NOW's and Super NOW's: Implications For Defining and Measuring Money

By Bryon Higgins and Jon Faust

The concept of money has long played a central role in economic theory and analysis. Moreover, empirical measures of money have increasingly been used in the implementation of monetary policy. Nevertheless, there has never been complete agreement on how best to define and measure money.

The transactions approach to defining money and a correspondingly narrow monetary aggregate such as **M1** have been predominant in both economic research and policy implementation. This approach was believed to be most useful because the essential distinguishing feature of money was considered to be its use as a medium of exchange. Although admitting in practice the existence of "near money" assets like time deposits, the logic of the transactions approach requires a strict dichotomy between money and other assets. To the extent that such a dichotomy was not inherent in the properties of the assets themselves, laws and regulations have been used to create differences between transactions balances and other assets.

Rapid financial innovation together with regulatory changes in recent years has reduced the distinctiveness of money as traditionally defined and measured. The nationwide introduction of NOW accounts in **1981** and Super NOW accounts in **1983** has been particularly important in breaking down the distinctions between transactions deposits and other assets.

This article provides a theoretical perspective for interpreting the implications of NOW accounts and Super NOW accounts for the traditional view of money and the conduct of monetary policy. First, the currently predominant "transactions" approach to defining and measuring money for monetary policy purposes is examined. Next, the experience with NOW accounts and the prospective impact of Super NOW accounts are discussed. Finally, a liquidity approach to defining and measuring money is presented as an alternative to the transactions approach.

Transactions balances and monetary policy

The Federal Reserve currently implements monetary policy 'by using various monetary measures as intermediate policy targets. These targets are used in short-run policy implementation because of a lack of timely information about the ultimate goals of policy. It is believed that achieving the intermediate target will result in achieving policy goals, such as economic growth, price stability, and high employment.

Bryon Higgins is assistant vice president and economist and Jon Faust is a research associate, both with the Economic Research Department of the Federal Reserve Bank of Kansas City.

Thus, the usefulness of alternative approaches to defining and measuring money for policy purposes can be evaluated by how well they meet three general criteria for intermediate targets.[1]

First, a reliable empirical measure of money must exist that corresponds closely to the method of definition chosen. Second, this empirical measure of money must bear a predictable and close relationship to the ultimate goals of policy. Such a reliable relationship is necessary to ensure that achieving target values will result in the desired behavior of goal variables. Third, the Federal Reserve must be able to achieve the targeted growth rate of mpney by adjusting the instruments of monetary policy. Although the controllability criterion raises many important issues, this article focuses on how NOW and Super NOW accounts have affected the ability to define and measure money for use as an intermediate target to achieve ultimate policy objectives.

Transactions approach to defining money

The transactions approach to defining and measuring money has been predominant both for empirical testing of economic theories and for the conduct of monetary policy. The basis for this predominance has been the widespread belief that the amount held in transactions balances is reliably related to total spending and thus to ultimate policy goals.

According to the transactions approach, the essential distinguishing feature of money is that it is generally accepted as a means of payment for other commodities. The utility of money, therefore, derives from the reduction in the costs of exchanging commodities made possible by having one commodity that represents generalized purchasing power. Because money is viewed as a "contrivance for sparing time and labor" in making transactions, the medium of exchange criterion corresponds to the transactions approach to defining money.[2]

The transactions approach to defining money assumes that assets performing as a medium of exchange are qualitatively different from other assets. Whereas all assets serve as a store of value, only a limited number are generally accepted as a means of payment. Because of their unique function as a medium of exchange, these assets are deemed to be different from other assets not just in degree but in kind.

The unique role of money as a medium of exchange also serves as the basis for the belief that transactions balances are reliably related to total spending and thus to the ultimate goals of monetary policy. This can be shown most easily within the framework of the quantity theory of money. The quantity theory is based on the equation of exchange, which can be written as the identity $MV = PT$, where M is the quantity of money defined as the sum of all assets used as media of exchange, V is the velocity of money, P is the aggregate price level, and T is the volume of transactions financed by monetary exchange. Under certain simplifying assumptions regarding the predictability of velocity and of the ratio of spending on goods and services to total transactions, the equation of exchange can be used to derive a relationship between the growth rate of money and the rate of inflation. The implications for monetary policy would then be clear—by controlling the growth of money, the monetary authorities

1 For a more detailed discussion of this issue, see Anna J. Schwartz, "Short Term Targets of Three Foreign Central Banks," in *Targets and Indicators of Monetary Policy*, ed. *by* Karl Brunner (San Francisco: Chandler Publishing Co., 1969), p. 39.

2 John Stuart Mill, *Principles of Political Economy* (London: Longmans, Green, and Co., 1909), p. 488.

could prevent inflation. Thus, a measure of money. composed of all assets used for transactions would be a very attractive intermediate target because of its simple and predictable relationship with goal variables.

M1 as an empirical measure of transactions balances

The M1 measure of money, which until recently included only currency and demand deposits, has been the preeminent monetary policy target in recent years. Although the Federal Reserve establishes targets for broader monetary aggregates and for bank credit, it has stressed the importance of M1 in the conduct of monetary policy except during brief periods when it was felt that various technical distortions caused M1 behavior to be unrepresentative of underlying monetary growth trends. The emphasis on the M1 monetary measure as a policy guide has been based on the presumption that the transactions approach to defining money is most useful for policy purposes. It was felt that M1 best fulfilled the first two criteria for a desirable intermediate target.

Before the recent wave of financial innovations, M1 met the basic criteria for a useful intermediate policy target. Despite minor qualifications, demand deposits and currency were the only generally acceptable means of payment. Moreover, both were distinguished from other assets by the fact that they alone did not earn interest. In part, the distinctiveness of M1 assets has resulted from regulations. Prohibition of interest on demand deposits is one regulation that establishes a sharp distinction between money and other assets from the point of view of depositors.

Although initially intended as a method of ensuring the safety and soundness of the banking system, the prohibition of interest on demand deposits was subsequently justified as being necessary to preserve the distinction between money and other assets.[3] Until recently, demand deposits and currency were the primary assets used as a medium of exchange in the United States. Since it is impractical to pay interest on currency, prohibition of interest on demand deposits increases the similarity between demand deposits and currency and distinguishes both from assets that yield interest.[4] By creating disincentives to holding demand deposits except as necessary to finance current transactions, the prohibition of interest on demand deposits helped to make demand deposits and currency relatively close substitutes for each other but relatively poor substitutes for other assets, thereby strengthening the distinctiveness of M1 assets as required under the transactions approach to defining and measuring money.

High reserve requirements on demand deposits also have contributed to the correspondence of the M1 measure of money to the theoretical requirements of the transactions approach by distinguishing demand deposits from time deposits. Some proponents of the transactions approach went so far as to recommend 100 percent reserve requirements on demand deposits and no reserve requirements on other deposits.[5] This would have the effect of

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3 The prohibition of interest on demand deposits was part of the Banking Act of 1933. For a further discussion, see Bryon Higgins, "Interest Payment on Demand Deposits: Historical Evolution and the Current Controversy," *Economic Review.* Federal Reserve Bank of Kansas City, July/August 1977, p. 3. For an example of the argument that prohibition should be maintained to distinguish money from other assets, see U.S. Committee on Financial Institutions (Heller Committee), *Report to the President of the United States* (Washington, D.C.: U.S. Government Printing Office, June 1976), pp. 20-22.

4 Implicit interest paid on demand deposits attenuates this distinction somewhat. See Higgins, "Interest Payment on Demand Deposits..."

5 Henry Simons, *Economic Policy for a Free Society* (Chicago: University of Chicago Press, 1948), p. 62.

making demand deposits a perfect substitute for currency from the point of view of the commercial banks supplying money to the public.[6] Although the 100 percent reserve requirement proposal has not been adopted, reserve requirements have been substantially higher on demand deposits than on time and savings deposits. This, too, has the effect of increasing the similarity between demand deposits and currency, while reducing the similarity between demand deposits and other assets, thereby enhancing M1 as an empirical counterpart to the transactions approach for defining money.[7]

Economic research seemed to confirm the validity of the transactions approach and the usefulness of M1 as an intermediate policy target. Empirical research conducted in the 1960s and early 1970s on the demand for money and other key relationships tended to confirm that M1 growth was reliably related to inflation and other policy objectives.[8] Because it had an empirical counterpart that was closely related to policy goals, the transactions approach to defining money gained wide acceptance both within the Federal Reserve and among economic researchers. Correspondingly, M1 came increasingly to serve as the primary intermediate target in the conduct of monetary policy.

Financial innovation and the transactions approach

A number of financial innovations in the 1970s blurred the distinction between M1 and other assets. Money market mutual funds with limited checkwriting privileges emerged in the mid-1970s and began to grow very rapidly in the latter part of the decade. Repurchase agreements and overnight Eurodollar deposits began to be used extensively by corporations to earn interest on very short-term funds. Although obviously important, these developments might be dismissed as merely expanding the range of near-money assets without fundamentally affecting the uniqueness of demand deposits and currency as the only generally acceptable means of payment

However, the introduction of NOW accounts in New England in the early 1970s could not be rationalized so easily as being nonessential for

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6 Moreover, 100 percent reserve requirements would effectively preclude paying interest on demand deposits if reserves do not yield interest, thus achieving the same effect on the substitutability in demand between demand deposits and currency as the legal prohibition of interest on demand deposits. One hundred percent reserve requirements also create a separation between the credit system and payments system, a separation necessary to the validity of the transactions approach. Under a fractional reserve system, a system with less than 100 percent reserve requirements, there is necessarily a link between the multiple expansion of deposits and the multiple expansion of credit. Thus, a sharp distinction between the credit system and the payments system can only be maintained with 100 percent reserve requirements on transactions balances. However, it must be noted that 100 percent reserve requirements on transactions deposits is a necessary condition for separation of the payments and credit systems, but it is not sufficient by itself to ensure that separation. Additional requirements include absence of overdraft privileges on checking accounts, inability to use credit cards for payments, and relatively high transactions cost for transferring funds between checking accounts and other assets.

7 Higher reserve requirements on demand deposits than other assets could be justified on other grounds. Initially, reserves were considered to be a liquid asset, allowing banks to withstand deposit losses. However, required reserves are now viewed as the least liquid of assets because they are legally required. Higher reserve requirements could be viewed as a means of controlling money. (See J. A. Cacy, "Reserve Requirements and Monetary Control," ***Economic Review.*** Federal Reserve Bank of Kansas City, May 1976, p. 3 (reprinted in ***Issues in Monetary Policy).)*** However, until October 1979, the Federal Reserve did not use a reserves approach to monetary control. Under an interest rate approach to implementing monetary policy, the level of reserve requirements is unimportant. Thus, reserve requirements could best be viewed as a tax on the holding of certain deposits. A higher tax on demand deposits does help distinguish demand deposits from other assets.

8 Stephen M. Goldfeld, "The Demand for Money Revisited," ***Brookings Papers on Economic Activity,*** 1973:3, p. 577.

the generally accepted method of defining and measuring money. After all, NOW accounts were just like demand deposits in most important respects except that NOW accounts were not available to businesses and paid interest, although at a rate constrained by Regulation Q ceilings. Nevertheless, so long as availability of NOW accounts was confined to the New England region, the traditional M1 measure could reasonably be defended on a priori grounds as an adequate measure of the nation's stock of transactions balances. However, empirical research suggested to some analysts that the formerly close relationship between the traditional M1 measure and policy goals began to break down in the mid-1970s. This research indicated an unpredictable downward shift in the demand for money soon after the introduction of NOW accounts in New England and other financial innovations.[9] As a result, the usefulness of the transactions approach to defining money and M1 as an intermediate policy target began to be reexamined in light of changes in the relationship between traditional transactions balances and new financial assets. Provisions of the Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) gave additional impetus to this reexamination because of their far-reaching implications for the transactions approach to defining money.

Effect of NOW accounts on M1

The DIDMCA authorized introduction of NOW accounts by all depository institutions beginning in 1981 and stipulated that interest ceilings on all time and savings deposits, including NOW accounts, be phased out by 1986. These changes have already posed problems for the use of M1 in the implementation of monetary policy. For instance, the similarity between NOW's and demand deposited prompted redefinition of the narrow aggregate, M1. Further, the uncertainty regarding the transitional phase during which consumers adjusted to NOW's required several special measures to understand the behavior of NOW's. With the transitional phase concluded at the end of 1981, new problems arose, as NOW accounts began to exhibit unexpectedly strong growth in the face of economic weakness.

Transition to Nationwide NOW accounts

The adjustments that took place following the introduction of NOW accounts required several special actions by the Federal Reserve Board. One was a redefinition of the monetary aggregates to include NOW accounts in the transactions measure, M1.[10] Before the redefinition, NOW accounts were considered to be passbook savings accounts for the purposes of the aggregates and were included only in the broader aggregates.

This change in the way assets were aggregated did not represent a change in the method used to define money. Monetary policymakers still intended to focus on money as measured by assets that serve as niedia of exchange. The redefinition merely represented an attempt to redraw the distinction between transactions and nontransactions deposits in light of the new type of account.

Although the transactions view of money was maintained in the redefinition of MI, it was clear that the emergence of NOW accounts

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9 Stephen M. Goldfeld, "The Case of the Missing Money," *Brookings Papers on Economic Activity,* 1976:3, p. 683.

10 At the time that M1 was redefined, the broader aggregates were also revised. This revision process included creation of a new aggregate, L, which was intended to be a measure of total liquid assets in the economy. For an explanation of these revisions, see Thomas Simpson, "The Redefined Monetary Aggregates," *Federal Reserve Bulletin,* Vol. 66, No. 2, February 1980, p. 97.

would blur some of the distinction between transactions and nontransactions balances. This is because the payment of explicit interest on NOW accounts lowers both the average and marginal cost to some people of holding funds in a checkable deposit, thereby prompting a shift of funds from nontransactions accounts into NOW accounts." Since these new funds would not have been held in a transactions account in the absence of interest payment, they were considered by the Federal Reserve not to be "pure" transactions balances.[12]

Because the timing and magnitude of the shift of funds into NOW's during 1981 were uncertain, the Federal Reserve took two additional steps to aid in understanding the transition period. One was the reporting of two narrow aggregates that year: M1-A, which included currency and demand deposits but excluded other checkable deposits, and M1-B, which included currency and all checkable deposits. Intended only as an aid in interpreting the events of 1981, M1-A was discontinued in January 1982, and M1-B became known simply as M1.

The most significant special measure taken during this period was the attempt to adjust M1-B to remove any balances that were not purely transactions balances. The rationale behind the adjustment process can be understood by dividing the shift of funds into NOW accounts into two components: (1) the transfer of funds from demand deposits, which merely changed the composition of checkable deposit holdings; and (2) the transfer of funds from other sources, such as passbook savings accounts. Unlike the first component, the second component is a shift from nontransactions assets to a checkable deposit, which increases total checkable balances and M1. Because these funds had been held in nontransactions accounts, they were judged to be nontransactions balances, which would artifically inflate M1-B as a measure of transactions balances."

The task of determining the purpose served by funds in NOW accounts was completed by

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11 The basis for this difference between the yields of NOW accounts and demand deposits is that NOW's pay explicit interest, while demand deposits typically pay a higher rate of implicit interest than NOW accounts in the form of services provided below cost. It is difficult to measure this implicit interest precisely, but a crude estimate can be obtained from Federal Reserve functional cost analysis data. The data used here are 1981 data for average earning banks with deposits between $50 and $200 million. These data indicate that for 1981 the implicit yield on personal demand deposits was approximately 6.9 percent, the same as the before-tax rate on NOW accounts. The data also indicate that the average balance in NOW accounts is $4,328, more than four times the average balance in demand deposits. The typical higher fee per check written on a NOW account resulted in the average number of debits per month being 14.7, approximately two lower than that of demand deposits. Thus, while the average yield across customers is the same for NOW's and demand deposits, individuals choose the account that offers them the highest return based on such considerations as desired minimum balance. desired number of debits, and tax bracket (since only explicit interest is taxed). It is important to note that the average yield on NOW's and demand deposits may be the same, but the marginal yield could be quite different. While a dollar added to a NOW account earns at least the explicit rate of interest, a dollar added to a demand deposit may yield little or no implicit interest. See Stephen H. Axilrod, "The Impact of Payment of Interest on Demand Deposits," Board of Governors of the Federal Reserve System, Division of Research and Statistics, January 31, 1977, p. 75 (processed).

12 Actually, the transactions model of money demand predicts that transactions balances would increase with a decrease in the cost of holding these funds. This increase in checkable funds would be an increase in transactions balances in the same sense that increased demand deposit holdings due to a fall in market rates are transactions balances. However, the NOW-induced increase in checkable deposits was caused by a change in regulation, not market conditions. Thus, it is possible to judge the new funds as nontransactions funds in the sense that they were not in the empirical measure of transactions balances before the regulatory change occurred.

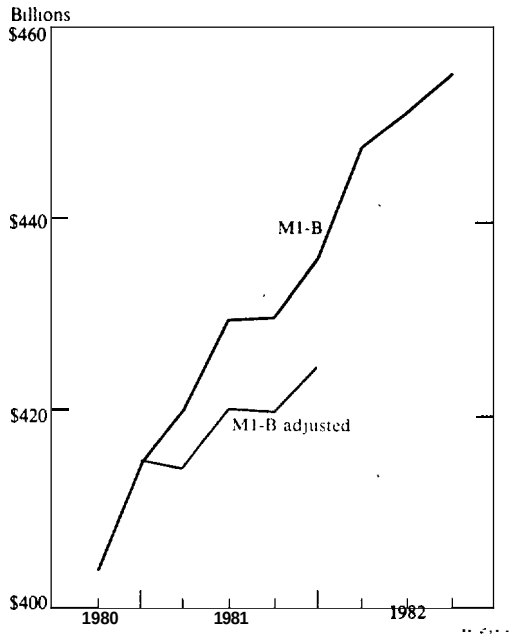
13 Thomas Simpson, "Recent Revisions in the Money Stock," *Federal Reserve Bulletin.* Vol. 67, No. 7, July 1981, p. 541.

removing from M1-B the proportion of net inflows to NOW's that was believed to have come from sources other than demand deposits. In estimating this proportion, the Federal Reserve considered several types of information. Surveys of households and financial institutions were used to divide inflows into NOW accounts between demand deposits and other sources. Cross-sectional regression analysis of deposit data was also used to ascertain the source of funds being transferred into NOW accounts.[14]

The data for 1981 indicate a rapid adjustment to NOW accounts. In January $16.3 billion was added to NOW accounts, and by December they had increased by $50.1 billion. By September 1981, NOW accounts accounted for about 46 percent of all household checkable deposits, a proportion that had grown to about 51 percent by June 1982.[15]

Of the funds deposited in NOW accounts in 1981, the Federal Reserve Board estimated that $12.1 billion was nontransactions funds. (See Chart 1.) More than 75 percent of the nontransactions funds were deposited in the first four months of the year. After that, the shift adjustment increased only slightly, and the unadjusted and adjusted measures moved together. This was taken as evidence that consumers' adjustment to NOW's took only a few months and was probably complete by the end of the year.[16] If the transfer of nontransactions funds were a once-and-for-all phenomenon, then the growth rates of adjusted and unadjusted M1-B

Chart 1
MI-B COMPARED WITH MI-B ADJUSTED



would be similar after 1981. Based on this reasoning, calculation of M1-B adjusted was discontinued in January 1982.

By using adjusted M1-B in 1981, the Federal Reserve expected to obtain a more meaningful measure of transactions balances for use in monetary policy. The shift adjustment significantly altered the view of the growth of money in 1981, lowering the growth rate of M1-B by 2.7 percentage points, from an unadjusted 5.0 percent to a 2.3 percent shift-adjusted rate. Thus, the use of M1-B adjusted in policy decisions placed a great deal of importance on the accuracy of the adjustment.

There have been both theoretically based and empirically based criticisms of the shift adjustment. Critics have contended that the survey evidence regarding sources of funds may have been flawed by indicating only the immediate source of funds placed in NOW accounts, in-

14 Simpson, p. 542.

15 Based on the level of personal demand deposits as estimated in the Demand Deposit Ownership Survey, *Federal Reserve Bulletin,* Vol. *68,* No. 9, September 1982, p. A24, and the level of NOW accounts as reported in the Federal Reserve H.6, "Money Stock Measures," release.

16 See, for example, Paul A. Volcker, *Hearings Before the Committee on Banking, Finance, and Urban Affairs,* H.R. 97-57, 97th Cong., 2d Sess., February 10, 1982, pp. 21, 41.

stead of the ultimate source, after all MI-B adjustments were completed. For example, a depositor might open a NOW account by drawing down a savings account, while waiting for the checks on a demand deposit to clear. Later, the savings deposit would be replenished with funds freed by closing the demand deposit. Thus, the immediate source of funds in the NOW would be a savings deposit, but the ultimate source, after all adjustments, would be a demand deposit. If surveys only discovered the immediate source of deposits in NOW accounts, the funds in the above example would have been mislabeled as nontransactions balances.[17]

The behavior of **M1-B** adjusted during 1981 led to further questions about the accuracy of the shift adjustment. These questions arose because MI-B adjusted growth in the first three quarters of 1981 was much weaker than expected, resulting in a growth rate of 2.3 percent for the year as a whole. This was well below the growth rate range of 3 1/2 to 6 percent selected by the Federal Open Market Committee (FOMC).

Several efforts have been made to explain this **phenomenon. One** explanation is that too large a portion of MI-B was removed by the shift adjustment. Several statistics used to summarize the behavior of money are cited in support of this view. For example, because of the inflows of nontransactions funds, the income velocity of unadjusted MI-B should have shown an unusual drop in 1981. The velocity of shift-adjusted **M1-B** should have been unaffected. However, the velocity of the adjusted measure grew at an unusually high 7.4 percent rate in 1981, compared with 4.7 percent for the unadjusted aggregate and 2.3 percent that was predicted by using a conventional velocity equation.[18] Such evidence could indicate that some of the funds removed from MI-B by the shift adjustment were actually used for transactions and, therefore, should not have been removed.[19]

Another explanation is that the redefinition of **M1,** which still relied on a clear distinction existing between transactions and **nontransactions** balances, could not capture all the changes occurring in types of assets and methods of payment. For instance, the rapid growth of money market mutual funds **(MMMF's),** against which checks can be written, probably led to a downward shift in the demand for **M1** assets by allowing depositors to earn a higher rate of return on some of their

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17 For a **more** complete explanation of this and other arguments regarding shift adjustment of MI-B, see John A. **Tatom,** "Recent Financial Innovations: Have They **Distorted** the Meaning of **M1?"** Federal Reserve Bank of St. Louis ***Review,*** Vol. 64, No. 4, April 19, 1982, p. 23.

18 The predicted values of MI-B velocity were obtained from dynamic simulation of a velocity equation estimated from the second quarter of 1959 through the second quarter of 1974. The estimated velocity equation, which was derived from a standard money demand equation, was of the form:

$$\log(V_t) = A_0 + A_1 \cdot \text{Log}(y_t) + A_2 \cdot \text{Log}(r_t) + A_3 [\text{Log}(P_t/P_{t-1}) - \text{Log}(y_{t-1}) + \text{Log}(V_{t-1})]$$

where

V is nominal **GNP/M1-B,**
y is GNP in 1972 dollars,
P is the implicit price deflator for GNP,
r is a weighted average of seven interest rates, and
Log( ) indicates the natural logarithm of the variable in parentheses.

This equation and the velocity of the monetary aggregates are discussed more fully in **Bryon** Higgins and Jon Faust, "Velocity Behavior of the New Monetary Aggregates," ***Economic Review,*** Federal Reserve Bank of Kansas City, **September/October** 1981, p. 3. (Reprinted in Issues ***in Monetary Policy: II,*** Federal Reserve Bank of Kansas City, March 1982.)

19 The behavior of other statistics that summarize money **are** discussed, with similar results, in **Tatom,** "Recent Financial Innovations.. .," pp. 27-32.

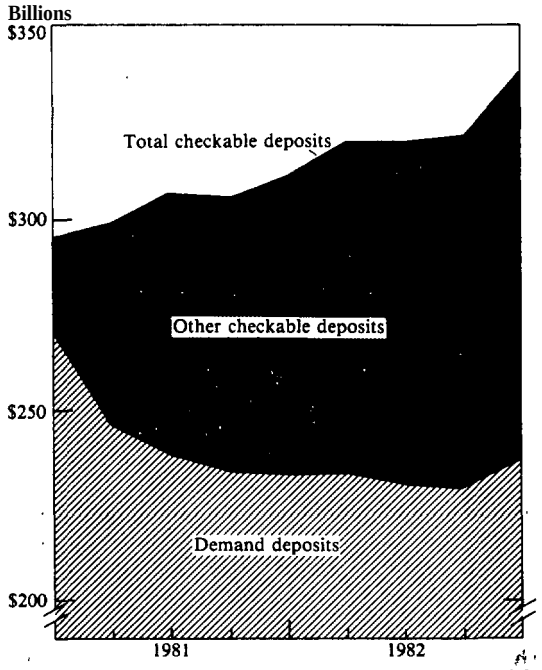
transactions balances. Also, the spread of "sweep" accounts in 1981 may have countered some of the increase in checkable deposits expected due to NOW accounts. These accounts sweep all funds above a prespecified minimum into a higher yielding asset and return the funds to the checkable account only when it falls below the minimum. Thus, growth of MMMF's or sweeps may have accounted for some of the weakness of M1-B in 1981.

If this explanation has some validity, the view that transactions deposits can be separated from nontransactions deposits may be suspect instead of the specifics of the shift adjustment. However, the limited information available about the experience in 1981 is not adequate for drawing any firm conclusions about the source of the controversial M1-B behavior.

Divergence of NOW accounts, and demand deposits

The NOW account component of M1 began causing further confusion in November 1981. The quarterly growth of other checkable deposits jumped from 21.2 percent in the third quarter of 1981 to 27.6 percent in the fourth quarter and 49.5 percent in the first quarter of 1982. The strength in NOW's, which occurred during a period of economic weakness, is even more confusing, given the belief that adjustment to the introduction of NOW's was completed by the end of 1981. If this were so, demand deposits and NOW accounts might be expected to grow thereafter at roughly similar rates.[20] However, demand deposits registered slight declines in the fourth quarter of 1981 and

Chart 2
DEMAND DEPOSITS AND OTHER CHECKABLE DEPOSITS



the first quarter of 1982. (See Chart 2.) This divergence continued in 1982 as other checkables grew over 30 percent while demand deposits increased about 1 percent.

The growth of other checkable deposits fueled greater-than-expected growth in M1 in 1982, and for this reason it has been a source of speculation. One relatively simple explanation is that the divergent growth of NOW's and demand deposits merely represents a continuation of the transfer of funds out of demand deposits and other assets into NOW accounts in response to the intial offering of NOW's. This explanation would imply somewhat longer lags in recognition and adjustment than some analysts have asserted, but is not inconsistent with the lags in adjustment of money balances implied by some money demand equations. If this view is correct, then the Federal Reserve

[20] Differences in ownership could cause some divergence in the behavior of demand deposits and NOW accounts, especially over short periods. For example, NOW accounts are held primarily by individuals while demand deposits are held primarily by businesses. However, it is unlikely that this difference accounts for all the divergence in the growth rate of NOW accounts and demand deposits for 1982 as a whole.

might be expected to merely accommodate the outward shift in money demand, since it is not related to a change in economic activity.

Another explanation is that the rapid growth of NOW accounts and M1 could be accounted for by a conventional transactions model of money demand. A conventional money demand equation based on the transactions model and past relationships between money, income, and interest rates can predict much of the behavior of M1 in 1982.[21] However, this argument does little to explain the wide divergence in the growth of NOW accounts and demand deposits. Despite this fact, if the strong money growth does imply increasing transactions and spending, the Federal' Reserve might be expected to restrain the money growth to avoid contributing to inflation.

A third explanation of the behavior of NOW accounts has received considerable credence both inside and outside the Federal Reserve. It is that the weak and uncertain state of the economy has prompted precautionary savings in NOW accounts. This explanation implies that NOW accounts are fundamentally different from 'demand deposits and currency in that their explicit yield removes the incentive to hold only the minimum amount necessary to meet transactions needs. Thus, consumers with NOW' accounts may store precautionary balances in a NOW that would formerly have been placed in a higher yielding liquid asset. Further evidence of an increased desire for liquidity beginning in November 1981 can be seen in the growth of' passbook savings accounts. These accounts declined significantly in 1979, 1980, and the first 10 months of 1981. However, they began to increase in 'November 1981, and in the 12 months ended November 1982 they grew by 6.1 percent. This may indicate that there has been a general shift toward liquidity on the part of the public.

Chairman Volcker explained the monetary policy implications of this view in July 1982:

> In light of the evidence of the desire to hold more NOW accounts and other liquid balances for precautionary rather than transactions purposes during the months of recession, strong efforts to reduce further the growth rate of the monetary aggregates appeared inappropriate. Such an effort would have required more pressure on bank reserve positions—and presumably more pressures on the money markets and interest rates in the short run.[22]

If the precautionary savings argument accounts for some of the recent rapid growth in NOW. accounts, unpredicable fluctuations in the growth rate of NOW's and M1 may be expected to continue. The emergence of NOW accounts may have blurred the distinction between transactions deposits and nontransactions assets enough to severely complicate the use of .the transactions model of money demand. In contrast, it may be that the puzzling behavior of money can be accounted for by particular characteristics of the current economic situation and the adjustment to the new asset. In either case, changes in the regulation of NOW accounts are likely to bring the meaning of M1 under further scrutiny in the near future.

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21 For instance, the velocity equation cited in footnote 18 tracks the decline in the velocity of M1 in 1982 as a whole fairly well.

22 Paul A. Volcker, "Monetary Policy Objectives for 1982," *Midyear Review of the Federal Reserve Board.* July 20, 1982, p. 8.

Monetary policy problems associated with Super NOW accounts

The introduction of Super NOW accounts on January 5, 1983 poses new problems for monetary policy. The Super NOW's have no interest rate ceilings yet offer unlimited checking account privileges to individuals willing to maintain $2,500 minimum balance in a checking account. Moreover, the authority to offer Super NOW's to businesses may be granted soon. As a result, interpretation of M1 growth will be difficult during the transition period in which funds are transferred into the new account. More importantly, problems for defining and measuring money under the transactions approach may persist and intensify as a result of the introduction 'of Super NOW's.

Transitional problems

Portfolio adjustments caused by the introduction of Super NOW accounts will complicate monetary policy implementation at least through the remainder of the year. Competition among depository institutions to retain existing deposits and to attract new funds is expected to keep the rate on Super NOW accounts near market rates adjusted for the 12 percent reserve requirement on Super NOW's. The near-market yield together with unlimited checking and federal insurance on Super NOW's may cause individuals—and prospectively, businesses—to shift substantial amounts of funds out of NOW accounts, demand deposits, time and savings deposits, money market funds, and a variety of other assets into Super NOW's. It is uncertainty regarding the magnitude and timing of these portfolio adjustments that will make it difficult to interpret growth in the monetary aggregates, especially M1, during the transition period.

The introduction of Super NOW's in 1983, like the introduction of NOW's in 1981, will cause M1 growth to be unrepresentative of the "true" growth of transactions balances.[23] This temporary distortion will reduce the usefulness of M1 as an intermediate target for monetary policy. In deciding how best to implement monetary policy in this uncertain environment, the Federal Reserve may decide to rely on a shift-adjusted version of M1, as in 1981. As in 1981, however, uncertainty regarding the accuracy of the shift adjustment procedure itself could result in controversy about the truest measure of growth in transactions deposits. Thus, the Federal Reserve may prefer to deemphasize M1 as a policy target for 1983 and focus instead on the broader monetary aggregates. These aggregates will be less severely affected by the introduction of Super NOW's because most of the funds transferred into the new account will be from assets included in the M2 and M3 measures of money. In addition, a broad credit aggregate may be used in policy implementation, as recently proposed by Chairman Volcker and advocated by some economists.[24] Whatever temporary measures are decided upon to deal with the problems for M1 caused by the introduction of Super NOW's could in principle be abandoned after the initial portfolio shifts are completed. However, the availability of Super NOW's may pose problems for monetary policy that persist even after the initial transition period is over.

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23 Transfer of funds into Super NOW's from assets not included in M1 will tend to raise M1 growth artificially. However, transfer of funds into the new money market deposit account introduced in December 1982 from NOW accounts and demand deposits is a countervailing factor tending to depress M1 growth artificially. Whether observed M1 growth will overstate or understate growth in transactions balances in 1983 will depend on which effect predominates. In either case, though, MI growth will be unrepresentative of the growth in transactions balances.

24 See Benjamin M. Friedman, "Using a Credit Aggregate Target to Implement Monetary Policy in the Financial Environment of the Future," *Monetary Policy Issues in the 1980s,* Proceedings of a symposium sponsored by the Federal Reserve Bank of Kansas City, held August 8-10, 1982 at Jackson Hole, Wyoming (January 1983).

Problems for defining and measuring money

The introduction of Super NOW's raises long-run monetary policy problems. Although reducing incentives for financial innovations that have in the past caused unpredictable shifts in money demand that have themselves complicated monetary policy implementation, the market rate of return paid on a major component of M1 raises questions not only about the appropriateness of M1 as an empirical measure of transactions balances but also about the usefulness of the transactions approach to defining money.[25]

The near-market yield on Super NOW's may make them attractive repositories for balances held for precautionary or other purposes. As discussed above, the rapid growth of M1 in 1982 may have been due in part to a buildup of precautionary balances in NOW accounts, even though the yield on NOW's was well below market rates and individuals had a substantial interest rate incentive to separate transactions balances from other balances. This interest rate incentive to segregate transactions balances has been substantially eliminated by the introduction of Super NOW's. Under current circumstances, individuals — and prospectively, businesses also — may decide to consolidate transactions balances with other funds in a relatively high-yielding Super NOW account. If so, the closeness of the relationship between M1 growth and ultimate policy objectives could be attenuated, thereby possibly reducing the effectiveness of M1 as an intermediate target.[26] On the other hand, the 12 percent reserve requirement on Super NOW's may provide sufficient incentive for separation of transactions from other balances that the traditional relationship between M1 and policy goals is not eroded.

The prospect that reserve requirements on Super NOW's will not by themselves prevent comingling of transactions with other balances has led some analysts to suggest that the Federal Reserve establish a "regulatory moat" around transactions balances. By imposing reserve requirements on all assets available for spending within a few days and including all of these assets in M1, it is argued, the Federal Reserve could reestablish the distinctiveness of transactions balances and make M1 less susceptible to financial innovation. This type of regulatory moat could compensate to some extent for removing the more traditional moat of ceiling interest rates on transactions deposits.

However, a regulatory moat might not be adequate in restoring M1 as a meaningful measure of transactions balances. Relatively low reserve requirements have little effect on

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25 This points up the inevitable tradeoff from a monetary policy perspective with respect to paying a market-related rate on checkable deposits. For example, a recent legislative proposal to pay interest on required reserves held against Super NOW accounts would remove the last vestige of the distinction between transactions balances and other assets. By so doing, it would eliminate the remaining incentive to introduce new near-money assets, thereby prospectively eliminating uncertainty for monetary policy arising from unpredictable shifts in money demand. However, by allowing the rate on Super NOW's to reflect market rates fully, enactment of this proposal would also eliminate the small incentive to minimize on transactions balances, thereby attenuating the relationship between M1 and total spending. Even if this proposal is not enacted, however, financial institutions may be able to devise methods of avoiding the cost of the 12 percent reserve requirements on Super NOW's. There is already discussion of linking the new money market deposit account with a transactions account through a sweep arrangement. See John Morris, "S&L Thinks It Can Beat Reserves Rule," *American Banker,* December *30, 1982.*

26 For example, rapid M1 growth might be due to increased demand for speculative balances resulting from belief that long-term rates would soon increase rather than to an increased demand for transactions balances related to increased spending for goods and services. If so, Federal Reserve actions to restrain M1 growth would cause interest rates to rise, thereby ratifying the expectations of investors but perhaps reducing growth in spending below the rate consistent with policy objectives for the economy.

yields and may not, therefore, provide a qualitative distinction between transactions balances and other assets. Moreover, the premise of a regulatory moat—as of earlier versions, such as 100 percent reserve requirements and interest rate ceilings on transactions deposits—is that transactions costs of transferring funds among assets are high enough to deter active cash management.[27] One of the main lessons to be learned from the rapid financial innovation in the past few years is that transactions costs of transferring funds have been reduced substantially by the application of computer technology to the financial industry. The private sector has both the means and the incentive to bridge whatever regulatory moat is established. There will always be opportunities to create new assets that are just beyond the scope of the regulations applying to transactions deposits but are close substitutes for these deposits. The low costs of transferring funds will encourage financial institutions to exploit these opportunities. Some might argue, therefore, that a regulatory moat is not likely to enable the Federal Reserve to construct an empirical monetary measure that corresponds to the theoretical concept of money as defined by the transactions approach.

The prospective inability to construct monetary measures that correspond closely to the transactions approach may necessitate a reappraisal of how best to define money. This is in part because paying a market rate on deposit used as a medium of exchange will lead to substantially greater integration of the payments system and the credit system. For instance, there may be lines of credit attached to NOW accounts. The medium of exchange function will not be as distinctly separable from the store of value function as in the past and, therefore, a less useful criterion for defining money.

Liquidity approach to defining money

Some analysts contend that a liquidity approach rather than a transactions approach may be the most appropriate method for defining money in the future. According to the liquidity approach, the essential feature of money is that it is the most liquid of all assets. The degree of liquidity is defined as the extent to which an asset can be sold or redeemed at an unknown future time at a known dollar price on short notice and with minimum costs.[28] The liquidity approach, then, stresses the store of value function rather than the medium of exchange function emphasized in the transactions approach.

Nature of liquidity

By its very nature, the liquidity approach assumes that money is not qualitatively different from other assets. Instead, liquidity is a property of all assets to some degree. The varying degrees of liquidity of different assets can, in principle, be ranked along a continuum. At one end, currency is by definition perfectly liquid in that it can be sold at a perfectly certain dollar value at any time, without incurring costs. At the other end of the spectrum, such assets as real estate are relatively illiquid, in part because selling them may take a long timt and involve substantial brokerage costs.[29] More importantly, assets such as real estate are illiquid because their prices fluctuate substan-

27 There are several operational problems with imposing this regulatory moat. For example, all assets with a secondary market could be converted to cash within one day. It would be difficult, as well as beyond the authority of the Federal Reserve, to impose reserve requirements on all such assets.

28 See J. R. Hicks, "Liquidity," *Economic* Journal, Vol. 72, No. 288, December 1962, p. 787.

29 Real estate is actually not the best example of an asset to use in contradistinction to currency. Human wealth is probably the least liquid form of asset.

tially, meaning that one cannot be certain of the price at which these assets can be sold in the future. Nevertheless, real estate has some degree of liquidity as do all other forms of wealth. With assets ranked according to their liquidity, it would be clear that, in this respect, assets used as a medium of exchange do not differ from other assets in kind but only in degree.

The liquidity of an asset depends on several factors, including the existence of an active secondary market. However, the factor most often stressed as determining the liquidity of a financial asset is its term to maturity. A long-term financial asset, such as a bond, is less liquid than a short-term asset that is similar in other respects, because its price fluctuates more with changes in interest rates.[30] As a result, long-term assets are generally considered less liquid than short-term assets.

The concept of liquidity and the importance of the distinction between long-term assets and short-term assets were central to the monetary theory of John Maynard Keynes.[31] According to Keynes, the demand for money results from the fundamental desire for liquidity and thus need not be limited to the need for financing current purchases.[32] Instead, the transactions motive for holding money must be supplemented by the precautionary and speculative motives to understand the total demand for money.

The precautionary motive results from uncertainty. It arises not from the need to finance perfectly anticipated expenditures in the near future, as does the transactions motive, but from the prospective need to finance an uncertain amount of expenditures at some unknown time. In addition, Keynes identified a speculative motive for holding money. He saw this motive as related to the difference between long-term and short-term assets. Expectation of an increase in interest rates would lead individuals to prefer short-term assets to long-term assets, because a decline in the prices of bonds and similar assets would accompany a prospective rise in interest rates. Because of its emphasis on the distinction between short-term and long-term assets and on the importance of liquidity, Keynes' monetary theory is called the liquidity preference theory.

Measuring money under the liquidity approach

A narrow monetary aggregate such as M1 is in many respects inadequate to measure money under the liquidity approach. Indeed, none of the current empirical measures of money is a close counterpart to the theoretical concept of liquidity. The broader M2 and M3 aggregates used in policy implementation include money market mutual fund shares, time deposits, repurchase agreements, and other very close substitutes for M1 assets but exclude some other liquid assets such as Treasury bills. Although the Federal Reserve collects data on a broader liquidity measure, L, this aggregate has never been used directly in the conduct of monetary policy, in part because of data limitations.

Even if the data availability problems associated with very broad aggregates could be overcome, however, these aggregates might not prove to be useful as intermediate policy targets due to the inadequacy of conventional methods for constructing financial aggregates. The theoretical concept of liquidity implies gradations in the degree of liquidity per dollar for various assets. The traditional method of constructing aggregates, however, is to include the

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30 Thomas D. Simpson, *Money, Banking, and Economic Analysis* (Englewood Cliffs, *N.J.:* Prentice-Hall, Inc., 1981), p. 128.

31 See Hicks, "Liquidity...," p. 788.

32 John Maynard Keynes, *The General Theory of Employment. Interest, and Money* (New York: Harcourt, Brace, and World, Inc., 1964), p. 194.

entire dollar value held in some assets but exclude the entire amount held in other assets. This "all-or-nothing" method of constructing empirical measures is appropriate, provided the corresponding approach to the definition of money implies qualitative differences between assets, as in the case of the transactions approach. However, traditional methods may be inappropriate for constructing empirical monetary measures that correspond closely to the liquidity theory of money, which implies that differences among assets are a matter of degree rather than kind. Ideally, the method of constructing empirical measures of liquidity would reflect the assumption that there are not discrete breaks along the continuum of assets.

A weighted average method for constructing monetary aggregates would most nearly conform to the liquidity approach to the definition of money. As described by Milton Friedman and Anna J. Schwartz, the weighted average method

> consists of regarding assets as a joint product having different degrees of 'moneyness,' and defining the quantity of money as the weighted sum of the aggregate value of all assets, the weights for individuals assets varying from zero unity with a weight of unity assigned to that asset or assets regarded as having the largest quantity of 'moneyness' per dollar of aggregate value. The procedure we have followed [that is, the conventional method] implies that all weights are either zero or unity."

33 Milton Friedman and Anna J. Schwartz, ***Monetary Statistics of the United States*** (New York: National Bureau of Economic Research. 1970). p. 151.

Such a procedure would be ideal for constructing empirical counterparts to the liquidity approach for defining money if there were a reliable empirical method for estimating weights that corresponded to the degree of liquidity of each asset. Several methods have been proposed, but none seems to be entirely satisfactory.[34] Despite their imperfections, however, one of these methods may become increasingly attractive for constructing monetary measures used in policy implementation if the deterioration in the relationship between M1 and ultimate policy goals becomes so severe that the transactions approach to defining money must be abandoned altogether. In this situation, a weighted average aggregate corresponding to the liquidity approach for defining money may become the best available measure for use in policy implementation."

Summary and conclusions

The transactions approach to defining money and the correspondingly narrow M1 monetary measure it implies have predominated in both economic research and policy implementation

34 An example of these methods is described in William Barnett, Paul Spindt, and Edward Offenbacher, "Empirical Properties of Divisia and Simple Sum Monetary Aggregates," Conference Paper No. 122, National Bureau of Economic Research Inc., August 1981. For a different method, see V. Karuppan Chetty, "On Measuring the Nearness of Near-Moneys," ***American Economic Review,*** Vol. 59, No. 3, June 1969, pp. 270-81.

35 The controllability of a weighted average aggregate is subject to question. It has been contended, however, that the problem is not insurmountable. See Paul A. Spindt, "A Multiplier Model for Controlling Divisia Monetary Aggregates," Federal Reserve Board of Governors, Division of Research and Statistics, Special Studies Paper No. 171, July 1982. To avoid control problems, a weighted average aggregate might be more useful as an information variable than an intermediate policy target. For a discussion of the use of information variables, see J. H. Kareken, T. Muench, and N Wallace, "Optimal Open Market Strategy: Tl U of Inf Vi i ic ic ***Review,*** Vol. 63, No. 1, March, 1973.

for the past several years. However, the introduction of NOW's and Super NOW's has cast doubt on the usefulness of a transactions approach to defining money. Interest on transactions deposits may lead to consolidation of balances held purely for transactions purposes with balances held for very different purposes. If so, the-close relationship between M1 and ultimate . policy goals would be weakened, thereby reducing the efficacy of using M1 as an intermediate target of monetary policy.

The liquidity approach to defining money may be preferable to the transactions approach in the emerging financial environment. Unlike the transactions approach, the liquidity approach assumes that assets used as a media of exchange are not qualitatively distinct from other assets. This assumption seems increasingly realistic, given the introduction of new accounts, such as NOW's and Super NOW's, that can be used as a means of payment but also provide interest income. If the liquidity approach to defining money becomes widely accepted, a reappraisal of conventional methods for constructing empirical monetary measures may also be required. A weighted average of a wide variety of assets rather than the traditional simple sum of a narrow range of assets seems most likely to yield a monetary'measure'that is useful for monetary policy purposes.