides an example. The highest rates in a century are in part a result of misinterpreting the thrust of monetary policy. If money had been used as an indicator, policy—guided by this indicator—would have been less inflationary; the high rates would have been avoided; the average market rate would have been lower, and monetary policy would have contributed more to economic stability and less to inflation.

A basic error lies behind the notion that the average level of interest rates would change if money replaced interest rates as the indicator. The source of the error is the belief that the Federal Reserve is able to control market interest rates, and the cause of the error is the neglect of the role of changes in the actual and anticipated rate of price change in the determination of market interest rates. There is no reason to doubt the Federal Reserve's ability to reduce or increase the level of market interest rates temporarily. However, there is also no reason to believe that the Federal Reserve can maintain rates above or below their equilibrium level, if it is unwilling to produce an ever-increasing rate of inflation or deflation. As before, it is important to recognize the roles of anticipations in the determination of market rates and to separate nominal and real changes.

²This leaves aside the desirability of these operations or the desirability of institutional changes that would remove some of the sources of instability. Recent practice has been to make institutional arrangements more complex and thus adds to the variability.

A third issue requires a distinction between the size of interest rate changes and the time rate of change. Many of the fears of market participants and Treasury department officials reflect concern about the size of cyclical or monthly changes in interest rates. On closer examination, the focus of the concern is on the effects of large changes in interest rates during periods of Treasury (or private) financing.

As before, there is no incompatibility between the use of money as an indicator, the use of the monetary base as a target, and the maintenance of defensive operations. The critical question is whether defensive operations and so-called "even keel" policies designed to assist the Treasury to sell debt issues should be permitted to interfere with the attainment of longer-term aims of monetary policy. In the recent past, the base money supplied during periods of even keel has remained in the system and has been used to produce the increases in money that have maintained or increased the rate of inflation.

Conclusion

The main practical issues about controlling money concern the role or roles assigned to money, the speed with which information on monetary aggregates becomes available, the degree to which unforeseen or unanticipated changes in monetary aggregates can be offset and the extent to which monetary aggregates can be controlled during short and longer time spans. By discussing these issues and avoiding the more abstract discussion of rules, I was able to compare some operating consequences of controlling money to the results of present policies which are based on control of interest rates and money market variables.

As in previous work with Karl Brunner, I distinguished between the role of money as an indicator, or measure of the thrust of monetary policy, and as a target of monetary operations. As an indicator, money provides a relatively accurate measure of changes in the degree to which monetary policy has become more or less expansive. Used as a target, money becomes the variable that the Manager attempts to control when carrying out the policies agreed upon by the Open Market Committee. Unlike previous work and despite my own predilections, I assumed, throughout, that defensive operations would be retained, that the short-term focus of policy operations would continue, and that the principal difference between future and past policies would be the use of monetary aggregates in place of free reserves and interest rates.

My main recommendations can be summarized succinctly. The Federal Reserve should translate the longer-term goals of monetary policy into a desired growth rate of money, defined as currency and demand deposits. The growth rate of the stock of money is then used as the indicator of monetary policy. The desired growth rate of money is translated in turn into a desired growth rate of the monetary base and a desired weekly or daily change in the monetary base. The Manager is instructed to obtain the target change or rate of change of the base.

The Committee is able to audit the Manager's performance by observing the change or rate of change in the base. More importantly, the Committee is able to assess the extent to which monetary policy is too expansive or too contractive by observing the size of changes in the indicator, the growth rate of money, and can change the degree to which monetary policy is expansive by changing the rate of change of the base. Nothing in the proposal requires the Federal Reserve to adopt a rule as a condition of controlling money. The desirable size and frequency of changes in money can and should be separated from the use of money as an indicator.

Since the Manager can control changes in the base more accurately than he now controls money market variables such as free reserves, there is no difficulty in using the base as a target. Data from past periods suggest that by controlling changes in the base and obtaining estimates of the change in Treasury deposits at commercial banks, the Federal Reserve is able to control more than 85% of the monthly changes in money.

Past policy errors were very often the result of misinterpretations of the effect of policy and reliance on misleading indicators. Acceptance of a more reliable indicator and more appropriate target can go a long way toward improving the conduct of monetary policy and avoiding some of the more serious errors of the past.

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