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FINANCIAL INNOVATIONS AND THEIR
EFFECT ON MONETARY POLICY

by

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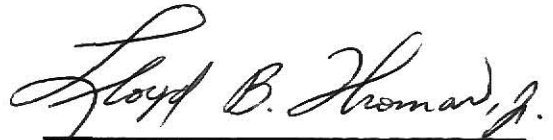
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I. History of Financial Innovations - Their Development and Effect on Monetary Policy

The Federal Reserve's ultimate objectives are to reduce inflation, promote economic growth, maintain low unemployment, and contribute to a sustainable pattern of international transactions. The evolution of the policy guides used by the Federal Reserve to accomplish the macro-economic goals mentioned above is one of continual changes. During the period in which the quantity theory of money had been supplanted by Keynesian analysis, little attention was accorded monetary growth in the implementation of monetary policy.

During the 1970's and early 1980's, however, the Federal Reserve has come increasingly to emphasize monetary aggregates as their policy guides. (In short, the Federal Reserve relies primarily on its ability to influence growth of nominal income to achieve the ultimate policy objectives of low unemployment, price stability, etc., and believes that control of monetary aggregates consistent with desired growth in income will achieve this result.)

Inherent in utilizing monetary aggregates as proxy for the real economic targets are the assumptions that:

1) The target, be it any given M, is closely and reliably related to the nonfinancial objective of monetary policy;

2) movements of the target contain information about the future movements of the nonfinancial objectives, i.e., a cause/effect relationship exists. Changes in the money supply effect changes in nominal income;

3) the target is closely and reliably related to an operating instrument that the Central Bank can control directly. (Since October, 1979, it's been "reserve aggregates"), and;

4) data on the target must be readily available on a timely basis.

Many economists and interested observers have raised questions recently over the tremendous growth of financial innovations and their effect on the control and reliability of the monetary aggregates as intermediate targets used by the Federal Reserve.

Mr. Lyle E. Gramley, member of the Board of Governors of the Federal Reserve System, goes so far as to say that financial innovations have "raised questions about the appropriate definition of money, the precision of the

Federal Reserve's control over the money stock, the meaning of changes in money balances, and the mechanism by which monetary policy affects economic activity."¹

Indeed, in the past several years financial innovations, such as repurchase agreements by banks, (where banks purchase corporate customers' money balances by selling them government securities overnight and buying them back the next morning), negotiable order of withdrawal accounts (N.O.W. accounts), super - N.O.W. accounts, money market mutual funds (MMMF's), "cash management" accounts, "sweep" accounts, and several others, have taken the financial community by storm.

These innovations are largely the result of:

1) An upward trend in the U.S. inflation rate during the 1965-82 period pulling up interest rates to record levels, coupled with the fact that the yields that depository institutions could pay were limited by prohibitions or ceilings on the payment of explicit interest;

2) a rise in awareness of inflation and its effects by households and firms, and the corresponding desire to earn

¹From a presentation made by Lyle E. Gramley, member of the Board of Governors of the Federal Reserve System, at the XIX Meeting of Governors of Central Banks of the American Continent, Quito, Ecuador, March 22, 1982.

market rates of return on balances that can be used for transactions purposes; and

3) an increase in computer technology making possible sophisticated accounting capabilities and lower effective costs of transferring funds between various assets, enabling financial institutions to meet the demand by firms and households to economize on the amount of funds held in low-yielding assets.

Perhaps the most immediate implication of these innovations is that measuring "money" has become much more difficult. Indeed, many observers assert that it was the recognition in the mid-1970's that financial innovation and government deregulation had changed the appropriate measure of transactions balances (especially the introduction of N.O.W. accounts in New England, which were excluded from M1) that resulted in a reevaluation of the traditional monetary aggregates. This reevaluation led to the conclusion that changes in the financial system had rendered the traditional aggregates less useful.

The redefined monetary aggregates that emerged in February of 1980 were different from the old aggregates in several respects. In the transactions balances measure of money, M1, it was recognized that deposits at thrift

institutions were becoming increasingly close substitutes for deposits at commercial banks, and thus, should be included in the monetary aggregates on the same basis as bank deposits. Also recognizing that some other checkable deposits were used as transactions balances, automatic transfer services (ATS) legalized in November, 1978, N.O.W. accounts (in New England since 1972), and credit union share draft accounts became part of the M1 money aggregate. Further revisions have taken place, including nationwide N.O.W. accounts (legalized in January of 1981), travelers checks (included during the June, 1981 revisions), and Super-N.O.W. accounts legalized in January of 1983. Thus we have redefined M1, the measure of transactions balances to include not only currency outside the banks plus demand deposits at commercial banks, but also deposits at thrift institutions, N.O.W. accounts, ATS accounts, credit union share draft balances, travelers checks of nonbank issues, and an M1 consolidation component which represents the estimated portion of thrift institution vault cash used to service their other checkable deposit liabilities.

Even this definition of M1 is less than clearcut, as money market mutual funds are excluded, although they do offer limited check-writing privileges. Overnight

repurchase agreements and Eurodollars are also excluded, although funds in these assets are available for spending the very next day and, therefore, must be considered close substitutes for transactions balances. Also, the recent emergence of money market deposit accounts, which do have some limited third-party transfer capability, are excluded from the narrow definition of money. Justification for exclusion from M1 seems to be on theoretical grounds instead of pragmatic ones, as the inclusion of some of these assets actually improved the empirical "fit".²

M2, a monetary aggregate intended to measure transactions balances plus very close substitutes for those balances, has been redefined also. Unlike the old aggregate, which basically included old M1 plus time and savings deposits at commercial banks, the redefined M2 includes the redefined M1, plus time and savings deposits at thrift institutions, overnight repurchase agreements, retail repurchase agreements (those less than \$100,000), overnight Eurodollar deposits of U.S. nonbank residents, money market mutual funds (excluding "institution only" MMMF's), the new

²Some justification for exclusion may be found in Richard D. Porter's, Thomas D. Simpson's, and Eileen Mauskopf's "Financial Innovation and the Monetary Aggregates," Brookings Papers on Economic Activity (1979:1), pp. 222-23.

money market deposit accounts introduced in December of 1982, and an M2 consolidation component representing the estimated amount of demand deposits and vault cash held by thrift institutions to service time and savings deposits.

Also, two additional aggregates, M3 and L, replaced old M3, M4, and M5 as the very broad measures of the public's liquid assets. Redefined M3 includes redefined M2, plus large-denomination time deposits at all depository institutions, term RP's at commercial banks and savings and loan associations, and balances of institution-only money market mutual funds. L is redefined M3 plus other liquid assets such as term Eurodollars held by U.S. residents other than banks, bankers acceptances, commercial paper, Treasury bills and other liquid Treasury securities, and U.S. savings bonds.

Even if financial innovation was the cause of the monetary aggregate redefinitions, is a redefinition in itself significant? Some economists assert that "the selection (of money's definition) is to be regarded as an empirical hypothesis asserting that a particular definition will be most convenient for a particular purpose because the magnitude based on that definition bears a more consistent and regular relation to other variables relevant for the

purpose than do alternative magnitudes of the same general class . . .³

Theoretically, any definition of "money" would be acceptable if my four requirements mentioned earlier exist; that is (1) the "money" target is closely and reliably related to the nonfinancial objectives, (2) the "money" target has a cause/effect relationship on nonfinancial objectives, (3) the target is closely and reliably related to an operating instrument controlled by the Central Bank, and (4) there are readily available data of high quality.

The acceptability of various definitions of "money" can be demonstrated by remembering that Y , the growth rate of nominal income, is equal to the growth rate of "money", M , plus the growth rate of velocity, V ⁴, or:

$$(1) \quad Y = M + V.$$

Let's assume the policymakers want the growth in the level of income, Y , to be 8 percent, and they choose to define "money" as currency held by the public plus demand deposits at commercial banks (you'll recognize this as the

³Friedman and Schwartz, Monetary Statistics of the United States, p. 91.

⁴Technically you also have to add a cross product, i.e., $Y = M + V + MV$. MV is so small however, that it is usually neglected.

definition of M1 before 1980).

Assuming the velocity growth to be fairly stable and predictable, say 5 percent, the policymakers could obtain the desired level of growth in income by simply setting the growth in money at 3 percent. That is $Y = M + V$, or $8\% = 3\% + 5\%$. By making the growth in "money" equal to 3 percent, one may obtain the desired level of growth in income.

On the other hand, say the policymakers define "money" as the current M1. Assuming the velocity growth for this definition of money is fairly stable and predictable, say 4 percent, we can again obtain the desired growth in the level of Y. That is $Y = M + V$, or $8\% = 4\% + 4\%$.

It appears therefore, that even if financial innovation has caused a redefinition of "money", that this in itself does not seriously flaw using monetary aggregates as a target. We may define "money" as M1, M2, M3, or whatever, and still theoretically make the growth in income be what we want, as long as we have a fairly stable, predictable growth in velocity associated with that definition of money. (Note, however, that redefining "money" does pose problems to analysts by increasing the technical difficulty of selecting a monetary aggregate that is sufficiently related to the policy objectives to qualify as a target. Also,

redefining "money" creates credibility problems with the public, and to the extent that financial innovations were part of the motivation to redefine the monetary aggregates, they have certainly affected recent monetary policy).

Throughout the preceding analysis, the truly crucial assumption used in being able to obtain the desired level of a given policy objective, in this case income, has been a constant, predictable growth in velocity. Even if we were to assume that we could perfectly control some measure of "money", we still need to have a fairly good idea of what velocity is doing to reach the ultimate goal.

Let's use the previous example of wanting to reach a desired growth in the level of income of 8 percent to demonstrate the importance of a stable, predictable velocity.

If we can say with some assuredness that velocity is going up 2 percent, then we would attempt to influence M to grow at 6 percent (that is $Y = M + V$, or $8\% = 6\% + 2\%$). If, on the other hand, we are confident velocity is going down 2 percent, then we would attempt to influence M to grow at 10 percent. ($8\% = 10\% - 2\%$). But what if velocity is erratic and hard to predict? Reaching the desired level of growth in Y is made much more difficult if velocity fluctuates unpredictably.

Thus, we see the importance of a stable or predictable velocity in determining the growth in the level of income. Most would agree with a statement made by Nancy Teeters, former member of the Board of Governors of the Federal Reserve System that:

... the efficacy of using monetary aggregates to target and characterize monetary policy depends importantly on the existence of a stable and predictable demand for money. Or, to put it another way, the velocity of money ... must be reasonably stable and predictable.⁵

More so than any other, this is the crucial issue surrounding financial innovation. To what extent have new innovations destabilized money demand, and hence, velocity, the link between "money" and GNP?

In this paper, we will emphasize the transactions model of money demand. Most of the papers and journals containing empirically estimated money demand functions utilize the transactions models of money demand that emphasize the role of money as a medium of exchange. This is to take nothing away from the adherents of other demand for money models, it is simply beyond the scope of this paper to examine that issue.

⁵"Changing Financial Institutions: A Governor's View", in The Future of the Financial Services Industry, proceedings of a conference June 3-4, 1981, at the Federal Reserve Bank of Atlanta, p. 52.

In its simplest form, the transactions demand for money model holds that firms and households want to hold money equal to a specified fraction (k) of their income.⁶ The amount of money demanded will equal the supply of money only when income is a specified multiple of the money supply. The multiple is the reciprocal of k , or the velocity of money. Velocity remains constant so long as k is unchanged.

Transactions models of money demand suggest that the velocity of money is positively related to market interest rates. This relationship exists because the incentive to economize on money balances depends on the yields available from alternative liquid assets. The model also implies that changes in income lead to less than proportional changes in money demand because of economies of scale in managing cash balances. Therefore, transactions models predict that the velocity of money increases as the level of income increases.

This type of a model implies that the demand for money, hence the velocity, is dependent upon the availability of close money substitutes and the cost of transferring funds

⁶There have been several variations on this model, replacing income as the main determinant in deciding how much money to hold. Most of this relates to measures of wealth. (For example, K. Brunner, A. H. Meltzer, and Milton Friedman have all done extensive work in this area).

between money balances and other assets. Enter financial innovations. A money market mutual fund which has some limited checkwriting privileges and is extremely liquid, and pays a higher rate of return than holding cash or demand deposits, could be expected to change the money demand relationship and increase the difficulty of predicting velocity movements accurately. If we cannot accurately predict velocity, the use of monetary aggregates as targets has been impaired. Some economists contend that this is exactly what happened in the mid-1970's. Financial innovations that could be considered transactions balances were not being included in the monetary aggregates and, therefore, distortion of the typical money demand function was occurring. Velocity was becoming erratic because the growth of financial innovations caused M1 to understate the true amount of the public's transactions balances. They contend that by redefining the monetary aggregates, which we discussed earlier, the Central Bank hoped to improve the stability and predictability of the velocity of the potential monetary measures.

Under the transactions model of money demand adopted by several economists to empirically test money demand, we saw that income and interest rates were the main variables used to explain velocity movements of the monetary aggregates.

It appears that income and interest rates adequately explained velocity movements of M1 and M2 throughout the 1960's and early 1970's. Indeed, most hold that the apparent predictability of velocity demonstrated in the 1960's and early 1970's was a major factor in leading the Federal Reserve to adopt monetary growth targets as the principal method for achieving ultimate policy objectives.

However, in the mid-1970's velocity began to fluctuate from the anticipated rate predicted by empirical estimates using a transactions demand model. For example, the velocity of M1 increased 13.3 percent in the 3½ year period of the second quarter 1974 to the fourth quarter of 1977. The estimated growth indicated by the behavior of interest rates and income would account for only a 3.5 percent increase in that same 3½ year period.⁷

The unexpected rise in M1 velocity beginning in the mid 1970's indicated that smaller than expected M1 balances were being held by the public. Several economists concluded that part of the explanation lay in financial innovations (particularly N.O.W. accounts in New England), understating

⁷Bryon Higgins and Jon Faust, "Velocity Behavior of the New Monetary Aggregates", in Issues in Monetary Policy: II, Federal Reserve Bank of Kansas City, p. 57.

the true amount of the public's transactions balances.⁸ They contend that a downshift in money demand occurred in response to very high and record levels of interest rates causing firms and individuals to institute new cash management techniques, i.e., to seek out the high yielding financial innovations such as money market funds, etc.⁹ They contend that the acceptance of these financial innovations as viable alternatives to cash and demand deposits lead to permanent decreases in desired real money balances relative to a given level of real income and interest rates. In other words, money demand shifts downward following a sharp rise in interest rates, due largely to the availability of liquid, high-yielding alternatives.

A review of recent history shows that the last three years have been particularly plagued with varying interpretations of the behavior of velocity.

⁸See Steven M. Goldfeld, "The Case of the Missing Money", Brooking's Papers on Economic Activity (1976:3); Gillian Garcia and Simon Pak, "Some Clues in the Case of the Missing Money", American Economic Review, Volume 69, Number 2, May 1979; and Jared Enzler, Lewis Johnson, and John Paulus, "Some Problems of Money Demand", Brooking's Papers on Economic Activity (1976:1).

⁹See Axilrod and Lindsey, "Federal Reserve System Implementation of Monetary Policy", p. 251, and Richard D. Porter, Thomas D. Simpson, and Eileen Mauskopf, "Financial Innovation and the Monetary Aggregates", Brooking's Papers on Economic Activity (1:1979), pp. 213-29.

II. Behavior of Velocity - 1981

Several financial developments affected the direction of money demand, velocity, and monetary policy in 1981. Perhaps the most important of these were the nationwide introduction of N.O.W. accounts on January 1, 1981; the liberalization of interest rate ceilings on small-savers certificates on August 1, 1981; the introduction of tax-exempt all-savers certificates on October 1, 1981; and the rapid and varied growth experienced in money market mutual funds.

The velocity of M1 increased at an unprecedented 18.8 percent annual rate in the first quarter of 1981.¹⁰ At least partially in response to the surge in the velocity of M1, one of the most interesting results of financial innovations occurred in this year with the use of shift-adjusted M1 in Federal policy.¹¹ The theory was that

¹⁰Based on M1, not shift-adjusted M1 which received much attention in 1981.

¹¹See Paul A. Volcker, "Monetary Policy Report to Congress", Federal Reserve Bulletin (March, 1981), pp. 195-208. In March, the Fed began releasing information on shift-adjusted M1_B in footnotes to the Federal Reserve Statistical Release H.6. A fuller discussion of the adjustment was presented in the May 15, 1981, H.6. release and in "Recent Revisions of the Money Stock", Federal Reserve Bulletin (July, 1981), pp. 539-542. Beginning May 22, 1981, monthly data on M1_B Shift-adjusted began to appear in Table 1 of the A.6. release.

some of the N.O.W. account balances introduced nationwide on January 1, 1981, were not transactions balances since they were shifted from savings and were simply being held to satisfy N.O.W. account minimum balances. Therefore, they argued that some of the N.O.W. account amounts should be removed from the narrow measure of money, M1. Whether or not the shift-adjusted M1 measure was needed in 1981 is still a point of controversy among many economists.¹² However, this much is clear from reading the "Record of Policy Actions" of the Federal Open Market Committee for 1981. The Central Bank of this country was uncertain about the extent to which financial developments were affecting the relative growth rates of various monetary aggregates, and the extent to which these developments in turn were affecting the relationship between the aggregates and economic activity.

If one could label a broad group of economists with somewhat similar views, and call them "financial innovation" theorists, they would contend that 1981 was a prime example

¹²For example, see John A. Tatom, "Recent Financial Innovations: Have They Distorted the Meaning of M1?", Economic Review, Federal Reserve Bank of St. Louis, April, 1982, pp. 23-25. Mr. Tatom goes to great lengths to provide evidence that a shift adjusted M1_B was not needed and actually proved to be a worse measurement than non-adjusted M1_B.

of an unpredictable velocity due to financial innovation and change. In fact, there appears to have been a substantial overprediction of money in 1981 if one compared the actual growth of M1 and the growth predicted by a conventional money demand equation.

Even though N.O.W. accounts were implemented nationwide in January, 1981 and are included in the M1 component, financial innovationists would hold that money (M1) demand shifted downward due to the high level of interest rates and the availability of liquid, high-yielding alternatives. That is, the growth of money-market mutual funds (up dramatically in 1981), retail repurchase facilities, "sweep" accounts, and the growing attractiveness of the equity market, all contributed to outweigh any growth in N.O.W. accounts and increase the velocity of the M1 measure as funds were removed from M1 and placed into assets not included in that measure.

Likewise, proponents of this view would expect the velocity of the broader based money aggregates to slow down more than anticipated. They would contend that this reflects the fact that a large and increasing fraction of M2 assets yields a market rate of return. (This is indeed what occurred in 1981). They, therefore, contend that the slower

growth in velocity of M2, i.e., the higher than anticipated M2 growth, is due to a reduced interest sensitivity of M2, directly related to financial innovations. It is interesting to note that by the second quarter of 1981, assets with a market yield, including money market funds, RP's, overnight Eurodollar deposits, and money market certificates, accounted for 35.4 percent of the funds in M2. This compares with less than 1 percent just 11 years earlier.

Most adherents of the hypothesis that financial innovations have appreciably affected the demand for money would probably agree with Daniel Thornton's assessment of the Central Bank in 1981. He said, "It appears that the most significant question for monetary policymakers in 1981 was which monetary aggregate to control in a financial environment marked by innovation and regulatory change (emphasis added). The impact of such developments on the growth rates of the monetary aggregates, and the relationship between the aggregate and economic performance will undoubtedly be significant policy issues in 1982."¹³

¹³ Daniel L. Thornton, "The FOMC in 1981: Monetary Control in a Changing Financial Environment", Federal Reserve Bank of St. Louis Review, April, 1982, p. 16.

III. Behavior of Velocity - 1982

If 1981 created controversy over what was going on with the monetary aggregates, 1982 turned out to be a banner year for one of the most widely tested theories in macroeconomics, i.e., alternative theories of the public's demand to hold money.

As one analyst put it, velocity "surfaced as the Achilles' heel of monetarism when it unexpectedly declined (in 1982) after growing at a fairly steady 3% annual pace over the postwar period."¹⁴ (Actually, prior to 1982 M1 velocity had a 2.8 percent average rate of increase over the previous twenty years. However, in 1982 M1 velocity declined at a 4.7 percent rate).

There are several schools of thought as to what happened to velocity in 1982. Financial innovationists (if there is such a "group") contend that again the public shifted their demand for money, this time upward, in the sense that for given interest rates, income, and prices, the public wanted to hold more money than historical relationships would predict. 1982 was not the first time there was a sizable disparity between the actual growth of M1 and the growth predicted by a conventional money demand equation.

¹⁴Business Week, 26 December, 1983, p. 13.

As I mentioned earlier in the paper, for 1974-75 the money stock tended to grow at rates considerably less than would have been expected from past relationships with income and interest rates. That is, there was a negative prediction error. A negative prediction error occurred again in 1981. In 1982, however, there appears to have been a sizable underprediction of money, or a positive prediction error. For many, not only was this drop in velocity surprising, but in absolute terms the 1982 prediction error of money is one of the two largest out-of-sample errors for any year in the post-1973 simulation period.

Just as they contend that a downshift in money demand occurred prior to 1982 (in response to financial innovations paying record high levels of interest rates) "financial innovationists" would hold that in 1982 the demand for money increased. They contend that this occurred partly due to uncertainty caused by the recession, but also because items in M1 (basically N.O.W. accounts) became more acceptable and attractive due to the falling interest rates, which made holding M1 assets less of a penalty.

It almost appears contradictory to assert that "financial innovations" can cause a decrease in the demand for money one year, and an increase the next. Those supporting

the idea that this is possible point out that one has to view closely how a new financial innovation affects the monetary aggregates. That is, some financial innovations, such as N.O.W. accounts and Super-N.O.W. accounts, may be used as transactions balances and included in the M1 measure. If the effect of these instruments are substantial, "financial innovation" has lowered the cost of holding money (M1), thereby increasing its demand and reducing velocity.

On the other hand, some financial innovations, such as money market deposit accounts and money market mutual funds, are not considered transactions balances and are not included in M1. To the extent that these types of financial instruments draw funds out of M1, "financial innovations" have reduced the demand for money, increasing velocity.

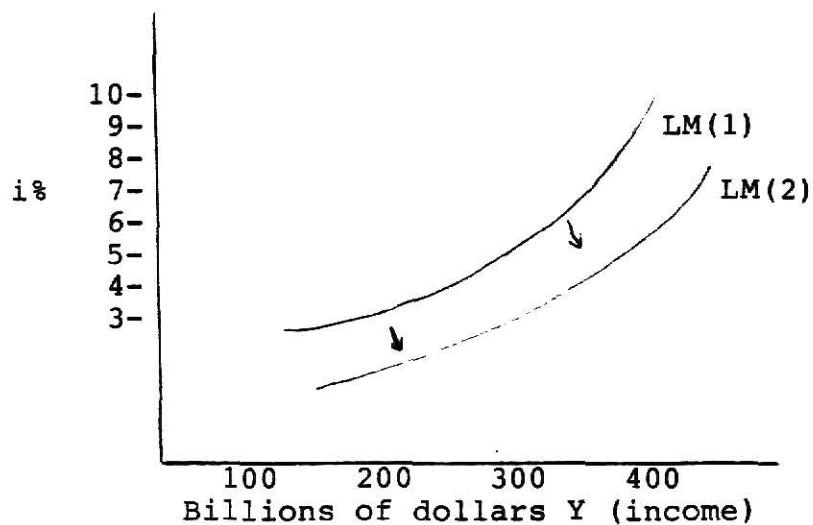
It appears what many are arguing is that the timing and magnitude of the various innovations affect the monetary aggregates in different ways. In 1981 the rapid growth of money market mutual funds, etc., pulled more funds out of M1 than N.O.W. accounts attracted due to the record level of interest rates on those instruments as opposed to money or N.O.W. accounts. In 1982 the rapid decrease in interest rates, coupled with the ability to hold transactions

balances in the form of N.O.W. accounts and still earn interest, pulled money back into M1. Survey data and econometric cross-section evidence indicate that this did occur to some extent.¹⁵ However, it does not appear that the empirical evidence could support the idea that "financial innovation" was the total cause for velocity fluctuations, and very few "financial innovationists" contend that this is the case. They are saying however, that recent financial innovations have exerbated the movements in velocity swings.

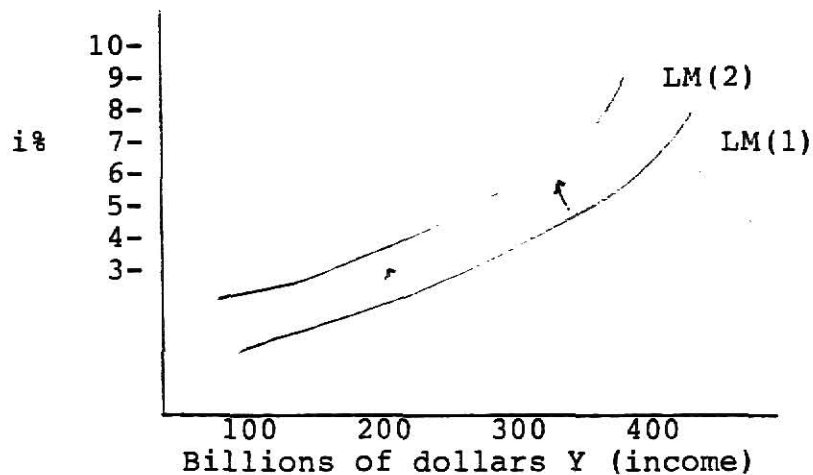
A graphical illustration of the position held by proponents of a "shift" in the demand for money would be as follows:

High interest rates, coupled with new financial innovations paying a high market rate of interest, make the cost of holding transactions balances higher. In response to this, the demand for money shifts downward, shifting the LM schedule from LM(1) to LM(2).

¹⁵Data compulated by the Research Division, Federal Reserve Bank of Kansas City.



Lower interest rates, coupled with financial innovations included in M1 that pay interest, make the penalty for holding transactions balances less. The response is to shift the demand for money upward, shifting the LM schedule from $LM(1)$ to $LM(2)$.



Of course, not all agree with the idea that financial innovations caused a shift in money demand in 1982. Some

contend that, in fact, the demand for money (M1) was stable in 1982, and that there are other possibilities that explain the larger than expected drop in velocity.

One such possibility is that the decline in M1 velocity in 1982 was caused by the sharp parallel drop in short-term interest rates and inflation. This explanation rests on the distinction between nominal, or market interest rates, and real, or inflation-adjusted interest rates.

The level of spending on goods and services depends on the real rate of interest. On the other hand, the public's demand for M1 depends on the nominal rate of interest. If the rate of inflation falls and nominal interest rates fall in a roughly equal amount, the real rate of interest would be unchanged. If the level of spending on goods and services depends on the real rate of interest, the decline in nominal rates coupled with an equal decline in inflation would not stimulate additional growth in real GNP.

However, since the public's demand for money depends on the nominal interest rate, their demand for money would increase, for a time, due to the drop in the nominal interest rates. As a result, the combination of fast M1 growth (the Federal Reserve responded to the increase in the quantity of money demanded by the public in 1982 by allowing

money to grow faster than originally targeted) and slow income growth meant that velocity actually fell.

Analysts who hold that this is what occurred in 1982 contend that the decline in velocity was consistent with a stable demand for money relationship representing an increase in the quantity of money demanded, rather than an unstable money demand function.¹⁶

Still others contend that the velocity decline in M1 in 1982 was not even that unusual; that the decline was not due to declining inflation, declining interest rates, or financial innovations, but due instead to the normal changes that occur in the business cycle.

Proponents of this view contend that the principal reason velocity declines in a recession (such as in 1982) is because of a temporary decline in real income.¹⁷

This is consistent with the view that the demand for money is, in principle, dependent upon "permanent income".

¹⁶John P. Judd and Rose McElhattan, "The Behavior of Money and the Economy in 1982-83". Economic Review, Federal Reserve Bank of San Francisco, Summer 1983, Number 3, pp. 46-51. Also, John P. Judd, "The Recent Decline in Velocity: Instability in Money Demand or Inflation?", Economic Review, Federal Reserve Bank of San Francisco, Spring 1983, pp. 12-19.

¹⁷John A. Tatom, "Was the 1982 Velocity Decline Unusual?", Economic Review, Federal Reserve Bank of St. Louis, August/September 1983, Vol. 65, No. 7, pp. 5-15.

In recessions, GNP declines relative to permanent income. As a result, money holdings rise relative to measured income or GNP, but not relative to permanent income. Such a movement in money holdings relative to spending also is expected based on the "precautionary motive" to hold money.

Also, some of the velocity movement can be attributed to the lagged adjustment of GNP to monetary growth. Proponents of this view hold that the growth rate of nominal GNP is determined primarily by the growth rate of the money supply. Due to the lags involved for nominal GNP to respond to changes in money growth, when money growth slows, GNP growth initially slows by less; thus, velocity growth rises. Within a few quarters, however, the effect of the slowing in money growth is reflected in further reductions in GNP growth. Now GNP growth continues to slow while money growth does not; thus, velocity growth falls.

Finally, during recessions, businesses often fail to anticipate the decline, assume the decline is just temporary, or just choose to adjust production growth more slowly. The result is excess inventory. The temporary production adjustments to eliminate the excess inventory initially push production down sharply relative to sales. The effect of inventory depletion is a fall in velocity. As

producers meet their sales out of inventory rather than stepped-up production, GNP does not keep pace with final sales, so that velocity measured relative to GNP will fall.

The conclusion reached by analysts holding the above view is that it is not unusual for velocity to decline in a recession. Short-term movements in velocity reflect diverse reactions of the economy to monetary policy actions. To them, 1982 was the result of monetary stringency during prior periods. (Other factors, such as the decline in inflation and movements in interest rates tended to work in the same direction, reducing velocity during the recession of 1982.)

IV. Behavior of Velocity - 1983

Early 1983 showed a continuance of the 1982 pattern. M1 velocity was down about 4.6% in the first quarter. However, starting in about the middle of 1983, M1 velocity reversed course. The second and third quarter showed a slight acceleration in the velocity of money, and the revised data indicates that velocity in the fourth quarter of 1983 increased at a 3.8% rate of expansion.¹⁸ This volatility (from a 4.6% rate of decline to a 3.8% rate of increase) in 1983 has not gone unnoticed, and again there

¹⁸Business Week, 27 February, 1984, p. 26.

are several theories as to why this has occurred.

A lot of the volatility is still being attributed to new financial innovations. For example, "the various measures of money are now being distorted by massive shifts in savings flows. There has been heavy activity in the money market deposit accounts (MMDA's), negotiable order of withdrawal (Super N.O.W.'s), and individual retirement accounts (IRA's).

"All of this churning has made it impossible to determine the underlying trend of transactions balances -- which is what the Fed is really trying to isolate and control."¹⁹

The impact of these shifts in savings flows on M1 velocity and M2 velocity depends upon the weight given to each of the factors and where the funds come from. Increases in money market deposit accounts would tend to increase the velocity of M1 and decrease the velocity of M2 if funds were drawn out of M1 to be placed in the MMDA's. Remember, money market deposit accounts are included in M2, but not M1. Conversely, increases in Super-N.O.W. account balances would tend to decrease M1 velocity and increase M2 velocity, assuming the funds going into Super-N.O.W. accounts came from sources included in M2 but not M1.

¹⁹Business Week, 25 April, 1983, p. 19.

These two recent innovations, money market deposit accounts (MMDA's) and Super N.O.W. accounts, are currently receiving a lot of attention. The money market deposit account is the result of the Garn-St. Germain Depository Institutions Act of 1982. This act provided for the authorization of a deposit account that is directly equivalent to and competitive with money market mutual funds. This is a replacement of the all-savers certificates established in October of 1981 for banks and thrifts to use in competing with money market mutual funds. Although the all-savers certificates did draw nearly \$47 billion, they were not close substitutes of the money market mutual funds, and were phased out by October of 1982.

Flows into the money market deposit accounts averaged more than \$35 billion per week in the first six weeks that the accounts were offered. MMDA balances totaled more than \$340 billion by mid-April, 1983, and a review of the September, 1983, Federal Reserve Bulletin (Table A15) reveals that MMDA's totaled \$368.4 billion in July, second only to small-denomination time deposits in size.

When one considers that MMDA's became available in December of 1982, and are already more than double money market funds (which stood at \$167 billion recently), the growth seems phenomenal.

Also note that since MMDA's are included in the M2 measure, about three-fourths of the balances in savings, small-denomination time accounts, and MMDA's at commercial banks as well as at thrift institutions were earning a market-determined rate of return as of March, 1983.

The real issue with the advent of MMDA's is where the funds came from. Did funds flow out of components in the M1 measure, other M2 components, the equity market or where?

On an annual basis, the growth of M2 surged in January and February of 1983 by 29.8 percent and 23.8 percent, respectively. To the extent that funds came from other M2 components, growth of this aggregate would not have been affected.

The large increase in M2, therefore, must reflect an outflow of funds from the components of the money supply not included in M2.

A study of the sources of the MMDA's reveals:

- 1) That general-purpose and broker/dealer funds fell about \$37 billion between November, 1982, and March, 1983. However, as this measure is also included in M2, it cannot account for the large increase experienced.

- 2) Institution-only money market funds declined by about \$6½ billion from November, 1982 to March, 1983. To the extent that some of this money found its way into MMDA's, M2 was affected. (Institution-only MMF's are in M3, not M2).
- 3) Savings deposits at all institutions fell a record \$48 billion between November, 1982, and March, 1983. Again, to the extent that this money was already in the M2 aggregate, it was not affected.
- 4) Small-denomination time deposits for November, 1982, to March, 1983, fell a dramatic \$130 billion; again, little effect on the M2 measure.
- 5) Some large CD's apparently were shifted to the MMDA's, as a drop in the amount of large CD's outstanding occurred. These funds are outside the M2 aggregate, so to the extent that they were added, M2 was affected.
- 6) Household surveys indicate that some savers transferred funds from Treasury securities and other interest-bearing market instruments, and MMDA balances also may have been drawn from mutual funds other than money funds and from the

stock market. To the extent that this transfer took place, M2 was affected.

The Super-N.O.W. accounts were introduced in January, 1983. They have no limit on the checks that can be written against them and, therefore, were classified as transactions balances and included in the M1 measure. The Super-N.O.W. accounts have not grown as rapidly as the money market deposit accounts, but by mid-April, 1983, balances in Super-N.O.W.'s totaled \$29½ billion. This is about one-fourth of the total "other checkable deposits" component of M1, which includes balances in regular negotiable order of withdrawal accounts, automatic transfer accounts, and share draft accounts at credit unions.

On an annual basis the M1 aggregate posted large gains in February and March of 1983, growing by 21.2 percent and approximately 16.7 percent, respectively. Again, the question is where did the funds come from?

To the extent that funds flowing into Super-N.O.W. accounts were transferred from other components of M1, the growth of this aggregate was not affected. Survey data and econometric cross-section evidence indicate that the vast bulk of the dollars going into Super-N.O.W.'s came from

other transaction accounts.²⁰ Moreover, it appears that mostly savings and time deposits rather than nondeposit sources, such as money market mutual funds, were attracted from nontransaction accounts. Therefore, it may turn out M1 was not greatly affected by the introduction of MMDA's and Super-N.O.W.'s due to the two new accounts offsetting each other. Limited funds have been attracted to Super-N.O.W.'s from sources other than transaction accounts, which would add to M1, and some demand deposits and regular N.O.W. balances have at the same time been moved into MMDA's, which would come out of M1. Although flows into the Super-N.O.W.'s have been comparatively small and primarily reflect shifts from other transaction accounts, the introduction of the account is important. It is possible that as Super-N.O.W.'s become a larger share of household transaction deposits in M1, they could significantly affect the behavior of those balances relative to other economic variables.

The data indicate that the introduction of MMDA's and Super-N.O.W. accounts have had the following effect on the various money aggregates:

1) As the flow of funds into M1 due to Super-N.O.W. and the flow of funds out of M1 due to MMDA's appear to be

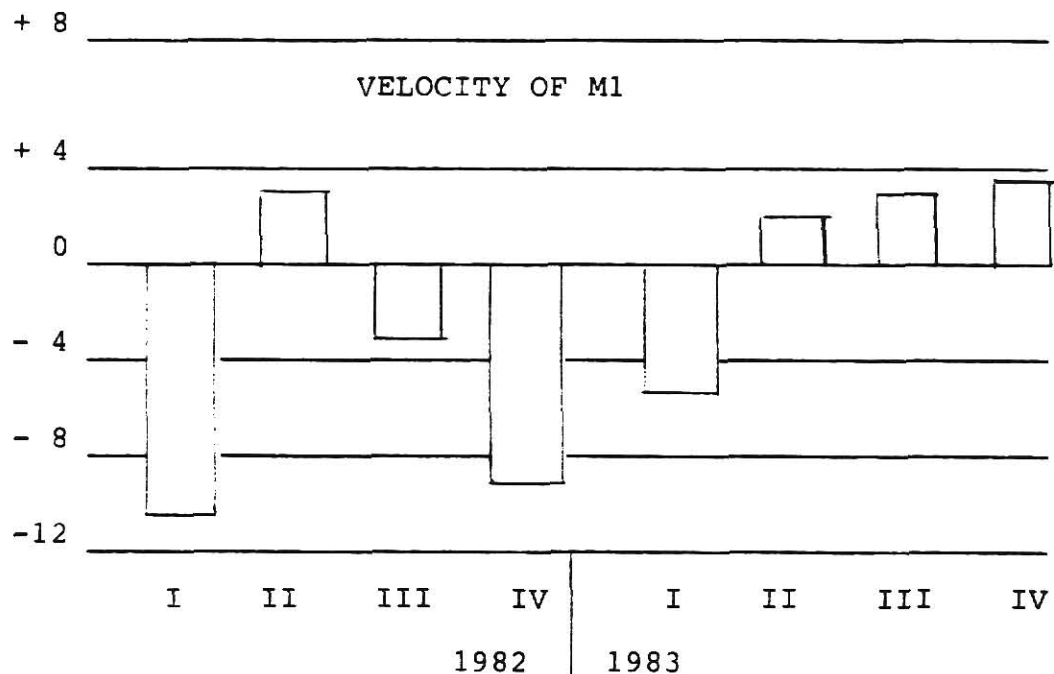
²⁰Financial Letter, Federal Reserve Bank of Kansas City, Vol. 9, No. 4, April 20, 1983.

roughly the same magnitude, there was probably little net effect on M1 in 1983.

2) The introduction of the two accounts undoubtedly served to increase M2.

3) The growth of M3 probably has been increased by a slight amount.

The volatility that occurred in M1 velocity in 1982 and 1983 is charted below. As was the case in 1982, again there are varying theories as to why the demand for money, hence velocity, fluctuated in 1983.



Percent change, quarter to quarter at annual rate (Data from Commerce Dept., Federal Reserve Board)

Many still contend that the introduction of new financial innovations, such as the Super-N.O.W. accounts and money market demand accounts introduced in 1983, have paved the way to an increasingly permanent volatility in the demand for money. They contend that accompanying the introduction of these innovations there is generally a shift in assets, which have changed the relationship of the monetary aggregates to economic activity.

They point to the recent volatility of the velocity of money (above chart) and contend that innovations, in part, have destabilized money demand. As a result, they contend that changes in the money supply have not had the effect on inflation or production that such changes would have had in the past. However, as was the case in 1982, the explanations for 1983 velocity fluctuations vary. Not everyone is in agreement that recent financial innovations have created a shift in the money demand function, thereby making velocity unreliable and hard to predict.

Analysis on whether or not there has actually been a "shift" in the demand for money generally involves the investigation of an empirical money demand equation. Using the variables common to a typical money demand equation, i.e., interest rates, real income, and often lagged real

balances (assuming actual real balances only partially adjust to current changes in interest rates or real income), some contend that no permanent shift in the demand for money has taken place due to financial innovations in the 1981-83 period. (As I mentioned before, it is interesting to note, however, that there is some belief that there was a large downward shift in M1 demand in the period 1974-1976, apparently in response to financial innovation.²¹ The public's demand for money apparently shifted downward by about 10 percent between mid 1974 and 1976).

An evaluation of a money demand function simulation of actual real money balances reveals no consistent one-sided errors, which according to some is the crucial point in being able to conclude that a "shift" has taken place. One should observe a level of real money balances that is consistently below simulated levels following the "down-shift" in the demand for money. According to economists who say no shift has taken place, this event has just not occurred.²²

²¹See for example John P. Judd and John L. Scadding's, "The Search for a Stable Money Demand Function: A Survey of the Post-1973 Literature," Journal of Economic Literature, September 1982, pp. 993-1023.

²²Among them, Scott E. Hein, as evidenced by his article, "Short-Run Money Growth Volatility: Evidence of Misbehaving Money Demand?", Economic Review, Federal Reserve Bank of St. Louis, June/July, 1982.

One alternative view as to the behavior of M1 velocity in 1983 has already been discussed in relation to 1982 velocity behavior. That is, that velocity normally displays a cyclical pattern, rising during expansions and falling in recessions. Holders of this view contend that the primary factor accounting for the decline in velocity in 1982 and the first quarter 1983 was the normal cyclical response to the transitory decline in income associated with the recession. The behavior of velocity in the second through the fourth quarter of 1983 is also consistent with their cyclical viewpoint, and indicates an expanding economy.

Proponents of this view hold that the primary determinant of the decline or increase in real output or the size of the GNP gap (the percentage by which the nation's potential output exceeds its actual real GNP) is the pattern of past monetary growth.

These theorists hold that after some time (about two quarters), a substantial decline in money growth will cause a recession. The periods of falling velocity growth associated with a slowing in money growth coincide with the period of recession induced by a slowing in money. To them, the decline in M1 velocity in 1982 is attributable to the

sluggish money growth in the latter part of 1981. Likewise, starting in the fourth quarter of 1982 and continuing into the middle of 1983 money growth picked up substantially. To proponents of this view, the corresponding increase in the velocity of M1 in the third and fourth quarters of 1983 is therefore a reflection of an expanding economy and the preceding acceleration of money growth.

This school of thought therefore contends that recent movements of velocity are not unusual, nor do they represent an atypical shift with important, but unknown, implications for policy-making.²³

An alternative viewpoint to either the monetarists or "financial innovationists", is one that holds that the 1982--early 1983 velocity decline was largely due to the sharp drop in interest rates that occurred in this period. They hold that the decline in velocity of M1 was a surprise to many, not because the demand for M1 shifted (they say to the contrary, it has not shifted at all), but was a surprise because the rate of inflation dropped more suddenly and by a larger amount than they expected, bringing down interest rates very sharply.

²³Most analysts who classify themselves as "monetarists" hold this view. For example, See John A. Tatom, "Was the 1982 Velocity Decline Unusual?", Economic Review, Federal Reserve Bank of St. Louis, August/September 1983, Vol. 65, No. 7, pp. 5-15.

To them, this inflation/interest rate explanation also explains the 1983 movements of velocity. They hold money growth will rise relative to GNP growth only as long as the public's demand for money is stimulated by declines in interest rates.

As interest rates have stabilized in 1983 at new lower levels, the effects on money growth have dissipated according to the lags in the demand for money. (Studies suggest that interest rates affect M1 demand for about six months. Therefore, under this theory, M1 growth [velocity decline], induced by a decline in interest rates in the latter part of 1982, would play itself out by the second quarter of 1983).

Indeed, the commercial paper rate fell sharply in the third and fourth quarters of 1982, and velocity showed a small (but positive) growth by the second quarter of 1983. According to supporters of this inflation/interest rate hypothesis, 1983 velocity has behaved exactly as they would have expected.²⁴

Accompanying the various views as to what has "caused" velocity fluctuations, there is a wide range of views as to

²⁴For a good explanation of this view see John P. Judd, "The Recent Decline in Velocity: Instability in Money Demand or Inflation?", Economic Review, Federal Reserve Bank of San Francisco, Spring 1983, pp. 12-19.

what policy-makers should focus their attention on in the future.

Some observers, interpreting the shifts in velocity as the breakdown of monetarist theory, have suggested that, "If velocity has become impossible to predict, it could be 20 years before monetarism becomes the linchpin of policy again."²⁵

Still others contend that the ability of the Fed to use monetary aggregates as guides to implementing policy has not been affected, and that the ... "need for precise short-run money supply control is technically questionable."²⁶

One of the key issues surrounding the recent behavior of velocity is whether or not we should base monetary policy on the monetary aggregates. Those who say we need to reconsider using monetary aggregates point to the recent erratic velocity behavior of those aggregates. Some are quick to point the finger at financial innovation as one of the culprits in creating this need to reassess monetary policy targets.

²⁵"The Failure of Monetarism," Business Week, April 4, 1983, pp. 64-67. In the same article, Robert J. Gordon remarks that "Monetarism has been decimated by the collapse of velocity in 1982."

²⁶Stephen A. Axilrod and David E. Lindsey, "Federal Reserve System Implementation of Monetary Policy: Analytical Foundations of the New Approach", American Economic Review Papers and Proceedings (May 1981), p. 252.

"In recent years, financial innovations have raised questions about the usefulness of narrowly defined money as a policy target ... the usefulness of monetary measures in general, and M1 in particular, has declined in recent years. Furthermore, the difficulty with money likely will continue during the transition period of adjustment to the new accounts."²⁷

"Recent financial innovations and changes in the legal and regulatory framework has distorted traditional money demand relationships, even for the redefined monetary aggregates. As a result, the Federal Reserve's ability to achieve ultimate policy objectives by using monetary growth targets as policy guides may be impaired for the foreseeable future."²⁸

"The money demand function, once a standard example of an easily estimated relationship to use as an exercise in elementary econometrics course, all but collapsed in its conventional form in the mid-1970s. Subsequent empirical work emphasizing the effects of financial innovations on the demand for money has discovered new relationships that fit the historical data better, but there is little ground for

²⁷ Credit Aggregates as Policy Targets, FBNY Quarterly Review, Winter 1982-83, p. 2.

²⁸ Bryon Higgins and Jon Faust, "Velocity Behavior of the New Monetary Aggregates," Issues in Monetary Policy: II, Federal Reserve Bank of Kansas City, p. 62.

confidence in the face of potential further changes."²⁹

The issue of what to focus on as a policy target has received even more attention recently.

"The Fed has said it is paying more attention to broader money measures than M1 in setting credit policy."³⁰

"The bottom line is that the Fed abandoned its targeting of the basic money supply in late 1982 and began paying attention to the wider monetary aggregates, overall credit, and the performance of the economy itself."³¹

And, "it seems clear that the money managers are giving the money supply numbers only secondary attention. They have made interest rates the centerpiece of monetary policy and are concentrating on what effect rates are having on the path of the economy."³²

Along with the belief that there are problems associated with using the monetary aggregates as the intermediate target has come the call to examine other possible targets.

²⁹ Benjamin M. Friedman, "Using a Credit Aggregate Target to Implement Monetary Policy," Monetary Policy Issues in the 1980's: A Symposium Sponsored by the Federal Reserve Bank of Kansas City, p. 227.

³⁰ "Evidence Mounts that Fed Has Tightened its Credit Grip to Slow Growth in Economy," Wall Street Journal, November 28, 1983, p. 44.

³¹ Business Week, 26 December, 1983, p. 13.

³² Business Week, 23 January, 1984, p. 29.

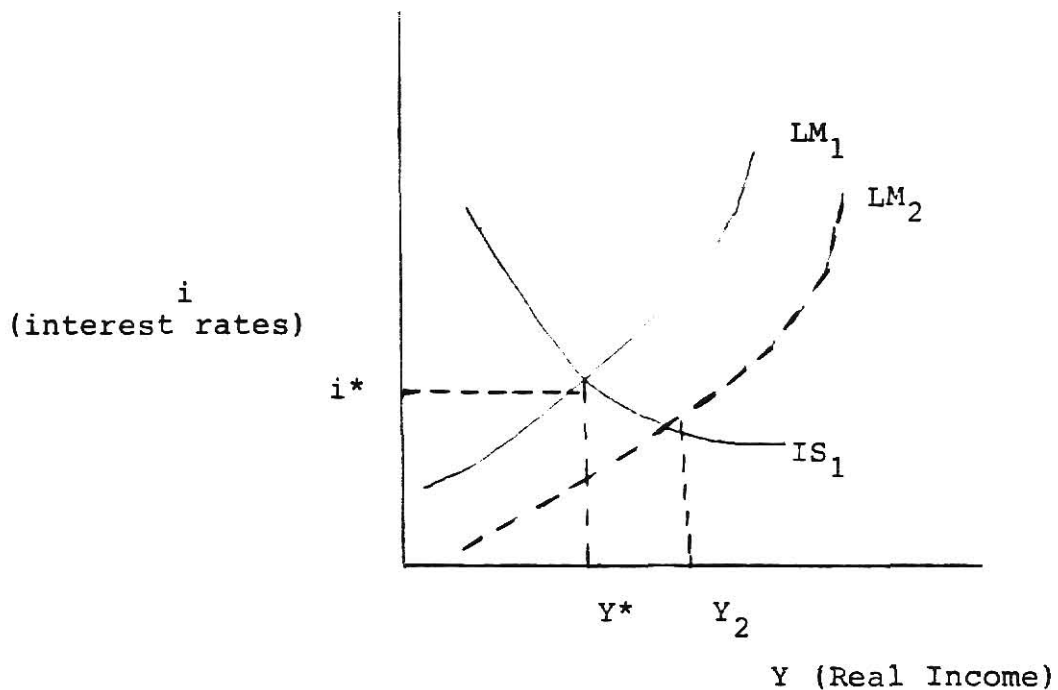
V. Possible Alternatives to the Monetary Aggregate as Intermediate Targets

Interest rates as a policy target

Proponents of using interest rates as a policy target use the argument that an appropriate target depends on the types of disturbances causing the problem and the impact of these factors on financial markets. As was discussed earlier, some hold that new financial innovations have affected the demand for money, i.e., that the slopes and position of the LM schedule have changed. They argue the LM curve has become less predictable as a result, and policymakers, therefore, need to return to an interest rate target.

Graphically, proponents of using interest rate targets instead of monetary aggregate targets are saying the following:

Let's suppose that the objective of the Federal Reserve is to hit some real output target Y^* . Initially the LM curve is at LM_1 , the IS curve is at IS_1 , and $Y = Y^*$.



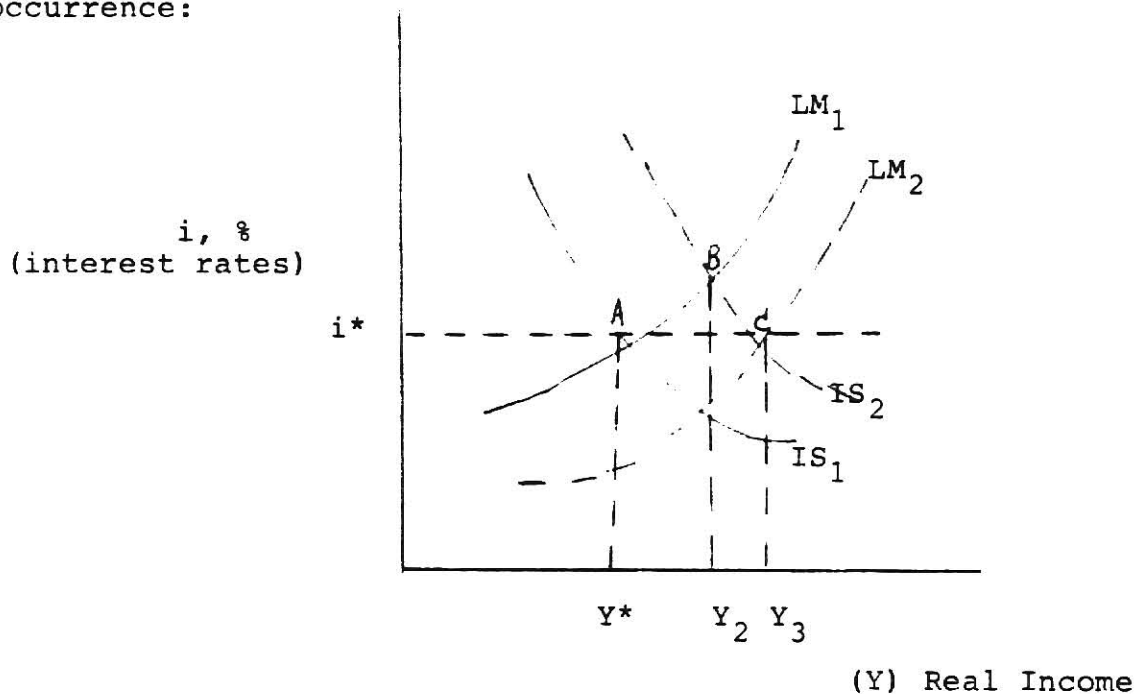
Now assume that due to financial innovations the public demands less money, i.e., we get a rightward shift in the LM curve from LM_1 to LM_2 .

If the policymakers are targeting money, we move to Y_2 . Since the Fed's objective was to hit real income of Y^* , we have an error equal to $Y_2 - Y^*$. If instead, the Fed had been focusing upon the interest rate target they would have had to lower the supply of money, pushing LM_2 back up to LM_1 in order to hit the interest rate target, i^* . By doing so they would end up at Y^* , which was their objective.

On the other side however, proponents of maintaining the monetary aggregates as guides say that the velocity of M_1 is behaving more normally, and that it would be risky to ignore the monetary aggregates when setting monetary policy in the future.

They hold that the LM curve has not shifted at all and that, although the slopes or positions of the LM curve are uncertain, the position of the LM curve is at least as stable, or more stable than, the IS curve.

If, as in the above example, the policymaker's objective is to hit Y^* , proponents of using monetary aggregates as guides would say the following is a more likely occurrence:



Again, suppose initially that the LM curve is at LM_1 , the IS curve is at IS_1 , and $Y = Y^*$. If the demand for money is "stable", and we have a shift in the IS curve (due to an increase in government spending, investment, etc.) to IS_2 , the following would occur:

If the Fed is focusing on an interest rate target, they would have to increase the money supply, shifting LM_1 to LM_2 . The interest rate holds constant, but we get output of Y_3 , an "error" of $y_3 - Y^*$.

If, however, the Fed were targeting the monetary aggregate, we end up at B, with an error of $Y_2 - Y^*$, much smaller than $Y_3 - Y^*$.

From the foregoing analysis, we can see that the "debate" still continues, and probably will for some time. If financial innovations have affected the demand for money, and will continue to make money demand highly unstable, the argument can be made that interest rates would be a better target. If on the other hand money demand is stable, and the real sector is more affected by instability, the money aggregates would be a better target.

Credit aggregates as policy targets

In some analysts' view, the recent unstable velocity behavior of the monetary aggregates (in particular M1 and

M2), coupled with their opinion that regulatory changes and continuing financial innovations will make it increasingly difficult to control broader monetary aggregates, calls for a move toward placing greater emphasis on credit aggregates in monetary policy implementation.

They contend that, just as the emergence of rapid and volatile price inflation reduced the usefulness of the interest rate framework, changes in financial innovations and regulatory guidelines have eroded the advantages of the monetary targets framework currently in use.

To these analysts, the belief that the supply side of the U.S. economy is essentially stable, and that economic fluctuations are due mostly to instability in aggregate demand (which a more stable money growth rate could help avoid) is questionable. They contend that financial innovations have called into question some key presumptions underlying the adoption of the monetary targets framework (mainly the money demand function), that change is endemic to financial markets, and the recent innovations are unlikely to be the end of the process.

To proponents of the use of a credit aggregate as a policy target instead of (or in conjunction with) a monetary aggregate, credit aggregates offer the following:

1) As close and as stable a relationship to U.S. nonfinancial economic activity as do the more familiar asset aggregates like the money stock (however defined).

2) That a credit aggregate (such as total net credit, bank credit, or the debt proxy) contains information about future movements of real income and prices which is both statistically significant and economically substantial.

3) That credit aggregates are at least as closely related to operating instruments the Fed can directly control as monetary aggregates or interest rates; and

4) The data on credit aggregates are available on a timely basis, and are very reliable. Advocates contend that monthly availability of data is quite adequate, and that relying on weekly data (such as M1) which is dominated by statistical "noise" is questionable for purposes of monetary policy decision-making.

To others, the idea that the use of credit aggregates would greatly improve monetary policymaking is not so clear-cut.

They question the proposition that a credit aggregate contains information about future movements of real income and prices. The use of vector autoregressions and other

techniques that show credit "causes" GNP are technically questionable.³³

Also, there is some question as to whether or not reliable data can be gathered as quickly on some credit aggregates as proponents of those measures suggest.³⁴

Finally, some analysts have expressed reservations about the ability of the Fed to control a target such as credit aggregates. Credit aggregates are not subject to reserve requirements and cannot be expected to exhibit a stable or predictable reserve multiplier.

The Federal Reserve could not control the growth of broad credit measures using the reserve aggregate approach because reserve requirements are imposed on the liabilities rather than the assets of depository institutions and many financial institutions that extend credit are not subject to reserve requirements at all. Also, in the absence of evidence of a stable "demand function" for credit in terms of short term interest rates, the rationale for using a funds rate target to hit a credit measure seems doubtful.

³³James Fackler and Andrew Silver, "Credit Aggregates as Policy Targets", Economic Review, Federal Reserve Bank of New York, Winter, 1982-83, pp. 2-9.

³⁴Richard G. Davis, "Monetary Policy Issues in the 1980's", Symposium Sponsored by the Federal Reserve Bank of Kansas City, Aug. 9-10, 1982, p. 259.

The Monetary Base

The monetary base is the sum of member bank reserves and currency held by nonmember banks and the nonbank public. The basic argument for its use as an intermediate target is three-fold.

(1) Financial innovations have not changed the appropriate definition of the monetary base as it has the monetary aggregates; (2) the monetary base is closely related to the economy and; (3) the Federal Reserve has better control over the base than over the money supply. (The argument here is that information is available on the base on a more timely basis than on money and that the Federal Reserve, through their open market operations, directly affect the monetary base and only indirectly affects money.)

Opponents of the use of the monetary base as a policy target cite several problems with its use.

1) There are problems in defining the monetary base, just as there is in defining money. This involves adjusting the base for reserve requirement changes.

2) Since the base is tied to money through reserve requirements, changes in the demand for money are automatically translated into changes in the demand for the monetary base.

3) Although the monetary base is related to the economy, it does not appear to be as closely related to GNP as is M1.

4) The major drawback cited is that the largest portion of the monetary base is in the form of currency. Opponents of using the base as an intermediate target say currency demand is poorly understood, and changes in currency appear to be largely unrelated to changes in economic activity.

Divisia Measure of Money

Some have suggested that perhaps some divisia measure of money may be more relevant in today's environment.

The theory is that the use of a weighted average (weighted by liquidity) of the assets included in the various measures of money may be more stable and predictable than using any single measure of money.

Opposition to this proposal is generally in the form of a lack of empirical evidence to show that this "divisia measure" will perceptively improve the performance of trying to reach the policy goal. Questions have been raised about the timeliness in gathering the data necessary to compute this divisia measure of money, and there are still some problems encountered in defining "money".

Summary and Conclusion

Some crucial economic issues have been raised with the recent increase in the use of financial innovations. Some have called into question the stability of the money demand function, and hence velocity, which is the crucial link between money and GNP.

Also, related to the question of an increase in money velocity volatility has been that of whether or not the Central Bank should continue to focus upon the monetary aggregates (in particular M1) as their policy targets.

A review of the literature shows that recently it has become more difficult to define a monetary aggregate for use as an intermediate target. In the environment of inflation and high interest rates encountered in the early 1980's, new types of financial instruments (most of which I discussed) were developed which some contend led to a shift in the demand for money. Others contend that no such shifts have taken place, and nothing has occurred which should have any lasting implications for policymaking.

Some observers feel that the Federal Reserve should return to an interest rate target in order to offset the impact of financial innovations. Others argue that what is needed is closer control of money and advocate focusing upon

the monetary base. Yet others contend that credit aggregates would give the Central Bank a better target in their struggle to create an environment conducive to economic growth and low inflation.

As recently as February 13th, 1984, Federal Reserve officials have said they will begin to pay more attention to M1 trends than they have recently, indicating that they still must believe the transactions balances of money to be the most reliable indicator.³⁵

Although no concrete conclusions may be drawn from a review of the literature, it appears that the case for "financial innovationists" is fundamentally weak.

There is a definite lack of empirical evidence to support the theory that financial innovations have had a major impact upon the demand for money, thereby inducing the erratic behavior velocity has demonstrated recently.

On the other hand, it would be hard to refute that financial innovations have had some effect on firms and households decisions regarding where to hold their "money". There is something inherently appealing about the concept that the demand for money shifts as interest rates go up and down coupled with the availability of new financial

³⁵"Reports on Economy Likely to Show Gains Last Month", Wall Street Journal, February 13, 1984, p. 26.

instruments, but once again, the empirical evidence just does not convincingly support this proposition.

One solid conclusion may be drawn from this study and that is that financial innovation has increased the uncertainty of the environment in which our policymakers must make crucial economic decisions. To this extent, "financial innovations" have been worthy of the time and effort spent by many analysts in the last several years reviewing their role in monetary policy.

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FINANCIAL INNOVATIONS AND THEIR
EFFECT ON MONETARY POLICY

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In the past few years there has been a tremendous growth in the use of new financial instruments.

This growth in "financial innovation" is largely attributed to:

- 1) relatively high interest rates due to an upward trend in the U.S. inflation rate during the 1965-1982 period;

- 2) an increase in awareness on the part of households and firms of how inflation penalizes them for holding cash or low-earning assets; and

- 3) an increase in computer technology making possible sophisticated accounting capabilities and lower effective costs of transferring funds between various assets. This, along with regulatory changes, has enabled financial institutions to meet the demand by firms and households to economize on the amount of funds held in low-yielding assets.

Accompanying this growth in financial innovation has been a growing concern over our continued reliance on the monetary aggregates as policy guides. Some analysts contend that financial innovations have called into question our ability to measure and define "money", the stability of the money demand function, and the mechanism by which monetary policy affects economic activity.

In order to assess the validity of such concerns, a review of the literature was undertaken focusing upon three categories.

- 1) What are the major recent (1981-83) financial innovations and how have they affected the monetary aggregates?;

- 2) Is there proof that the demand for money, hence velocity,

has been destabilized by new financial innovations?; and

3) Is the transactions balances measure of money (M1) still the most relevant policy target, or have financial innovations rendered M1 less useful, creating the need to focus on some other target?

The conclusion reached by a review of recent literature was anything but clear-cut. Although I could define the major recent financial innovations, there does not seem to be conclusive empirical evidence supporting the theory that financial innovations have destabilized money demand. The review also revealed that the view taken by the various analysts as to whether or not the money aggregates were still the most relevant policy targets depended upon their view of the causes behind recent money velocity volatility.

Financial innovation is one of the latest in a long line of variables being reviewed as a "cause" in changes in the money demand function. There is something inherently comforting to look at a transactions model of money demand, say that the velocity of money is positively related to market interest rates, and that therefore the availability of financial vehicles that pay market interest rates are affecting the demand for money.

To some extent this is true, but again, proponents of this view have not provided empirical evidence showing the strength of the ties between financial innovation and the demand for money, hence velocity.

One final conclusion reached through this study is so obvious as to be overlooked, and that is that financial innovation has

definitely increased the uncertainty of the environment that financial analysts and policymakers must operate in. To this extent, financial innovations have definitely impacted monetary policy in recent years.