

FRBSF WEEKLY LETTER

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Would a New Monetary Aggregate Improve Policy?

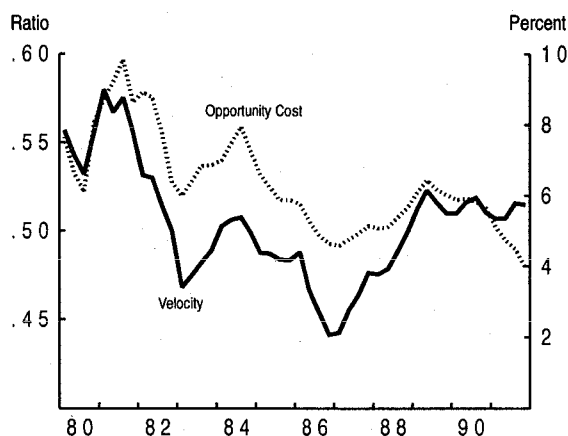
M2 growth has been significantly slower than the Federal Reserve expected when it set the 1992 annual target range of 2½ to 6½ percent. Since the fourth quarter of 1991, the aggregate, which includes currency, checking accounts, various kinds of savings instruments, and small time deposits, has increased at an annual rate of only 1½ percent. This is the third successive year in which M2 has been close to, or below, the lower bound of its annual range.

For many years, M2 was a useful long-run policy indicator because the public's willingness to hold M2 assets had a stable and predictable relationship to the level of nominal GDP. As shown in Chart 1, the *velocity* of M2, measured by the ratio of nominal GDP to M2, fluctuated around an almost constant level from 1959 to 1989. But in recent years the link between M2 growth and nominal GDP appears to have deteriorated. Since 1989, the yields on short-term securities have declined more rapidly than deposit rates paid on M2 assets—thus reducing the opportunity cost of holding M2—but we have not seen the drop in its velocity we would have expected from past experience. V2 was at roughly the same level in the second quarter of this year as in the second quarter of 1989, even though the opportunity cost of holding M2 declined more than 150 basis points.

The slowdown in M2 growth has been concentrated in a decline in the volume of small time deposits. For the other components of M2—currency, checking accounts, and savings instruments—we see either strong or moderate growth. Initially, the decline in small time accounts mostly reflected the closing of weak thrift institutions that had been paying above-market interest rates to attract time deposit funds. More recently, funds also have been shifting out of time accounts at commercial banks.

Before these developments began, I suggested an alternative definition of M2 that would exclude small time deposits (Motley 1988). A variation

Chart 1
Velocity of M2 and
Opportunity Cost



on this theme has been taken up by Poole (1991), who proposes an alternative monetary aggregate that he calls MZM, to stand for Money with Zero Maturity. This aggregate would include all of the current M2 except small time deposits, plus institution-only money market funds, which currently are included in M3 but not in M2.

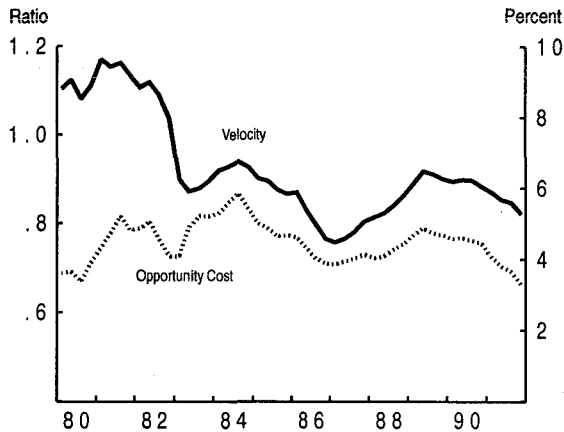
The opportunity cost of MZM also has declined since 1989. In the case of this aggregate, however, this decline in opportunity cost has had the expected effect of causing its velocity to decrease (see Chart 2). In other words, although growth in MZM also has slowed, this slowing is in line with historical experience. Poole argues that this greater stability in the demand to hold MZM assets would make it a better target for policy.

"Money" in theory and practice

In monetary theory, "money" is regarded as a unique and special asset for two reasons. First, money is an asset that gives its holder immediate purchasing power over goods and services. Second, holding money involves little or no interest rate risk, because either it yields no interest, or any interest return that it does yield rarely changes.

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Chart 2
**Velocity of MZM and
Opportunity Cost**



These features mean that money is held as a "temporary abode of purchasing power" rather than for investment purposes, and the amount of money the public chooses to hold is closely related to total spending.

Until the late 1970s, M1, which includes only currency and checking accounts, satisfied both these criteria. Since assets in M1 could be spent immediately but yielded no interest, people had an incentive to hold only transactions funds in this aggregate. As a result, the demand to hold M1 was found to be especially closely linked to nominal spending.

M2 also was a close empirical proxy for the theoretical concept of "money" in this period. Most of the assets in M2 yielded a zero or regulated return. Depository institutions often permitted their customers to liquidate savings deposits on demand or with only a short delay, making them almost as liquid as M1. Small time deposits generally could be liquidated before maturity at the cost of paying an early withdrawal charge. As a result, for many people, all M2 assets (and not only those in M1) were almost risk free and relatively liquid. Although M2 was found to be less reliably related to the short-run performance of the economy than M1, it did provide some useful policy information.

Deregulation and the aggregates

The deregulation of deposit interest rates beginning in the late 1970s had two important effects on these aggregates. First, since some M1 deposits

yield an interest return, people had less incentive to separate their transactions and nontransactions funds and to hold only transactions balances in M1. As a result, shifts of funds between M1 and non-M1 assets within M2 occurred more frequently. This weakened the link between M1 and nominal income and appears to have made the demand for M1 unstable. As a result, M1 became less useful as a policy indicator, and the Federal Reserve ceased to set growth targets for this aggregate after 1986.

Second, M2 has become a less homogeneous aggregate. Although no longer regulated, yields on savings and checking accounts still are adjusted relatively infrequently. The result is that savings and checking accounts continue to be used largely as temporary abodes of purchasing power by asset-holders who respond only slowly to interest rate changes. By contrast, depository institutions treat small time deposits as managed liabilities and vary their yields flexibly in response to changes in the returns on other short-term instruments and in their requirements for funds to finance the credit demands of their customers (Judd and Trehan 1992). Hence, small time deposits have become more like other short- and intermediate-term investment instruments and are held by people who are more rate-sensitive. This means that the volume of small time deposits is more apt to respond to shocks affecting the credit and securities markets than is the remainder of M2. For example, one explanation of the recent decline in small time deposits is that the unusually steep yield curve has induced investors to shift funds out of time deposits at depository institutions and into instruments with longer maturities, for example, bond funds.

This change in the character of small time deposits has made them less like the rest of M2 than they used to be. As a result, the demand for M2 as a whole may have become less stable. By contrast, MZM remains a relatively homogeneous collection of liquid assets. This may explain why the velocity of MZM has remained in line with historical experience in the last three years, while that of M2 has not.

A better indicator?

Although MZM appears to be a better empirical proxy than M2 for the theoretical concept of "money," it is not necessarily true that it would be a reliable indicator in the future. First, it is always possible to find an aggregate that *in the past* was more closely related to nominal GDP than potential alternatives; but its *past* performance is not independent evidence that this relationship will persist in the *future*. It should not be surprising that when one moves beyond the sample period used to *define* an aggregate, the rela-

tionship may deteriorate. For example, the present definition of M2 itself was chosen in part because the demand for it was found to be a stable function of a small number of variables over a sample period that ended in 1979. Just as innovation and deregulation affected the behavior of M2 after it was defined, new liquid assets could be developed in the future that would be close substitutes for the present components of M2. For example, some bond funds already allow investors to write checks up to a certain maximum against their holdings.

A second problem arises because causation runs not only from money to the economy but also from the economy to money. Even though an aggregate's velocity has been stable, it may not provide useful information if the Federal Reserve is unable or does not choose to control it closely. To test whether a change in an aggregate provides useful information about future GDP growth, one must take account of the causation in both directions.

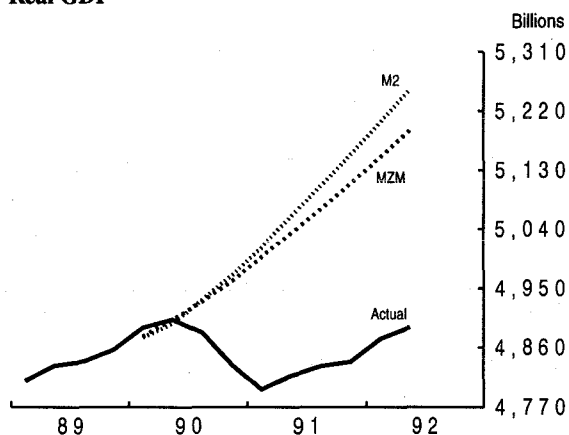
One way to examine the indicator properties of an aggregate is to estimate a statistical model that captures both kinds of causation and to examine the responses of GDP and inflation to unexpected changes in the aggregate. I have estimated two four-variable vector error correction models that include a monetary aggregate (M2 or MZM), a corresponding opportunity cost variable, real GDP and the price level. When estimated over a sample period that ends in 1989, both models yield theoretically plausible coefficient values and predict that an unanticipated increase in the aggregate will be associated with a permanent rise in the average price level and a temporary increase in real GDP. These results conform to theoretical expectations.

However, the indicator properties of both aggregates have deteriorated since 1989. Chart 3 compares real GDP since 1989 with forecasts from the two statistical models. Both models would have missed the downturn in GDP in 1990 and overestimated the strength of the subsequent recovery.

Conclusions

In recent years the velocity of M2 has been higher than expected given the levels of nominal GDP and interest rates. No such shift in the behavior

Chart 3
Real GDP



of MZM's velocity has occurred. In addition, MZM more closely approximates economists' traditional notion of what they mean by "money." These findings provide support for proposals that the Federal Reserve use MZM as a policy indicator in place of M2.

However, one cannot be optimistic that such a change would improve the implementation of monetary policy. The fact that a particular monetary aggregate has been stably related to the economy's performance in the past does not provide independent evidence that it would continue to be a good indicator in the future, especially in a period of ongoing financial change. And despite the stability in the demand function for MZM, its indicator properties appear to have deteriorated almost as much as M2.

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