demand was more predictable, a monetary targeting procedure based on theoretical relationships was not expected to lead to the smoothest interest rates or to the least variable outcome for short-run changes in real economic activity.

In the absence of monetary targeting, it is unclear how one would choose some other benchmark for short-run policy decisions. A benchmark often discussed is a trend in potential real GNP. If real activity falls below this trend, the FOMC eases; if real activity rises above trend, the FOMC tightens. The technical problems here are fundamentally different than in the case of money. In theory, the links between policy tools, *real activity*, and inflation are not as well understood as the links between policy tools, *money*, and inflation. In practice, the observed relationships among policy tools, real activity, and inflation are also expected to change when policy changes.

Furthermore, the FOMC cannot choose a *desired* trend for real economic growth because the long-run trend in real economic growth does not necessarily depend much on what the FOMC does. While there is substantial agreement that the FOMC can temporarily improve real activity in a few quarters, it probably does so at the expense of real activity in future quarters.[8] Therefore, the FOMC could only attempt to smooth out economic cycles and would need to rely on uncertain estimates of the trend for real economic growth to know whether to ease or tighten.

Whatever information is used to guide policy, errors will be made and will need to be corrected. If M1 is used as a benchmark, the FOMC risks that policy would be inappropriate when velocity shifts. If velocity declines (rises) unexpectedly, a corrective increase (decrease) in the M1 target would be needed to achieve long-run price stability. The results in chart 2 suggest that judgment can be used effectively to make these corrections.

If real economic activity is used as a benchmark, the FOMC risks that policy would be inappropriate whenever the estimates of the trend in potential output are in error. If the trend in potential real GNP is lower (higher) than estimated, a decrease (increase) in the target is needed to achieve long-run price stability. This created a problem in the late 1970s, because the actual rate of real GNP growth turned out to be lower than the estimates of potential made at the time.

If the FOMC eases policy because it incorrectly views real output as below trend, then it may cause a temporary increase in real output above the true trend. The risk is that inflation will become evident in reported price indexes about the same time the policy-induced temporary increase in real output above trend begins to reverse itself.

The need for correction would then become evident at an unfortunate time. This timing problem might cause policy to be inadvertantly procyclical—to stimulate the economy when it is inherently stronger and to restrain the economy when it is inherently weaker. M1 targeting was adopted to reduce both the risk of procyclical policy and the tendency for policymakers to avoid corrections that would prevent inflation. Policymakers avoid these corrections because the evidence of a slowdown in economic activity arrives at the same time the FOMC learns that a restrictive correction in policy is needed to maintain price stability.

**Conclusion**

To what can we attribute the success of our disinflationary policy? Certainly, the Federal Reserve's high priority on ending inflation has played an important role. The mechanism of monetary targeting was also important. Money demand has become less predictable during this period of declining inflation, and the Federal Reserve has operated with considerable judgment in setting the money supply targets. One measure of the success of judgment can be seen in the offsetting relation between surprises in velocity and errors in hitting the M1 target.

Currently, the FOMC has apparently chosen to place more emphasis on indicators of real economic activity rather than on deviations of M1 from target. Thus far, the outcome has justified this approach. However, as long as there is uncertainty about velocity, there is a chance that above-target M1 growth will lead to more inflation. While more uncertainty about velocity naturally leads to a less aggressive reaction to a deviation of M1 from target, the long-run goal of price stability requires some reaction to reduce the probability that more difficult corrections will be needed in the future.

8. For a discussion of the quantitative aspects of this tradeoff, see Craig S. Hakkio and Bryon Higgins, "Costs and Benefits of Reducing Inflation," *Economic Review*, Federal Reserve Bank of Kansas City, vol. 70, no. 1 (January 1985), pp. 3-15.

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# ECONOMIC COMMENTARY

## The M1 Target and Disinflation Policy

by William T. Gavin

To regulate the nation's money supply, the Federal Reserve System sets target ranges for three measures of money, which are designated M1, M2, and M3.[1] Although there are three different monetary targets, academic researchers and the public focus primarily on the M1 measure, which is announced on a weekly basis. Researchers find it most useful in academic pursuits. The public considers M1 useful for monitoring the Federal Reserve's monetary policy and for predicting the future effects of monetary policy on inflation and interest rates.

Since the fourth quarter of 1984, M1 has grown rapidly (over 12 percent), and in July, the Federal Open Market Committee (FOMC), the principal monetary policymaking arm of the Federal Reserve, raised and widened the M1 target range. Since the target revision, M1 has grown even more rapidly than before (9.3 percent in July and 20.3 percent in August).

The rapid growth of M1 typically indicates a strong economy. The recent growth of M1, however, has been associated with an unusually weak economy and has been marked by a surprising increase in the demand for money. This unusual condition has resulted in speculation about how or if the FOMC will use M1 as a target in the future.

Many observers want the Federal Reserve to stop using intermediate monetary targets and to focus instead on measures such as real economic growth and inflation.[2] The unexpected discrepancy between rapid M1 growth and slow economic growth in the first half of 1985 appears to support this suggestion.

As we discuss below, however, the risks of error in conducting policy and the costs of correcting these errors are probably greater if the M1 target is ignored. No doubt, it is more difficult to know how much M1 to supply when money demand becomes less predictable, but the growth of M1 still might have important implications for future economic activity and inflation.

The erratic behavior of money demand might reflect the deregulation of the banking industry that, in a series of steps, has relaxed restrictions on direct payment of interest on deposits included in M1. However, the widely publicized change in the Federal Reserve's policy, beginning in October 1979, of placing greater emphasis on eliminating inflation may have played a role. In this discussion, we focus on how a successful disinflation policy will affect the public's demand for M1.

**Money Demand and Gradual Disinflation**

The idea that the Federal Reserve's economic policy should be designed to eliminate inflation gradually is based on the presumption that it would cost more to eliminate inflation if the economy were forced to go through a major change in a short period than if it were forced to go through the same change over an extended period. Whether or not this presumption is true, those who advocate a gradual policy generally want the reduction of inflation to be gradual. However, a gradual slowing in the money supply would not necessarily be associated with an equally gradual slowing in inflation.

A gradual change in money growth, designed to slow and reverse inflation, should cause an increase in the demand for money relative to income. A fundamental change away from a policy of accelerating inflation would break a long-term increase in interest rates that tended to reduce the demand for money relative to income in the past. Just stopping the increase in the interest rate would increase the amount of money that people would be willing to hold for transaction purposes.

Furthermore, the goal of the System's policy is not only to stop the long-term increase of inflation, but also to gradually reduce inflation. A permanently lower expected inflation rate would lead to a one-time decline in the nominal interest rate that would further encourage people to hold larger amounts of money relative to their incomes. This effect on the level of demand for money in our economy is *permanent*. Observed rapid growth in money may be associated with the transition to a lower expected inflation rate, and could be expected to last until price stability is achieved. When the transition to price stability is complete, the ratio of real money balances to real income should be higher, but the growth rate of money should return to a more normal range.

Assuming that the Federal Reserve wants to follow a policy of gradually eliminating inflation (as opposed to gradually slowing M1 growth), then an appropriate policy response to a rise in

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*The views expressed herein are those of the author and not necessarily those of the Federal Reseve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.*

1. The Federal Reserve maintains targets for M1, M2, and M3. See the *Federal Reserve Bulletin*, any recent issue, for definitions of these measures. Generally, M1 includes balances used in making transactions, while M2 includes M1 plus household savings assets. M3 includes M2 plus institutional savings assets.

2. The term *real* denotes constant dollar amounts. Real magnitudes are measured in terms of goods and services, nominal magnitudes are measured in terms of dollars.

the quantity of money demanded (due to the successful application of a disinflation policy) could be to allow a *temporary* increase in the money growth rate.[3] Failure to allow more rapid money growth under these conditions could result in more rapid disinflation than originally planned.

However, the gradual approach to disinflation is not without problems. The short-term volatility in money growth and other variables tends to obscure the gradual changes in the long-run trends for these variables. Previous attempts to eliminate inflation gradually have not been successful because policymakers allowed M1 to reaccelerate for reasons unrelated to the disinflation goal. Consequently, investors are continually watching to see if the Federal Reserve will once again deviate from its disinflation goal. Such a policy decision to accelerate money growth would be accompanied by a *temporary* rise in the demand for money relative to income, but not by a permanently higher level of real money demand. As the public learned about the new policy, inflation and interest rates would rise, leading to a decline in the demand for money relative to income.

To accurately predict future inflation, one must be able to sort out the temporary from the permanent changes in the demand for real money balances. Hence, the uncertainty about Federal Reserve policy poses a challenge for those who monitor incoming information about M1 growth to predict inflation. On the one hand, a successful disinflation policy that is applied gradually should lead to a *permanent* upward shift in the public's demand for money relative to income. The proper response to these shifts is to accommodate the public's demand, and if necessary, let money grow faster for a time.

On the other hand, a policy-induced increase in money growth (say, to attempt to prevent a recession) should cause a *temporary* rise in demand for money until the public learns about and adjusts to the new policy. Therefore, in order to predict the inflationary consequences of any episode of rapid money growth, one must know the FOMC's desired path for future inflation.

In recent years, money has grown faster than the price level because the quantity of real money balances demanded has grown in response to falling interest rates. People may be willing to hold this higher level of money balances forever if inflation continues to stabilize around zero. However, if inflation returns, we can expect people to reduce their real money balances. This would be asssociated with a period in which the price level grew faster than the money stock—a reversal of recent experience.

## Judgment in the Execution of Policy

While there is always a great deal of uncertainty in predicting money demand, this uncertainty increases with the adoption of a disinflation policy. This increased uncertainty is unavoidable. It requires a greater reliance on judgment and increases the number of adjustments that will be made to the monetary targets.

As Chairman Volcker pointed out in recent testimony before Congress,

> "The uncertainties surrounding M1, and to a lesser extent the other aggregates, in themselves imply the need for a considerable degree of judgment rather than precise rules in the current conduct of monetary policy—a need that, in my thinking, is reinforced by the strong cross-currents and imbalances in the economy and financial markets. That may not be an ideal situation for either the central bank or those exercising oversight—certainly the forces that give rise to it are not happy. But it is the world in which, for the time being, we find ourselves."[4]

The FOMC has been aware of uncertainties surrounding the use of M1 since the beginning of monetary targeting. The use of "... judgment rather than precise rules in the conduct of monetary policy ..." has been the norm rather than the exception. This can be seen in chart 1 (taken from the most recent *Economic Report of the President*) which shows the annual target ranges chosen at the beginning of each year and the actual growth of M1 from 1976 through 1984.[5] In these nine years, M1 grew within the *first-announced* annual target range only twice—in 1976 and again in 1984. M1 grew below the bottom of the target range only once—in 1981. In the remaining six years, M1 grew above the top of the target range.

In spite of the fact that M1 grew above the target ranges over this entire period, inflation was much different before October 1979 than afterwards. Inflation (measured by the implicit GNP deflator) rose from 4.7 percent in 1976 to 8.2 percent in 1979. After October 1979, inflation fell from 10.2 percent in 1980 to 3.6 percent in 1984. Judgments to exceed the M1 target led to inflation before 1980, but were associated with disinflation afterwards.

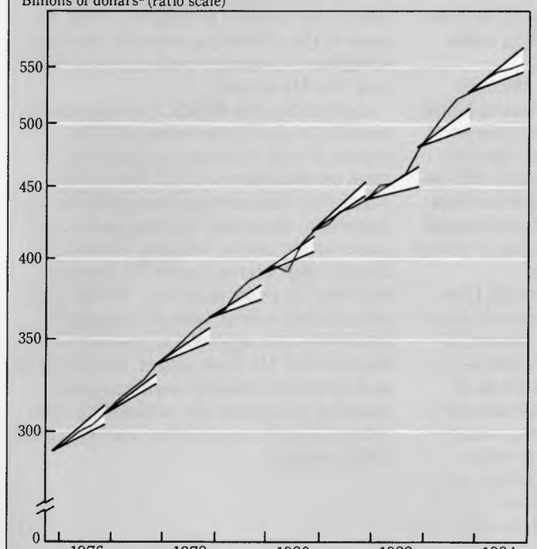
Relative success in the use of judgment in a framework of monetary targeting is illustrated in chart 2. This chart displays the deviation of velocity from the expected trend and the deviation of M1 from the midpoint of the target range for the period 1975 through the first half of 1985. Velocity is the ratio of real income to real money balances. The money demand relationship shows that changes in the relationship between money and income can be expected whenever real interest rates change, whenever inflation changes, and whenever the regulations and technology of the financial services industry change. By definition, a change in the relationship between money and income is a change in velocity. A permanent 1 percent increase in velocity has the same inflationary potential as a 1 percent increase in the money supply.

As chart 2 illustrates, the inflationary effects of surprises in velocity growth above the expected trend before 1979 were *reinforced* with above-target M1 growth. After 1979, velocity was much less predictable. In this period, however, the potentially inflationary impact of surprises in velocity were *offset* by deviations of M1 from the announced target.

What explains the difference? In each period, the FOMC used judgment. Targets were missed, and the base for the next year's target was adjusted to actual levels of M1. Part of the explanation for the difference might be in the priority placed on eliminating inflation. Part of the explanation might also lie in the different operating procedures used to implement policy. Before 1979, the FOMC did not react automatically to short-run deviations of M1 from target. Even at FOMC meetings, the reaction to deviations of M1 from target was relatively weak.[6] The FOMC set short-run targets for the interest rate on federal funds and looked at indicators of financial activity, including the monetary aggregates, and at indicators of economic activity. Before 1979, this procedure was associated with a rapid acceleration of inflation.

**Chart 1 M1 Money Stock and Federal Reserve Target Ranges**

Billions of dollars[a] (ratio scale)




a. Averages of daily figures, seasonally adjusted.
NOTE: Targets are fourth quarter to fourth quarter as described in the text.
SOURCES: Board of Governors of the Federal Reserve System; and Council of Economic Advisors.

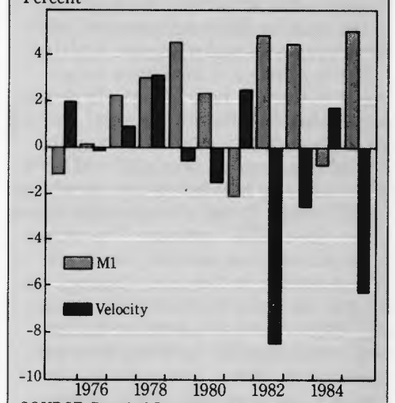
After the change in operating procedures, the FOMC continued to monitor the same set of economic indicators, but its automatic reaction was to resist short-run deviations of M1 from the target. When new information about GNP and M1 suggested that M1 velocity was behaving unusually, the M1 target was adjusted in a way that offset the inflationary or deflationary effect of unusual velocity behavior. This has led to the offsetting pattern seen in chart 2.

The problem today is to decide how much of this year's velocity decline could be permanent—due to deregulation and the successful disinflation policy of the last five years—and how much could be temporary—possibly due to the monetary policy response to the 1984 second-half slowdown in M1 growth. M1 growth rebounded in late 1984 and early 1985. The FOMC made a decision to accommodate rapid M1 growth in February—before the 1985 velocity decline was observed.

The decision not to keep M1 in its target range in February 1985 could be interpreted as the FOMC's judgment that the rapid M1 growth early in the year was not inflationary. This judgment could have been based on observations that the foreign exchange value of the dollar had appreciated rapidly, that inflation-sensitive prices (commodities, real estate, etc.) were not signaling future inflation, and that supply-side cost pressures (wages and energy costs) did not seem to be building. This judgment has been vindicated in subsequent economic reports, which show nominal GNP growing around 5 percent in the first half of 1985, a rate that is 2.5 percent to 3 percent below the original projection made when the M1 target range was chosen.

**Chart 2 Deviations of M1 and Velocity from Expected Values**

Percent




SOURCE: Board of Governors of the Federal Reserve System; and U.S. Department of Commerce.

## Risks in the Use of Judgment

Today many observers want to de-emphasize the M1 target. Many would like the Federal Reserve to react more promptly to information about real economic activity. But the choice to base routine FOMC decisions more heavily on incoming information about real economic activity—as appears to have been the practice over the last year or so—entails a different set of risks than does the choice to base routine FOMC decisions primarily on incoming information about M1.[7]

When using a monetary targeting procedure, the FOMC chooses a target according to its best judgment about the *desired* long-run trend in the rate of inflation and, on a more technical level, about the relationship between inflation and money. When money goes either above or below its target, the FOMC can be relatively confident that either tightening or easing action will, with sufficient time, move money back toward the target.

In theory, there are well-understood links between policy tools, money, and inflation, that can be used to choose targets and to decide when to change them. In practice, the relationships observed during the post-World War II era occurred during a period of slowly accelerating inflation. Forecasting models of money demand built on data observed during this period might not predict accurately, as the economy makes the transition from accelerating inflation to stable or declining inflation. Of course, in the past, when we thought money

3. This permanent shift in the level of real money demand requires a one-time increase in the level of the money supply to prevent disinflation. This point is demonstrated in an article by Thomas Sargent, "The Ends of Four Big Inflations" in Robert E. Hall ed., *Inflation: Causes and Effects*. Chicago: University of Chicago Press, 1982.

4. "Statement by Paul A. Volcker, Chairman, Board of Governors of the Federal Reserve System before the Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs. U.S. House of Representatives, July 17, 1985," *Federal Reserve Bulletin*, vol. 71, no. 9 (September 1985), pp. 690–97.

5. See *Economic Report of the President*. Transmitted to the Congress February 1985, U.S. Government Printing Office, p. 53.

6. See William T. Gavin and Nicholas V. Karamouzis, "Federal Reserve Credibility and the Weekly Announcements of M1," *Working Paper 8502*, Federal Reserve Bank of Cleveland, July 1985.

7. Note that there is a fundamental difference between targeting nominal GNP and real GNP. When the Federal Reserve targets M1 with one eye on velocity, it is practicing a form of nominal GNP targeting. For further discussion of nominal GNP targeting, see John B. Carlson, "Nominal Income Targeting," *Economic Commentary*, Federal Reserve Bank of Cleveland, May 21, 1984.