Role of Projections and Data Evaluation with Monetary Aggregates as Policy Targets

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The Federal Reserve has in recent years placed more stress on monetary aggregates in the formulation and execution of monetary policy. This is abundantly clear from published documents. Among the monetary aggregates, money supply narrowly defined (M_1) to include currency held by the nonbank public and demand deposits other than U.S. Government deposits has played an important role. Other aggregates involved in policy formulation include money more broadly defined to include time deposits other than large negotiable CDs (M_2), bank credit, and various measures of reserves.

Without arguing the question of whether money is best defined narrowly or broadly, or of how much weight money should be given in policy formulation and execution, we will focus in this paper on some of the problems in measuring M_1 and in projecting relationships among M_1 and other financial variables that serve as intermediate and/or day-to-day operating objectives of monetary policy. The projection problem can be thought of in a number of ways. One, of course, is to attempt to determine what M_1 (and related financial conditions) will produce the best chance of attaining desired ultimate goals for the nation's economy, as expressed in terms of economic activity, prices, etc. We will not deal in any detail with that aspect of the question. Instead we will concentrate on the shorter-run operational questions that involve projected relationships among a particular M_1 growth rate, if that is taken as a target, other monetary aggregates, bank reserves, day-to-day money market conditions and interest rates more generally.

The ability to carry out a policy that includes monetary aggregates as objectives evidently requires – in addition to a method by which the objectives can be achieved – reasonably accurate data to gauge

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whether the aggregates are in practice on path. This may seem a mundane problem. And if data reliability and speed of availability is a problem, the obvious answer is to improve the figures. Improvement of figures does involve an assessment of benefits and costs, though. And such an assessment would require knowledge of the range of error in figures as they are published.

In a later section of this paper, we will attempt to show how much revision there has been in M_1 figures, comparing them with, for example, revisions in GNP. Revisions in money supply figures represent only a partial measure of error. They show the extent to which first published figures for M_1 deviate from final published figures, but they do not indicate the extent to which final figures deviate from "true" figures, given the Federal Reserve definition of M_1. There still may be errors which have not been uncovered between first publication and final revision. At best, though, we may be able to see to what extent past revisions may or may not have made M_1 an uncertain target, to the extent it was a target.

Targets and Projections

It is probably useful first to distinguish between targets and projections. In discussing projections, we basically mean a projection of a set of relationships. That is, what is being projected is the relationship to be expected among various monetary aggregates — including bank reserves — and interest rates, taking gross national product as given for purposes of making short-run projections, of about a quarter or less, of financial relationships.

A projected relationship is not, of course, a policy target. Whether monetary policy takes as a target either an interest rate or an aggregate depends on much broader and more important considerations than projected financial relationships a quarter ahead. Decisions as to the particular policy targets chosen depend on the whole set of considerations involved in deciding whether money or interest rates as a target link more dependably to ultimate economic objectives. And the dimensions of the intermediate money or interest-rate targets, or the relative emphasis among them, depend on assessment of the future strength of demands for goods and services, trade-offs, if any, among various domestic ultimate objectives and between domestic and international goals, estimates as to lags in effect between current policy targets and ultimate goals, and how uncertainties about demands for money are weighed against uncertainties about demands for goods and services.

While monetary policy can choose a particular target, say M_1, and also ignore what is happening to all other variables, in practice it is unlikely that monetary policy would ever take the single-minded course of adhering to one target, regardless of its consequences for other financial variables. Since policy makers – given their uncertainties about future economic developments and as to how interest rates or money interact with these developments – will tend to have trade-offs between what they would like to see happen to monetary aggregates and what they would like to see happen to interest rates, projected financial relationships are of interest as a means of setting reasonable bounds within which policy operations might be carried out over the short run.

Nevertheless, projected relationships should not be thought of as determinants of policy. For discussion purposes, a relationship between M_1 and the Federal funds rate can be taken as indexing a whole set of financial relationships. If monetary policy were to decide to strive for a, say, 6 percent annual rate of growth for M_1, it might be willing in practice to attain such a growth rate provided the Federal funds rate did not rise by a substantial amount from what were prevailing levels. Such a decision, though, would not depend on projected relationships between M_1 and the Federal funds rate; it would depend on an analysis of economic conditions and on the weight policy makers assign to the relationship between M_1 and GNP as compared to the relationship between the funds rate, or interest rates more broadly, to GNP.

If projections were to indicate that the Federal funds rate would have to rise substantially for a 6 percent increase in M_1, this need not necessarily stop policy from choosing that M_1 growth as its desired target. In the first place, the projected relationship may be wrong, and it may prove possible to attain the desired M_1 growth without an undesired rise in the Federal funds rate. This may occur because GNP does not turn out to be as strong as expected or because demands for money at a given GNP were not as intense as expected.

If the projected relationship does turn out to be right, policy might in the end countenance a higher M_1 growth than initially desired because of unwillingness to see the Federal funds rate rise. In the latter case, of course, monetary policy would be giving up on a particular M_1 target, at least over a short run, but would be doing so in the belief that it was more important at the particular time for interest rates not to rise as much as they otherwise would either because of uncertainties as to the future strength of GNP, because of short-run market problems, or because of evidence that money demand is stronger for a given GNP than expected.

It is not our purpose in this paper to discuss the rightness or wrongness of an approach in which policy tends to bounce between money supply and interest rates as targets. What we want to point out particularly is that policy decisions about how much to stress monetary aggregates relative to interest rates are separable from technical estimates of relationships likely to be expected between money supply and the Federal funds rate.

But as suggested above, there are reasons for policy to give weight both to aggregates and interest rates. For one, there is always a good deal of uncertainty as to the demand for money for a given desired growth in income. If M_1 is tending to grow more rapidly than was initially thought to be consistent with income, policy makers may conclude – after examining all the available evidence such as may be obtainable from deposit ownership figures, from other domestic and international financial developments, and from appraising the trend in economic activity – that the original estimate of the demand for money was too low. Or, they might conclude that there are short-run reasons for money growth to be higher than expected, and that over the long run it can be expected to move back to target.

The Best Means to Achieve the Target

If policy were to take M_1 as a target, though perhaps not an absolute target to be achieved irrespective of other financial developments, there is still the question of what is technically the best means of achieving the target. The answer to this is complicated, but in brief might be said to depend on whether one is more certain of the relationship between bank reserves and M_1 or of the relationship between money market conditions and M_1. This is basically an empirical question, and one in which results do not yet appear to be conclusive. For our purposes, though, it may be relevant to point out that the Federal Open Market Committee has recently adopted a concept of reserves available to support private nonbank deposits (RPDs) as one of its day-to-day operating guides. This measure may be thought of as a handle through which desired M_1 is obtained, although we do not mean to suggest that the FOMC necessarily has taken so narrow a view. One of the advantages of an RPD target, as compared with total reserves, is that it permits day-to-day operations to be completely accommodative of the highly volatile short-run swings in U.S. Government deposits.

The next section of this paper will discuss how one can go about estimating likely relationships among the various monetary aggregates, bank reserves, and interest rates for operating purposes.

Projected Relationships

The method of projecting short-run financial relationships with which we are most familiar is a combination of judgment and use of econometric models. One approach utilizing M_1 as an important target variable might be along the following lines. Suppose for the moment that you are at the beginning of a quarter and want to estimate relationships that are likely to obtain over the quarter as a whole. For these purposes, the rate of growth in Gross National Product can be taken as given, as noted earlier. The expansion in GNP would be projected on the basis of past monetary policy, fiscal policy, and current tendencies in spending by key economic sectors.

As an aspect of the assumption of given GNP, the effect of alternative rates of growth in M_1 on financial conditions during the quarter could be worked out without assuming any feedback effects on GNP in the course of the quarter. This seems a reasonable enough assumption for one quarter – given what we know about the lag structure of the economy – but the assumption would become more and more unreasonable, of course, as the time period lengthens. In this paper we will concentrate mainly on projections one quarter ahead and for monthly periods within the one-quarter time horizon.

One key input to projecting short-run relationships among money and other potential variables is the summary of past historical relationships contained in econometric models. James Pierce and Thomas Thomson of the Board of Governors staff have worked out a monthly money-market model which helps provide some basis for projections. This model is being continuously improved, and is not, of course, the sole basis of making projections. But out of the model – which takes account of lagged relationships between interest rates and money demand – one can derive estimates of what is likely to happen to the Federal funds rate in the quarter ahead if M_1 were to grow at, say, a 6 percent annual rate. Alternative estimates of the Federal funds rate can be made for growth rates of M_1 on either side of 6 percent.

Model results can then be compared with and modified by judgmental projections based on long experience working with these relationships and utilizing in part estimating equations for particular aspects of the projected relationships. In addition, special factors that may not be contained in a model – such as effects on money demand from a new wage-price program or a foreign exchange crisis – can also be taken into account judgmentally. Finally, very sharp changes in U.S. Government deposits can affect the money stock

held by the public at least for periods of a week or a month, even though basic money demands over a quarter or more may not be affected.

Once a basic M_1 — Federal funds rate relationship is established through combining judgment with model results, a projection can be made of the behavior of the three-month Treasury bill rate. This rate can be taken as indicative of the whole structure of short-term rates, although clearly there can be differences in rate spreads from time to time between the three-month bill rate and longer-term bill rates and between bill rates and private rates, such as the commercial paper rate.

A given Federal funds rate will tend to exert a strong pull on the three-month bill rate, but the rate spread will vary depending on Treasury debt-management practices and cash borrowing needs and on expectational forces in the market. The expectational forces come into play, of course, because the three-month bill rate permits more scope for attitudinal shifts than does the one-day Federal funds rate.

Given the three-month bill rate, estimates can then be made of likely public demand for time deposits. For estimating purposes, time deposits might be divided into two types: large negotiable time certificates of deposit acquired mostly by business corporations and savings and other time deposits, principally interest-bearing deposits of consumers. Recent trends and an evaluation of consumer behavior in past periods when market rates had roughly the same relationship to interest rates offered by banks for consumer-type time deposits provide a basis for making a specific estimate of the likely increase in such deposits. In that process, of course, account would also have to be taken of the likelihood that banks will adjust their offering rate on these deposits, assuming they are not constrained by Regulation Q ceilings. Banks typically adjust such offering rates sluggishly, however, and thus to an important degree play a passive role in the short run in relation to flows of consumer-type time deposits.

Banks are much more likely to adjust frequently offering rates on large negotiable CDs as market interest rates move. Partly, this is because prospective holders of large CDs are considerably more responsive to interest-rate differentials than are typical holders of time and savings deposits. And, because of the responsiveness of CD investors, banks tend to view large CDs as a readily-available adjustment mechanism. For instance, when business loan demands are strong or when there is a sharp shift toward expectations of lower long-term interest rates, banks may quickly increase their issuance of

large CDs by raising their offering rates, to the extent it is possible under Regulation Q ceilings, in order to accommodate business customers or to invest in longer-term U.S. Government or municipal securities. Similarly, when loan demands are weak, banks are likely to reduce offering rates relative to market rates because they have no need for the funds to satisfy customer relationships.

In this context, key elements in trying to estimate likely bank demand for CD funds would be the expected state of business loan demand and bank attitudes toward long-term interest rates. In addition, banks would tend to use large CD funds as a means of offsetting flows of funds over which they have little immediate control. Thus, if demand deposits or consumer-type time deposits are not growing as much as a bank wants, it may attempt to take up the slack by issuing more large CDs into the market.

Banks also can obtain funds by borrowing abroad or through issuance of commercial paper. Over the past year or so, these have not been very important sources of funds, partly because domestic CD funds have been readily available and partly because of regulatory measures which have reduced the relative value to banks of issuing commercial paper or borrowing abroad through their branches.

One source of funds over which a bank has practically no control is U.S. Government deposits. The fluctuations in these deposits are, of course, the combined result of the current Treasury budgetary position and its cash and debt management practices. In projecting financial relationships, estimates can be made of the month-to-month and quarter-to-quarter fluctuations in U.S. Government deposits. The extent to which these fluctuations might be reflected in changes in money supply and/or in bank credit have to be predicted.

Short-run variations in U.S. Government deposits often appear to have been reflected in bank credit, given interest rates. As banks obtain an increase in Government deposits generated by, say, a surplus of Treasury tax receipts relative to outlays, bank credit rises as banks invest the funds, with the counterpart of this purchase of securities being the net sale of securities by businesses or high-income individuals who may be paying taxes, net, to the Treasury on a current basis. Similarly, when there is a sharp drop in Government deposits from an excess of outlays relative to tax receipts, this is reflected in a smaller increase in bank credit as those who are net receivers of Government funds invest them, at least temporarily, in short-term securities; the counterpart would be the sale of such securities by banks.

When banks acquire Government deposits at a time when the Treasury is a net issuer of debt, there is a positive effect on bank credit as expansion in bank investments and a rise in Treasury deposits occur concurrently as part of the same transaction. As these deposits are drawn down, there is a negative effect on bank credit as banks in effect sell the securities to the public, who can be conceived of as investing the funds dispensed by the Treasury.

It does not seem as though Government deposit variations are solely reflected in bank credit variations, however. Evidence is not clear, but there does seem to be some degree of substitutability at least in the very short run between Government deposits and private demand deposits. Private demand deposits in that case are temporarily reduced below or raised above desired levels as individuals and businesses receive net payments from, or make net payments to, the Treasury. It is difficult on *a priori* grounds to see why a change in Government deposits should effect a permanent change in the public's willingness to hold cash, given interest rates, though. And a one-or-two week rise in private demand deposits associated with a drop in U.S. Government deposits is likely to prove transitory unless the monetary authorities permit a substantial decline in interest rates.

When all these elements affecting bank balance sheets are put together, estimates are obtained of M_1, M_2, and bank credit for given Federal funds rates and Treasury bill rates. There is no reason, in view of the history of economic forecasting, to be very certain about the relationships that are established. As a result, it is best to think of relationships as ranges. Thus, one might expect, for a given rate of increase in M_1, the Federal funds rate might vary within a range that could be put as 1 or 2 percentage points around a central tendency.

A range for the Federal funds rate can be considered as a range of uncertainty with respect to projected relationships. On the other hand, policy makers may take a range for the Federal funds rate as representing the boundaries beyond which, for one policy reason or another, they do not wish the Federal funds rate to fluctuate during a specified interval of time. The technical range of the funds rate and the policy boundary range need not coincide, of course.

Alternative projected financial relationships can be readily developed using the same approach outlined above. Given the GNP, one can judge what Federal funds rate is likely to develop from a different M_1 growth, and then make estimates of alternative specifications for other monetary aggregates and interest rates.

When a quarterly pattern is set, for operating purposes it is desirable also to have monthly patterns, so as to provide bench-marks by which to determine whether current policy operations, as they are carried out, are on track of a desired longer-run path, assuming an aggregate objective. Monthly and also weekly levels of M_1 within a quarterly pattern can be projected using the best judgment possible. An infinite variety of weekly and monthly patterns can be consistent with a desired quarterly growth rate. One method for choosing a particular pattern would be to take the one that appears to minimize day-to-day instabilities in the money market and the credit market generally.

Fluctuations in Treasury deposits would be one factor influencing short-run projections of M_1. Information about special factors that might be influencing very recent tendencies in M_1, such as stock market fails or international currency crises, would also be taken into account in working out a projected weekly or monthly pattern of M_1 performance. Since projections can be undertaken on a seasonally adjusted basis, past seasonal variations are already taken into account in the forecast.

When a pattern of growth is established not only for M_1, but also for other deposits at banks that is consistent with a longer-run target for M_1, the required reserves needed to support such deposits can be determined for, say, the month ahead. (This also, of course, requires knowledge of breakdowns of deposits by city vs. country banks under the old reserve system and by banks by deposit size under the new reserve system.) The total required reserves can then be broken down between those behind so-called RPD-type deposits and those behind all deposits. RPDs represent reserves behind all deposits or other liabilities requiring reserves except U.S. Government deposits and net interbank deposits. The measure of RPD would include such required reserves plus excess reserves of banks. Thus, the projected relationships would have to include an estimate of the excess reserves banks are likely to want to hold at the interest rates likely, given a set of monetary aggregates indexed by a particular rate of growth in M_1.

With an estimate of excess reserves and a projection of short-run deposit behavior, an RPD target can be established which will serve as a short-run operating guide for purposes of achieving desired M_1 growth. One would not expect, of course, that all of any increase in RPDs would necessarily be supplied through the effect of open-market operations on nonborrowed reserves but that some might be provided through reserves borrowed from the discount window, depending on the relation between market rates and the discount rate.

As operations proceed, a different weekly or monthly pattern of M_1 and related reserves may develop and prove consistent with longer-run growth rates since very short-run propensities to hold cash on the part of the public are notoriously unstable and unpredictable. This would, of course, make for a certain amount of suspense in carrying out operations to achieve a longer-run M_1 growth rate.

It is not the purpose of this paper to discuss, once all financial relationships are projected, whether it is then best to operate monetary policy on the basis of a particular reserve measure thought consistent with all the relationships – such as RPDs, nonborrowed RPDs, total reserves, etc. – or a particular Federal funds rate. As is known, in recent months the Federal Reserve has been giving increasing attention to RPDs as an operating device to attain its financial objectives.

It is of some interest to know, however, whether such a complicated set of financial relationships would or would not provide information for policy that is more misleading than helpful. Some information on projected relationships has been published in the FOMC policy records. The following section takes information from the policy records, showing expected relationships between the Federal funds rate and M_1, and compares them with actual developments.

Projections and Results

The policy records published by the Federal Open Market Committee contain estimates of expected quarterly relationships between M_1 and the Federal funds rate – expressed with varying degrees of clarity – beginning in early 1970. Such estimates do not appear after the late summer of 1971. If we assume the Federal Reserve goes through a projection procedure somewhat as described in preceding sections, the published projected relationships can be compared with actual results to obtain a rough idea of the "success" of such a procedure.

We mean "success" in the narrow, technical sense of accuracy in projected relationships. We do not mean to be judging the success of particular monetary policies followed, however one might choose to define policy. To restate, projected relationships should not be confused with policy. The success of policy does not depend on whether initial expectations of an M_1 – Federal funds rate relationship are realized but depends rather on whether the actual financial impacts of monetary policy operations contribute in some optimal sense to attainment of the nation's economic goals.

If a particular rate of M_1 growth were optimal, then it would not matter if the projected M_1 – funds rate relationship were wrong so long as policy permitted the funds rate to vary while attaining M_1. If a particular funds rate were optimal, it would also not matter if the projected relationship were wrong so long as policy permitted M_1 to vary. As suggested earlier, policy for what may be good reason probably varies its emphasis on monetary aggregates relative to interest rates depending on economic and financial circumstances.

The table on the following page compares projected relationships from the policy record with actual results for seven quarters from the first quarter of 1970 through the third quarter of 1971. For most of that period only one set of relationships was shown in the policy record, but at times more than one was indicated. When there was a choice, we have chosen the one which contains the Federal funds rate closest to that which actually prevailed.

Some judgment had to be used in interpreting the policy record. The degree of specificity in the policy records does not permit a very accurate assessment of the Federal funds rate projected to be associated with a particular M_1. The record normally refers to money market conditions, and notes that for a given M_1 future money market conditions (presumably over the interval between meetings) are expected to be about prevailing, or a little tighter, or a little easier. We have used the recent Federal funds rate at the time of a meeting as a measure of prevailing money market conditions, and have indicated by sign whether it was expected to be greater or less than that. Examination of normal variation in the funds rate would seem to indicate that easing or tightening of the money market would mean a change in the funds rate of generally about ½ percentage point or less in an inter-meeting period – though sometimes the change was larger, as much as 1 percentage point.

Differences between projected and actual annual rates of change in M_1, assuming no significant difference between projected and actual Federal funds rates, are summarized in the text table below. There were, in fact, minor differences from time to time between the actual and projected Federal funds rate, and these can account for some of the differences between the actual and projected rate of change in M_1. There were no doubt also differences between projections of the rate of increase in nominal GNP for a quarter and the actual results. This would, of course, contribute to differences between projected M_1 – Federal funds rate relationships and actual results. However,

PROJECTED RELATIONSHIPS AND ACTUAL RESULTS
(ΔM_1 REPRESENTS SEASONALLY ADJUSTED ANNUAL RATE OF CHANGE; r_f REPRESENTS FEDERAL FUNDS RATE)

	1970								1971					
	I		II		III		IV		I		II		III	
Policy Record	ΔM_1	r_f	ΔM_1	r_f	ΔM_1	r_f	ΔM_1	r_f	ΔM_1	r_f	ΔM_1	r_f	ΔM_1	r_f
Last month of preceding quarter	—	—	3	<8.5	5	<8	5	<6.5	>3.4	5–5.5	>8.9	3.5	9–10[2]	>4.75
First month of quarter	0	9	3	7.25–8	5	7–7.625	5	6.125	7.5	<4.5	>8.9	3.75–4	9	>5.125
Second month of quarter	3–4	9	4	8–8.5	5	<6.5	4	<5.75	6	3.75	8.5	4.5	9	5.5
Third month of quarter	2	<8.5	7[1]	8	4.5	6.5	5	5–5.5	7	3.5	12.0	4.5–4.75	<9	>5.5
Actual														
First published	3.8	8.5	4.2	7.875	5.1	6.75	3.4	5.5	8.9	3.875	11.3	4.5	3.0	5.25
Latest revised	(5.9)		(5.2)		(6.5)		(3.8)		(9.1)		(10.6)		(3.7)	

[1]Meeting of May 26

[2]Meeting of June 8

the FOMC policy records do not contain specific enough information on GNP projections to permit a comparison of actual and projected GNP.

SUMMARY OF DIFFERENCES BETWEEN M_1 PROJECTIONS (GIVEN FUNDS RATE) AND ACTUALS (DIFFERENCE IS AVERAGE OF ACTUAL ANNUAL RATE OF CHANGE AND PROJECTED RATES OF CHANGE FOR THE QUARTERS 1970 I THROUGH 1971 III)

	As 1st Published		As of Latest Revision	
	Without regard to sign	With regard to sign	Without regard to sign	With regard to sign
Last mo. of preceding qtr.	2.4	−1.7	2.7	−.8
First mo. of qtr.	2.4	− .2	3.0	+.8
Second mo. of qtr.	1.8	−.04	2.3	+.7
Third mo. of qtr.	1.6	− .1	2.1	+.6

Under the circumstances, the differences shown in the summary table at best serve as only very crude indications of success in projecting relationships. And it must be remembered that differences are expressed as annual percentage rates of change, which tend to magnify the extent of error on the level of M_1. For a quarter, for example, an error of 2 percentage points at an annual rate would represent an error of ½ of 1 percent, or about $1 billion, on the level of M_1. The level of M_1 varied from $205 billion in early 1970 to over $225 billion by the end of summer 1971.

As may be seen from the first column of the text table, the average miss in M_1 was almost 2.4 percentage points at an annual rate at the beginning of a quarter and generally improved as the quarter progressed. In the middle of a quarter the average was 1.8 percentage points at an annual rate. The misses tended to be offsetting, and the second column shows virtually insignificant misses when "plus" misses are averaged against "minus" misses. This might be interpreted as indicating the absence of bias in the projections; one is just as likely to miss in one direction or another. It might also be interpreted as suggesting that a projected relationship will prove out over a longer run than a quarter.

The third and fourth columns of the text table show results after the annual revision for bench mark and other corrections had been made. This increases the degree of error to a modest extent. The increased error is mainly a result of the special circumstances of 1970, however, when there was an unusually large correction in M_1

figures. In that year new figures were obtained to adjust for a downward bias in M_1 growth that occurred because of increasing check clearing activity through New York banks during the year for agencies and branches of foreign banks and Edge corporations.[1]

It is a little difficult to know what to make of the result that FOMC records indicate that for a given Federal funds rate M_1 growth was predicted with an error (without regard to sign) of around 2 percentage points at an annual rate. If the FOMC had been adhering to a Federal funds rate rigidly as a day-to-day operating guide, and if a particular M_1 initially associated with the funds rate were an objective, the objective would not have been attained in a particular quarter.

But there is no need to believe that a Federal funds rate is a rigidly held operating target, nor is there reason to believe that objectives have to be attained within one quarter – an M_1 objective could average out over two quarters for instance. And to the degree that M_1 were an objective, the funds rate would not be rigidly held. The increased emphasis on reserves in recent months would in itself appear to suggest more day-to-day flexibility for the funds rate. If and when data become available, it would be interesting, of course, to test out the projected relationship between RPDs and M_1.

Whatever was in fact the emphasis on a particular M_1 as a target, the results suggest that projections of financial relationships over a period of a quarter had their deficiencies, but probably not so great as to throw policy very far out of kilter. In the current state of economic knowledge, it would be hard to argue that we know what M_1 should be obtained for a desired GNP within a range of precision that is represented by 2 percentage points at an annual rate for a particular quarter. In any event, a 2 percentage point miss, at an annual rate for a quarter, is not very large since it can fairly readily be made up in a subsequent quarter and adjustments in that direction can be set in train during a current quarter. Moreover, there is no evidence that we know of which suggests that a moderate M_1 miss for a quarter, or even two quarters, relative to a desired trend, has significant impacts on GNP. Thus, the projected relationships do not seem so bad that they are capable of throwing the FOMC off a desired M_1 path, if there were such a path and if that path were construed as of at least six months in duration.

[1] See "Revision of the Money Stock", *Federal Reserve Bulletin,* Dec. 1970.

One cannot really know, though, to what extent projected relationships affected the extent to which M_1 was taken as a target, or what rate of growth in M_1 was desired, or acceptable, to the extent it was a target. One would suspect that relationships between financial variables and desired future GNP would be more important in conditioning an M_1 target or an interest rate target, depending on the degree to which FOMC members had more faith in an M_1 to GNP relationship or in an interest rate to GNP relationship.

Whether one does or does not believe that an effort to have an M_1 target for policy requires estimates of demand relationships among M_1, other monetary aggregates, and interest rates, it does seem clear that an M_1 target requires reliable and timely statistics to measure money supply. The money supply statistics, in particular the extent to which they have been revised, are discussed in the succeeding section.

Money Supply Statistics and Revisions

The daily average money supply series published by the Board is a constructed series based on member bank deposit data, weekly condition reports of large commercial banks, Federal Reserve Bank balance sheets, call reports and items of information collected from Edge Act Corporations and agencies and branches of foreign commercial banks.[2] This series is published weekly with an eight-day lag; that is, the first estimate published for a statement week ending Wednesday comes out a week from the subsequent Thursday. These estimates are usually revised to a degree over the weeks immediately following publication, as new or revised figures dribble in. These revisions are usually small before being "finalized" in about three weeks; over the past year and a half, for example, revisions have been $100 million or less 50 percent of the time and $300 million or less 80 percent of the time. A major annual bench mark[3] and seasonal factor revision is undertaken, however, in the fall of the year, and this usually accounts for the bulk of revisions.

[2]For explanation of the series, see "A New Measure of the Money Supply," *Federal Reserve Bulletin,* October 1960, and "Revision of the Money Stock," *Federal Reserve Bulletin,* December 1969 and October 1970.

[3]Roughly 25 percent of the M_1 series is estimated on the basis of call report relationships; call report data are available for the end of June and at the end of December with about a two- or three-month lag.

Revisions aside for the moment, week-to-week variations in the money supply are large and appear to reflect a considerable amount of short-run noise. Thus, a month might be taken as the minimum unit of time (and even this could be too short on economic grounds) for which it is reasonable to compare first published and revised figures. The first published seasonally adjusted annual rates of growth for a month for the years 1961 through 1971 are compared with such growth rates derived from the currently published series in the chart on the following page. Roughly 26 percent of the differences shown are no more than 1 percentage point, at an annual rate, and roughly 65 percent of the differences shown are no more than 3 percentage points, at an annual rate. Annualizing monthly rates of change – which is done for ease of comparing months, quarters, and years – tends to exaggerate differences, of course. At current levels of M_1 these annual rate percentage differences represent from $200 to $600 million in the monthly average level of the series. And such absolute differences represent only about one-fifth of a percentage point of the level of the series.

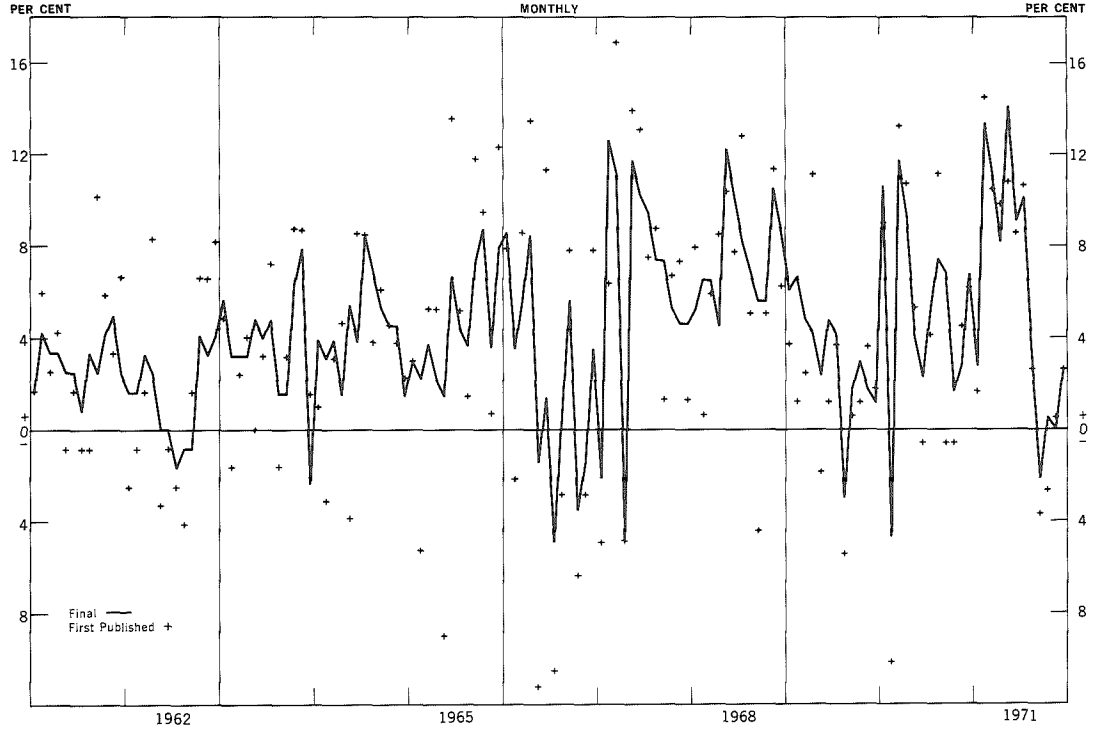
On a short-run basis the money supply is clearly subject to shifts from the time it is first published until it has completed successive bench mark and seasonal reviews and becomes "final." But these shifts primarily affect the intra-yearly movement of the money supply. Changing seasonal factors, which are the source of most of the difference between first published and final monthly (and also quarterly) growth rates have to offset within a 12-month period. Bench mark adjustments are usually small (though there were relatively sizable measurement improvements made at bench mark time in 1969 and 1970) and have little effect on monthly growth rates since these adjustments are spread throughout the 12-month period.

As a further check on the reliability of the monthly series, the correlation between the first published and current money supply monthly annual rates was calculated first for the entire period from 1961 to 1971 and for two subperiods 1961 to 1967 and 1968 to 1971.[4] The subperiods were selected to see if there was any measurable difference in the correlation before and after sizable adjustments that were made for Eurodollar float and for cash items in the process of collection that had been inappropriately deducted. The correlation coefficient for the entire period was .767. For the subperiods

[4]This analysis follows very closely that used in an earlier study. See William Poole, "Rules-of-Thumb for Policy," *Open Market Policies and Operating Procedures – Staff Studies,* Board of Governors of the Federal Reserve System, July 1971.

CHART 1

COMPARISON OF MONEY SUPPLY GROWTH RATES



1961 to 1967 and 1968 to 1971 the correlation coefficients were .740 and .832, respectively. Correlation coefficients of this magnitude may not be as high as one might hope for in a series that might be used as a guide for monetary policy purposes. Nevertheless, the monthly first published money supply figures do appear to be reliable enough to be used for policy guidance purposes. This is particularly so if it is recognized that monthly variations in M_1 growth have little economic significance as such, with much greater significance to be attached to a longer-run average annual rate of growth.

To lengthen the time horizon for checking on the reliability of first published money supply statistics, annual growth rates first published for a quarter were computed and compared to current quarterly growth rates. On a quarterly basis the coefficient of correlation for the entire 1961-71 period rose to .920. For the 1961 to 1967 subperiod R was .922 and for the 1968 to 1971 period R was .948. All of these correlation coefficients show significant improvements over the monthly relationships.

It may be of some interest to compare money supply revisions with revisions in other economic series. Almost every economic series used by policy makers and economic analysts is subject to annual bench mark and seasonal factor revisions as well as other major adjustments from time to time. We have compared revisions in the money supply with revisions in one of the series – nominal GNP – that reflects an ultimate objective of policy. Coefficients of correlation for final and first published GNP growth rates for a quarter were calculated for comparison with the quarterly money supply growth rate revisions. The correlations between first published money supply and GNP growth rates and their respective revised figures are little different for the entire 1969-71 period and for both subperiods, although in two of the three periods the final money supply growth rates correlate more closely with first published figures than do the GNP series.[5]

Another way to look at the relationship of the final to the first published growth rates is to use a simple regression equation; final growth is a function of first published growth. This simple regression equation was applied to the quarterly money supply and quarterly GNP growth rate data. The regression results are shown in the following table. When the quarterly GNP and money supply equations are

[5]For the whole period 1961-1971, the correlation for GNP was .852 as compared with a .920 for M_1. For 1961-1967, and 1968-1971, the GNP correlations were .821 and .959, respectively, compared with .922 and .948 for M_1.

compared, the fit of the money supply equation is generally better than the fit of the GNP equation. On the basis of the regression coefficients for the 1961-1971 money supply equation one can say that given a first published quarterly growth rate of 8.0 percent, the best point estimate of the final growth rate would be 7.8 percent. Further, there is about one chance in three that the final growth rate will fall outside of a 6.7 to 8.8 percent range.

In addition to being reliable, money supply figures must be timely if they are to be used as a guide for the implementation of monetary policy. The figures published weekly with an 8-day lag represent the first fairly-firm indication of the most recent tendencies of M_1. The Federal Reserve does have earlier figures, based on sample information for smaller banks and daily deposit reports of larger banks. These can be used as an interim guide, but the extent of revision in the data is considerably larger than between the first published weekly estimate and the subsequent "final" figure. Efforts are, of course, being made to speed up data reporting, and to devise methods to improve early estimates based on partial reporting (including reports from a possibly shifting sample of banks depending on which banks in a particular week turn out, for one reason or another, to report earlier than others).

Other problems relating to the construction of the money supply series are also being investigated. These include the best method of resolving the perennial seasonal adjustment problem (not excluding the question of what meaning, if any, can be attached to a seasonally adjusted M_1 series if it were assumed to be policy-determined); timelier reports from nonmember banks; investigations into biases in the level of M_1 resulting from such items as deduction of inappropriate "cash items" related to U.S. Government checks or to other bank liabilities not currently included in M_1.

In addition to improvement of the money supply as currently defined, work is also proceeding on conceptual problems of the money supply. It is not our intention to enter into that large subject, which requires a paper to itself. But we might mention issues such as the proper role of foreign deposits in U.S. banks and of U.S. individuals' or firms' deposits held abroad (as Eurodollars or otherwise); questions as to how float (checks in transit) should be treated in the calculation of money supply; and the role to be assigned time and savings deposits and other assets which to greater or lesser degrees substitute for demand deposits (and may even serve directly as a means of transactions if regulations such as those permitting savings and loan associations to make third-party transfers for certain types of transactions become more widely used or more broadly applicable).

SIMPLE REGRESSION EQUATIONS OF FINAL MONEY SUPPLY AND GNP GROWTH RATES ON FIRST PUBLISHED MONEY SUPPLY AND GNP GROWTH RATES
(Quarterly Average Data)

	Constant	Regression Coefficient	R^2	S.E.
1961-1971				
M_1	.933 (3.68)	.845 (15.20)	.846	1.026
GNP	1.696 (3.14)	.806 (10.56)	.726	1.394
1961-1967				
M_1	.882 (3.14)	.768 (12.16)	.850	.881
GNP	2.527 (3.78)	.706 (7.32)	.673	1.494
1968-1971				
M_1	1.555 (3.65)	.870 (11.20)	.900	.897
GNP	−0.767 (−1.20)	1.112 (12.65)	.920	.833

NOTE: t-values in parentheses

Concluding Comment

We would first like to note again that this paper did not concern itself with the critical economic question of whether money, somehow defined, interest rates, or both in some mixture, should be the immediate target(s) of monetary policy. The paper was a much more limited effort to determine how projected relationships between M_1 and other financial variables and how data revisions in M_1 might affect the possibilities of achieving an M_1 target.

The material we have reviewed does not suggest that the rate of change in M_1 under present circumstances technically cannot be taken as an immediate target of monetary policy, provided that it is not important to hit a pre-determined target weekly, monthly, or possibly even quarterly. The length of time over which it is important to be able to achieve an M_1, or any other immediate, policy target is an empirical question. The work we have seen, particularly

that of Messrs. Pierce and Thomson of the Board staff,[6] suggests that if an M_1 growth rate can be achieved over a period of three to six months, significant economic disturbances will not be caused by shorter-run deviations around the growth path.

The revisions that have occurred in M_1 growth rates have been fairly sizable for months but have been less for quarters (as would naturally be the case since much of the revision results from changing seasonal factors), although in one or two years impacts on quarterly growth rates have been noticeable. And while conclusions with respect to projections and their use are highly subjective, projected relationships between M_1 and other financial variables do not appear to have been an insuperable obstacle to achieving an M_1 objective. The Federal funds – growth in M_1 relationship would have led to misses in the rate of change of M_1 by about 2 percentage points on average in any given quarter, but if a quarterly M_1 growth rate were a rigidly-held target, the funds rate could have been permitted to vary. However, because of lagged relationships between money demand and interest rates, if the funds rate is too high or too low relative to desired growth in M_1 long enough, the funds rate variation required to achieve a particular growth rate in M_1 may be so great as to make it practically impossible to achieve the desired growth rate within a quarter. In that case, one would have to attain a target over a longer-run – say, a six-month period.

Nevertheless, the extent of revision in incoming M_1 statistics (including particularly revision of the early, pre-publication figures) makes it difficult to modify day-to-day open market operating decisions on the basis of the very current flow of M_1 data. One is likely to be conservative in adjusting operations because of the likelihood that preliminary M_1 figures will be revised substantially and in unpredictable ways. This raises the danger that needed modifications in a bank reserve or Federal funds rate operating target might not be undertaken until too late (or will be undertaken too soon) to achieve, say, a quarterly M_1 objective – given continued constraint on the degree of fluctuation permitted in money market conditions and the extent of lag, and elasticity, in the relationships between interest rates and money demand.

It seems clear, therefore, that so long as M_1 is considered an important near-term policy target, further improvements in the accuracy of the data will be required. And further research on the

[6] See their paper in this volume.

relationship between M_1 and interest rates will be needed, so as to be better able to determine what is the range for a Federal funds rate constraint, if such constraint there must be, that would be most consistent with a growth in M_1 objective, if such an objective is desirable.

DISCUSSION

KARL BRUNNER*

The Committee on Banking and Currency of the U. S. House of Representatives published in 1964 a critical study surveying Federal Reserve policymaking.[1] This study questioned both the diagnostic procedure and the established strategies. It argued that the traditional diagnosis produced serious misconceptions of monetary events. Policies were frequently characterized as "tight" when the Federal Reserve's behavior was actually expansionary, or they were described as "easy" when this behavior was actually deflationary. Systematic misinterpretation converted the downswing of 1929 into the secular disaster of the Great Depression. The same misinterpretation also explains repeated experiences of apparent failure of monetary policy. The appearance of failure or impotence was created by the negative association between rhetoric and action conditioned by a persistent misinterpretation of monetary policy and monetary events.

The Committee study also argued at the time that the Federal Reserve's strategy was usually centered on one form or another of money-market conditions. Changes in the Federal Reserve's portfolio of securities and other policy actions were adjusted in response to desired and actual patterns on the money market. A money-market strategy converts rising pressures on market rates of interest into accelerations of the monetary base and eventually accelerating aggregate demand for output. Conversely, the strategy converts a faltering demand on credit markets into decelerations of the base and retardations of economic activity. This result holds quite generally and does not depend on specific monetarist hypotheses of the transmission mechanism or about the dominant impulse force driving the economy. A Neo-Keynesian view of the transmission mechanism and some Wicksellian hypothesis of the dominant impulse force yield the same implications.

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[1]U. S. Congress, House Committee on Banking and Currency, *An Analysis of Federal Reserve Monetary Policy Making*, prepared by Karl Brunner and Allan H. Meltzer, 1964.

Traditional diagnosis and strategy were conditioned by the Federal Reserve's governing conception of the money supply process expressed by the free-reserve hypothesis. This hypothesis emerged during the 1920s under Governor Strong's leadership in a special form centered on the role of bank borrowing from the Federal Reserve System. It became codified in the writings of Burgess and Riefler in the late 1920s and early 1930s. But the experience of the 1930s forced several modifications of the inherited conceptions. The Strong-Burgess-Riefler doctrine became gradually transmuted into the free-reserve conception of the 1950s and 1960s. This view assigned to the level of free-reserves and assorted money-market conditions a causal role of central significance. The rate of adjustment of the commercial banks' portfolio of earning assets and thus the supply of bank credit depended under this view on the level of free reserves and the money-market conditions. This causal link justified the frequent use of free reserves both as an indicator to guide the interpretation of monetary policy and also as a target controlling the adjustment and execution of open-market policies.

Dominance of the Free-Reserve Doctrine

The free-reserve doctrine dominated official views for many years. This view should not be imputed however to the staff members of the research division. It prevailed at the operational and policymaking levels of the Federal Reserve System. It is remarkable to observe at this date that the free-reserve conception has been fading away for several years. Some lingering traits still remain, most visibly at the Friday briefing of the Wall Street Journal on the money-market conditions. The fading of the free-reserve doctrine also affected the traditional diagnosis and strategy. Strict and unquestioned adherence to a money-market strategy has been abandoned even on the operational and policymaking levels of the Federal Reserve System. The traditional diagnosis has also waned and is not propounded with the vigorous naivite of the 1950s or earlier 1960s. We observe less frequently that rising free reserves and falling short-term rates are interpreted as symptoms of an expansionary policy, or falling free reserves combined with rising short-term rates are interpreted to indicate a more restrictive policy. This change does not mean that the Federal Reserve authorities have accepted the monetarist interpretation or concentrate on monetary growth as the optimal target guiding the FOMC's policy procedure. It essentially

means that a somewhat vaguely mixed position stressing simultaneously the relevance of interest rates or money-market conditions and monetary aggregates replaced the traditional diagnosis and strategy.

These changes accompanied the gradual emergence of the money-market theory of the money-supply process. The older theory represented by the free-reserve doctrine had evolved on the operational levels of the Federal Reserve System with almost no exposure to economic analysis. The money-market theory developed on the other hand from the work of staff economists. It surfaced for the first time in a paper articulating the Federal Reserve's counter-critique prepared by Lyle Gramley and Samuel Chase for the *Federal Reserve Bulletin* of October 1965. Its structure has been incorporated into the description of the monetary system of the Fed-MIT model and it is represented also in papers recently prepared by Richard Davis and James Pierce. The money-market theory centers the description of the money-supply process on the Walrasian money market. Variations in interest rates adjust the implicit demand and supply of base money on this market. This contrasts with the credit-market theory which centers the process on a credit market. The difference between the two alternative theories is conditioned by a fundamental issue in contemporary monetary analysis, *viz.* the relevant range of substitution relations centered on money. The money-market model expresses the Keynesian view that these relations are constrained to money and some financial assets of the same risk class. The credit-market theory on the other hand is based on the denial of such restrictions and follows from an explicit assertion that money substitutes over the whole spectrum of assets. It follows that in a "Keynesian world" the public's money demand and asset supply to banks are identical, whereas they are separate and independent behavior patterns in a Non-Keynesian world. It also follows that the money-market theory assigns to the public's money demand a central position in the process. In this view the properties of money demand dominate the outcome.[2]

[2]The reader will find a detailed comparison between the "credit-market theory" and the "money-market theory" in my forthcoming paper on "Two Alternative Theories of the Money Supply Process".

Variability of Money Demand

This Keynesian money supply theory has been supplemented in many Federal Reserve discussions with a special hypothesis asserting the fragile, volatile or highly unstable nature of the public's money demand. This instability hypothesis of money demand has been particularly cultivated on the operational and policymaking levels of the Federal Reserve System. There is nothing inherently "Keynesian" about this conjecture. It satisfies on the other hand an established institution's desire for operational continuity. The money-market model supplemented with this conjecture offers support for the traditional attention to an interest target. It is, however, not a sufficient argument. William Poole has demonstrated that the variability of money demand *relative* to the variability of aggregate demand for output forms the crucial condition and not instability *per se*. Still, it remains true that an interest-target policy effectively screens economic activity from the volatile behavior of the public's money demand according to the money-market theory. Another implication of the money-market model formulated in conjunction with the hypothesis of volatile money demand and an interest-target policy bears on the interpretation of observable changes in the money stock. All changes in the money stock are attributable to the inherent instability of money demand. This implication has been used in recent years by members of the policymaking body or of the operational staff to absolve the Federal Reserve from any responsibility for the observed accelerations or decelerations in the money stock. This absolution is more impressionistic than real however. The reduction of all variations in the money stock to the variability in money demand is crucially conditioned by the empirical relevance of the money-market model and the Federal Reserve's obsession with an interest-target policy. The reduction does not hold for an alternative money-supply theory, even in the context of an interest-target policy. Moreover, the association between money stock and money demand depends, within the confines of the money-market model, on the Federal Reserve's traditional strategy. The Federal Reserve's responsibility for this strategy is thus transferred to the variability in monetary growth resulting from the variability in money demand *under this strategy*. Still, the Federal Reserve authorities can argue that its traditional strategy protects economic activity from the variability in money demand. This assertion is conditioned, however, by two questionable empirical hypotheses. The assertion depends on the

relevance of the money-market theory and the postulated variability of money demand. The assertion does not hold under an alternative theory of the money-supply process which is based on the assumption that money substitutes over the whole spectrum of assets. The alternative analysis implies that a volatile money demand is transmitted to economic activity even with a rigid policy geared to an interest target.

The Federal Reserve's presumption about the character of money demand assumes thus a crucial role. It is remarkable that the weight attached by policymakers and members of the operational staff is not matched by a similar weight of evidence supporting the frequent contentions that money demand has shifted. Actually, a note prepared by Michael Hamburger and to be published in the *Journal of Money, Credit and Banking* establishes that the studies prepared by staff members of the Research Division of the Board of Governors and the Federal Reserve Bank of New York strongly disconfirm the hypothesis of a volatile money demand. These studies deny in particular that major accelerations or decelerations of the money stock observed over the past few years can be attributed to the vagaries of money demand. It would appear that the Federal Reserve should pursue the reexamination of inherited positions and views somewhat further and with deliberate vigor.

The Role of Analysis

The paper submitted to this conference by Axilrod and Beck offers some interesting material bearing on the reexamination initiated in recent years. The authors remove the target problem with an insistent agnosticism and the obvious compromise. This prudent compromise performed within the confines of a money-market model explains probably the peculiar procedures evolved by the FOMC over the past years and described in some detail by the paper. The procedure centers on some projections involving money stock and interest rates. The projections are apparently based on a money-market conception of the money-supply process. But the detail is blurred and an exact interpretation is barely possible to the uninitiated. It is not clear whether the authors project a family of money stock-interest rate *combinations* once a forecast for GNP is fixed. This family would be expressed by a *single* projected relationship. On the other hand, the reader wonders on occasion whether the projection mentioned involves a family of *relations* expressing different beliefs about money demand factors omitted in the explicit

analysis, based possibly on some regressions. The ambiguity can be stated in terms of a matrix with rows representing given money stock levels and columns with levels of the Federal funds rate. The account leaves obscure whether discussions are centered on the diagonal of the matrix or the whole matrix.

The initial ambivalence is reinforced by the subsequent description. Enter now the policymakers' judgments, possibly supplemented with some unrevealed analysis. A particular point (or relation) on the projected relation (or projected family of relations) must be selected. This selection may also involve a particular association between two *ranges* of money stock and Federal funds rate. Moreover, judgment may, or may not, substantially modify the projected association of selected ranges. One wonders at this stage what happened to analysis and what the role of analysis really is. It appears to offer no more than a more-or-less definite proposal to initiate a discussion at the FOMC. This discussion is however essentially "liberated" from the drudgeries of analytical requirement. It seems anybody's guess how much of the ancient "tone, feel and color" still remains with a different vocabulary. The reader of the Axilrod-Beck paper wonders about the appropriate interpretation of the procedure. Should he infer from the freewheeling intrusion of the FOMC's judgment that the underlying analysis submitted to the FOMC is of dubious quality and marginal relevance? Or should he infer that the FOMC cannot recognize relevant analysis with potentially useful applications? The reader finds moreover no clue to the proper interpretation of the eventually-selected combinations. Should we consider them as targets imposed on monetary policy? Or should the projections be regarded as an expectation expressing a consensus? Or do they reveal the social preferences of the FOMC negotiated in policy discussions? This unresolved ambiguity explains the absence of any relevant information about the response of the Federal Reserve authorities to emerging differences between the eventually-projected combination and the actual trend. The discrepancy *may* be accepted by the monetary authorities or *may* induce some appropriate actions. But we learn nothing from the paper concerning the conditions which determine either neglect of the discrepancy or some specifiable adjustments. Should we infer that the Federal Reserve authorities randomly decide that substantial deviations from the projections do not matter or are actually desirable? If this were the case the initial choice of the FOMC would be judged irrelevant or false. Or should we suspect that old patterns of behavior persist under the camouflage of a new procedure and a

new vocabulary? This would be the case if deviations are disregarded in order to maintain an implicitly desired course of the Federal funds rate. The reader also wonders about the connection between the projections prepared for a particular quarter and the GNP forecasts made for *subsequent* quarters. I confess even more curiosity about the connection between the failure of a projection for a given quarter and the forecasts already prepared for GNP in subsequent quarters. The discussion is decently obscure and sufficiently empty to preclude useful answers. One wonders therefore whether the FOMC could really provide any useful answers for these questions.

The problems of interpretation extend also to the authors' tabulation comparing projected and observed values over a sample period selected from recent years. The ambiguities of the procedure yielding the projections necessarily blur the meaning of this table. What does it really establish? Do we learn from it the relative adequacy of target achievements, or the relative ease of sacrificing established targets? Do we obtain information about the FOMC's skills in determining expected values by political consensus? Or do we acquire information concerning the closeness of negotiated social preferences and their realization? The paper offers no answers to these questions but vaguely suggests that the deviations are not too bad. But what it is that is measured more or less adequately stays a mystery. The tabulation remains for the reader essentially an empty exercise. This conclusion is reinforced by the reader's difficulty in reconstructing the table from published material. Economic analysis appears still consigned to a dubious and uncertain role in the political councils of Federal Reserve policymaking.

Two other themes of the paper reinforce the reader's doubts concerning the use of analysis in Federal Reserve procedures. The authors assert for instance that "short-run variations in U. S. government deposits often appear to have been reflected in bank credit, given interest rates". They also write that "evidence is not clear, but there does seem to be some degree of substitutability. . . between Government deposits and private demand deposits". The argument linking "bank credit" and Treasury deposits fits without strain into the old textbook chapters on the determination of the money stock and bank credit. A substantial development of money-supply theory over more than a decade seems to have completely bypassed the authors. It is also remarkable that staff members of the Federal Reserve System complain about the inadequate evidence available bearing on the impact of variations in Treasury deposits on private deposits or money stock and bank credit. Surely, this

problem can be successfully examined. It appears that either the authors are poorly informed about the work of the research staff, or the FOMC has not directed the research staff to acquire some relevant information for a reliable appraisal of Treasury deposits in the money-supply process.

RPDs As The Target

The authors' discussion of the role assigned by the authorities to RPDs (i.e. volume of reserves held by banks against private deposits) touches another theme. This magnitude has recently emerged as the target variable preferred by the FOMC among the monetary aggregates. The paper outlines how the desired, preferred or expected volume of RPDs is linked with the projected combination of money stock and Federal funds rate. Once this volume is derived it is apparently used by the FOMC to track proximately the course of the money stock. The paper offers however no explanation or analytic justification for the choice of RPDs as a target variable, or whatever it is that it is used for in the Federal Reserve's procedures. Albert Burger presented in his paper an excellent critique of the RPDs which need not be repeated here. The reader wonders of course why the FOMC strained itself to construct such a measure when better and more useful measures with at least some analytic and empirical support are available. The reader also wonders why the FOMC, or the Board for that matter, did not request a detailed comparative study by the research staff in order to guide its choice of suitable measures guiding its assessments and constraining the Account Manager's actions.

In summary, the Axilrod-Beck paper is actually quite informative, in some indirect fashion, about the current state in the Federal Reserve's policymaking. So where do we stand? We certainly note some changes since the early 1960s. The free-reserve doctrine may not be dead, but it certainly faded away like a good old soldier. With it faded also the naive concentration on money-market conditions to interpret monetary events and guide monetary policy. It appears that academic and Federal Reserve economists agree that interest rates or money-market conditions are a poor target to guide monetary policy beyond the very short-run. But the ambiguities and ambivalences of the paper also reveal serious problems in our policymaking procedures. We note foremost the unresolved issue of the target or strategy problem. Some economists and probably most of the Federal Reserve staff attempt to preserve a money-market approach

for shortest-run adjustment with suitable constraints producing the desired monetary growth beyond the shortest-run, say over a period of two quarters. The procedure developed in recent years and described in the present paper may be understood to form such an attempt. But this attempt remains haphazard and unreliable. Its execution also failed during 1971. The target problem is not unsolvable. James Pierce presented some studies in the first volume on *Controlling Monetary Aggregates* published by the Federal Reserve Bank of Boston which offered a potentially useful and interesting avenue. It is regrettable that such studies were discontinued; at least the outside observer sees no further evidence of such studies. The study of Albert Burger presented at this Conference also offers an interesting avenue worthy of serious exploration. It would require however a somewhat greater willingness on the part of the staff members at the Board of Governors to examine and pursue seriously ideas which do not necessarily fit their accustomed preconceptions or paradigmatic constraints. It appears particularly important to reexamine in this context the rationale of short-run stabilization of interest rates. There can be little doubt that this policy induced large variations of interest rates over cyclic phases. The cost was very high indeed over the past years. What is the social benefit, an illusion of the Account Manager? Another request addressed to the Federal Reserve's staff bears on the money-market theory of the money-supply process. It would be useful to develop an explicit awareness of the world described by this conception. It is a world which perpetuates the ancient confusion of money and credit. It assigns perturbations to money demand which more probably are assignable to the public's loan demand or willingness to hold securities. Moreover, these perturbations in loan demand or the stock demand for securities are not necessarily mirrored in the demand for money. The Federal Reserve's special hypothesis of a volatile and unstable demand for money requires of course particular attention. I challenge the Board's research staff to apply their skills to this issue and either offer evidential support for this so far purely impressionistic contention, or convince the FOMC and the staff at the Federal Reserve Bank of New York to abandon this unfounded idea. And beyond these questions we would naturally ask what the rationale of the procedure described by the authors is, and more importantly, what the procedure *really* is.

Further studies of appropriate strategies will no doubt yield proposals for substantial changes in policymaking procedures. These studies should also attend to important problems associated with the controllability of the money stock. The authors discuss one of these issues and offer some interesting comments. They examined the extent of the revisions in the money stock measures. I suggest that the measurements procedures require serious reexamination. We need at least two distinct measures, one expressing the domestically-held money stock and one the total money stock. I would argue that our current measure forms essentially a rather strange concoction with its treatment of foreign claims and liabilities of U. S. banks, or the treatment of cash items in process of collection. The seasonal adjustment of the raw data forms probably even a more serious problem. This problem has been recently discussed in an interesting paper by William Poole. It is difficult to interpret a seasonal adjustment which is arbitrarily determined by the Federal Reserve's policymaking procedures. We thus experience substantial difficulties in interpreting monetary evolutions within one year – and most particularly over a few months.

Lastly, a variety of institutional changes were introduced over the past decade. The reserve requirements were substantially complicated and the ceiling rate on time deposits became repeatedly a serious constraint. Concern with the development of an optimal strategy should be extended to investigate the nature of institutional arrangements which improve the degree of control over monetary growth exerted by the Central Bank. This problem has been quite neglected by economists and barely considered by Central Banks. I conjecture that a serious examination of this problem could yield useful proposals of substantial improvements in many countries.

My requests are addressed to the research staff of the Federal Reserve System. Ultimately, progress depends on the policymakers' willingness to use their research facilities to prepare the information required for rational policymaking. This willingness and interest on the part of the Board and the FOMC determines the research staff's ability to communicate with the policymakers. It also determines in the longer run the quality and the nature of the research pursued. But we cannot expect an established and fundamentally political institution to modify its procedures and impose systematic constraints on the free-wheeling judgment of the policymakers. Changes will at best emerge in response to persistent pressures from the outside. This seems to be the function of independent academic

researchers and also the function, a very crucial function indeed, of the press and various forms of information media. The changes observed over the past ten years in major newspapers (e.g., *Wall Street Journal* and *New York Times*) concerning the mode of discussion applied to monetary or banking problems effectively contribute to maintain the necessary outside pressure on an entrenched institution.