

Operational Constraints on the Stabilization of Money Supply Growth

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The debate over whether the Federal Reserve should rely exclusively on the money stock—somehow defined—as an indicator or a target of monetary policy, or both, continues unabated. While the debate has shed some light on the role of money in monetary policy and the role of monetary policy in the overall mix of policies that affect the real economy, there has been perhaps as much heat as light. And the light that is being generated from the many research studies that have stemmed from the debate is very often dim indeed.

This paper does not attempt to contribute to the controversy. Instead it tries to sketch out briefly current practices of the FOMC in establishing guidelines for the conduct of open market operations—guidelines that involve a blend of interest rates and monetary aggregates. It then turns to the operational constraints and problems that would be involved if the Federal Reserve were to rely exclusively on the money supply as the guideline for day-to-day operations.

The approach taken in the paper is essentially practical rather than theoretical. The views expressed should be taken as those of the author, and not as representative of the Federal Reserve System. It will probably not come as much of a surprise, however, that the conclusions find much in favor of current FOMC practices and procedures.

Current FOMC Practices

The Federal Reserve has frequently been accused of money market myopia. This is a false charge usually made by economists affected in some degree by a peculiar myopia of their own. The charge stems, or so it seems to me, in the first instance from a confusion between monetary policy decisions *per se* and the oper-

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ational instructions given by the FOMC for the day-to-day conduct of open market operations.

The Federal Reserve has always maintained that money matters just as it believes that interest rates matter too, particularly given the institutional framework of our financial system. In reaching policy decisions, the Committee not only pays attention to the real economy—to current and prospective developments in employment, prices, GNP and the balance of payments—but it also considers a broad range of interest rates and monetary measures. Among the monetary measures, there are the various reserve measures—total reserves, nonborrowed reserves, excess reserves, and free or net borrowed reserves. Next are the measures of money ranging from M_1 on out. Finally, there are the credit measures, bank credit, the credit proxy—ranging on out to total credit in the economy and the flow of funds.

Is the Federal Reserve wrong in its eclectic approach? Is it wrong to consider a broad range of interest rates and aggregates and to reach a judgment as to the combination of rates and aggregates (and the resultant impact of that mix on market psychology and the expectations of consumers, savers, and investors) that is compatible with desirable movements in the real economy and the balance of payments? Should it instead adopt a single aggregate variable—the money supply—and devote its entire attention to stabilizing that variable no matter what happens to other aggregates or to interest rates?

Despite the empirical claims of the monetary school, there appears to be little conclusive evidence to support their case that such a course of action would give the desired overall economic results. Both the St. Louis equations and correlation analysis at the Federal Reserve Bank of New York, for example, give slightly better marks to bank credit than to money supply. Moreover, the analyses suggest that significantly different results can be attained by relatively small changes in the time period covered.

While I do not believe that research results to date justify adopting an operating policy designed solely to stabilize the monetary growth rate, I nevertheless believe that the research efforts stimulated by the monetary school have a real value. Out of it all, there is bound to develop a better understanding of the relationships between monetary aggregates, interest rates, and the real economy. I suspect, however, that the underlying relationships are so complex that no simple formula can be found as an unerring guide to monetary

policy. The psychology and expectations involved in private decision making are probably too complicated to compress into any such simple formula.

Thus, I think, the FOMC is right in paying attention to a broad range of reserve, money, and credit aggregates; in trying to understand why they are behaving as they are; and in assessing the implications of their past and prospective behavior for employment, prices, and GNP. Further, I think the Federal Reserve is right in not restricting itself to a single theory of money, and in choosing the best from a number of theories.

In reaching a policy decision, the Committee pays close attention to a wide spectrum of interest rates, ranging from the Federal funds rate, through the short and intermediate term rates, out to rates in the long-term capital markets. One obvious problem with interest rates as either an indicator or target of monetary policy is that they may be measuring not only the available supply of money and credit but also the demand for money and credit. Obviously, a policy aimed at stabilizing interest rates in the face of rising demand will give rise to greater increases in the monetary aggregates than would be the case if demand were stable. Interest rates can also be misleading indicators of underlying conditions at times of special short-lived supply and demand relationships—of some fiscal policy development or of prospects for war or peace in Vietnam, to take some recent examples. But interest rates have the decided advantage of being instantaneously available, and they can often be excellent indicators that estimates of monetary aggregates, particularly reserve estimates, are wrong. The judicious use of interest rates as correctors of poor aggregative forecasting should not be underestimated.

Thus, when the FOMC reaches a policy decision, it is not thinking exclusively in terms of rates or of monetary aggregates, but of a combination of the two. A move towards a tighter policy would normally involve a decline in the rate of growth of the aggregates and an increase in rates. And a move towards an easier policy would normally involve an increase in aggregate growth rates and a decline in interest rates.

But, unfortunately, given the nature of our commercial banking system, money and credit flows cannot be turned off and on instantaneously. At any given point in time, banks have on their

books a large volume of firm commitments to lend money. Also, potential borrowers may, if they surmise that the Federal Reserve is tightening policy, decide *en masse* to take down loans in anticipation of future needs. Hence there may be, for a time, an undeterred growth in bank credit and the money supply. But this, in turn, should involve a more rapid and larger rise in interest rates than would otherwise have been the case. The point is that the Federal Reserve is always making a trade-off between aggregates and rates. It has, and takes, the opportunity at its FOMC meetings every three or four weeks to assess what has developed, what the impact has been on the real economy and on private expectations of the future, and to determine whether another turn of the screw—towards tightness or ease—is called for.

The moral of the story, if there is one, is that Federal Reserve policy should not be judged exclusively in terms of interest rates or in terms of monetary aggregates but by the combination of the two—and by the resultant impact of this combination on market psychology and expectations about the future and, ultimately, on the real economy. The weights placed on aggregates and rates, including those placed on individual components of either group, can and do vary from time to time. It is important to recognize that there is nothing in the present framework of Federal Reserve policymaking, or policy implementation, that would prevent placing still greater weight on aggregates if that should be considered desirable. I think it is obvious that aggregate measures of money and credit are getting their full share of attention at the present time.

Rates and aggregates, along with real economic developments and prospects, are the basic ingredients of any FOMC policy decision. They are also involved in the instructions that the FOMC gives to the Federal Reserve Bank of New York for the day-to-day conduct of operations in the interval between Committee meetings. Obviously, it would make little sense for the Committee to issue directives to the Desk in terms of the real economy with which it is basically concerned. Not only are open market operations in the very short run unlikely to have a major impact on the real economy, but adequate measures of economic change are unavailable in the short time span involved.

Thus the Committee, in its instructions to the Manager, focuses on a set of money market conditions—a blend of interest rates and rates of growth of various reserve and credit measures—the Committee believes is compatible with its longer run goals. At each FOMC

meeting, the Committee has before it staff estimates of ranges for the Federal funds rate, the Treasury bill rate, bank borrowings from the Federal Reserve, and net borrowed reserves that the Staff believes compatible with an overall policy of no change, or of greater tightness or ease, as the case may be. Additionally, the Staff prepares estimates of the money supply and the bank credit proxy that it believes likely to correspond to a given set of money market conditions. Needless to say, these forecasting techniques fall short of being an exact science, but their existence tends to focus attention on the vital interrelationships between interest rates and aggregates that will ensue from any policy decision.

As is well known, since the spring of 1966 the Open Market Committee has usually included in the directive a proviso clause with an explicit reference to one aggregate measure—the bank credit proxy—with specific instructions to modify open market operations if the proxy is tending to move outside a predicted or desired range. Thus the Committee expects to see money market conditions moving to the tighter end of the scale if the proxy is expanding too rapidly, or towards the easier end of the scale if the proxy is falling short.

How does this all work out in practice? First of all, the money and capital markets send out a constant stream of signals of interest rate developments that we can and do measure from day-to-day and hour-to-hour. If there are deviations from past patterns or levels (or from anticipated patterns or levels) of interest rates, we can usually find out a good deal about the source and meaning of the deviations.

Second, we have forecasts of the factors affecting bank reserves apart from open market operations—estimates of float, currency in circulation, gold and foreign exchange operations, and the level of Treasury balances at the Federal Reserve. These factors can and do supply or absorb hundreds of millions in bank reserves from day-to-day or week-to-week. The estimates are made at the Board and at the New York bank for the current statement week and for three weeks ahead, and they are revised daily on the basis of the inflow of reserve information available within the System each day.

Third, we have available an estimate once a week (on Friday) of the bank credit proxy and of the money supply for the current month; and, as we get towards the middle of the month, for the next month as well. And this estimate can be revised—at least informally—by the middle of a calendar week, after there has been time to analyze weekend deposit performance at Reserve City banks and a weekly sample of deposit data at country banks. We can then use these aggregate data—available less frequently and with a greater time

lag than interest rate or reserve data—to modify subsequent open market operations with an impact on interest rates and the reserve supply.

I should add that we are fairly cautious about over-interpreting any short-run wriggle in the credit proxy. While forecasts of the proxy have generally proved to be more stable than money supply forecasts—perhaps mainly because the proxy avoids the large and erratic shifts between Treasury deposits in commercial banks and private demand deposits—they, too, have proved to be somewhat undependable on a week-to-week basis. Thus we have felt it desirable—particularly early in the month when firm data are scant—to wait for some confirmation of any suggested movement of the proxy before beginning to shade operations towards somewhat greater firmness or ease.

Nevertheless, the proxy has been a useful adjunct to the directive, modifying reserve and rate objectives on a number of occasions and tending to flag aggregate problems for the Committee's attention at subsequent FOMC meetings.

It should, of course, be noted that, at times like the present, when Regulation Q ceilings are pressing hard on bank CD positions, the credit proxy loses much of its value as a continuous series. It does not, however, necessarily lose its value as a short-run guide—provided that it is understood that much lower growth rates may be required to allow for the shift of intermediate credit away from the commercial banking system. Despite all the talk about disintermediation and intermediation, we need to know much more about the process and its implications for monetary policy. The problem is that commercial banks are at the same time creators of money and credit and intermediaries between savers and borrowers in competition with other nonbank financial institutions. Worthwhile research remains to be done in this area, particularly in light of the dramatic changes that are occurring in our financial institutions.

In summary, there are four main points that I would like to draw from this abbreviated review of monetary policy formulation and implementation. First, monetary policymakers have always paid close attention to monetary aggregates—along with interest rates—in the formulation of policy decisions. It has been the interaction of the two on the real economy—on employment, prices, the GNP, and the balance of payments—that has been the focus of concern. Reluctance to adopt money supply as the sole guide to policy decisions has not stemmed from lack of concern about money but from the lack of

evidence that the adoption of such a guide would give the desired results. Empirical research to date does not supply that evidence.

Second, it is incorrect to characterize monetary policy in terms of money supply alone. A rise in money supply—outside some specified range—does not necessarily mean easy money nor a decline of tight money. Policy has to be judged by a combined pattern of interest rates and monetary aggregates—and money supply is only one of those aggregates.

Third, since the spring of 1966 the FOMC has included an aggregate measure—the bank credit proxy—in its directive covering day-to-day open market operations. While use of the aggregates to shape interest rates and reserve measures has probably not been as aggressive as the monetarists would like to see (and, besides, it is the wrong aggregate according to some of them), it has been a useful adjunct to the directive.

Fourth, information on the performance of monetary aggregates (e.g., credit proxy and money supply) is available only with a time lag, and week-to-week forecasts of monthly data have tended to be erratic. This suggests that, in the short run, interest rate movements may provide a very useful indication of forecasting errors. It further suggests that aggregates can contribute more to the process of policy formulation—when there are opportunities to take a long-range view—than to the process of policy implementation as exemplified by the second paragraph of the directive. But current procedures for both policy formulation and policy implementation provide room for as much attention to monetary aggregates as may be required, and it is apparent that the aggregates are receiving a full measure of attention at the present time.

Operational Problems in Stabilizing Money Supply

In the absence of a concrete proposal, there are major difficulties in attempting to isolate the operational problems that would be involved in stabilizing the monetary growth rate to some targeted level. Much would depend on the definition of the money supply used, the time span over which the growth rate was to be stabilized, and whether the money supply was to be the sole indicator and/or target of monetary policy or mainly a primary indicator or target.

It obviously makes a great deal of difference whether the proposal is for a rigid monetary rule or whether there is room—and how much—for discretion. Some of the proposals for moving to the

money supply as a target and indicator have been coupled with the complete abandonment of so-called "defensive" open market operations—a suggestion that raises a host of other problems that are not relevant to the main point at issue.

There is, of course, a strong temptation to pick and choose among the various suggestions, and to erect a money supply target as a "straw man" that can be readily demolished. I shall try to resist that temptation and consider in more general terms the operational problems that would be involved if the FOMC were to move to money supply as the principal indicator of policy or target for open market operations.

But before setting straw men aside, it might be worthwhile to consider the proposition that open market operations should be limited to the injection of a fixed amount of reserves at regular intervals—say \$20 million a week. So-called defensive operations—the offsetting of net reserve supply or absorption through movements in float, currency in circulation, gold or foreign exchange operations, etc.—would be abandoned, leaving the banking system to make its own adjustments to these outside movements. While such a system would certainly reduce the level of operations at the Trading Desk, it has never been quite clear how the banking system would make the adjustments to the huge ebb and flow of reserves stemming from movements in the so-called market factors. Either banks would have to operate with excess reserves amounting to many billion dollars at periods of maximum reserve supply by market factors, or they would have to have practically unlimited access to the discount window. Neither possibility seems very desirable, if one is really interested in maintaining a steady growth rate in some monetary aggregate.

There is no reason to suppose that banks would, in fact, hold idle excess reserves in the amounts required. At times of reserve supply by market factors, attempts to dispose of excesses through the Federal funds market would drive the Federal funds rate down and generally lower dealer borrowing costs and the interest rate level. At other times, the reverse would happen. As a result, there would be either feast or famine in the money market, inducing changes in bank loan and investment behavior that would make it impossible to achieve the steady growth of financial aggregates that was presumably desired to begin with. The resultant uncertainty would undermine the ability of the money and capital markets to underwrite and to provide a means of cash and liquidity adjustment among individuals and firms.

The opening of the discount window, on the other hand, runs the risk that reserves acquired at the initiative of the commercial banks would be used to expand the total supply of money and credit and not solely to meet the ebb and flow of reserves through movement of market factors. As a result, the Federal Reserve would have to institute the same controls—in a decentralized fashion—at the various discount windows to limit the supply of reserves that are now provided in a more impersonal way through open market operations.

Consequently, it would appear wise to disassociate the debate over money supply from the problem of so-called defensive open market operations. There seems to be no reason why a seasonal movement of currency, a random movement of float, or a temporary bulge in Federal Reserve foreign currency holdings should automatically be allowed to affect the money market or bank reserve positions. There would seem to be no point in consciously reducing our efficient and integrated money and capital markets to the status of a primitive market where the central bank lacks the means and/or the ability to prevent sharp fluctuations in the availability of reserves—in the misguided attempt to hold “steady” the central bank’s provision of reserves.

But the point remains that the ebb and flow of reserves through market factors is very large. While defensive operations are generally successful in smoothing out the impact of these movements on reserves, even a 3 percent margin of error in judging these movements would exceed a \$20 million reserve injection in many weeks. Hence the small, regular injection of reserves, week by week, is not really a very practical approach.

The idea of a regular injection of reserves—in some approaches at least—also suffers from a naive assumption that the banking system only expands loans after the System (or market factors) have put reserves in the banking system. In the real world, banks extend credit, creating deposits in the process, and look for the reserves later. The question then becomes one of whether and how the Federal Reserve will accommodate the demand for reserves. In the very short run, the Federal Reserve has little or no choice about accommodating that demand; over time, its influence can obviously be felt.

In any given statement week, the reserves required to be maintained by the banking system are predetermined by the level of deposits existing two weeks earlier. Since excess reserves in the banking system normally run at frictional levels—exceptions relate

mainly to carryover excess or deficit positions reached in the previous week or errors by banks in managing their reserve positions—the level of total reserves in any given statement week is also pretty well determined in advance. Since banks have to meet their reserve requirements each week (after allowance for carryover privileges), and since they can do nothing within that week to affect required reserves, that total amount of reserves has to be available to the banking system.

The Federal Reserve does have discretion as to how the banks can acquire this predetermined level of needed reserves. The reserves can be supplied from the combination of open market operations and the movement of other reserve factors, or they can come from member bank borrowing at the discount window. In this context, it might be noted that the suggestion that open market operations should be used in the short run to prevent a rise in total reserves through member bank borrowing is completely illogical. Within a statement week, the reserves have to be there; and, in one way or another, the Federal Reserve will have to accommodate the need for them.

This does not mean that the way that reserves are supplied makes no difference, nor that aggregate indicators cannot be used to influence the decision as to whether reserves will be supplied through open market operations or whether banks will be required to use the discount window. A decision to provide less reserves through open market operations in any given week, thereby forcing banks to borrow more at the window, could be triggered by a prior FOMC decision (based partly on a review of aggregate money and credit measures) to move to tighter money market conditions, or it might be occasioned by the implementation of the proviso clause if the bank credit proxy was exhibiting a tendency to expand more rapidly than the Committee deemed to be warranted.

No individual bank, of course, has unlimited access to the discount window. Borrowing from the Federal Reserve involves the use of adjustment credit that is limited in both amount and in frequency of use. Eventually, as the aggregate level of borrowing is built up, the discount officers' disciplinary counseling of individual banks that have made excessive use of the window will force the banks to make the necessary asset adjustments. Other banks, desirous of maintaining their access to the discount window intact for use in their own emergency situations, will try to avoid use of the window by bidding up for Federal funds or by making other adjustments in their reserve positions. In the process, interest rates, spreading out from the

Federal funds rate, will have been on the rise. As pressure on the banks is maintained or intensified, the banking system as a whole is forced to adjust its lending and investment policies with corresponding effects on money and credit—and eventually on the real economy.

A switch to money supply as the target of monetary policy would, of course, make no difference in the process through which open market operations work on the banking system to affect monetary aggregates. But, depending on the time span over which it was desired to stabilize the rate of monetary growth and on whether money were to become the exclusive indicator and/or target, there would be a significant difference in the rate of interest rate variations. How great that variation might be would be a matter of concern for the Federal Reserve in the conduct of open market operations. I would like to return to that subject in just a few minutes.

First, however, it may be worthwhile to touch on the extensively debated subject whether the Federal Reserve, if it wanted to, could control the rate of money supply growth. In my view, this lies well within the power of the Federal Reserve to accomplish provided one does not require hair-splitting precision and is thinking in terms of a time span long enough to avoid the erratic, and largely meaningless, movements of money supply over short periods.

This does not mean that the money supply could be used efficiently as a target for day-to-day operations. Given the facts that adequate money supply data are not available without a time lag and that there may be more statistical noise in daily or weekly figures than evidence of trend, we would be forced to rely on our monthly estimates for guidance in conducting day-to-day operations. Projections of money supply—and other monetary aggregates—are, of course, an important ingredient of monetary policymaking. While I believe we have made considerable progress in perfecting techniques, forecasting is far from an exact science. Money supply forecasting is especially hazardous because of the noise in the daily data and because of the massive movements in and out of Treasury Tax and Loan accounts at commercial banks.

Let me illustrate the sort of problem that might be faced by citing some numbers representing successive weekly forecasts of annual rates of money supply growth for a recent month—admittedly not a good month for our projectors. The projections cited begin with the one made in the last week of the preceding month and end with the

projection made in the last week of the then current month. The numbers are: -0.5 percent, +4 percent, +9 percent, +14 percent, +7 percent and +4.5 percent. I might also note that, in the middle of that then-current month, the projections for the following month were for a 14 percent rate of growth. By the end of the month, the projection was -2.5 percent.

Assuming that the Desk had been assigned a target of a 5 percent growth rate for money supply, it seems quite obvious that, at mid-month, when the forecast was for a 14 percent growth rate for both the current and the following month, we would have been required to act vigorously to absorb reserves. Two weeks later, on the other hand, if the estimates had held up, we would have been required to reverse direction rather violently.

The foregoing should suggest that short-run measures of monetary growth do not provide a good target for the day-to-day conduct of open market operations. Use of such a target runs the serious risk that open market operations would be trying to offset random movements in money supply, faulty short-run seasonal adjustments, or errors of forecasting. In the process, offensive open market operations might have been increased substantially—and I have the uneasy feeling that financial markets might find such operations offensive in more than one sense.

While short-term measures of money supply growth appear to be too erratic to use as a primary target of open market operations, there are times when cumulative short-term evidence begins to build up—even between meetings of the FOMC—that strongly suggests that a deviation from past trends has gotten under way. Such evidence could of course be used, if interpreted cautiously, to modify operations in much the same way that the bank credit proxy is now used.

To return to the question of interest rate variation, there appears to be general agreement that variations would be greater with money supply as a guideline than they have been while the System was using multiple guidelines involving both monetary aggregates and interest rates. How great interest rate variations would be, would depend very much on how rigid the guideline was and how short the time horizon in which it was supposed to operate might be. The question of how great variations might be can probably never be resolved in the absence of any concrete experience.

Some exponents of the monetary school, however, seem to imply that interest rate variations make no difference at all—somehow the

market is supposed to work everything out. It seems to me that there are serious risks in the assumption that the financial markets of the real world—in contrast to the markets of a theoretical model—can readily handle any range of interest rate variation. Pushing too hard on money supply control in the face of rapid interest rate adjustment could wind up by destroying the very financial mechanism which the monetary authority must use if it expects to have any impact on the real economy. Psychology and expectations play too great a role in the operations of these markets to permit the monetary authority to ignore the interpretations that the market may place on current central bank operations.

Thus, in the real world of day-to-day open market operations—theoretical considerations aside—the use of money supply as a target would appear to be too mechanistic and, in the short run, too erratic to be of much use. The use of money market conditions—a blend of interest rates and reserve and credit measures—is a more realistic short-run guide, providing opportunities for trade-offs between interest rates and aggregates in the light of market psychology and expectations. Aggregate measures, including the money supply, are, of course, indispensable indicators for the monetary authorities as they reach policy decisions. But exclusive reliance on—or blind faith in—any single indicator does not appear justified by the current state of the arts.

DISCUSSION

JAMES TOBIN

A graduate student of mine, taking advantage of the publicity now given to Open Market Committee minutes, set himself the following problem: to relate the Committee's vote to the movement over the next three weeks of some monetary and financial variables. He tried everything he could find relating to bank reserves, interest rates, and credit conditions.

There was no perceptible relationship between the votes of the committee and the behavior of these statistical magnitudes over the three weeks between meetings. He also observed that nobody worried at the next meeting about whether the previous vote had been carried out. That was before Alan Holmes was at the desk, and I don't know if it is still true. Anyway, my student found that, in spite of the low short-run correspondence of votes to measurable quantities, the Committee's will was gradually executed over longer periods of policy stance.

This is by way of introducing a simple but surprisingly neglected point about the discussion of *indicators*. There is too much emphasis on what happens in a three-week period. It doesn't really matter much whether, let's say, the desk has a procedure which keeps some interest rate constant for three weeks, or does something specific to reserves for three weeks. It doesn't really matter if at the end of the three weeks, at the new meeting, the whole question is going to be reviewed, and the whole policy can be reformulated, and a new target or a new order given to the desk.

Sometimes these discussions seem to me to pretend that the chosen indicator is to be a target fixed for a year, or two years or—God help us—for a whole period of infamous pegging. If that were true, there would indeed be a point in arguing about which indicator should be chosen: if you must choose between a quantity of money and an interest rate and stick to one or the other for five years, which should it be? But we're not in that position; and we don't have to make that kind of long-run decision. Whether Alan Holmes is keeping some interest rate constant for the next three weeks, or whether he's doing something specific to reserves the next three weeks, he doesn't have to do either one forever. The Open Market Committee will meet again and will make another decision.

This observation may limit somewhat the applicability of John Kareken's ingenious results. In his model, he fixes either the quantity of money or "the" interest rate, and he fixes them, it would seem, for a long enough period for the important economic behavioral reactions that follow from any such fixing to have their effect on the economy.

Nevertheless, I think John is going about the problem the right way, namely, to try to find some rules of policymaking that will minimize the variance of the objective of Federal Reserve policy around its target. He contrasted two policies—one was to fix M and the other was to fix interest rates—and he asked under what circumstances can you say one of them is preferable to the other.

Of course, there is a range of intermediate policies, and Kareken's question might be reformulated to say: what is the optimal supply function, relating money stock to interest rates, for the Federal Reserve to follow? The Open Market Committee might respond—or order Alan Holmes to respond—to a certain rise in interest rates with a certain expansion of quantity of money. If they built into their operations some supply response of this kind, our task would be to figure out what the optimal degree of response would be. Maybe it's zero, maybe it's infinite. Zero response would correspond to keeping the quantity of money constant at some desired target, and infinite response would mean supplying whatever money is needed to keep interest rates constant. In between, there is a lot of room.

Generally, Kareken's results could be said to be as follows: The degree to which the Federal Reserve supplies money in response to an observed rise in interest rates above its interest rate target should be higher, the higher is its estimate of the variability of the demand for money relative to the variability of spending on GNP. I can add that the response of the Federal Reserve should be higher, the higher the Federal Reserve's view is of the sensitivity of spending to interest rate changes. If interest rates can go up and down without affecting spending, then the Federal Reserve shouldn't care about whether the interest rates are going up or down or not. There is no reason to worry about interest rate fluctuations if they are not causing any variance in GNP around the target that the Fed is seeking to meet. (Of course, there may be other reasons, perhaps connected with money market myopia—that's Alan Holmes's phrase, not mine—that would lead the Federal Reserve to wish to reduce fluctuations of interest rates.)

The size of the multiplier is also relevant. A high multiplier would tend to move you toward wanting to hold the quantity of money constant rather than interest rates constant.

One problem with Kareken's model is that it assumes that the Federal Reserve can know the structure well enough to know, on the average, what combination of quantity of money and reserves will produce what interest rate and will be geared to the target for GNP. Assuming that they've got the averages right, the only problem is how they respond to deviations around the averages due to random causes in the monetary and financial sector or in real spending. The actual problem the Federal Reserve faces is more complicated. When they observe a deviation—the interest rate is exceptionally high or spending is exceptionally high, relative to their targets—they don't know whether they are just observing a random drawing from the same old hat, something which they ought to expect to happen, or whether they are seeing a change in structure such that the whole average position of policy should be shifted.

Let me also point out that there are lots of interest rates and that stabilizing the ones that the Federal Reserve has readily at hand doesn't mean stabilizing the whole structure. It certainly doesn't mean that stabilizing or controlling those interest rates that are closest to spending decisions—longer-term interest rates, or interest rates on riskier assets, or implicit interest rates, or costs of capital in equity markets, and so on. So that it's not so clear that the Federal Reserve faces more difficulties in controlling the quantity of money than in controlling interest rates. It's not easy to control the rates that are really important for ultimate spending decisions.

I return to the question with which I began. Should the policy made at each Open Market Committee meeting be expressed in terms of stabilizing some indicator, an interest rate or a monetary aggregate, for the next three weeks? For many reasons which have been expressed today, neither type of indicator seems adequate to express the thrust of monetary policy on the real economy. Actually, if we must look for a single indicator short of the ultimate target variables themselves—GNP, prices, unemployment, and so on—I would be tempted to look not at the ones suggested but rather at the state of the markets where used capital goods and used durable goods are valued—stock markets and bond markets. . . markets where the plant and equipment owned by American corporations is valued daily. . . and markets in existing houses, cars, etc. These markets in general seem to me the important locus of linkage between monetary events

and policies and the real economy. One step in that linkage is changing the valuation that the market places on durable goods and capital goods compared with their reproduction costs. Changes in this relationship between the market valuation of real assets and the costs of producing them may be an important indicator of future desirability of producing those things.

Perhaps the real dispute is between using any single indicator at all and using a procedure of adaptive forecasting, as follows: Every time the FOMC meets, they are provided with a set of forecasts of the development of the economy for the next few quarters. Those forecasts not only take into account their past actions but are conditional on future settings of the policy instruments at their disposal—open market purchases, discount rate, etc. The FOMC can estimate the difference that alternative instrument settings will make to the future course of the things they are really interested in. They are not really interested in interest rates or money supply, for example, while they are really interested in GNP, unemployment, and price levels. They can estimate, for example, what difference it makes to the course of those target variables whether or not at this meeting they order the desk to make open market purchases of \$100 million, having in mind a particular plan for future actions. I think this is the procedure the Committee should follow, and the economics profession should be trying to make this procedure feasible. I am not willing, myself, to give up on this objective and to settle for some simple indicator on the ground that our knowledge is so poor about the way the economy operates that we can't make policy the way it ought to be made.

Another and related dispute concerns the sources of variation in aggregate economic activity. On the one hand, we have those who emphasize that aggregate economic activity would be stable along a nice growth path if only government policy were stable, so that the reason that we have instability is government policy itself. (Monetarists generally take this position, although there is no logical connection between one's view on the issue of stability and his view of the monetary-fiscal debate.) On the other hand, there are those who see many exogenous sources of economic fluctuation other than government policy—from the private economy, from abroad, from technology, and from tastes. In this view, the economy would be quite unstable in the absence of discretionary policy. Maybe there is some reconciliation of these two views in the proposition that all those supposed non-governmental exogenous shocks are merely lagged

consequences of long-ago instability in government behavior. Here the debate becomes pretty abstract and fruitless. We can't erase the fact that the government behaved in some shaky irregular manner in the past and may, by its actions from 1776 on, have built up lots of waves that look to some of us like exogenous shocks. In any case, we have to deal with the fact that those waves exist now. It may take 50 to 100 years of stable government policy with X percent per year growth in M before everything settles down. I doubt that we want to wait that long.

In this age, we are hoping to stay within a rather narrow band around a full employment growth track, with very little deviation on the unemployment side or the excess inflation side. To stay there, given the sources of shock from the private economy still in the system, there will have to be sizable fluctuation of interest rates. You need more fluctuation of interest rates than you might have if you were willing to have larger fluctuations in economic activity. We have to make people willing to change the timing of their expenditures in order to chop off peaks and fill in valleys. I am not sure that monetary policy and fiscal policy, in the forms we have them now, are sufficiently flexible to do the trick. Rather appealing to me is the idea of the Swedish investment tax and investment fund, a flexible device that we also may need in our arsenal.