

RPDs and Other Reserve Operating Targets

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SINCE EARLY this year the Federal Reserve has emphasized member bank reserves available for private nonbank deposits (RPDs) as its short-run operating target.¹ RPDs are a reserve aggregate, defined as total member bank reserves less reserves required against U.S. Government demand deposits and net interbank deposits. This article examines a framework in which a reserve aggregate, such as RPDs, functions as an operating target to achieve policy objectives.

U.S. monetary authorities — the Federal Reserve System and the U.S. Treasury — share in the responsibility for achieving the Government's economic stabilization objectives. These objectives, such as reducing inflation and unemployment, and encouraging a sustainable growth of output and income, are sometimes summarized in a growth rate for gross national product (GNP). From the point of view of the monetary authorities, influencing GNP is generally interpreted as being achieved through the intermediate step of influencing market interest rates or growth of the money stock. In this article we assume that policy objectives have been translated into a desired growth rate for the money stock and examine how the use of a reserve aggregate as an operating target can help the Federal Reserve achieve the desired rate of growth of the money stock.

Definition of the Money Stock

The money stock can be measured in several different ways. Most commonly, it is measured as M_1 (demand deposits plus currency in the hands of the public). Other measures include M_2 (M_1 plus time

deposits at commercial banks other than large certificates of deposit) and M_3 (M_2 plus deposits at non-bank-thrift institutions).²

In this article the M_1 measure — demand deposits and currency in the hands of the public — is used, where "public" is any person or institution other than a monetary authority or a commercial bank. This definition of public means that currency held by commercial banks, the U.S. Treasury, or Federal Reserve Banks, and demand deposits owned by the U.S. Treasury (Government deposits) or commercial banks (interbank deposits) are excluded from the money stock.

The demand deposit component of the money stock is sometimes called "private demand deposits." When this terminology is used, "private" deposits must be interpreted as including those owned by state and local governments. The term "demand deposits adjusted" is also used to refer to the demand deposit component of money, computed as demand deposits at all commercial banks other than those due to domestic commercial banks and the U.S. Government, less cash items in process of collection and Federal Reserve float, plus foreign demand balances at Federal Reserve Banks.

Sources of the Money Stock

The Role of Commercial Banks

The public's most immediate sources of money are commercial banks. The ultimate sources of money in our economy, however, are the monetary authorities — the U.S. Treasury and the Federal Reserve System.

¹"Record of Policy Actions" of the Federal Open Market Committee, *Federal Reserve Bulletin* (May 1972), p. 459.

²Time deposits due to domestic commercial banks or the U.S. Government are not included in M_2 or M_3 .

Commercial banks are very important in the money supply process because the public chooses to hold money in the form of demand deposits. When currency supplied by the monetary authorities is exchanged by the public for a demand deposit, the form of money changes. In addition, banks obtain additional reserves. In a fractional reserve banking system, which is what we have in the United States, required reserves equal only a fraction of deposits. The remainder of funds obtained with deposits may be used by banks to make loans or investments. By making loans commercial banks increase their liabilities (demand deposits) and assets (loans), and in a sense "create" money on the basis of the original money (reserves) provided by the monetary authorities. The net monetary liabilities of the monetary authorities are held either as currency in the hands of the public or as commercial bank reserves and can be viewed as the "base" for the nation's money stock.

The Role of Monetary Authorities

The capacity of the commercial banking system to create demand deposits is constrained by the total amount of reserves it has and by the ratio of required reserves to deposits. The Federal Reserve System can directly influence the money stock by both influencing the amount of reserves and changing reserve requirements.

The Board of Governors of the Federal Reserve System establishes the proportions of various types of deposits that member banks must hold either as vault cash or as deposits at Federal Reserve Banks to meet legal reserve requirements. Presently, required reserve ratios are between 12.5 and 17.5 percent on demand deposits and 3 or 5 percent on time deposits.³ The higher the required reserve ratio, the smaller the amount of demand deposits the banking system can create with any given amount of reserves.

The Federal Open Market Committee (FOMC), through decisions on Federal Reserve open market operations, has an important influence on the amount of reserves in the banking system. This Committee, composed of the Board of Governors of the Federal Reserve System and Federal Reserve Bank Presidents,

³Reserve requirements of member banks are listed in the Federal Reserve *Bulletin*. For example, see p. A 10 of the July 1972 issue.

Since reserve requirements for commercial banks currently differ with respect to their classification and amounts of deposits, shifts in deposits from reserve city banks to country banks or vice versa, from member banks to nonmember banks or vice versa, or from smaller to larger banks or vice versa, may change the ratio of required reserves to deposits for the banking system as a whole.

meets about once a month to consider economic conditions and the ways in which its actions can best serve economic goals. The decisions of the FOMC are carried out at the Trading Desk of the Federal Reserve Bank of New York. The Manager of the Trading Desk buys and sells securities on behalf of the twelve Federal Reserve Banks in accordance with the instructions of the "Directive" from the FOMC.

When the Trading Desk buys a security, it pays for it by supplying either bank reserves or currency. On the other hand, when it sells a security, payment to the Federal Reserve results in a reduction of bank reserves or currency in the hands of the public.

Reserve Aggregates as Operating Targets

We have seen that bank reserves influence the money stock and that the total amount of reserves in the banking system is strongly affected by Federal Reserve open market operations. Next we want to identify the factors that determine the relationships between changes in various measures of bank reserves, that is, various reserve aggregates, and changes in the money stock. For a reserve aggregate to function as an operating target, policymakers must be able to predict the relationship between the reserve aggregate and money with some degree of accuracy over the period in which they are attempting to control the reserve aggregate. Information about this relationship is necessary in order to *select* the appropriate path for the reserve aggregate. We must also examine the information which is necessary to *achieve* desired changes in the reserve aggregate, since paths of the reserve aggregates themselves are not under the complete control of the monetary authorities.

There are many reserve aggregates which bear definable relationships to the money stock on one side and to open market operations on the other. We will consider three: the monetary base, member bank reserves, and RPDs (member bank reserves used to support private nonbank deposits).

The Monetary Base

One reserve aggregate concept that is useful for monetary analysis is the monetary base. The base is defined as the net monetary liabilities of the Government (U.S. Treasury and the Federal Reserve System) held by commercial banks and the nonbank public. These monetary liabilities are member bank reserves and currency in the hands of the public.⁴

⁴A use of the base which is excluded from the analysis in this paper is vault cash held by nonmember banks.

The monetary base is derived from a consolidated balance sheet of the Treasury and Federal Reserve "monetary" accounts. The total amount of base outstanding at any time is principally determined by the U.S. gold stock (which has been relatively constant in recent years) and the amount of U.S. Government securities owned by the Federal Reserve System. Whenever the Federal Reserve buys securities on the open market for its own account, the monetary base increases.⁵

The amount of money the base will support is largely determined by the decisions of commercial banks, the public, and the Treasury. Each \$1 of base the public chooses to hold as currency, for example, supports only \$1 of money; whereas \$1 of base held in the banking system as reserves may support more than \$1 of demand deposits and therefore more than \$1 of money. However, if reserves are absorbed as requirements against Government deposits, interbank deposits, or time deposits, then they are not available to support expansion of private demand deposits. The amount of demand deposit money that the banking system can supply to the public with a given amount of reserves is influenced by decisions determining the relative amounts of different types of bank deposits.

A more detailed example can help explain how the behavior of commercial banks, the public, and the Treasury influences the amount of money that the base will support (see illustration). Suppose the base equals \$100 billion, \$60 billion of which is used as currency in the hands of the public and \$40 billion as bank reserves. These reserves may be used as legal reserve requirements against time deposits, private demand deposits, U.S. Government deposits, interbank deposits,⁶ or they could be held by banks as excess reserves. We can assume a certain set of reserve requirement ratios for the different types of deposits and a certain amount of each type of deposit, and compute the money stock which is consistent with the \$100 billion base. Assume banks must hold reserves equal to 5 percent of time deposits and 15 percent of

all other deposits. If the public chooses to hold \$300 billion of time deposits, this uses up or absorbs .05 x \$300 billion or \$15 billion of reserves. Now \$25 billion of reserves are available to support various types of demand deposits. If Government deposits equal \$4 billion and interbank deposits equal \$1 billion, these two types of deposits use up 0.15 x \$5 billion or \$0.75 billion of reserves. The remaining \$24.25 billion of reserves will support a maximum of approximately \$162 billion of private demand deposits.⁷ If banks choose to hold \$1 billion in excess reserves, then given our other assumptions, reserves used to support private demand deposits will equal \$23.25 billion and private demand deposits will amount to \$155 billion. In this example, the base of \$100 billion supports a money stock of \$215 billion, \$60 billion of which is currency and \$155 billion of which is private demand deposits.

A change in the composition of deposits could be expected to change the amount of money resulting from a \$100 billion base. Suppose the public decided to increase its holdings of time deposits by \$50 billion. Initially this would require a \$50 billion reduction in private demand deposits, assuming other factors do not change. Since the ratio of required reserves to time deposits is less than the ratio of required reserves to demand deposits, the shift would lower the average reserve requirement for the banking system. By making loans with reserves released in the shift of deposits, the banking system could again raise the level of demand deposits in the system. In the example, a \$50 billion contraction of demand deposits would release \$7.5 billion of reserves (0.15 x \$50 billion). The increase in time deposits would absorb \$2.5 billion of reserves (.05 x \$50 billion). The remaining \$5 billion of reserves would support \$33.33 billion of demand deposits $\left(\frac{\$5 \text{ billion}}{0.15}\right)$. One might look at it in the following way. A \$50 billion increase in time deposits would require a \$16.67 billion contraction of demand deposits, given other things do not change. Increased preference for time deposits, with no change in the amount of base, results in a decline in private demand deposits, and hence money stock.

An increase in Government deposits at the expense of private demand deposits, with no change in total bank reserves, would also result in a contraction of the money stock. One occasion in which this occurs is when people pay Federal income taxes. With more reserves used to support Government deposits and

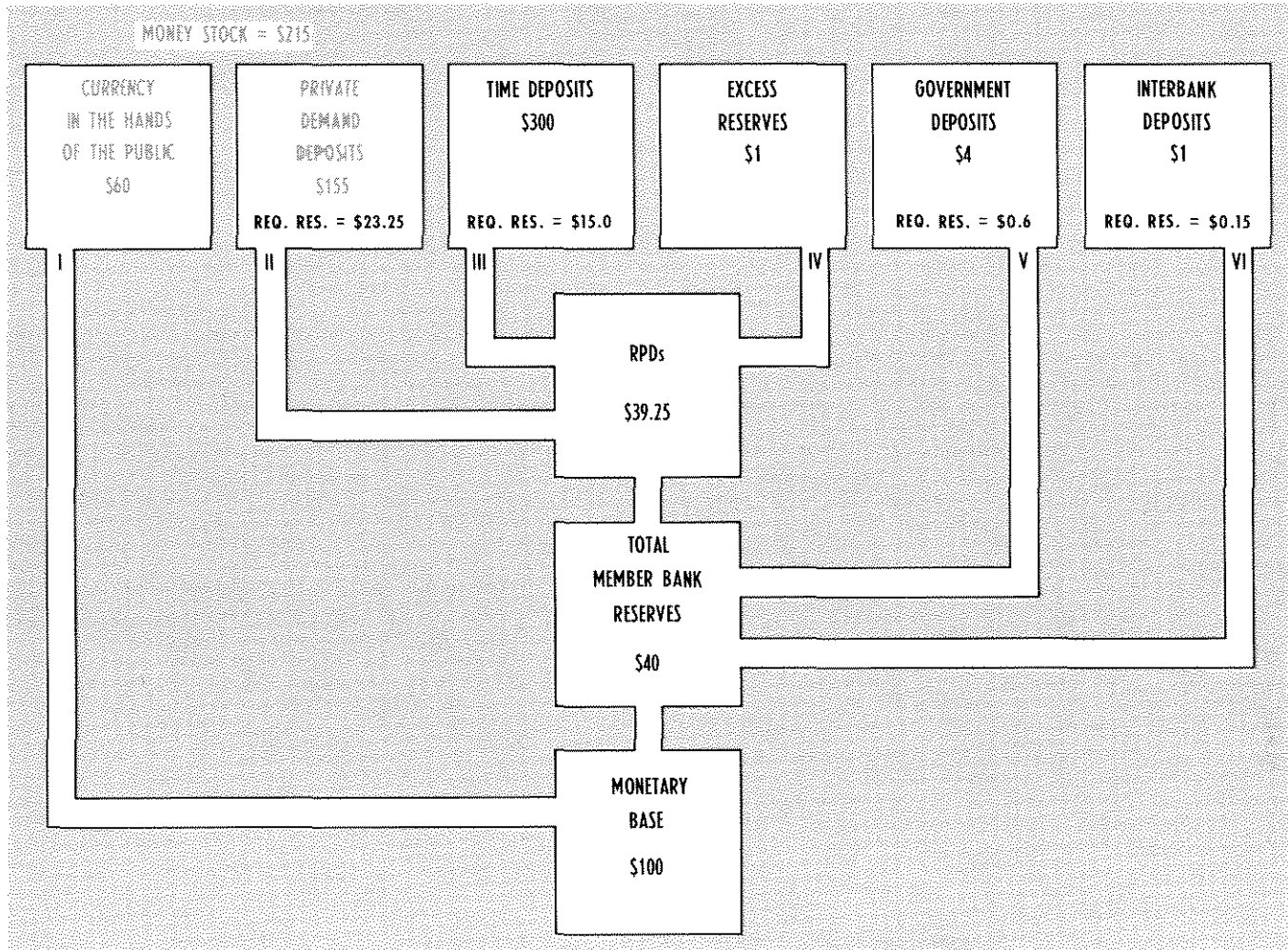
⁵For a more detailed discussion of the monetary base, see Leonall C. Andersen and Jerry L. Jordan, "The Monetary Base — Explanation and Analytical Use," this *Review* (August 1968), pp. 7-11; Jerry L. Jordan, "Elements of Money Stock Determination," this *Review* (October 1969), pp. 10-19; Jane Anderson and Thomas M. Humphrey, "Determinants of Change in the Money Stock: 1960-1970," *Monthly Review*, Federal Reserve Bank of Richmond (March 1972), pp. 2-8; John D. Rea, "Sources of Money Growth in 1970 and 1971," *Monthly Review*, Federal Reserve Bank of Kansas City (July /August 1972), pp. 3-13.

⁶Banks have some nondeposit sources of funds against which they must hold reserves. We ignore these in the analysis in this article.

⁷This is computed by dividing reserves available by the required reserve ratio $\left(\frac{\$24.25 \text{ billion}}{0.15} = \$161.67 \text{ billion}\right)$.

Illustrations of Uses of Reserve Aggregates*

(Billions of Dollars)



A reserve aggregate can serve as an effective operating target when monetary authorities can select the appropriate growth rate of the reserve aggregate and achieve that growth rate with an acceptable degree of accuracy. Selecting a desired growth path for a reserve aggregate involves predicting its relationship to the money stock. Achieving the selected growth rate requires predicting the relationship between monetary actions and the reserve aggregate.

The boxes across the top of the illustration show the "uses" of reserve aggregates. Each of these "uses" influences either the relationship between a reserve aggregate and money, or the relationship between open market operations and the path of the reserve aggregate. Assuming the monetary base can be controlled by the monetary authorities, its use as an operating target and the selection of its magnitude requires predicting its relationship to money, which is affected by I-VI. If total member bank reserves are used as the operating target, the selection of their path requires that the money relationship involving II-VI be estimated. Achieving the target itself implies knowledge of the monetary base and I. The use of RPDs (reserves available to support private nonbank deposits) as the operating target requires predicting a relationship involving II, III, and IV to select the growth of RPDs and information about I, V, and VI to achieve that path.

*The illustration excludes consideration of nondeposit sources of funds and vault cash of nonmember banks. Reserve requirements are assumed to be 15 percent on private demand, Government demand, and interbank deposits, and 5 percent on time deposits.

fewer available to support private deposits, the money stock tends to decline.

If the Federal Reserve were to use the base as its operating target to achieve the desired rate of growth of the money stock, it would have to predict with some degree of accuracy the relationship between the growth rate of the base and the growth rate of the money stock. If all the *uses* of the base were known with certainty, the relationship between growth of the

base and growth of the money stock could be known precisely, and the FOMC could translate any desired growth rate of the money stock into a target rate of growth for the base. Since most of the uses cannot be predicted with complete certainty, the relationship between the base and money is often estimated from historical behavior as a single number, or "multiplier." This multiplier nevertheless incorporates conceptually and quantitatively all of the uses of the base discussed in preceding paragraphs.

A second criterion for using the base as an operating target is that the Trading Desk must be able to achieve the targeted rate of growth of the base. To do this, it must predict what will be happening to factors, other than those under its initiative, which affect the base. These factors include changes in Federal Reserve float and member bank borrowing from Federal Reserve Banks. With information about how outside factors would result in increases or decreases in the base, the Desk could use open market operations to make up the difference between the change in the base caused by uncontrolled factors and the desired change. For example, suppose that the base were the operating target, that the only two sources of the base were Federal Reserve purchases of securities and Federal Reserve lending to member banks, and that these two sources were independent of each other. If the desired rate of growth of the base were translated into a \$1 billion increase in a given week, and the Trading Desk expected a \$0.3 billion increase in member bank borrowing that week, it would purchase \$0.7 billion of securities to make up the difference.

Member Bank Reserves

Bank reserves can be viewed as the base less the currency component of the money stock. If reserves were used as an operating target, then the relationship to be estimated would be between reserves and the demand deposit component of money. Information about currency, necessary to achieve a certain growth rate of reserves, could be used to compute the change in private demand deposits necessary to achieve the desired money growth.

The Trading Desk must predict the public's demand for currency in order to attain the desired growth rate for reserves, since changes in the public's holdings of currency change the amount of the base available for bank reserves. In other words, the Desk must predict the distribution of uses of the base between currency in the hands of the public and bank reserves, as well as uncontrolled influences on the base. If the FOMC has very good evidence about what will be happening to currency in the hands of the public because, say, currency has increased at a historically steady rate, then it may be no more difficult to achieve a given growth rate for reserves than for the base. If at the same time the relationship between reserves and demand deposits is more predictable than that between the base and money, using reserves instead of the base as the operating target might result in a lower error involved in achieving the desired rate of money growth.

RPDs

RPDs are a particular reserve aggregate that can be viewed as the base minus currency in the hands of the public and reserves used to meet legal requirements against U.S. Government demand deposits and net interbank deposits. This is equivalent to total member bank reserves minus required reserves against Government and interbank deposits. In the illustration RPDs amount to \$39.25 billion.

As is the case with any other reserve aggregate, how changes in RPDs affect the money stock is influenced by its uses. Uses of RPDs include required reserves against all time and savings deposits, required reserves against private demand deposits, and excess reserves. Since RPDs exclude required reserves against Government and interbank deposits, information about these two types of deposits is not needed to estimate the relationship between RPDs and private demand deposits. However, in order for the Trading Desk to achieve the targeted path of RPDs, it must estimate reserves required against Government and interbank deposits. This is in addition to forecasting factors needed to achieve total reserves.

Since fewer factors affect the relationship between RPDs and demand deposits than those involving the base or total reserves, the relationship between RPDs and the money stock may exhibit greater stability than either of the others. If this is so, errors involved in *selecting* the correct path of RPDs might be smaller than those involved in selecting an appropriate path for the monetary base or total reserves. If at the same time, currency, Government deposit, and interbank deposit uses of the base can be estimated with considerable accuracy, errors involved in *achieving* the targeted growth rate for RPDs would not be significantly larger than those involved in achieving given growth rates for the base or total reserves. In general, reliable information about some of the uses of a reserve aggregate may tend to make the aggregate which excludes those uses a better operating target.

Interpreting Changes in Reserve Aggregates

As is implied in the foregoing discussion, changes in the growth rate of a reserve aggregate, such as RPDs, should not be viewed as indications of the tightness or ease of monetary actions. For example, any increase in a reserve aggregate which is absorbed as required reserves against time deposits is not available to support expansion in private demand deposits. Consequently, when the public is accelerating the pace of acquiring time deposits, larger growth rates

in the reserve aggregates discussed will be necessary to achieve a given growth rate of money, compared to when time deposit growth is constant or decelerating. In other words, the same rate of growth of a reserve aggregate may result in different rates of growth of money at different times.

In terms of RPDs, one might find that a 6 percent annual rate of growth in money could require a 6 percent rate of growth of RPDs in one month and an 8 percent rate in another. This suggests that one should employ some caution in interpreting changes in the growth rate of RPDs over short periods. A change in the rate of growth of RPDs does not necessarily suggest a change in the influence of monetary actions on economic activity.

It is sometimes assumed, as it is here, that the rate of growth of the money stock over a period of significant duration indicates the impact of monetary developments on the economy. Interpreting the role of reserve aggregates in such a framework requires information about changes in other factors that influence money growth.

Summary

A reserve aggregate is an effective operating target for monetary policy when the Federal Reserve can both select the growth rate of the aggregate required to meet policy goals and achieve that growth rate with some degree of accuracy. If the growth of the money stock is an important intermediate link between monetary actions and the ultimate goal of monetary policy, then the first criterion suggests that the Federal Reserve must be able to forecast the average relation between the reserve aggregate and the money stock over the period in which it attempts to control the reserve aggregate. The second criterion

suggests that the Trading Desk must be able to forecast changes in the reserve aggregate that would result from circumstances other than its own actions.

Errors are bound to exist in both the estimation of the relationship between the growth rates of the reserve aggregate and money and in the forecast of uncontrollable factors influencing the growth of the reserve aggregate. If the errors are small, however, they may be of little consequence to the growth rate of the money stock over the period in which it is significant to GNP.

Thus the choice of a specific reserve aggregate as an operating target depends on whether:

- (1) the information necessary to *select* the appropriate growth path of that reserve aggregate is better than the information necessary to select growth paths of other aggregates;
- (2) the information necessary to *achieve* a selected growth path of that reserve aggregate is better than the information necessary to achieve growth paths of other aggregates; and
- (3) the total information errors (in selecting and achieving) are minimized by using that reserve aggregate as compared to other aggregates.

The FOMC adopted RPDs as its operating target at its February 1972 meeting. RPDs are a reserve aggregate defined as total member bank reserves less reserves required against U.S. Government demand and net interbank deposits.

Since the experiment using RPDs as the operating target has been in existence for only about seven months, there is insufficient evidence to judge the extent to which it is a better target than reserves or the base. The experience thus far indicates, however, that the use of RPDs has been quite successful in producing desired money growth.

