UNIT- I

Money Supply

The money supply is the total value of money available in an economy at a point of time. In India, Reserve Bank of India (RBI), measures the money supply and publishes it on a weekly or fortnight basis.

What is meant by Monetary Aggregate?

Monetary aggregates are the measures of the money supply in a country.Very often, the money supply in the economy is represented using a monetary aggregate called 'broad money', also denoted as M3.

There are also different other monetary aggregates.

From 1977 to 1998, RBI used four monetary aggregates – M1, M2, M3 and M4 – to measure money supply. The central bank also used the concept of Reserve Money.

However, measuring standards changed in 1998.

Now, the nomenclature is M0, M1, M2, and M3.

To distinguish new aggregates from old aggregates, RBI sometimes mentions new aggregates as NM0, NM1, NM2, and NM3.

Old Monetary Aggregates

From 1977, RBI has been publishing four monetary aggregates – M1, M2, M3 and M4 – besides the reserve money.

In the new system, reserve money is named M0.

M2 and M4 that included post office savings banks deposits. However, these are not very widely used now.

New Monetary Aggregates

The RBI has started publishing a set of new monetary aggregates following the recommendations of the Working Group on Money Supply: Analytics and Methodology of Compilation (Chairman: Dr. Y.V. Reddy) which submitted its report in June 1998.

The Working Group recommended compilation of four monetary aggregates on the basis of the balance sheet of the banking sector in conformity with the norms of progressive liquidity:

- NM0 (monetary base)
- NM1 (narrow money)
- NM2
- NM3 (broad money)

NM0 (Monetary Base or Reserve Money)

M0 is the sum of Currency in Circulation, Bankers' Deposits with RBI, and 'Other' Deposits with RBI

Components of M0:

- Currency in Circulation
- Bankers' Deposits with RBI
- 'Other' Deposits with RBI

Note: 'Other' deposits with RBI comprise mainly: (i) deposits of quasi-government and other financial institutions including primary dealers, (ii) balances in the accounts of foreign Central banks and Governments, (iii) accounts of international agencies such as the International Monetary Fund, etc.

NM1 (Narrow Money)

M1 is the sum of Currency with the Public, Demand Deposits with the Banking System, and 'Other' Deposits with RBI.

Components of M1:

- Currency with the Public
- Current Deposits with the Banking System
- Demand Liabilities Portion of Savings Deposits with the Banking System
- 'Other' Deposits with RBI

In other words, M1 = Currency with the Public + Demand Deposits with the Banking System + 'Other' Deposits with RBI

Significance of M1: M1 includes currency with the public and non-interest bearing deposits with the banking sector including that of RBI.

NM2

M2 is the sum of Currency with the Public, Current Deposits with the Banking System, Savings Deposits with the Banking System, Certificates of Deposits issued by Banks, Term Deposits of residents with a contractual maturity up to and including one year with the Banking System, and 'Other' Deposits with RBI.

Components of M2:

- Currency with the Public
- Current Deposits with the Banking System
- Demand Liabilities of Savings Deposits with the Banking System
- 'Other' Deposits with RBI
- Term Deposits of residents with a contractual maturity up to and including one year with the Banking System
- Certificates of Deposits issued by Banks

In other words, M2=M1+ Time Liabilities Portion of Savings Deposits with the Banking System + Certificates of Deposit issued by Banks + Term Deposits of residents with a contractual maturity of up to and including one year with the Banking System.

NM3 (Broad Money)

M3 is the sum of Currency with the Public, Current Deposits with the Banking System, Savings Deposits with the Banking System, Certificates of Deposits issued by Banks, Term Deposits of residents with the Banking System, Call/Term borrowings from 'Non-depository' financial corporations by the Banking System, and 'Other' Deposits with RBI.

Components of M3:

- Currency with the Public
- Current Deposits with the Banking System
- Savings Deposits with the Banking System
- Certificates of Deposits issued by Banks
- Term Deposits of residents with a contractual maturity up to and including one year with the Banking System
- 'Other' Deposits with RBI
- Term Deposits of residents with a contractual maturity of over one year with the Banking System
- Call/Term borrowings from 'Non-depository' financial corporations by the Banking System.

M3=M2+ Term Deposits of residents with a contractual maturity of over one year with the Banking System + Call/Term borrowings from 'Non-depository' financial corporations by the Banking System.

Significance of M3: M3 captures the complete balance sheet of the banking sector.

Liquidity Aggregates – L1, L2, and L3

In addition to the monetary aggregates, the Working Group had recommended compilation of three liquidity aggregates namely, L1, L2 and L3, which include select items of financial liabilities of non-depository financial corporations such as development financial institutions and non-banking financial companies accepting deposits from the public, apart from post office savings banks.

L1 – NM3 + All deposits with the post office savings banks (excluding National Savings Certificates).

L2 – L1 + +Term deposits with term lending institutions and refinancing institutions (FIs) + Term borrowing by FIs + Certificates of deposit issued by FIs.

L3 – L2 + + Public deposits of non-banking financial companies.

Source:https://www.clearias.com/monetary-aggregates/

Money Supply: Determinants of Money Supply and High-Powered Money and Money Multiplier

The supply of money is a stock at a particular point of time, though it conveys the idea of a flow over time. The term 'the supply of money' is synonymous with such terms as 'money stock', 'stock of money', 'money supply' and 'quantity of money'.

The supply of money at any moment is the total amount of money in the economy. There are three alternative views regarding the definition or measures of money supply. The most common view is associated with the traditional and Keynesian thinking which stresses the medium of exchange function of money.

According to this view, money supply is defined as currency with the public and demand deposits with commercial banks. Demand deposits are sayings and current accounts of depositors in a commercial bank. They are the liquid form of money because depositors can draw cheques for any amount lying in their accounts and the bank has to make immediate payment on demand. Demand deposits with commercial banks plus currency with the public are together denoted as M_1, the money supply. This is regarded as a narrower definition of the money supply.
The second definition is broader and is associated with the modern quantity theorists headed by Friedman. Professor Friedman defines the money supply at any moment of time as "literally the

number of dollars people are carrying around in their pockets, the number of dollars they have to their credit at banks or dollars they have to their credit at banks in the form of demand deposits, and also commercial bank time deposits."

Time deposits are fixed deposits of customers in a commercial bank. Such deposits earn a fixed rate of interest varying with the time period for which the amount is deposited. Money can be withdrawn before the expiry of that period by paying a penal rate of interest to the bank. So time deposits possess liquidity and are included in the money supply by Friedman. Thus this definition includes M_1 plus time deposits of commercial banks in the supply of money. This wider definition is characterised as M_2 in America and M_3 in Britain and India. It stresses the store of value function of money or what Friedman says, 'a temporary abode of purchasing power'.

The third definition is the broadest and is associated with Gurley and Shaw. They include in the supply of money, M_2 plus deposits of savings banks, building societies, loan associations, and deposits of other credit and financial institutions.

The choice between these alternative definitions of the money supply depends on two considerations: One "a particular choice of definition may facilitate or blur the analysis of the various motives for holding cash and two from the point of view of monetary policy an appropriate definition should include the area over which the monetary authorities can have direct influence. If these two criteria are applied, none of the three definitions is wholly satisfactory.

The first definition of money supply may be analytically better because M_1 is a sure medium of exchange. But M_1 is an inferior store of value because it earns no rate of interest, as is earned by time deposits. Further, the central bank can have control over a narrower area if only demand deposits are included in the money supply.

The second definition that includes time deposits (M_2) in the supply of money is less satisfactory analytically because "in a highly developed financial structure, it is important to consider separately the motives for holding means of payment and time deposits." Unlike demand deposits, time deposits are not a perfect liquid form of money. This is because the amount lying in them can be withdrawn immediately by cheques.

Normally, it cannot be withdrawn before the due date of expiry of deposit. In case a depositor wants his money earlier, he has to give a notice to the bank which allows the withdrawal after charging a penal interest rate from the depositor. Thus time deposits lack perfect liquidity and cannot be included in the money supply. But this definition is more appropriate from the point of

view of monetary policy because the central bank can exercise control over a wider area that includes both demand and time deposits held by commercial banks.

The third definition of money supply that includes M, plus deposits of non-bank financial institutions is unsatisfactory on both the criteria. Firstly, they do not serve the medium of exchange function of money. Secondly, they almost remain outside the area of control of the central bank. The only advantage they possess is that they are highly liquid store of value. Despite this merit, deposits of non-bank financial institutions are not included in the definition of money supply.

Determinants of Money Supply:
There are two theories of the determination of the money supply. According to the first view, the money supply is determined exogenously by the central bank. The second view holds that the money supply is determined endogenously by changes in the economic activity which affects people's desire to hold currency relative to deposits, the rate of interest, etc.

Thus the determinants of money supply are both exogenous and endogenous which can be described broadly as: the minimum cash reserve ratio, the level of bank reserves, and the desire of the people to hold currency relative to deposits. The last two determinants together are called the monetary base or the high powered money.

1. The Required Reserve Ratio:
The required reserve ratio (or the minimum cash reserve ratio or the reserve deposit ratio) is an important determinant of the money supply. An increase in the required reserve ratio reduces the supply of money with commercial banks and a decrease in required reserve ratio increases the money supply.

The RR_1 is the ratio of cash to current and time deposit liabilities which is determined by law. Every commercial bank is required to keep a certain percentage of these liabilities in the form of deposits with the central bank of the country. But notes or cash held by commercial banks in their tills are not included in the minimum required reserve ratio.

But the short-term assets along with the cash are regarded as the liquid assets of a commercial bank. In India the statutory liquidity ratio (SLR) has been fixed by law as an additional measure to determine the money supply. The SLR is called secondary reserve ratio in other countries while the required reserve ratio is referred to as the primary ratio. The raising of the SLR has the effect of reducing the money supply with commercial banks for lending purposes, and the lowering of the SLR tends in increase the money supply with banks for advances.

2. The Level of Bank Reserves:

The level of bank reserves is another determinant of the money supply. Commercial bank reserves consist of reserves on deposits with the central bank and currency in their tills or vaults. It is the central bank of the country that influences the reserves of commercial banks in order to determine the supply of money. The central bank requires all commercial banks to hold reserves equal to a fixed percentage of both time and demand deposits. These are legal minimum or required reserves.

Required reserves (RR) are determined by the required reserve ratio (RRr) and the level of deposits (D) of a commercial bank: RR-RRr' D. If deposits amount of Rs 80 lakhs and required reserve ratio is 20 percent, then the required reserves will be 20% x 80=Rs 16 lakhs. If the reserve ratio is reduced to 10 per cent, the required reserves will also be reduced to Rs 8 lakhs.

Thus the higher the reserve ratio, the higher the required reserves to be kept by a bank, and vice versa. But it is the excess reserves (ER) which are important for the determination of the money supply. Excess reserves are the difference between total reserves (TR) and required reserves (RR): ER=TR-RR. If total reserves are Rs 80 lakhs and required reserves are Rs 16 lakhs, then the excess reserves are Rs 64 lakhs (Rs 80-16 lakhs).

When required reserves are reduced to Rs 8 lakhs, the excess reserves increase to Rs 72 lakhs. It is the excess reserves of a commercial bank which influence the size of its deposit liabilities. A commercial bank advances loans equal to its excess reserves which are an important component of the money supply. To determine the supply of money with a commercial bank, the central bank influences its reserves by adopting open market operations and discount rate policy.

Open market operations refer to the purchase and sale of government securities and other types of assets like bills, securities, bonds, etc., both government and private in the open market. When the central bank buys or sells securities in the open market, the level of bank reserves expands or contracts.

The purchase of securities by the central bank is paid for with cheques to the holders of securities who, in turn, deposit them in commercial banks thereby increasing the level of bank reserves. The opposite is the case when the central bank sells securities to the public and banks who make payments to the central bank through cash and cheques thereby reducing the level of bank reserves.

The discount rate policy affects the money supply by influencing the cost and supply of bank credit to commercial banks. The discount rate, known as the bank rate in India, is the interest rate at which commercial banks borrow from the central bank. A high discount rate means that commercial banks get less amount by selling securities to the central bank. The commercial banks, in turn, raise their lending rates to the public thereby making advances dearer for them. Thus there will be contraction of credit and the level of commercial bank reserves. Opposite is the case when the bank rate is lowered. It tends to expand credit and the consequent bank reserves.

It should be noted that commercial bank reserves are affected significantly only when open market operations and discount rate policy supplement each other. Otherwise, their effectiveness as determinants of bank reserves and consequently of money supply is limited.

3. Public's Desire to Hold Currency and Deposits:
People's desire to hold currency (or cash) relative to deposits in commercial banks also determines the money supply. If people are in the habit of keeping less in cash and more in deposits with the commercial banks, the money supply will be large. This is because banks can create more money with larger deposits. On the contrary, if people do not have banking habits and prefers to keep their money holdings in cash, credit creation by banks will be less and the money supply will be at a low level.

High Powered Money and the Money Multiplier:
The current practice is to explain the determinants of the money supply in terms of the monetary base or high-powered money. High-powered money is the sum of commercial bank reserves and currency (notes and coins) held by the public. High-powered money is the base for the expansion of bank deposits and creation of the money supply. The supply of money varies directly with changes in the monetary base, and inversely with the currency and reserve ratios.

4. Other Factors:
The money supply is a function not only of the high-powered money determined by the monetary authorities, but of interest rates, income and other factors. The latter factors change the proportion of money balances that the public holds as cash. Changes in business activity can change the behaviour of banks and the public and thus affect the money supply. Hence the money supply is not only an exogenous controllable item but also an endogenously determined item.

Conclusion:

We have discussed above the factors which determine money supply through the creation of bank credit. But money supply and bank credit are indirectly related to each other. When the money supply increases, a part of it is saved in banks depending upon the depositors' propensity to save. These savings become deposits of commercial banks who, in turn, lend after meeting the statutory reserve requirements. Thus with every increase in the money supply, the bank credit goes up. But it may not happen in exactly the same proportion due to the following factors:

(a) The marginal propensity to save does not remain constant. It varies from time to time depending on changes in income levels, prices, and subjective factors.

(b) Banks may also create more or less credit due to the operation of leakages in the credit creation process.

(c) The velocity of circulation of money also affects the money supply. If the velocity of money circulation increases, the bank credit may nor fall even after a decrease in the money supply. The central bank has little control over the velocity of money which may adversely affect bank credit.

High-Powered Money and the Money Multiplier:

The current practice is to explain the determinants of the money supply in terms of the monetary base or high-powered money. High -powered money is the sum of commercial bank reserves and currency (notes and coins) held by the public. High-powered money is the base for the expansion of bank deposits and creation of the money supply. The supply of money varies directly with changes in the monetary base, and inversely with the currency and reserve ratios.

The use of high-powered money consists of the demand of commercial banks for the legal limit or required reserves with the central bank and excess reserves and the demand of the public for currency. Thus high-powered money $H=C+RR+ER$ where C represents currency, RR the required reserves and ER the excess reserves.

A commercial bank's required reserves depend upon its deposits. But a bank usually holds reserves in excess of its required reserves. In fact, banks do not advance loans up to the legal limits but precisely less than that. This is to meet unanticipated cash withdrawals or adverse clearing balances. Hence the need arises for maintaining excess reserves by them. The money supply is thus determined by the required reserve ratio and the excess reserve ratio of commercial banks. The required reserve ration (RRr) is the ratio of required reserves to deposits (RR/D), and the excess reserve ration (ERr) is the ratio or excess reserves to deposits (ER/D).

Currency held by the public is another component of high-powered money. The demand for currency by the public is expressed as a proportion of bank deposits. Thus the currency ratio C/-C/D, where C is the currency and D deposits. The currency ratio is influenced by such factors as changes in income levels of the people, the use of credit instruments by the public, and uncertainties in economic activity.

The formal relation between the money supply and high-powered money can be stated in the form of equations as under:

The money supply (M) consists of deposits of commercial banks (D) and currency (C) held by the public. Thus the supply of money:

$$M = D + C \qquad \text{...(1)}$$

High-powered money (H) (or monetary base) consists of currency held by the public (C) plus required reserves (RR) and excess reserves of commercial banks. Thus high-powered money

$$H = C + RR + ER \qquad \text{...(2)}$$

The relation between M and H can be expressed as the ratio of M to H. So divide equation (1) by (2):

$$\frac{M}{H} = \frac{D + C}{C + RR + ER} \qquad \text{...(3)}$$

Divide the numerator and denominator of the right hand side of the equation (3) by D:

$$\frac{M}{H} = \frac{\dfrac{D}{D} + \dfrac{C}{D}}{\dfrac{C}{D} + \dfrac{RR}{D} + \dfrac{ER}{D}}$$

or

$$\frac{M}{H} = \frac{1 + \dfrac{C}{D}}{\dfrac{C}{D} + \dfrac{RR}{D} + \dfrac{ER}{D}} \qquad \text{...(4)}$$

By substituting Cr for C/D, RRr for RR/D and ERr for ER/D, equation (4) becomes

$$\frac{M}{H} = \frac{1 + Cr}{Cr + RRr + ERr} \qquad \text{...(5)}$$

Thus high-powered money

$$H = \frac{Cr + RRr + ERr}{1 + Cr} \times M \qquad \text{...(6)}$$

And money suply

$$M = \frac{1 + Cr}{Cr + RRr + ERr} \times H \qquad \text{..(7)}$$

Equation (7) defines money supply in terms of high-powered money. It expresses the money supply in terms of four determinants, H, Cr, RRr, and ERr. The equation states that the higher the supply of high powered money, the higher the money supply. Further, the lower the currency

ratio (Cr), the reserve ration (RRr), and the excess reserve ratio (ERr) the higher the money supply, and vice versa.

The relation between the money supply and high-powered money is illustrated in Figure 1. The horizontal curve Hs shows the given supply of high-powered money. The curve Hd shows the demand for high-powered money associated with each level of money supply and represents equation (6). The slope of the Hd curve is equal to the term $(Cr + RRr + ERr)/(1+Cr)$. Given Cr, RRr, Err and the high-powered money Hi, the equilibrium money supply is OM. If the money supply is larger than this, say OM_y there will be excess demand for high-powered money. On the contrary, a less than OM money supply will mean less demand for high-powered money.
If there is an increase in any one of the ratios Cr or RRr or ERr, there would be an increase in the demand for high-powered money. This is shown by the Hd' curve in Figure 69.1 where the increase in the demand for high-powered money leads to decline in the money supply to OM.
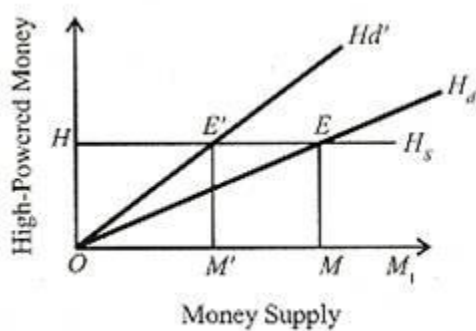

Fig. 69.1

The quotient of equation (7) is the money multiplier m. Thus

$$m = 1 + Cr/ CR+RRr+ERr \ldots (8)$$

Now the relation between the money supply and high -powered money of equation (7) becomes

$$M = mH \ldots..(9)$$

Equation (9) expresses the money supply as a function of m and H. In other words, the money supply is determined by high powered money (H) and the money multiplier (m). The size of the money multiplier is determined by the currency ratio (Cr) of the public, the required reserve ratio (RRr) at the central bank, and the excess reserve ratio (ERr) of commercial banks. The lower these ratios are, the larger the money multiplier is. If m is fairly stable, the central bank can manipulate the money supply (M) by manipulating H. The central bank can do so by open

market operations. But the stability of m depends upon the stability of the currency ratio and the reserve ratios RRr and ERr. Or, it depends upon off-setting changes in RRr and ERr ratios. Since these ratios and currency with the public are liable to change, the money multiplier is quite Money Supply volatile in the short run.

Given the division of high-powered money between currency held by the public, the required reserves at the central bank, and the excess reserves of commercial banks, the money supply varies inversely with Cr, RRr and ERr. But the supply of money varies directly with changes in the high-powered money. This is shown in Figure 69.2. An increase in the supply of high-powered money by DH shifts the Hs curve upward to Hs'. At E, the demand and supply of high-powered money is in equilibrium and money supply is OM. With the increase in the supply of high-powered money to Hs', the supply of money also increases to OM_1 at the new equilibrium point E_1. Further, Figure 2 reveals the operation of the money multiplier. With the increase in the high-powered money DH, the money supply increases by DM. An increase in high-powered money by Re 1 increases by a multiple of Re 1.
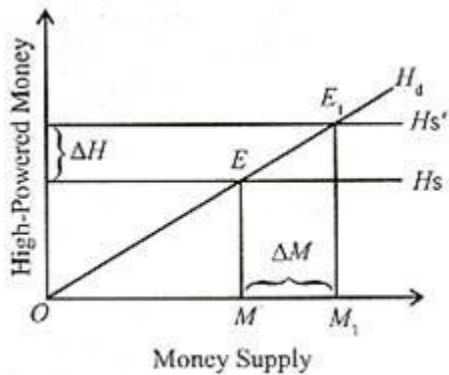

Fig. 69.2

Some economists do not take into consideration excess reserves in determining high-powered money and consequently the money supply. But the monetarists give more importance to excess reserves. According to them, due to uncertainties prevailing in banking operations as in business, banks always keep excess reserves. The amount of excess reserves depends upon the interaction of two types of costs: the cost of holding excess reserves, and the cost generated by deficiency in excess reserves. The first cost is in terms of the market rate of interest at which excess reserves are maintained. The second cost in interms of the bank rate which is a sort of penalty to be paid to the central bank for failure to maintain the legal required reserve ratio by the commercial bank.

The excess reserve ratio varies inversely with the market rate of interest and directly with the bank rate. Since the money supply is inversely related to the excess reserve ratio, decline in the

excess reserve ratio of banks tends to increase the money supply and vice versa. Thus the money supply is determined by high-powered money, the currency ratio, the required reserve ratio and the market rate of interest and the bank rate.

The monetary base or high-powered money is directly controllable by the central bank. It is the ultimate base of the nation's money supply. Of course, the money multiplier times the high-powered money always equals the money supply, i.e. M=mH. This formulation tells us how much new money will be created by the banking system for a given increase in the high-powered money.

The monetary policy of the central bank affects excess reserves and the high-powered money identically. Suppose the central bank makes open market purchases. This raises the high-powered money in the form of excess reserves of banks.

An increase in money supply that results from it comes from the banking system which creates new money on the basis of its newly acquired excess reserves. Thus this concept tells us that the monetary authorities can control the money supply through changing the high-powered money or the money multiplier.

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