

Research Department
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Money's Second Dimension

When the Federal Open Market Committee meets next week to set target rates of growth for the money supply over the next year, its members will be trying to gauge the amount of monetary growth that will permit continued economic expansion yet not add to inflationary pressures. This question is not a simple one, since the impact of money on the economy depends not only on the amount of money people have available, but also on their willingness to hold it. As Fed Chairman Arthur Burns said at a recent Congressional hearing, "Money has a second dimension, namely, velocity, or . . . the intensity with which it is being used." The behavior of velocity is therefore certain to be a major topic in the upcoming discussions of the FOMC.

Evolution of a concept

The technical definition of velocity is the ratio of nominal GNP to the stock of money. In the first quarter of 1977, nominal GNP was \$1,799 billion, while the average level of M₁ (currency plus demand deposits) was \$314 billion. Thus, the velocity of the narrow money supply was 5.73. Similarly, the velocity of the more broadly defined M₂ money supply was 2.40 (M₂ equals M₁ plus bank time and savings deposits except large certificates of deposit).

In a simple economy in which all money is in the form of currency,

the concept of velocity can be understood intuitively. For example, if the amount of circulating cash were \$1 million and nominal GNP were \$5 million, the average dollar of currency would be used to purchase \$5 of final goods and services. That is, each dollar would "turn over" five times during the year.

In a modern economy, the bulk of the money supply is in the form of bank deposits of various kinds. Thus, it's not clear what we mean when we say that the average dollar of M₂—being an agglomeration of currency, demand deposits, and time and savings accounts—"turned over" 2.4 times. But the usefulness of the notion of velocity for the purposes of monetary policy does not depend on its intuitive appeal. Rather, it depends on the predictability of velocity.

After all, nominal GNP is just equal to velocity times the money supply, by its very definition. If a policy-maker could predict the future course of velocity, he could control nominal GNP by controlling the money supply. (Of course, he would need more information to determine how much of any increase in nominal GNP would take the form of real GNP growth and how much would merely represent inflation.)

Trend or random walk?

Clearly, the best of all possible worlds from a policy-maker's point

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of view would be a world of constant velocity. Unfortunately, the gods are not that kind, as a brief look at the numbers demonstrates. As recently as 1960, M_1 -velocity was only 3.52, compared to its current value of 5.73. While M_2 -velocity has not changed significantly since 1960, a policy-maker could not safely regard it as a constant, either, since it has shown substantial variation on a year-to-year basis.

However, despite this variability, the movements of velocity might still be predictable if they exhibited a clear long-term trend. In *A Monetary History of the United States*, Milton Friedman and Anna Schwartz focussed much of their analysis on the trends they discerned in the behavior of velocity. They noted a slow, secular decline in velocity from 1880 to the end of World War II, interrupted by a number of episodes of partial rebound. Since World War II, velocity has generally been characterized by irregular increases.

The whole Friedman-Schwartz approach has been challenged by John Gould and Charles Nelson, in an article in the June 1974 issue of the

American Economic Review. They argue that the purported trends are in fact illusory, and that the movements in velocity can be adequately described as a "random walk." (Wall Street analysts are now familiar with the same type of theory, with reference to stock prices.) When a series behaves like a random walk, a knowledge of its past values is of no help in predicting future ones. The best prediction of the next period's value is that it will be the same as the current period's.

Other side of the coin

Yet to say that velocity is a random walk only means that its own past history is of little use in predicting its future. That does not preclude the possibility of predicting it on the basis of a knowledge of other variables. In other words, a stable relationship might exist between velocity and, say, interest rates.

In fact, there are ample theoretical reasons to suspect that just such a relationship exists, for the other side of velocity is the demand for money. To say that the narrow money supply (M_1) turns over almost six times a year is the same as saying that people wish to hold in the form of

money an amount equal to one-sixth of nominal GNP. By holding this much of their wealth as money, they gain the convenience of having cash (or checks) available as needed, but they forego the interest return they could have enjoyed on a bond, for example. Presumably, the higher the interest payments they must forego, the greater the incentive they have to economize on holding money.

Do the data suggest the existence of a stable demand for M_1 ? According to a study by Stephen Goldfeld in a recent issue (No. 3, 1976) of the *Brookings Papers*, a stable demand existed until about 1974. But money-demand equations estimated from pre-1974 data have substantially overpredicted the public's M_1 -holdings since then. Put slightly differently, the equations have underpredicted the growth in M_1 -velocity. On the other hand, there has been no such marked deterioration in the stability of the demand for M_2 .

Both of these findings can be partially explained by a number of technological and institutional changes occurring in financial mar-

kets in recent years. Innovations such as business savings accounts, interest-bearing NOW accounts (negotiable orders of withdrawal), and money-market mutual funds have allowed individuals and firms to hold less of their assets in the form of M_1 . The use of computerized cash-management techniques and telephone transfers between time deposits and demand deposits have had a similar effect. As a result, a given level of M_1 is consistent with a higher level of GNP than before. But to the extent that some of the funds which used to be in M_1 have been shifted into the time-and-savings component of M_2 , the demand for that broader aggregate has not been as affected by these innovations.

As always, the future is uncertain. The demand for M_1 might return to its old relationship. But since M_1 -demand—and, hence, M_1 -velocity—have been displaying unusual behavior for some time, in contrast to the more stable behavior of M_2 -velocity, we can understand why some policymakers are now paying relatively more attention to M_2 than they did in the past.

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BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

| Selected Assets and Liabilities Large Commercial Banks | Amount Outstanding 6/29/77 | Change from 6/22/77 | Change from year ago | |
|---|----------------------------------|-------------------------------|---------------------------------------|---------|
| | | | Dollar | Percent |
| Loans (gross, adjusted) and investments* | 98,620 | + 220 | + 8,617 | + 9.57 |
| Loans (gross, adjusted)—total | 75,506 | + 494 | + 7,322 | + 10.74 |
| Security loans | 1,916 | - 2 | + 633 | + 49.34 |
| Commercial and industrial | 23,764 | + 28 | + 1,342 | + 5.99 |
| Real estate | 24,047 | + 139 | + 3,680 | + 18.07 |
| Consumer instalment | 12,982 | + 90 | + 1,774 | + 15.83 |
| U.S. Treasury securities | 9,656 | - 250 | - 29 | - 0.30 |
| Other securities | 13,458 | - 24 | + 1,324 | + 10.91 |
| Deposits (less cash items)—total* | 96,110 | + 318 | + 5,238 | + 5.76 |
| Demand deposits (adjusted) | 27,073 | + 132 | + 1,865 | + 7.40 |
| U.S. Government deposits | 223 | - 55 | - 319 | - 58.86 |
| Time deposits—total* | 67,220 | + 278 | + 3,880 | + 6.13 |
| States and political subdivisions | 5,469 | - 71 | - 731 | - 11.79 |
| Savings deposits | 31,803 | + 205 | + 5,521 | + 21.01 |
| Other time deposits‡ | 27,735 | + 106 [†] | - 588 | - 2.08 |
| Large negotiable CD's | 10,799 | - 40 | - 2,289 | - 17.49 |
| Weekly Averages of Daily Figures | Week ended 6/29/77 | Week ended 6/22/77 | Comparable year-ago period | |
| Member Bank Reserve Position | | | | |
| Excess Reserves (+)/Deficiency (-) | - 75 | + 1 | + 85 | |
| Borrowings | 4 | 4 | 10 | |
| Net free(+)/Net borrowed (-) | - 79 | - 3 | + 75 | |
| Federal Funds—Seven Large Banks | | | | |
| Interbank Federal fund transactions | | | | |
| Net purchases (+)/Net sales (-) | - 1,302 | + 83 | - 548 | |
| Transactions with U.S. security dealers | | | | |
| Net loans (+)/Net borrowings (-) | - 402 | + 295 | + 61 | |

*Includes items not shown separately. †Individuals, partnerships and corporations.

Editorial comments may be addressed to the editor (William Burke) or to the author. . . .
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