

# *The Monetary Base - Explanation and Analytical Use*

**T**HE MONETARY BASE recently has achieved prominence as a measure of monetary influence on the economy. Other aggregates often used are the money stock defined as currency plus demand deposits held by the nonbank public, money plus time deposits at commercial banks, member bank reserves, bank credit, liquid assets, and total credit. Other frequently used measures of monetary actions include market interest rates and so-called marginal reserve measures such as member bank excess reserves, borrowings from Reserve banks, and free reserves.

Those who find the monetary base to be a measure of monetary influence give two reasons for doing so. First, there is a significant body of monetary theory which incorporates the monetary base as an important link between Federal Reserve monetary actions and their ultimate impact on income, output, and prices. Second, among all the variables cited above as measures of monetary actions, the monetary authorities have the most complete control over the monetary base, and the base reflects the actions of these authorities more directly than the other measures do.

This article first explains the monetary base concept and presents the method of its computation, and then discusses its role in monetary analysis, briefly developing some of the arguments for using the base as a measure of monetary actions.

## Monetary Base Concepts

Three concepts are used in this article to compute the monetary base. These are the "source base," "reserve adjustments," and the sum of these two, called the "monetary base."

### *The Source Base*

The "source base" is derived from a consolidated monetary balance sheet of the Federal Reserve System and the United States Treasury.<sup>1</sup> Table I presents this consolidated balance sheet. According to column one of this table, the source base is the sum of Federal Reserve credit (Federal Reserve holdings of U.S. Government securities, member bank borrowing from

<sup>1</sup>The term "source base" used in this article is the same magnitude which Friedman-Schwartz-Cagan call "high-powered money," and which Brunner-Meltzer call the "monetary base."

Table I CALCULATION OF THE SOURCE BASE — JUNE 1968 Monthly Averages of Daily Figures <sup>1</sup> (Millions of Dollars)			
Sources of Base		Uses of Base	
Federal Reserve Credit:		Member Bank Deposits	
Holdings of Securities	+51,396 <sup>2</sup>	at Federal Reserve	+21,350
Discounts & Advances	+ 705	Currency held by Banks	+ 5,566
Float	+ 1,712	Currency held by	
Gold Stock	+10,369	the Public	+41,900
Treasury Currency Outstanding	+ 6,744		
Treasury Deposits at Federal Reserve	- 960		
Treasury Cash Holdings	- 973		
Other Deposits and Other			
Federal Reserve Accounts	- 177		
<b>Source Base</b>	<b>68,816</b>		<b>68,816</b>

<sup>1</sup>Data are not adjusted for seasonal variation.  
<sup>2</sup>Includes acceptances of \$90 million not shown separately.  
 Source: Board of Governors of the Federal Reserve System, Federal Reserve Bulletin. The sources and uses of the base are a rearrangement of data contained in the first table appearing in the Financial and Business Statistics section of the Bulletin—"Member Bank Reserves, Federal Reserve Bank Credit, and Related Items."

Reserve banks, and Federal Reserve float), the nation's gold stock, and U. S. Treasury currency outstanding less Treasury deposits at Reserve banks, Treasury cash balances, and other deposits and accounts at Reserve banks.

For ease of computation, the source base is frequently measured by summing the monetary liabilities of the Federal Reserve and the Treasury. These liabilities, consisting of member bank deposits (reserves) at Reserve banks and currency held by banks and the nonbank public, are referred to as *uses of the base* and are listed in column two of Table I. These uses of the base are equal to the source.

For monetary analysis it is important to distinguish between the source base as a magnitude supplied by monetary authorities (Table I, Column 1) and the demand for the base by other sectors of the economy (Table I, Column 2). This distinction is discussed more fully later.

### *Reserve Adjustments*

Because of changes in laws and regulations and in the distribution of deposits among banks subject to different regulations, adjustments must be made in the source base in order to maintain comparability over time. "Reserve adjustments" allow for the effects of changes in reserve requirements on member bank deposits, and for changes in the proportion of deposits subject to different reserve requirements (reserve city member banks versus country member banks versus nonmember banks, demand deposits versus time deposits, and recently the over and under \$5 million reserve requirement differentials on both demand and time deposits). These reserve adjustments are expressed as dollar amounts which are positive when average reserve requirements fall and negative when they rise.<sup>2</sup>

The following method is used to calculate the reserve adjustment for an individual month. The procedure is the same for both demand and time deposits, but for purposes of explanation the example used is for demand deposits. First, the weighted average reserve requirement on demand deposits for the month (using for weights the distribution of these deposits by class of member bank) is computed. Then, the difference in average reserve requirements from the previous month is multiplied by net demand deposits for the previous month. The procedure is carried out for every month since January 1929.

<sup>2</sup>These reserve adjustments are referred to by Brunner-Meltzer as "liberated reserves." The reserve adjustment procedure used here was developed by Brunner-Meltzer.

Finally, the reserve adjustment for a particular month is the algebraic sum of the monthly reserve adjustment figures for both demand and time deposits from January 1929 to the month under consideration. In addition to the above computations, the data on reserve adjustments since December 1959 include a small positive adjustment to reflect the gradual allowance of member bank vault cash as a part of their reserves.

### *The Monetary Base*

The monetary base is defined in this article as the source base plus reserve adjustments.<sup>3</sup> In deriving a seasonally-adjusted time series for the monetary base, the source base was first seasonally adjusted and then the month's reserve adjustment amount was added to this magnitude. There are no discernable seasonal movements in the latter. The first chart presents a weekly time series since January 1967, and the second chart presents the time series for the monetary base since January 1947.

### **Analytical Use of the Monetary Base**

This section discusses factors influencing the supply of the monetary base and the demand for the base. It concludes with a brief discussion of the adjustment process by which the amount of the base demanded is brought into equilibrium with the amount supplied by monetary authorities. This adjustment process establishes the monetary base as a strategic economic variable for monetary management and for interpreting actions of such management.

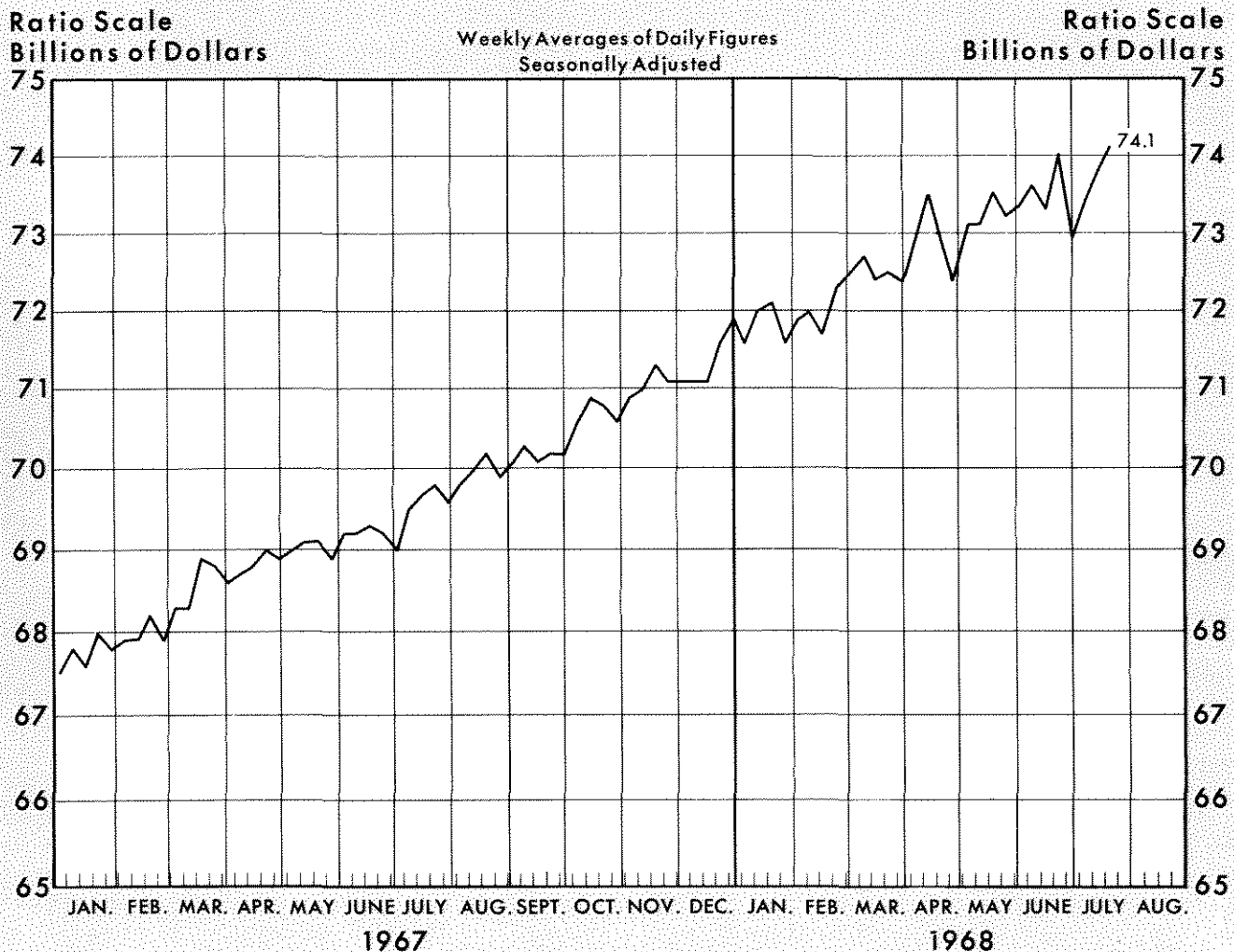
### *Supply of the Monetary Base*

The "source base" (Table I, Column 1) is by far the main part of the supply of the monetary base. The source base plus reserve adjustments give the total supply. Federal Reserve credit, the main component of the monetary base, is under the direct control of the Federal Reserve System. The gold stock depends on such factors as movements in the nation's balance of payments. Treasury currency outstanding and Treasury cash balances and deposits at Reserve banks are under the direct control of the Treasury Department. In recent years, other deposits and accounts at Reserve banks have been only minor factors affecting the supply of the monetary base.

The supply of the monetary base is substantially under the complete control of the Federal Reserve

<sup>3</sup>This definition of the monetary base is the same magnitude which Brunner-Meltzer define as the "extended base."

## Monetary Base\*



\*Uses of the monetary base are member bank reserves and currency held by the public and non member banks. Adjustments are made for reserve requirement changes and shifts in deposits among classes of banks. Data are computed by this bank. Latest data plotted: Week ending July 24, 1968 preliminary

System.<sup>4</sup> Recent studies have found that movements in Federal Reserve credit dominate movements in other sources of the source base, and therefore determine most of the movements of the monetary base.<sup>5</sup> Evidence has also been presented that Federal Reserve open market operations are able to offset, to a high degree, seasonal and irregular move-

ments in other components of the source base.<sup>6</sup> Consequently, the Federal Reserve, if it so chooses, is able to achieve desired levels of the monetary base for purposes of economic stabilization.

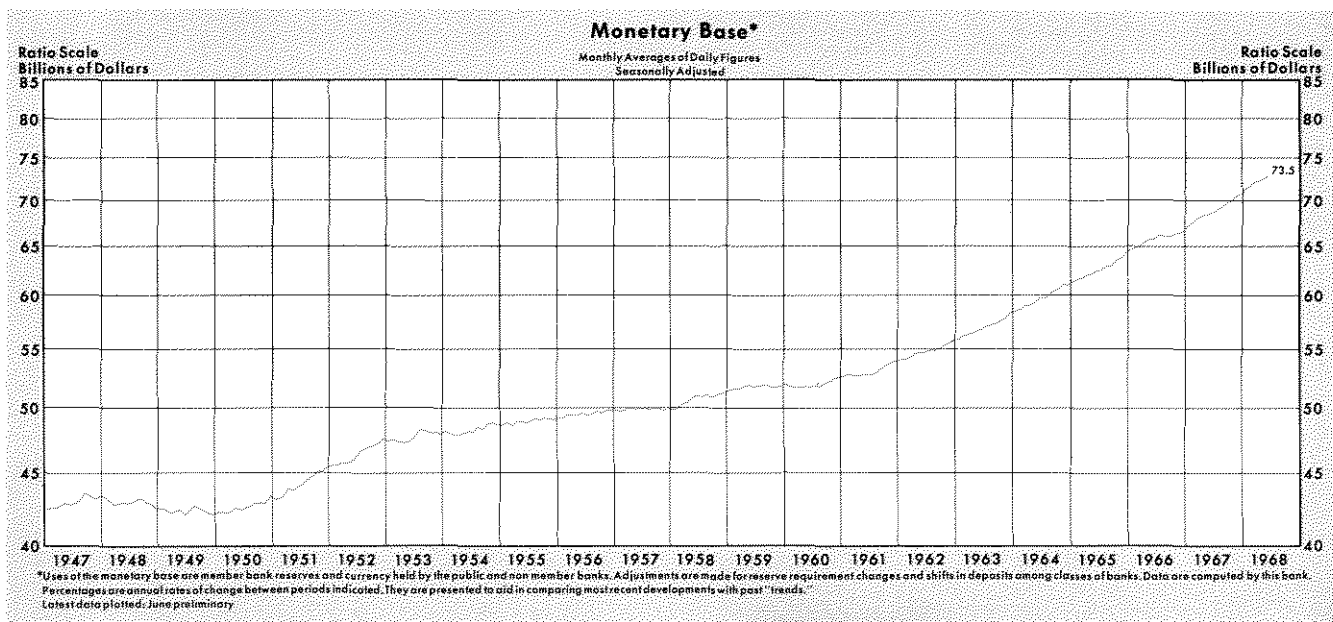
### *Demand for the Monetary Base*

Demand for the monetary base consists of the demand of commercial banks for excess reserves and required reserves and the demand of the nonbank public for currency (Table I, Column 2). Banks' demand for required reserves is a derived demand

<sup>4</sup>Although member bank borrowing from Reserve banks and changes in the gold stock and float are not under the direct control of monetary authorities, it is generally believed that open market operations may be used to offset short-term changes in these and other accounts in order to achieve a desired level of the monetary base.

<sup>5</sup>For a discussion of these studies, see Karl Brunner, "The Role of Money and Monetary Policy," this *Review*, July 1968.

<sup>6</sup>Leonall C. Andersen, "Federal Reserve Defensive Operations and Short-Run Control of the Money Stock," *Journal of Political Economy*, April 1968.



reflecting the demands for private demand deposits, Government demand deposits, net interbank deposits, and time deposits.<sup>7</sup> Demand for the monetary base consequently reflects economic decisions made by commercial banks, the nonbank public, and the Government. Therefore, all of the factors influencing the decisions of each of these sectors influence the demand for the monetary base. Some of the factors influencing each of these sectors are discussed below:

**Bank Demand**—Commercial bank direct demand for the monetary base consists of demand for excess reserves and net interbank deposits. Bank indirect demand for required reserves, for reasons mentioned above, is considered as nonbank demand for the base. A bank's demand for excess reserves generally is believed to be related positively to its size (total deposits) and the cost of borrowing short-term funds (Federal Reserve discount rate, Federal funds rate, and rates paid on large certificates of deposit), and negatively related to yields on its short-term assets (loan rates and Treasury bill rates). Also, the demand for excess reserves is often viewed as being positively related to the pace of economic activity, which generates different amounts of loan demand at given loan rates. Net interbank deposits vary directly with economic activity and inversely with

<sup>7</sup>Calculations of the monetary base, as presented in this article, include reserve adjustments; these factors are viewed as influencing the supply of the base. For example, a rise in reserve requirements decreases the monetary base. Therefore, it is appropriate to *exclude* changes in reserve requirements and the effects of shifts in deposits as factors influencing demand for the monetary base. In effect, on the demand side reserve requirements are held at their January 1929 level. The use of this date to start the reserve adjustments is arbitrary and carries no special significance.

short-term interest rates, but are probably little affected by these variables.

**Public demand**—The nonbank public's demand for the monetary base reflects its direct demand for currency. Also, because of reserve requirements on bank deposits, the nonbank public's demand for demand deposits and time deposits constitutes an indirect demand for the monetary base. Demand for currency and demand deposits by consumers, businesses, financial institutions, and state and local governments is usually held to be positively related to economic activity, wealth, and prices of real assets, and negatively related to short-term interest rates and rates paid on time deposits and other forms of savings accounts. Demand for time deposits at commercial banks is postulated to be influenced in the same general manner (but in different degrees) by the factors influencing the demand for currency and demand deposits, except that rates paid on time deposits have a positive effect.

**Government demand**—Demand by the Government for demand deposits at commercial banks, another indirect demand, is based on decisions of the Government to hold varying amounts of these deposits. These decisions are influenced little by economic factors.

**Total demand**—Total demand for the monetary base is the summation of sector demands; it is therefore influenced by the factors determining individual sector demands. Consequently, total demand for the base (given wealth, interest rates paid on time deposits and other forms of savings accounts, and the Federal Reserve discount rate) is positively related

to economic activity and prices of real assets, and negatively related to a wide variety of short-term market interest rates.

### *The Adjustment Process*

Most recent developments in monetary theory, which pertain to the determination of economic activity, stress the role of assets, both financial and real, and the market adjustment of asset holdings through the relative price mechanism.<sup>8</sup> The monetary base, according to some economists, is an asset which monetary authorities supply to the economy. Since the supply of this asset can be controlled by the Federal Reserve System, banks and the nonbank public must adjust their holdings of real and other financial assets so as to bring the amount demanded of the monetary base equal to the amount supplied. In the process of adjustment, economic activity, prices of real assets, and interest rates are changed.

There is a "weak" and a "strong" view regarding the role of the monetary base. The weak view embodies the process just outlined and goes no further. The strong view also adopts this adjustment process, but then extends the analysis with additional hypotheses and empirical tests. It holds that the monetary base is the main determinant of the money stock, which, in turn, is a good indicator of the thrust of monetary forces. Furthermore, according to the strong view the monetary base is the proper measure of Federal Reserve monetary actions. Whichever view one adopts, changes in the monetary base are held as ultimately leading to changes in the growth of total demand for goods and services.

There are differences between the two views regarding the strength and predictability of the influence of monetary forces on economic activity. The weak view holds that other factors, such as fiscal actions, or shifts in the demand for goods and services, also influence to a considerable degree changes in economic activity. As a result, the influence of monetary forces is not very predictable. The strong view recognizes these other influences on economic activity, but maintains that monetary forces are the dominant influence and that their influence is highly predictable.

According to the strong view, if the monetary base were to expand at a trend rate of 6 per cent, total demand would adjust to vary around a trend rate consistent with, but not necessarily the same as, the rate of expansion in the base. If the rate of

growth in the monetary base were reduced by monetary authorities, total demand would slow and vary around a lower trend rate. Sources of variations around an established trend in economic activity result from changes in fiscal actions and other independent forces.

### **Summary**

The monetary base can be controlled by the Federal Reserve System and is directly influenced by its actions, even though other economic variables are used as guides by monetary managers. Moreover, reliable data for the source base, the main component of the monetary base, are readily available from the balance sheets of the Federal Reserve System and the Treasury. Monetary managers, therefore, have up-to-date information on the major factors affecting movements in the monetary base. Such knowledge makes it possible for them to offset, by open market operations, movements in these other factors in order to achieve a change in the monetary base appropriate for economic stabilization.

Interpretations of movements in the monetary base are not obscured by short-run movements in Government demand deposits or movements between demand and time deposits. Such movements frequently lead to disagreements among monetary analysts regarding the proper interpretation of changes in the money stock, money plus time deposits, and bank credit. Movements in market interest rates and marginal reserve measures are also subject to these same problems of interpretation.

Whether one takes the weak or the strong view, the Federal Reserve System, by varying the supply of the monetary base, causes commercial banks and the nonbank public to adjust their spending on real and financial assets so as to bring the amount demanded of the base into equilibrium with the amount supplied. In the course of these adjustments, the pace of economic activity is affected.

Three points should be noted: the monetary base is under the direct control of the Federal Reserve System, it may be changed by monetary managers in a predictable manner, and such changes have an important influence on output, employment, and prices. These considerations lead to the conclusion that the monetary base is an important magnitude for those interested in monetary management.

LEONALL C. ANDERSEN  
JERRY L. JORDAN

*This article is available as reprint series No. 31.*

<sup>8</sup>For a discussion of these developments and the two points of view discussed in this section, see Brunner, *ibid.*