Should Money Be Redefined?

Since 1981, the rate at which money changes hands in the purchase of goods and services has trended downward in contrast to its steady growth over the previous two decades. Economists describe this rate as the *velocity* of money and measure it by the ratio of the value of the nation's output (or GNP) to the stock of money. For example, during the 1960s and 1970s, the velocity of M1, which consists of currency and fully checkable deposits, increased quite steadily at an average annual rate of around three percent, but since mid-1981, M1's velocity has *declined* at an average annual rate of more than two percent. Also, as shown in Chart 1, M1's velocity has been more variable in the 1980s than in earlier years.

The unexpected decline and greater variability of velocity have made it more difficult for the Federal Reserve to set targets for monetary growth that are consistent with acceptable rates of growth of GNP. Partly in response, the Federal Reserve has permitted quite rapid M1 growth in recent years. Compared to the 1979-82 period, however, it also has de-emphasized the role of the monetary aggregates, especially M1, in setting policy, and has paid more attention to other indicators of economic activity.

Some economists have argued that the unusual behavior of M1 velocity has been due to a change in the *nature* of this monetary aggregate since the nationwide introduction of interest-bearing checkable deposits (or NOW accounts) in 1981 and the subsequent deregulation of rates on these deposits in 1983 and 1986. According to this argument, balances in M1 prior to the changes were held primarily for transactions purposes, whereas NOW accounts may contain a mixture of transactions and savings balances and hence may not be closely related to spending on goods and services.

Some proponents of this view that the nature of M1 has changed recently suggested that M1 be redefined to include only currency and demand deposits which, because they bear no explicit interest, are more likely to contain only transactions funds. This narrower definition of money was termed M1A prior to 1983. As shown in Chart 1, the trend of M1A velocity has changed less in recent years than that of M1. This *Letter*, however, will argue that other evidence indicates that the narrower aggregate would not be a superior indicator for monetary policy in the future.

Are NOW accounts spent less often?
In 1985, the annual turnover rate of demand deposits at banks outside New York City was about 300 times. That is, each dollar in these deposits was transferred about 25 times each *month*. In contrast, NOW accounts were transferred less than 17 times per *year*. These numbers suggest that moneyholders treat demand deposits differently from NOW accounts and that the latter may contain a large volume of nontransactions funds.

Much of this apparent difference in activity between the two types of accounts, however, is due to the composition of their holders. NOW accounts are held only by households, who use their money holdings less intensively than businesses. Although there are no separate direct measures of the turnover rates of deposits owned by individuals and corporations, indirect estimates made in the early 1970s (before NOW accounts existed) suggested that, at that time, corporations turned over their accounts three to five times more rapidly than did households. In addition, evidence on the number of payments from various types of accounts suggests that households use NOW accounts about as intensively as they do personal demand deposits. Thus, the lower turnover rates of NOW accounts compared to demand deposits appear to be due to differences in the *holders* of these accounts rather than differences in the nature of the accounts.

Moreover, a majority of transfers of business demand deposits represent either financial transactions or purchases of intermediate products, which do not enter into the demand for GNP

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and hence do not affect money's measured velocity. Of course, households also engage in financial transactions, but they do so to a smaller extent. Paul Spindt of the Federal Reserve staff has estimated that, in 1982, the annual turnover rates of demand deposits and NOW accounts in the purchase of *final products* only were 7½ and 4 times, respectively. The difference between these rates clearly is much smaller than that between the 300 and 17 times for demand deposits and NOW accounts, respectively, mentioned earlier. It is these "final demand" turnover rates that determine average velocity.

NOW accounts and M1 demand
More importantly, the lower turnover rate of NOW accounts compared to demand deposits does not necessarily imply that M1 is somehow "contaminated" by the inclusion of NOW accounts, or that M1A would consequently be a "purer" and more reliable indicator of monetary policy.

For the nature of M1 to have changed, today's NOW accounts must contain a significant volume of funds that previously were outside M1. But since Money Market Deposit Accounts (MMDAs) and other liquid accounts that are outside M1 provide higher yields than NOW accounts, and have grown rapidly since 1982, it does not seem likely that households have switched a large volume of savings funds into NOW accounts. Moreover, since it is likely that M1A included a certain amount of low-turnover funds before 1981 that have since been shifted into interest-bearing NOW accounts, M1A today probably is not the same aggregate that it was before 1981.

Thus, the relationship between the quantity of M1 that the public desires to hold and the levels of income, prices and interest rates that they face is less likely to have been affected by deregulation since 1981 than the corresponding relationship for M1A. Economists describe this relationship as the *demand function* for a monetary aggregate.

Empirical evidence supports the idea that the demand function has been much more stable for M1 than for M1A. Chart 2 compares actual M1 and M1A with values from simulating a statistical M1A demand equation estimated at this Bank using pre-1981 data — before NOW

accounts were widely available. Up to the end of 1984, this equation tracks M1 (including NOWs) quite closely, but it seriously overestimates both the level *and* the growth rate of M1A. This result suggests that the introduction of NOW accounts did not affect the relation of M1 demand to its principal determinants but that it did reduce the demand for M1A as households switched transactions funds from demand deposits into NOW accounts. Had M1 been "contaminated" by an inflow of nontransactions funds from other sources, this equation would have *under*stated the growth of M1 after 1981.

Velocity and money demand
In setting annual targets for growth in the monetary aggregates, the Federal Reserve must make three principal judgments. First, it must judge what rates of growth of real output and inflation are feasible and acceptable for the year ahead. Second, the central bank must estimate the levels of interest rates consistent with these economic projections. Finally, given projections of economic activity and interest rates, the Federal Reserve must estimate how much money the public will want to hold and set money growth targets accordingly.

Clearly, if the demand for an aggregate becomes more difficult to forecast, the third stage would become more difficult as well. For example, if the demand to hold M1 were to increase more rapidly than suggested by its historical relationship with income, prices and interest rates, the aggregate would tend to exceed the Fed's target even though economic activity was evolving as the Fed had projected. These developments would show up as a decline in M1 velocity. If the central bank were to attempt to keep the supply of M1 within its target range despite the increase in demand, interest rates would be driven up and economic activity would tend to slow.

Although an increase in the demand to hold money will, other things equal, lead to a decline in its velocity, unexpected movements in velocity do not necessarily mean that the demand for money has shifted. Between the middle of 1981 and the middle of 1983, for example, M1's velocity declined seven percent, but the public's demand to hold money — given the levels of interest rates, income and prices prevailing — appears to have remained stable. As Chart 2 shows, our money demand equation was able to explain the behavior of M1 during 1982-83 reasonably accurately. Thus, this episode of declining M1 velocity apparently reflected the sharp and unexpected drop in interest rates resulting from the slowing in the

Chart 1
Monetary Velocity

Chart 2
$ Billions **Actual and Simulated Money Growth**
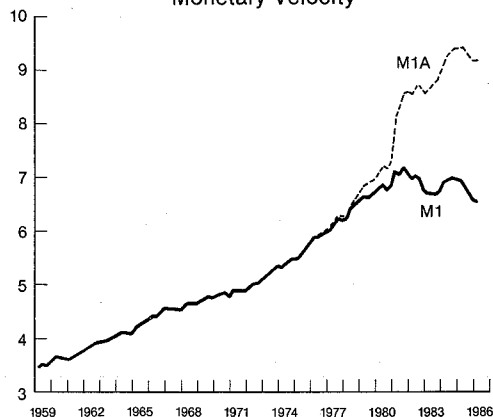
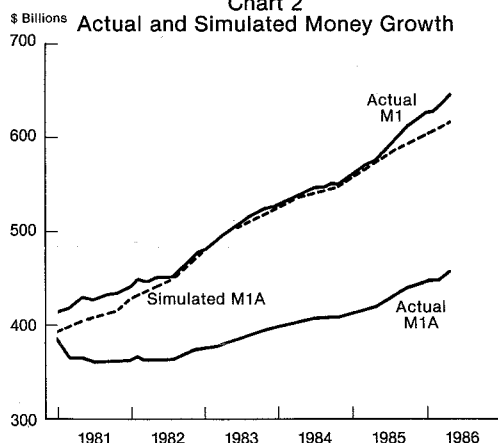inflation rate in 1982 rather than a shift in M1 demand.

The situation with respect to M1A since 1981 has been the opposite of that for M1. Although the velocity of M1A has behaved much as it did in the preceding decades, the demand for this aggregate has not been related in a stable way to income, prices and interest rates. In fact, the lesser variability of MIA's velocity appears to have been largely fortuitous. For example, the failure of M1A velocity to decline in 1982-83 in response to the fall in interest rates apparently was caused by the simultaneous reduction in the demand for M1A as the public continued to move funds into higher-yielding NOWs. Hence, the stability of M1A velocity in that episode does not provide grounds for believing that M1A would be a useful monetary policy indicator in the future.

The 1985-86 experience

Chart 2 suggests that the demand for M1 *has* changed since early 1985 since the simulation underpredicts its growth since then. The reasons for this shift in the demand for M1 are not well understood.

It appears likely that deposit rate deregulation has played a role in shifting M1 demand by effectively raising the return that depository institutions pay on their checkable deposits and thus making the public willing to hold more of their financial wealth in the form of these deposits. A disproportionate amount of the recent increase in M1 has been in NOW accounts.

But it is unclear why this effect was felt in 1985 and not in earlier years since there were no regulatory changes in that year. If deposit rate deregulation were to cause a major shift in M1 demand, one would have expected this to occur in 1983 when Super-NOW accounts bearing fully deregulated interest rates were authorized, or in 1986 when rate ceilings on regular NOW accounts were removed.

The greater-than-expected increase in M1 growth since early 1985 has coincided with a decline in market interest rates. As a result, the differential between the returns available on other highly liquid deposits, such as MMDAs, and that on fully checkable NOW accounts has become extremely narrow. This small spread may explain why the public apparently has taken to holding larger NOW account balances relative to their incomes.

In the future, the impact of changes in interest rates on M1 demand may become more difficult to predict because it will depend on the speed and extent to which banks alter the deposit rates they pay on both NOW accounts and other liquid deposits. As a result, it seems likely that the central bank will find it necessary to continue its recent practice of monitoring other economic indicators as well as the monetary aggregates when setting policy. It also seems likely that M1A will not offer a solution to the problems created by the unusual behavior of M1 that began last year.

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BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT
(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 8/13/86	Change from 8/6/86	Change from 8/14/85 Dollar	Percent[7]
Loans, Leases and Investments[1] [2]	200,148	87	6,295	3.2
Loans and Leases[1] [6]	182,044	11	6,844	3.9
Commercial and Industrial	50,381	− 385	− 610	− 1.1
Real estate	67,351	205	3,064	4.7
Loans to Individuals	39,175	− 176	2,504	6.8
Leases	5,501	− 15	92	1.7
U.S. Treasury and Agency Securities[2]	10,383	− 53	− 1,264	− 10.8
Other Securities[2]	7,721	129	714	10.1
Total Deposits	205,681	− 897	7,522	3.7
Demand Deposits	51,964	− 768	5,143	10.9
Demand Deposits Adjusted[3]	37,029	615	− 5,853	− 13.6
Other Transaction Balances[4]	16,825	− 251	2,822	20.1
Total Non-Transaction Balances[6]	136,892	121	− 441	− 0.3
Money Market Deposit Accounts—Total	46,827	75	1,796	3.9
Time Deposits in Amounts of $100,000 or more	35,163	− 43	− 2,833	− 7.4
Other Liabilities for Borrowed Money[5]	23,351	1,726	− 197	− 0.8

Two Week Averages of Daily Figures	Period ended 8/11/86	Period ended 7/28/86	
Reserve Position, All Reporting Banks			
Excess Reserves (+)/Deficiency (−)	3,582	79	
Borrowings	13	35	
Net free reserves (+)/Net borrowed(−)	3,569	43	

[1] Includes loss reserves, unearned income, excludes interbank loans
[2] Excludes trading account securities
[3] Excludes U.S. government and depository institution deposits and cash items
[4] ATS, NOW, Super NOW and savings accounts with telephone transfers
[5] Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources
[6] Includes items not shown separately
[7] Annualized percent change