How the Fed Defines and Measures Money

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"Money Supply Drops $3 Billion, Sends Stocks and Bonds Higher." "Market Drops on Fears of a July Money Bulge." Headlines like these appear weekly in the financial press. They reflect a preoccupation with money that stems from the fact that the policy strategy of the Federal Reserve is to control the money supply, to control it so that the economy has the amount estimated to be necessary for the achievement of the nation's goals for output and prices. Just how well the Fed keeps the money supply on target has important implications for the economy—not only for production and prices, but also for profits, stock prices, and interest rates. It is therefore understandable why financial markets and the press show a vital interest in money, with whether it is growing too rapidly, too slowly, or about in line with Fed intentions.

This concern is almost exclusively with how money behaves, not with what money is. Yet this last question is critical to the Fed. There can be no control without a quantity to control, no quantity without a measurement process, no measurement without a definition that identifies the assets to be quantified, and no definition without a prior idea or concept of what it is that a definition should seek to identify. These are the essentials that are preliminary to any control policy.

The purpose of this article is to take a closer look at these essentials. What is the money the Fed attempts to control? What is it in concept, definition, and measurement? Answering these questions can bring out some of the complexities and difficulties that are encountered in obtaining a quantity to control.

Defining Money

Defining money, which is the task of identifying the real world assets held by the public that are to be called *money*, requires a prior idea or concept of what money is. There are at present two leading concepts, a duality that reflects a lack of agreement among economists on the essential, distinguishing characteristics of the assets to be classified as money for purposes of analyzing and formulating monetary policy.[1] The more restrictive of these concepts is that money consists of those assets held by the public that are generally acceptable in payment of goods and services. This concept focuses on money's role as a *medium of exchange* and is probably the concept that most economists prefer.

Some economists, however, suggest that money has another role—to act as a temporary abode of purchasing power or *store of value*. The main proponents of this view, Friedman and Schwartz, note that a money economy is distinguished from a barter system by the existence of a medium of exchange which permits the sale of one commodity to be separated from the purchase of another. They point out that, during the time between a sale and a purchase, the seller does not always have to retain the sales

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[1] A third view is that money consists of the noninterest-bearing liabilities of the monetary authority that can be used to settle debts. In the U.S. economy, these liabilities are the currency issued by the Federal Reserve and the U.S. Treasury and the deposits held by depository institutions at the Fed. Since both items—currency and deposits at the Fed—can be used by depository institutions to satisfy their legal reserve requirements, this concept and its associated definition and quantitative measure are often referred to as *high-powered* or *base money*. Discussion of it is omitted from this article because it does not currently serve as an intermediate monetary target in the Fed's policy strategy.

proceeds in the form of the medium of exchange; other financial assets, not themselves media of exchange, may be available as alternative means of storing purchasing power. If so, and if these other assets are considered by the public to be close substitutes for the medium of exchange, then, according to this view, the relevant variable for monetary policy includes both the medium of exchange and these substitutes.[2] If close substitutes do not exist, then the appropriate total would simply be the medium of exchange. (See Friedman and Schwartz 1970, pp. 89–90, 106–107.)

In practice, of course, these two concepts of money could amount to the same thing. That is, the assets that function as media of exchange could be the public's only assets that serve as temporary stores of purchasing power. But this isn't true in the complicated U.S. financial system. The Fed, therefore, tries to identify which existing financial assets held by the public correspond to each of these two concepts.

As yet, the Fed has no magic formula for doing this. In determining whether an asset serves as a medium of exchange or a temporary store of value, consideration is given to both direct and indirect evidence. The direct evidence includes qualitative information on the character and use of financial assets and quantitative data on the dollar amounts outstanding, the distributions of these amounts among different types of holders, such as individuals and firms, and the frequency with which the assets may be employed in carrying out transactions.

The indirect evidence the Fed examines consists primarily of measures of correlation between various groups of assets that are candidates for the title, *money,* and various nonmonetary economic variables that, according to dominant monetary theories, ought to be correlated with money. The Fed has looked at several tests of this kind, including those that search over several candidates for the one definition of money that has the highest correlation with some measure of national income, like gross national product, and those that attempt to determine which definition is most highly correlated with a set of variables (including interest rates and income) used to predict and explain the public's demand for money. Even with this direct and indirect evidence, however, the Fed's assessment of the role of any particular asset usually requires a substantial use of judgment.[3]

In its attempts at matching financial assets and money concepts, the Fed also must contend with the practical matter of data availability. If casual observation suggests the importance of a particular financial asset for inclusion in, say, the medium of exchange definition of money, the final decision will in part depend on the availability of accurate and comprehensive information on the amount of the asset outstanding. If data are not available, the Fed weighs the cost of collecting them and the relation of this cost to the significance of the item.

The end products of these definitional efforts can be said to answer two questions. What financial assets held by the public have the characteristics called for by the theoretical concepts? And what is meant by the term, *public?* This last question might appear to have a self-evident answer, namely, U.S. residents. But this is not the case. Before this point is considered in more detail, the question of assets is taken up.

Assets That Match Concepts

With the two basic concepts discussed earlier as starting points, the Fed defines and then measures three money supplies, labeled *M1, M2,* and *M3.* The first is the empirical counterpart to the concept of money as a medium of exchange, while the other two are representatives of money as a temporary store of purchasing power.

☐ Medium of Exchange: M1

Prior to 1980, the Fed defined M1 to be the sum of currency and commercial bank demand deposits held by the public. At least through the early 1970s, there was little doubt within the Federal Reserve System or most of the economics profession that this was a fitting definition. The main reservation of some observers concerned the treatment of traveler's checks: the amounts issued by commercial banks were reported to the Fed as demand deposits and thus were counted in M1, as it was generally agreed they should be, but the amounts of traveler's checks issued by nonbanks such as American Express were not counted because data on them were not available.

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[2]The term *close substitute* refers, in this context, to an asset that either matures quickly into an exchange medium or can be converted to an exchange medium at (or close to) face value with little effort and cost.

[3]The correlation tests described above make use of time series data. In order that such tests provide reliable information about definitional questions, it is necessary that the most recent data period be homogeneous, that is, that the period be one in which no significant changes have taken place in the menu and character of financial assets and services. When this condition is violated, as it has been in the U.S. financial system for the past several years, the results of such tests must be viewed with more than ordinary scepticism. This in turn means that in matters of definition more reliance must be placed on the direct evidence concerning use of assets by the public.

The Fed's confidence in this definition began to break down in the mid-1970s when the financial system began to undergo significant and fairly persistent change. Particularly relevant for M1 was the development of new types of interest-earning savings deposits on which checks could be written. These included negotiable order of withdrawal (NOW) accounts and automatic transfer savings (ATS) accounts at both banks and thrift institutions and share draft balances at credit unions.[4] Hereafter, this group of assets is referred to as *other checkable deposits* (OCDs).[5] In mid-1975, OCDs totaled only $700 million, considerably less than 1 percent of the amount of commercial bank demand deposits held by the public. But by mid-1979, the total had expanded to $14.7 billion, almost 6 percent of demand deposits. This remarkable growth attested to the apparent attractiveness of OCDs and suggested that they would continue to gain in popularity and further outdate the existing definition of M1.

In response to the changing financial system, the Fed in early 1979 published a proposal for redefining the monetary aggregates, asked for written comments from interested parties, and held seminars with recognized experts to solicit their views. (See Simpson 1979.) With respect to the medium of exchange, the proposal called for adding OCDs to old M1 and subtracting commercial bank demand deposits held by foreign commercial banks and official institutions. (This last item will be discussed later.) Those responding to the Fed's proposal generally agreed on these changes. However, some thought the proposal for M1 might be too narrow. In particular, the suggestion was made that M1 include shares in money market mutual funds (MMMFs), since shareholders generally have or can sign up for the option of writing checks on their accounts in amounts above specified minimums (usually $500). Also put up as candidates for M1 were overnight repurchase agreements (RPs) issued by commercial banks and overnight Eurodollar deposits.[6] These items do not serve as media of exchange, but their extremely short maturity, less than 24 hours, convinced some observers (and still does) that they are in practical effect the same as, and should be counted with, demand deposits. (See Garcia and Pak 1979 and Hart 1980, pp. 89–92.)

On the basis of these views as well as substantial work by the Federal Reserve Board staff, the Fed announced new definitions in early 1980. (See Simpson 1980.) OCDs were included in M1 because of their role as media of exchange. (This is a role, it should be noted, that has grown substantially since 1980; OCDs now total about $87 billion, equal to 38 percent of commercial bank demand deposits held by the public.)[7] The other suggested items were not included in M1, because they did not appear to resemble media of exchange closely enough. The Fed omitted shares in MMMFs because their turnover rate, a measure of their activity, was about the same as savings deposits' and far short of the turnover rate exhibited by demand deposits. RPs were left out because the evidence on how large organizations used them in cash management programs suggested that they were comparable to other short-term financial assets rather than the equivalent of demand deposits. Finally, overnight Eurodollar deposits were excluded because of their similarity in function to RPs. The Fed also indicated that it would shortly be able to add traveler's checks issued by nonbanking organizations, which it did in mid-1981. As a result, M1 now includes currency, demand deposits at commercial banks, OCDs at all depositories, and traveler's checks of nonbanking firms.

☐ *Temporary Stores of Value: M2 and M3*

The task of finding the empirical counterpart to money as a temporary abode of purchasing power is that of drawing a line in the long continuum of financial assets, a line between those that are media of exchange and close substitutes for media and those that are not. The presumption is that such a line exists and can be found, but the difficulties of acting on this presumption, drawing a line between money and nonmoney, have always been formidable, whether reliance has been placed on experience and judgment or on statistical tests. Furthermore, as already noted, the difficulties have been compounded in recent years by the extent of change in the financial system,

[4]ATS accounts are savings accounts from which funds in the necessary amounts are automatically transferred to associated checking accounts in order to cover checks presented for payment. Thus, ATS accounts are not technically media of exchange, since checks are not drawn against them, but they in effect serve this function because of the automatic transfer feature.

[5]OCDs also include a small amount of demand deposits at thrift institutions located in those few states that permit thrifts to offer such deposits.

[6]Repurchase agreements are arrangements in which one party sells assets to a second party and agrees to buy them back at some specified price and future date. Depositories sell securities from their portfolios under such arrangements as a means of borrowing funds. Eurodollar deposits are U.S. dollar–denominated deposits issued by banking organizations located outside the United States.

[7]One of the primary factors accounting for this expansion was the 1981 introduction of NOW accounts on a national scale. Prior to this time, NOW accounts had only been legal in New York, New Jersey, and the New England states. The Depository Institutions Deregulation and Monetary Control Act of 1980 extended to all depository institutions the authority to offer NOW accounts starting December 31, 1980.

which has altered the continuum and made the drawing of any line a more tentative undertaking.

In recognition of the complexity of the problem, the Fed has two definitions of money as a temporary store of value, M2 and M3. Like M1, they were redefined in 1980 to take account of the changed character of financial assets.[8] The Fed's current definition of M2 starts with M1 and adds the following fixed-price assets, the first three of which were among the rejected candidates for M1:

- Overnight RPs issued by commercial banks.
- Overnight Eurodollar deposits issued by Caribbean branches of member banks to U.S. residents.
- Shares in general purpose and broker/dealer MMMFs.
- Savings deposits at all depositories other than NOW, ATS, and share draft accounts included in M1.

  Though depository institutions have the right to require prior notice of withdrawal of not less than 14 days, as a general rule this right is not exercised. As a result, savings deposits can be withdrawn at any time, often with a telephone call.
- Small time deposits (less than $100,000) at all depositories.

  This category includes standard types of time deposits, such as the six-month and recently authorized three-month money market certificates. Time deposits can only be withdrawn before maturity with a substantial penalty. Also included are small RPs other than those already counted in the overnight category: they are termed *retail RPs*, are less than $100,000, and have less than 90 days to maturity.

The Fed considers these assets to be close substitutes for money: either they have short maturities and thus mature quickly into cash, as do RPs, overnight Eurodollar deposits, and small time deposits, or they can with little or no cost be converted into cash at the holder's option, as can shares in money funds and savings deposits.

As an alternative line between money and nonmoney, the Fed has an even broader definition, M3. It consists of M2 plus assets that are highly liquid in the sense just described but far more restricted in use because of size or convention; that is, these assets are used primarily by large organizations, not individuals. The added assets include

- Large time deposits ($100,000 and over) at all depositories.
- RPs $100,000 and over and more than one day in maturity at all depositories.

  They are designated *term RPs*.
- Shares in MMMFs that only serve other financial institutions, not individuals.[9]

The Public

Now that money definitions have been described in terms of assets, the discussion can turn to the question raised earlier: Who are the holders of the assets just listed that are counted as members of the public?

This question arises largely because U.S. monetary assets can be held by nonresidents as well as residents of the United States. How should nonresident holdings be treated? In general, the Fed lets them remain in U.S. monetary statistics if they are held primarily for the purpose of making purchases of U.S. goods and services and excludes them otherwise. But this principle cannot always be applied.

Consider U.S. currency. Casual observation indicates that it is held (and often circulated) in places as widely separated as Mexico and Poland. Just how much is held by nonresidents is not known; there are no reliable estimates. As a result, all U.S. currency is counted as a component of U.S. money, even though some part is held outside the country and may have no relation to U.S. economic activity.

What of other U.S. monetary assets that can be held by nonresidents? The Fed excludes amounts owned by foreign commercial banks and foreign official institutions from all money definitions because they are largely held as international reserves or for clearing and financing foreign

[8]In addition to currency and commercial bank demand deposits included in old M1, old M2 included time and savings deposits at commercial banks less negotiable certificates of deposits at large banks. Old M3 was defined as old M2 plus time and savings deposits at thrifts. Notice that the definitions of old M2 and M3 are based on a distinction between type of issuing institution; that is, time and savings deposits issued by banks are considered different from similar types of deposits issued by thrifts. This distinction was eliminated in the 1980 redefinition. In the current M2, all savings and small time deposits are included, whether issued by banks or thrifts (Simpson 1980).

[9]One important attribute of the assets listed in the three definitions is that, as a general rule, they are all issued by financial institutions located in the United States. The one exception is overnight Eurodollar deposits at Caribbean branches of member banks. This item was added at the time of the 1980 redefinitions, as noted previously. All other Eurodollar deposits owned by U.S. residents were excluded from serious consideration at that time because of a lack of timeliness in the availability of appropriate data. However, the dollar volume of these deposits has grown rapidly in recent years, raising again the issue of whether they belong in some definition of U.S. money. The Board staff is now attempting to reduce the lag with which Eurodollar information is received so that the question of their incorporation can be reconsidered. If and when they are added, the assets included in U.S. money definitions will take a second step beyond the range of domestically issued assets.

exchange operations, not for purchasing U.S. goods and services. However, monetary assets held by all other nonresidents are counted in U.S. money definitions because evidence indicates they are related to U.S. activity.[10]

Measuring Money

It is one thing to give definitions and quite another to provide quantitative measures of M1 and the other monetary aggregates. To go from one to the other, the Fed undertakes a multistage process of collecting and processing data. The basic data come from the institutions that issue money. The balance sheet information they supply goes through several processing steps. It is first carefully reviewed for errors. Next, since the basic data from some reporters are not complete, statistical procedures are used to fill the gaps. Then adjustments are made to eliminate double-counting. The products of these steps are the Fed's money supply measurements or, it might be more appropriate to say, estimates. Finally, the Fed seasonally adjusts these estimates so that users of money supply statistics have both adjusted and unadjusted figures with which to work. Seasonal adjustment has recently been discussed in detail elsewhere (Pierce and Cleveland 1981), so will not be taken up here.

Collecting Data

The basic data for measuring the monetary aggregates come to the Fed from issuing institutions located in the United States—from the Fed itself, the U.S. Treasury, bank and thrift depositories, money market mutual funds, and nonbank issuers of traveler's checks. The task of recording the necessary information, on the one side, and collecting it, on the other, entails an enormous effort by both financial institutions and the Fed. An appreciation of the size of the job can perhaps be glimpsed by noting some of its dimensions.

At present, there are about 10 nonbank issuers of traveler's checks; they furnish end-of-the-month data to the Fed on their outstanding checks. Money market mutual funds, which number about 220, report their end-of-the-week outstanding shares to the Investment Company Institute, the industry trade organization that in turn provides data to the Fed.

These numbers are dwarfed by the number of depositories that provide data: about 40,400. Of these, 17,800 report to the Fed indirectly. They are depositories which are not members of the Federal Reserve System and which are exempt from Fed requirements on filing reports and maintaining reserves because of their small size; in total, they account for less than one-half a percent of M2-type deposits. They do submit quarterly or semiannual balance sheet figures to their chartering agencies, and this information is obtained by the Fed, though sometimes with a considerable lag. The remaining and largest number of depositories, some 22,600, supply data directly to the Fed. Their *report of deposits,* which provides the bulk of the information needed for money measurement, gives information on 13 types of depository liabilities and 3 classes of assets. The reporting burden is heaviest for the largest organizations. Weekly reporters number 14,900 and supply seven days of balance sheet data with each report. They are institutions with $15 million or more in total deposits and smaller institutions that either elect to supply data on a weekly basis or are required to do so because of their involvement in international banking. Quarterly reporters are all other depositories. They number 7,700 and hold about 3 percent of M2-type deposits. They are divided into three panels of approximately equal size, with one panel reporting each month. They provide seven days of data for the third week of the month in which they report.

Correcting and Completing Data

All information used in measuring the monetary aggregates is carefully reviewed to eliminate errors. In the case of the depositories that report directly to the Fed, their data are edited twice, first at the regional Federal Reserve Banks, where the reporting forms are initially received, then at the Federal Reserve Board in Washington, D.C., where final processing takes place. Report data are examined for arithmetic accuracy, then searched for what appear to be implausibly large day-to-day and week-to-week changes. All outliers are checked with the reporting institutions. Report data are also examined for consistency with information submitted on other report forms.

The next step in processing is estimation. It is undertaken because the data obtained by the Fed are not complete; that is, some data do not have a daily frequency or do not cover all the relevant institutions.

The bulk of the information reported to the Fed is consecutive-day data, the type necessary to construct money measures as averages of daily figures for the stan-

[10]The Fed's treatment of monetary assets other than currency held by nonresidents is based on work done by the Advisory Committee on Monetary Statistics (1976, pp. 4, 15–18).

dard periods of a week or a month. When daily data aren't available, various interpolation and projection techniques are used by the Fed to estimate the missing data. For example, quarterly reporting depositories supply only one week of data per quarter. The interpolation procedure used to estimate their balance sheet figures for the twelve weeks between any two weeks of reported data makes use of information received from a limited group of small depositories that do supply weekly reports on their daily data. The procedure assumes that the daily and weekly behavioral pattern of deposits at this group is the same as that at quarterly reporters. Further, in order to obtain information on quarterly reporters between the time of their last report and the time of their next, the same procedure is employed to project their weekly and monthly deposit levels. In this way, the Fed can promptly release initial money supply estimates for periods that have just closed. When actual data are received, revised estimates are published.

The need for estimation also arises when information comes from only a subgroup rather than all relevant institutions. In terms of dollar values involved, the only significant example is RPs. Overnight and retail RPs are elements of M2, while term RPs of $100,000 and over go into M3. Since data on RPs are not supplied on the report of deposits referred to earlier, the Fed relies on a sample of depositories. Their data are statistically blown up to represent RPs at all institutions, the blow-up factors determined from studies of the more comprehensive data obtainable from other reports and special surveys.

Eliminating Double-Counting

The last processing step involves the adjustment of reported data to eliminate bank float and exclude the monetary asset holdings of issuing organizations. Both adjustments are made to prevent double-counting and thus make the measurement process more accurate.[11]

☐ *Bank Float*

The adjustment for bank float is made in the construction of M1. Since M1 is a basic component of M2 and M3, the adjustment has an indirect effect on these broader aggregates. It is made because deposited checks are immediately credited to depositors' checking accounts but often are not promptly collected from the checking acounts on which they are drawn. To ignore this timing lag between crediting and collecting would lead to double-counting and a sizable overestimate of M1.

The correct adjustment would be to subtract from deposit data the dollar volume of checks drawn on M1-type accounts that have not been collected. But information on this ideal concept of bank float is not available. What the Fed subtracts is an approximation derived from CIPC and FR float. *CIPC,* or cash items in the process of collection, is an asset accounting category on depository balance sheets that depositories debit when they send a check or other item to be collected to either a correspondent bank or the Federal Reserve. *FR float* is derived from the Fed's balance sheet. It represents the dollar volume of checks and other items which have not as yet been collected but have, because of the Fed's payment schedule, been credited to the accounts of the sending depositories (and have been taken out of CIPC at these depositories). The sum of these two items is the Fed's estimate of bank float.[12]

This estimate has well-known imperfections, however. CIPC contains items that are not drawn against M1-type checking deposits, items such as food stamps, bond coupons, and checks drawn on the U.S. Treasury. Their inclusion overloads CIPC, so that subtracting it as part of bank float takes too much out of M1. This is sometimes referred to as the *cash-items* bias. But a second imperfection works in the opposite direction. Some banks, when sending checks to their correspondents for collection, debit the asset account *due from other banks* rather than CIPC, with the result that CIPC fails to contain items that it should contain. Thus, subtracting CIPC takes too little out of M1. This is referred to as the *due-from* bias in M1.

The importance of these imperfections is not precisely known because little evidence exists on the contents of CIPC and due-from accounts. Based on indirect evidence, however, it is generally believed that, though the two biases are quite limited in size, the due-from bias exceeds the cash-items bias. This leads to a small overestimate of M1, but an overestimate whose relative size does not change significantly over time to distort calculated monthly, quarterly, or yearly growth rates.[13]

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[11] Reported data are also adjusted to eliminate the holdings of foreign official institutions and commercial banks. That is, their holdings of deposits, repurchase agreements issued by depository institutions, and other monetary assets that can be specifically identified are excluded from all money measures. The rationale for this adjustment was discussed earlier.

[12] The Fed does not publish its estimate of float. Some idea of its magnitude can be gained by noting that on June 30, 1982, CIPC at all commercial banking institutions in the United States amounted to $68.5 billion while FR float totaled $2.5 billion. Since the sum of the two fails to incorporate any information on CIPC at thrift institutions, it is smaller than the estimate of the float the Fed deducts in measuring M1.

[13] For a discussion and analysis of these biases, see Nissen and Beck 1978.

This view was recently challenged in an attempt to explain the strong pickup in M1 growth that occurred between October 1981 and January 1982. Over this period, M1 expanded at a 14.5 percent annual rate, well above the rate either expected or desired by the Fed. Various explanations were put forward and considerable efforts made at the Board and individual Federal Reserve Banks to find the most plausible. One thesis was that the due-from bias had increased relative to the cash-items bias and, in so doing, had given rise to progressively larger overestimation errors in M1, which in turn had resulted in an upward bias in the calculated growth rate of M1. The basis for this thesis was an observation and a conjecture. The observation was that banks had been clearing a smaller proportion of their checks through the Federal Reserve, very likely because of the introduction of Fed pricing in mid-1981, and a larger proportion through local clearinghouses and the correspondent banking system. The conjecture was that this change in clearing patterns had been accompanied by a step-up in debits to due-from accounts, resulting in an increase in the due-from bias. The Board staff examined this possibility and found that the ratio of dollar amounts in due-from accounts to dollar amounts in CIPC accounts had not risen during 1981 and early 1982. This suggested that the two biases had not changed relative to one another and had not been the cause of the step-up in M1 growth.

☐ *Holdings of Issuers*

Adjustments are also made to eliminate the monetary holdings of the issuers of monetary liabilities and, by elimination, to get more accurate measures of the amounts held by the public. Consider the case of commercial banks. They hold cash in their vaults and demand deposits at other banks in order to service the checking accounts of their customers. To include in M1 both the customers' checking accounts and the interbank demand deposits specifically held to service these accounts would be to double-count. A similar error would be involved if the currency banks hold to provide cash to their checking customers were included as part of the public's holdings of currency. The general principle: In measuring a particular M, exclude from it those amounts held by the issuers to service their M-type liabilities.

For M1, practice deviates somewhat from the ideal in the treatment of commercial banks, though not in the treatment of thrift institutions. For thrifts, the adjustment involves the exclusion from M1 of a proportion of their holdings of vault cash and demand deposits at commercial banks, the proportion determined by the ratio of their OCD accounts to the sum of their OCD and savings accounts. For commercial banks, the adjustment entails the subtraction of all vault cash and all commercial bank deposits held at other commercial banks, even though some portion of these assets, a fairly small proportion, is employed to service savings accounts, time deposits, and nondeposit liabilities. This way of handling the commercial bank adjustment has a long history in the construction of M1 estimates, and its continuation seems explainable more in terms of this tradition than anything else. In any event, it appears to result in an underestimate of M1. Just how much of an underestimate is not easy to judge, but most observers agree that the understatement changes only slowly and is not a source of bias in short-run M1 growth rates (Advisory Committee on Monetary Statistics 1976, p. 14).

The differences between the ideal and actual adjustments at the M2 and M3 levels are relatively unimportant and are dictated by lack of data. Note that the underestimate of M1 that occurs because of the subtraction of all commercial bank holdings of vault cash and deposits at other banks does not give rise to underestimates of M2 and M3, since for these aggregates the full subtraction is approximately correct.

Final Products

The adjustments the Fed makes to each of the monetary aggregates are summarized in Tables 1 and 2. Several points on Table 1 deserve comment. Traveler's checks issued by nonbanks are accepted and collected by depositories, but are not held to service their customers' deposits, so no adjustment for this item is required. Traveler's checks held by foreign official institutions and commercial banks are assumed to be insignificant in size. OCDs are not held by the monetary authorities, depositories, or foreign official institutions and commercial banks; so no adjustments are needed. Finally, while the float adjustment is split between demand deposits and OCDs, the sum of the two components is an estimate of the volume of checks that have been credited but not yet collected.

Concluding Note

The money that the Fed targets in its strategy to achieve national goals for prices and output is not something simple, definite, and accurate to the last dollar. There are three monetary aggregates that serve as targets. They are based on the two underlying concepts of money as a medium of exchange and money as a temporary store of

Table 1

The Fed's Measure of Money as a Medium of Exchange: M1

June 1982*
(averages of daily figures, not seasonally adjusted)

▶ Currency outstanding at the Federal Reserve and the U.S. Treasury		
LESS:	*Holdings of Issuers* All vault cash held by the Federal Reserve, the U.S. Treasury, and commercial banks Estimate of vault cash held by thrifts to service OCDs	
EQUALS:	Currency component of M1	$128.3 billion
▶ Demand deposits at commercial banks		
LESS:	*Bank Float* Cash items in the process of collection at commercial banks Federal Reserve float	
	Holdings of Issuers Demand deposits due to the U.S. Treasury and commercial banks Estimate of demand deposits due to thrifts used to service OCDs	
	Holdings of Nonresidents Demand deposits due to foreign commercial banks and official institutions	
EQUALS:	Demand deposit component of M1	$230.1 billion
▶ OCDs at all depositories		
LESS:	*Bank Float* Cash items in the process of collection at thrifts	
EQUALS:	OCD component of M1	$ 87.0 billion
▶ Traveler's checks of nonbank issuers		$ 4.7 billion
	TOTAL M1	$450.0 billion**

*Estimates of July 9, 1982
**Items do not add to total due to rounding.

purchasing power. They depend on definitions that are imperfect embodiments of these concepts, imperfect because of both data restrictions and the complexity of an advanced financial system that makes classifying monetary assets into different categories a task marked with uncertainties. And they depend on a measurement process that produces high quality estimates, but not exact assessments.

There is a final complication to be noted. Definitions depend on the spectrum of financial assets and services available to economic agents, and when the spectrum changes, existing definitions often become outdated. In recent years, the U.S. financial system has experienced some very significant modifications as the result of a potent mixture of elements: most particularly, market rates of interest that have been generally higher (sometimes very much higher) than the maximum rates payable by law and regulation on deposits; the development and application of computer-telecommunications technology, which has lowered the real costs of exchanging and storing informa-

Table 2

The Fed's Measures of Money as a Temporary Store of Value: M2 and M3

June 1982*
(averages of daily figures, not seasonally adjusted)

		Billions
▶ M1 ($450 billion from Table 1)		
LESS:	Estimate of vault cash and demand deposits held by thrifts to service time and savings deposits	
EQUALS:	M1 component of M2	$444.0
▶ PLUS:	*The Following Assets, Excluding Holdings of Issuers and Nonresidents***	
	Overnight RPs issued by commercial banks	35.7
	Overnight Eurodollars issued by Caribbean branches of Federal Reserve member banks to U.S. nonbank residents	7.0
	Shares outstanding at general purpose and broker/dealer MMMFs	168.6
	Savings deposits at all depositories	347.8
	Small time deposits at all depositories	901.9
	TOTAL M2	$1,905.0
▶ M2 ($1,905 billion from previous line)		
LESS:	Overnight RPs held by institution-only MMMFs	
EQUALS:	M2 component of M3	$1,899.7
▶ PLUS:	*The Following Assets, Excluding Holdings of Issuers and Nonresidents***	
	Large time deposits at all depositories	323.9
	Term RPs, excluding retail RPs, at all depositories	31.0
	Shares outstanding at institution-only MMMFs	33.7
	TOTAL M3	$2,288.3

*Estimates of July 9, 1982

**Issuers of M2 include U.S. monetary authorities, depositories, and general purpose and broker/dealer MMMFs. Issuers of M3 include issuers of M2 plus institution-only MMMFs. For both M2 and M3, nonresidents include foreign official institutions and foreign commercial banks.

tion; and legal and regulatory changes that have given depository institutions greater freedom to compete for customers. These factors were primarily responsible for the Fed's redefinition of the monetary aggregates in 1980. They remain in force at the present time. Thus, the definitions discussed above may not prove to be the appropriate ones for the financial world of 1984.

The recent development of sweep accounts provides emphasis to this warning. Sweep accounts are checkable deposits with automatic management features designed to give deposit holders market rates of interest on their surplus funds. Accounts differ in details, but a typical one might work in the following way. When the amount on deposit rises above some set limit—say, $2,600—the

excess is automatically swept out at the close of business and invested in a money market fund or RP. And when cash withdrawals and check payments reduce the deposit account below some limit—say, $2,400—funds are automatically drawn back in from these market investments. Sweep accounts were relatively unknown in 1981, but have now started to spread. One task for the Fed will be to keep tabs on how far they go. If they gain in popularity, another will be to consider their current definitional treatment. Checkable deposits are in M1, and RPs and money market funds for individuals are in M2. Should this split continue? Should the investment accounts associated with sweep accounts be reclassified into M1, since they in effect serve as the source of funds for withdrawals and check payments, either immediately or with a short lag? Or should they continue to be classified in M2, since technically they are not media of exchange? These questions may arrive well before 1984.

References

Advisory Committee on Monetary Statistics. 1976. *Improving the monetary aggregates: report of the Advisory Committee on Monetary Statistics.* Washington, D.C.: Board of Governors of the Federal Reserve System.

Friedman, Milton, and Schwartz, Anna Jacobson. 1970. *Monetary statistics of the United States: estimates, sources, methods.* New York: National Bureau of Economic Research.

Garcia, Gillian, and Pak, Simon. 1979. Some clues in the case of the missing money. *American Economic Review* 69 (May): 330–34.

Hart, Albert Gailord. 1980. Regaining control over an open-ended money supply. In *Stagflation: the causes, effects, and solutions.* Special Study on Economic Change 4: 85–142. Prepared for the Joint Economic Committee, U.S. Congress, 96th Cong., 2d sess. Washington, D.C.

Nissen, Anton S., and Beck, Darwin L. 1978. An alternative method for calculating M_1. In *Improving the monetary aggregates: staff papers,* pp. 135–45. Washington, D.C.: Board of Governors of the Federal Reserve System.

Pierce, David A., and Cleveland, William P. 1981. Seasonal adjustment methods for the monetary aggregates. *Federal Reserve Bulletin* 67 (December): 875–87.

Simpson, Thomas D. 1979. A proposal for redefining the monetary aggregates. *Federal Reserve Bulletin* 65 (January): 13–42.

_____. 1980. The redefined monetary aggregates. *Federal Reserve Bulletin* 66 (February): 97–114.

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