Federal Reserve Policy Since 1979

By now, it is common knowledge that, in October 1979, the Federal Reserve (Fed) changed its procedures for controlling the monetary aggregates. Before that date, the Fed used bank reserves to establish an interest rate on federal funds which, given the estimated demand for money, would yield the desired level (or growth) of the money stock. Then, allegedly because money demand had become too difficult to predict, the Fed replaced the federal funds rate as the operating target (or control variable) with the volume of (total and nonborrowed) bank reserves. [1]

Now, before anything else is said, it should be noted that, *in principle*, there is little to choose between these two operating targets with respect to control over the monetary aggregates, provided the will exists to adjust interest rates when the money stock is off target. [2] Here

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[1] For a good discussion of the mechanics of the new procedures, see PETER D. STERNLIGHT (1981). Briefly, under the new procedures, a path for total reserves is calculated based on short-run (usually quarterly) targets for M1 and M2, together with estimates of the corresponding money multipliers. Then a path for nonborrowed reserves is calculated on the basis of forecasts of bank borrowings from the Fed. Adjustments of the nonborrowed reserve path may be made when the aggregates deviate from the short-term targets, but to date these have been infrequent.

[2] This statement (and others below) can be illustrated by means of a simple model of money demand and supply:

$$(1)\ M^d = kY + ai + e \qquad (a < 0)$$
$$(2)\ M^s = mR + bi + u \qquad (b > 0)$$

where Y denotes the gross national product, i the federal funds interest rate, R the reserve variable, defined as bank reserves plus currency held by the public, and e and u are random error terms. If R^T is the control (exogenous), or target, variable, set (1) = (2), solve for i, and substitute the result into (1) [or (2)] to get the reduced form:

$$(3)\ M = bkY/(b-a) - amR^T/(b-a) + be/(b-a) - au/(b-a)$$

In turn, given the monetary target, M^T, this equation can be solved for the value of R^T that will yield the targeted M.

If on the other hand, i^T is the control (exogenous), or target, variable, set (1) = (2), solve for R and substitute the result into (2) to get the reduced form:

$$(4)\ M = kY + ai^T + e$$

which is simply the money-demand equation (1). Again, with the monetary target given, (4) can be solved for the value of i^T that will yield the targeted M.

and there, confusion reigns on this score. Critics of the Fed's policy prior to October 1979 often confuse principle with practice. Especially in the two-to-three years before this date, Fed policy was closer to *pegging* the federal funds rate than to using it as a control over the quantity of money. And, as we have long known, any policy resembling a pegging of interest rates implies a loss of control over the money stock. In particular, unforeseen shifts in money demand tend to be accommodated, more or less, by open-market operations that adjust the money-supply function in the same direction as money demand. [3]

Why the Fed was so reluctant to alter its interest-rate target is a matter for conjecture. Some have attributed this reluctance to political timidity — to fear of criticism for allowing wide fluctuations in interest rates. In view of the unprecedentedly wide fluctuations that marked the three years following October 1979, however, this reason lacks credibility. For then we must believe that a mere change in operating procedures was enough to induce the Fed to shed its timidity.

I. The Record

Instead of engaging in mind-reading, let us examine the Fed's success in controlling the quantity of money since October 1979. Has it improved? A comparison of the records before and after this date shows not only no improvement, but if anything a deterioration of control. For

Equations (3) and (4) show that the reliability of both R and i as control variables hinges, in part, on the accuracy of the predictions of Y made at the time the monetary targets are chosen. Similarly, as control variables both R and i are subject to the vagaries of errors — unexpected shifts — e in the money-demand function, shifts that have been giving the Fed fits off and on since 1974.

But, in addition, equation (3) shows the use of R to be subject to the vagaries of supply-side errors u. Although these errors originate partly in influences on unborrowed (and total) reserves such as fluctuations in float and currency, they consist largely of errors in estimating the various factors that determine the money multiplier [the coefficient m in equation (2)]. These include unforeseen shifts among the categories of deposits with different legal reserve ratios as well as shifts between (reservable) deposits included in M1 and M2 and those that are not, such as interbank and Treasury accounts and negotiable certificates of deposit. Errors from unexpected changes in bank demand for excess reserves, once a chronic source of headache, have been supplanted in importance by unanticipated behavior in the demand for borrowed reserves. Finally, the M2 multiplier, particularly, is prone to unforeseen shifts in investor preferences for all the many assets now included in it. Of the latter, more anon. On these and related matters, see the oft-cited paper by RICHARD DAVIS (1974) and the recent paper by STEPHEN AXILROD and DAVID LINDSEY (1981).

[3] By the same token, adherence to a nonborrowed-reserve target means that all unforeseen shifts in the money-supply function [u in equation (2), footnote 2] are also "accommodated".

example, if one compares the raw quarterly data on M1 growth rates during the Seventies with those for 1980 and 1981, the range of fluctuations is so much larger during the latter two years as to be shocking (see John Wenninger, *et. al.*, 1981, Table 1). Better, we may compare the means (μ) and standard deviations (σ) of these growth rates for the same two periods: [4] For 1970-79, $\mu = 6.6$, $\sigma = 2.2$; for 1980-81, $\mu = 6.2$, $\sigma = 5.3$. With (surprisingly) little difference in the means, the dispersion around the mean was almost two and a half times greater in the latter period.

Some may argue that the volatility of M1 growth rates is less important than how well the Fed met its annual growth targets for M1. For the period 1976 (the first full year of announced targeting) to 1981, the data in Table 1 enable us to assess this measure of Fed performance.

The figures in Table 1 show that for the period 1976-79, the Fed missed its targets in two out of the four years; for the period 1980-81, the target was missed in both years. Thus, on the evidence, the new control procedures have yielded no greater control over the money stock than before. What they did yield was a mind-boggling, unprecedented volatility of interest rates, [5] with undesirable consequences worth noting.

II. Consequences of Interest Volatility

In ascending order of importance, the first of these consequences was a sharp increase in securities-dealer spreads between their bid and ask quotations. This was a natural response to the increased risk (i.e.,

[4] Note the absence of 1982 data from these calculations as well as from those of Table 1 below. The reason is that the Fed has been allowing M1 to deviate from target, without serious effort at correction, since the beginning of 1982, not, as commonly supposed, since October of that year. From the time of the Federal Open Market Committee's meeting in December 1981, the Fed expressed concern that repeated spurts in the interest-bearing, checkable deposits of M1 resulted from an expansion of highly liquid precautionary balances at a (recessionary) time of considerable public uncertainty about economic and financial conditions. It found support for this concern in the spurts of growth in savings deposits that accompanied those of M1 and in some of the sharpest declines in the velocity of money seen since 1959, at least. Thus, far from reading the election returns of 1982, as cynics have suggested, the Fed could be said to have anticipated them. Thus, also, the retreat from M1 targeting announced in October because of the maturing of one-year "All-Savers" accounts, and continued since then, was actually the culmination of Fed behavior that began almost a year earlier. See, e.g., the "Record(s) of Policy Actions of the Federal Open Market Committee (1982) and "Monetary Policy Report to Congress" (1982).

[5] For a detailed description of the enormous increase in interest volatility, see JAMES HOEHN (1982).

TABLE 1

ANNUAL TARGET RANGES AND GROWTH RATES FOR M1, 1976-81
(in percentages)

	Target Ranges	Actual Growth Rates
1976	4.5–7.5	5.8
1977	4.5–6.5	7.4
1978	4.0–6.5	7.2
1979	3.0–6.0	5.5
1980	4.0–6.5	7.3
1981 (adjusted)*	3.5–6.0	2.3
1981 (non-adjusted)	6.0–8.5	5.0

* Adjustment made for shifts to "other checkable deposits" from other assets, primarily savings deposits, to obtain a better measure of the underlying trend in M1.

price variance) of holding inventories of securities. For example, dealer spreads on Treasury bills that used to be four to six basis points are now 8 points or more. Before the decline in interest rates in the latter part of 1982, these spreads had reached levels of 14 basis points or more. Dealer spreads represent a major component — and for short-term, money-market instruments, most of — investor transactions costs. Increases in these costs of such magnitudes, therefore, tend to raise the level of interest rates above what they would otherwise be, as investors seek to maintain the net interest returns at which they lend. [6]

Second, business investment planning, both in inventories and fixed capital, was put in a dither. Volatile short- and long-term interest rates rendered virtually impossible the calculation of the costs of investment. Like high interest rates, this kind of uncertainty acts as a damper on investment outlays.

Third, the Fed policy of allowing yo-yo-like behavior of interest rates increased the vulnerability of the economy to liquidity crises. Traditionally, financial institutions have borrowed short and loaned long. Now, this has changed. The volatility of interest rates has greatly increased the risk of getting caught with interest costs higher than returns on fixed-rate assets. The financial institutions have responded

[6] BENJAMIN FRIEDMAN (1982) has also noted an increase in the spread between yields on new corporate-bond issues and the yields on "seasoned" bonds in the secondary markets.

by seeking to equalize the maturity of assets and liabilities, mostly by shortening the maturity of assets (loans). Variable rate mortgages and floating-rate bank loans are further institutional responses to this increased risk. Thus, volatile interest rates have not only made lending a much riskier business than previously, but they have led to a set of developments that force borrowers to share much of the risk that was formerly borne almost entirely by the financial institutions. As a result, borrowers and lenders alike are now more exposed to the danger of bankruptcy.

Having noted some of the untoward consequences of interest volatility, we hasten to warn against inference of a proposal to return to a regime of (virtual) interest pegging. [Incidentally, the period 1973-75 was one in which the Fed used a flexible (but not volatile) interest target. It was not until later that it came close to a pegging policy.] Those who would have us choose between such a regime, with its associated abandonment of control over the money stock, and its opposite pose a false dichotomy. Elsewhere (Hamberg, 1981, pp. 387-90), I have argued that there is a middle ground between these two "control" regimes.

III. M1 and GNP

Thus far, we have been focusing on problems that have arisen from the use of reserves as an operating target to control the intermediate or policy targets, the monetary aggregates. Implicitly, we have been assuming the desirability of the use of these aggregates as variables for controlling the *ultimate* targets of monetary policy: GNP and the rate of inflation. But developments in the financial world have occurred recently that make it timely to question the wisdom of this approach, too.

First and foremost, it must be said that the use of a monetary aggregate to control GNP and prices assumes a more or less stable demand function for money. In other words, successful use of a monetary aggregate as an intermediate target of Federal Reserve policy requires relative stability in the relationship between money and GNP — that is, the velocity of money.

It may be one of the supreme ironies of the last decade that the Fed has adopted an increasingly monetarist stance at a time when the

demand for (velocity of) money has displayed extraordinary instability and unpredictability. As Milton Friedman has said (1956, p. 4) "the quantity theory of money (i.e., monetarism) is in the first instance a theory of the *demand* for money." It assumes the money-demand function to be much more stable than expenditures functions in determining GNP and prices. A corollary of this assumption is that changes in total spending are primarily a reflection of adjustments in asset portfolios resulting from changes in the supply of money rather than changes in money demand.

This theory has always left open the question of how best to define money. Now, more than ever, this question is up in the air. Traditionally, most economists have stressed the payments (medium-of-exchange) function of money as its defining property. Accordingly, they have favored a transactions-oriented definition of money and thus a measure that includes those funds commonly used for transactions (or payments) purposes. In the past, that criterion led to a well defined monetary aggregate called M1, and it is still the basis for the components of the new M1: currency and checking deposits held by the public and traveler's checks. Unfortunately, however, a myriad of deposit substitutes has appeared whose differences from money require an electronic microscope to detect. These include overnight repurchase agreements, overnight Eurodollars, and at least some fraction of money-market funds. The Fed has chosen to place them in M2 (and M3), instead of M1, but is beset with doubts (see Paul Volcker, 1981). Accompanying these developments has been the increasing computerization of financial technologies that, with the aid of electronic communications networks, enable payments to be made by quick transfers of funds out of all kinds of financial assets.

These innovations have been progressively reducing the demand for the deposit components of M1. More important, the innovation process operates unevenly over time and has been hard to predict. Correspondingly, it has been responsible for introducing a large element of unpredictability between M1, in particular (but other aggregates as well) and GNP — in defiance of the predictable relation upon which the emphasis on control over the monetary aggregates is predicated. This problem is calculated to get worse as interest ceilings are phased out. For example, as interest rates on NOW and similar deposits become market-related, the demand for M1 may *increase* in reflection of an investment, as well as a transactions, component. Alternatively, the opposite may occur: the recently introduced retail (consumer) repurchase agreements with automatic investment arrangements (so-called "sweep" accounts) as well as the newly authorized "money-market deposit account," especially the latter, appear to be skyrocketing in importance because the absence of reserve requirements enables depository institutions to pay interest rates above those on reservable checking deposits: [7]

IV. M2 and Broader Aggregates

In light of the difficulties of defining a transactions-oriented monetary aggregate, some have proposed reliance on the broader aggregate M2. [8] Whether or not the relation between this aggregate and GNP is any more stable than that between M1 and GNP is very much a moot question. In February, 1983, the Fed adopted total credit (i.e., total outstanding debt of domestic nonfinancial businesses, households, and federal, state, and local governments) as a yardstick with which to gauge the behaviour of the money aggregates. In making this decision, the Fed apparently relied upon staff evidence of stability in the relation between total credit and GNP. But the evidence on this relation is also decidedly mixed. On the subject of these various money and credit velocities, see Richard Davis (1979), R.W. Hafer (1981), Shafiqul Islam (1982), and Benjamin Friedman (1982). Recently, so-called vector autoregression studies have called into question the results of velocity (and related) studies. They have raised serious doubts concerning the very existence of a reliable relation between *any* of the money and credit aggregates and GNP. See James Fackler and Andrew Silver (1983) and Fackler (1982).

Quite apart from these questions, however, is one concerning the Fed's ability to control M2, let alone a credit aggregate. Because a substantial proportion of the instruments now included in M2 pay market-related interest rates, much of its earlier sensitivity to changing

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[7] Other things equal, a reservable monetary asset, like checking deposits, can pay an interest rate equal to $i(1-r)$, where i is an open-market rate and r is the relevant reserve ratio. A nonreservable asset (for which $r = 0$), like many included in M2, can pay i. The role of financial innovations, and their implications for financial instability, has been stressed by Minsky (cf. e.g. MINSKY 1980a, 1980b).

[8] Milton Friedman has been a long-standing proponent of M2 as the most appropriate measure of money. Contrary to a not uncommon misperception, however, even among monetarists his has been a minority view.

market rates has disappeared. This has potentially direful consequences for Federal Reserve control of M2. For example, suppose the demand function for M2 is displaced from the position expected at the time the Federal Open Market Committee establishes a target for it. Specifically, assume that for any given interest rate, there is an increase in demand for M2, such that M2 exceeds its target. The result is an excess demand for M2 and depository reserves that, with the Fed adhering to its reserve target, exerts upward pressure on the interest rate for federal funds and thus other market interest rates. Automatically, because of the inverse relation between interest rates and money demand, the quantity of M2 adjusts downward toward the target, the more so the more elastic is the demand for money. If this adjustment is deemed inadequate, the Fed can shift the supply schedule of money by reducing the amount of nonborrowed reserves (base), so that further upward pressure on interest rates effects a still greater reduction in the quantity of money demand and forces M2 still further back to target. Substitute M1 for M2 and nothing just said would change. This is how the process of adjusting the monetary aggregates to their targets works, or is supposed to work, under present operating procedures.

But notice that this adjustment process rests on an interest-elasticity of money demand that is at least positive in absolute value. In turn, this elasticity is predicated upon a failure of interest rates paid on monetary assets to rise along with open-market rates, because of interest ceilings, so that loss of interest induces the public to economize on funds held in these assets and shift them into open-market instruments. However, when the rates paid on many instruments included in M2 — from six-month money-market certificates to money-market accounts at mutual funds and depository institutions — move upwards along with open-market rates, the incentive to shift funds from these instruments into open-market ones is removed. [In the future, this development will intensify with the elimination of interest ceilings. It has already done so with the elimination of reserve requirements on personal time and savings deposits, repurchase agreements, Eurodollar deposits, and money-market accounts (see footnote 7).] In short, the interest elasticity of demand for M2 may approximate zero, if not now then in the near future. In this circumstance, the mechanism for adjusting M2 back to

target levels, just described, ceases to function,[9] or leads to intolerably wide fluctuations in interest rates.

In time, with the removal of interest ceilings on "other checkable deposits," the demand for M1, or what is left of it, may similarly decline in elasticity. The recent introduction of "SUPER-NOW" accounts — free of interest ceilings but still reservable — is a move in that direction.

But the story does not end there. For in the same circumstances — M1 and M2 above target because of an increase in money demand above its expected position — the increase in interest rates that occurs will reduce total spending on GNP. As a result, the quantity of money demanded declines and the quantity of money adjusts downward toward target. This process of adjustment, however, is tantamount to standing current monetary policy on its head. Based on monetarism, this policy aims to control GNP by manipulating the monetary aggregates. Instead, what has just been depicted is a mechanism for controlling the monetary aggregates by manipulating GNP through the effects of interest rates on spending. GNP replaces the monetary aggregates as the policy instrument, and the aggregates replace GNP as the ultimate policy objective.

As for the Fed's ability to control a broad *credit* aggregate, the problems are, if anything, more difficult. For one thing, absent legal reserve requirements for a credit aggregate, it is highly probable that the (multiplier) relation between credit and depository reserves would be both unstable and unpredictable. Yet any effort to regulate the volume of credit by regulating the volume of reserves presumes a fairly stable and reasonably predictable reserve multiplier. Substitution of capital ratios on bank assets for reserve ratios, as has been recently suggested, is no solution to this problem, either. Moreover, by raising the cost of bank loans, capital ratios on bank assets would induce borrowers to seek alternative sources of credit, such as commercial paper, bonds, trade credit, letters of credit, private (as opposed to public) borrowings, and foreign loans. Legal reserve requirements, especially if extended to nonbank credit, would close many, although not all, of these "loopholes."

If the Fed sought to control a credit aggregate by means of the federal funds rate, the variable it used to control M1 before October

[9] Note that this statement holds only for deviations from target that originate in money-demand disturbances. Deviations resulting from disturbances in money *supply* would (with zero interest elasticity of demand) be fully adjusted back to target automatically, albeit with wide fluctuations in interest rates.

1979, it would have to rely on a demand function for the credit aggregate analogous to the money-demand function of equations (1) and (4) in footnote 2. If such a (credit) demand function exists, especially with respect to a short-term interest rate like the federal funds rate, it has yet to be discovered.

Not least in importance, the mechanism for controlling a credit aggregate would suffer from the same perversity as that just discussed in connection with an inelastic demand for M2 (and M1). Thus, for example, should the growth of credit exceed target, any effort by the Fed to restrain it — by whatever means — would lead to a rise in interest rates and, consequently, to a reduction in total spending on GNP. Hence, the amount of credit demanded would fall, and the credit aggregate would adjust downward toward target. But as earlier, this adjustment process would turn monetary (or credit) policy upside down. Instead of the credit aggregate's being used to control GNP, the latter would be employed to control the credit aggregate.

Given all these difficulties, the future of monetary policy based on monetary and/or credit aggregates as the instruments for controlling GNP is not promising. What then? In prospect is a reappearance of interest rates, not so much — if at all — as an operating target for controlling the aggregates, but as the intermediate (policy) target for controlling GNP. In the face of substantial agreement between monetarists and non-monetarists on the crucial role of interest rates and other yields in the mechanism that transmits changes in the quantity of money to changes in GNP, this use of interest rates may evoke less of an outcry than would be the case otherwise. [10] Moreover, the vector autoregression studies alluded to earlier have found that interest rates displace both money and credit aggregates in "explaining" the behavior of real GNP and prices (see Fackler, 1982).

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[10] On January 2, 1983, a newspaper wire service reported that the Fed said that its Open Market Committee had shifted its focus, at least temporarily, to control interest rates instead of money supply. At this writing, there is nothing to confirm this in the records of FOMC policy actions that appear in the Federal Reserve *Bulletin*. It is a fact, however, that since October 1982, when the Fed announced that it was temporarily refraining from targeting M1 (see footnote 4), interest rates have been much less volatile on a daily and weekly basis. This is readily apparent from the behavior of the federal funds rate and long-term bond prices.

REFERENCES

AXILROD, STEPHEN H. and LINDSEY, DAVID E., "Federal Reserve System Implementation of Monetary Policy: Analytical Foundations of the New Approach," *American Economic Review*, May 1981, 71, 246-52.

DAVIS, RICHARD G., "Implementing Open Market Policy with Monetary Aggregates Objectives," *Monetary Aggregates and Monetary Policy*, New York: Federal Reserve Bank of New York, 1974, 1-19.

DAVIS, RICHARD G., "Broad Credit Measures as Targets for Monetary Policy," Federal Reserve Bank of New York *Quarterly Review*, Summer 1979, 4, 13-22.

FACKLER, JAMES, "An Empirical Model of the Markets for Money, Credit and Output," Federal Reserve Bank of New York, December 1982 (mimeo).

FACKLER, JAMES, and SILVER, ANDREW, "Credit Aggregates as Policy Targets," Federal Reserve Bank of New York *Quarterly Review*, Winter 1982-83, 7, 2-9.

FRIEDMAN, BENJAMIN M., "Federal Reserve Policy, Interest Volatility, and the U.S. Capital-Raising Mechanism," NBER Working Paper No. 917, June 1982 (mimeo).

FRIEDMAN, BENJAMIN M., "Monetary Policy with a Credit Aggregate Target," NBER Working Paper No. 980, September 1982 (mimeo).

FRIEDMAN, MILTON, "The Quantity Theory of Money — A Restatement," in M. Friedman, ed., *Studies in the Quantity Theory of Money*, Chicago: University of Chicago Press, 1956, 3-21.

HAFER, R.W., "Much Ado About M2," Federal Reserve Bank of St. Louis *Review*, October 1982, 63, 13-18.

HAMBERG, DANIEL, *The U.S. Monetary System*, Boston: Little, Brown, 1981.

HOEHN, JAMES G., "Recent Interest Rate Behavior in Perspective: Some Descriptive Statistics," Federal Reserve Bank of Dallas Research Paper No. 8301, December 1982 (mimeo).

ISLAM, SHAFIQUL, "Monetary and Credit Aggregates and Economic Activity: Evidence from Germany, Japan, and the United States," Federal Reserve Bank of New York Research Paper No. 8203, January 1982 (mimeo).

MINSKY, HYMAN P., "Capitalist Financial Processes and the Instability of Capitalism", *Journal of Economic Issues*, June 1980, Vol. XIV, No. 2, pp. 505-23.

MINSKY, HYMAN P., "Finance and Profits: The Changing Nature of American Business Cycles", *The Business Cycle and Public Policy, 1929-80*, Joint Economic Committee, U.S. Government Printing Office, Washington 1980.

STERNLIGHT, PETER D., "Monetary Policy and Open Market Operations in 1980," Federal Reserve Bank of New York *Quarterly Review*, Summer 1981, 6, 56-75.

VOLCKER, PAUL A., "Statement" to the Subcommittee on Banking, Finance and Urban Affairs, U.S. House of Representatives, Federal Reserve *Bulletin*, July 1981, 68, 548-55.

WENNINGER, JOHN, RADECKI, LAWRENCE and HAMMOND, ELIZABETH, "Recent Instability in the Demand for Money," Federal Reserve Bank of New York *Quarterly Review*, Summer 1981, 6, 1-9.

"Monetary Policy Report to Congress," Federal Reserve *Bulletin*, August 1982, 68, 443-52.

"Record of Policy Actions of the Federal Open Market Committee," Federal Reserve *Bulletin*, February 1982, 68, 105-10; and *ibid.*, September 1982, 68, 541-49.