CHAPTER 20

SUPPLY OF MONEY AND ITS DETERMINANTS

Money supply plays a crucial role in the determination of price level and interest rate. In the present chapter we shall explain what determines the money supply in an economy. In economic analysis it is generally presumed that money supply is determined by the policy of Central Bank of a country and the Government. However, this is not fully correct as in the determination of money supply, besides Central Bank and Government, the public and commercial banks also play an important role. There are various measures of money supply depending upon which types of deposits of banks and other financial institutions are included in it. We will explain various measures of money supply later in this chapter.

Importance of Money Supply

Growth of money supply is an important factor not only for acceleration of the process of economic development but also for the achievement of price stability in the economy. What constitutes the money supply and what factors cause variation and growth in money supply will be explained in the present chapter. There must be controlled expansion of money supply if the objective of development with stability is to be achieved. A healthy growth of an economy requires that there should be neither inflation nor deflation. Inflation is the greatest headache of a developing economy. A mild inflation arising out of the creation of money by deficit financing may stimulate investment by raising profit expectations and extracting forced savings. But a runaway inflation is highly detrimental to economic growth. The developing economies have to face the problem of inadequacy of resources in initial stages of development and it can make up this deficiency by deficit financing. But it has to be kept strictly within safe limits. Thus, increase in money supply affects vitally the rate of economic growth. In fact, it is now regarded as a legitimate instrument of economic growth. Kept within proper limits it can accelerate economic growth but exceeding of the limits will retard it. Thus, management of money supply is essential in the interest of steady economic growth.

THE CONCEPT OF MONEY SUPPLY AND ITS MEASUREMENT

By money supply we mean the total stock of monetary media of exchange available to a society for use in connection with the economic activity of the country. According to the standard concept of money supply, it is composed of the following two elements :

1. Currency with the public,
2. Demand deposits with the public.

Before explaining these two components of money supply two things must be noted with regard to the money supply in the economy. First, the money supply refers to the total sum of money available to the public in the economy *at a point of time*. That is, money supply is a *stock concept* in sharp contrast to the national income which is a flow representing the value of goods and services produced *per unit of time*, usually taken as a year. Secondly, money supply always refers to the amount of money *held by the public*. In the term public are included households, firms and institutions other than banks and the government. The rationale behind considering money supply as held by the public is to separate

the producers of money from those who use money to fulfil their various types of demand for money. Since the Government and the banks produce or create money for the use by the public, the money (cash reserves) held by them are not used for transaction and speculative purposes and are excluded from the standard measures of money supply. This *separation of producers of money from the users of money is important from the viewpoint of both monetary theory and policy.*[1]

Let us explain the two components of money supply at some length.

Currency with the Public

In order to arrive at the total currency with the public in India we add the following items:

1. Currency notes in circulation issued by the Reserve Bank of India.
2. The number of rupee notes and coins in circulation.
3. Small coins in circulation.

It is worth noting that *cash reserves* with the banks has to be deducted from the value of the above three items of currency in order to arrive at the total currency with the public. This is because cash reserves with the banks must remain with them and cannot therefore be used for making payments for goods or by any commercial bank's transactions. It may further be noted that these days paper currency issued by Reserve Bank of India (RBI) are not fully backed by the reserves of gold and silver, nor it is considered necessary to do so. Full backing of paper currency by reserves of gold prevailed in the past when gold standard or silver standard type of monetary system existed. According to the modern economic thinking the magnitude of currency issued should be determined by the monetary needs of the economy and not by the available reserves of gold and silver. As mentioned in the last chapter, as in other developed countries, since 1957 Reserve Bank of India follows Minimum Reserve System of issuing currency. Under this system, minimum reserves of ₹ 200 crores of gold and other approved securities (such as dollars, pound sterling, etc.) have to be kept and against this any amount of currency can be issued depending on the monetary requirements of the economy.

As stated earlier, RBI is not bound to convert notes into equal value of gold or silver. In the present times currency is inconvertible. The words written on the note, say 100 rupee notes and signed by the governor of RBI that '*I promise to pay the bearer a sum of 100 rupees*' are only a legacy of the past and do not imply its convertibility into gold or silver. Another important thing to note is that *paper currency or coins are fiat money*, which means that currency notes and metallic coins serve as money on the basis of the *fiat* (*i.e.* order) of the Government. In other words, on the authority of the Government, no one can refuse to accept them in payment for the transaction made. That is why they are called *legal tender.*

Demand Deposits with the Public

The other important component of money supply are demand deposits of the public with the banks. These demand deposits held by the public are also called *bank money* or *deposit money.* Deposits with the banks are broadly divided into two types: demand deposits and time deposits. Demand deposits in the banks are those deposits which can be withdrawn by drawing cheques on them. Through cheques these deposits can be transferred to others for making payments from whom goods and services have been purchased. Thus, cheques make these demand deposits as a medium of exchange and therefore make them to serve as money. It may be noted that demand deposits are *fiduciary money proper.* Fiduciary money is one which functions as money on the basis of *trust* of the persons who make payment rather than on the basis of the authority of Government. Thus, despite the fact that demand deposits and cheques through which they are operated are not legal tender, they functions as money on the basis of the trust commanded by those who draw cheques on them. They are money as they are generally acceptable as medium of payment.

1. S. B. Gupta, *Monetary Economics : Institutions, Theory and Policy*, S. Chand & Co., New Delhi, 3rd Edition, 1997, p. 272.

Bank deposits are created when people deposit currency with them. But far more important is that banks themselves create deposits when they give advances to businessmen and others. On the basis of small cash reserves of currency, they are able to create a much larger amount of demand deposits through a system called *fractional reserve system* which will be explained later in detail.

In the developed countries such as USA and Great Britain deposit money accounted for over 80 per cent of the total money supply, currency being a relatively small part of it. This is because banking system has greatly developed there and also people have developed banking habits. On the other hand, in the developing countries banking has not developed sufficiently and also people have not acquired banking habits and they prefer to make transactions in currency. However in India after 50 years of independence and economic development the proportion of bank deposits in the money supply has risen to about 50 per cent.

FOUR MEASURES OF MONEY SUPPLY

Several definitions of money supply have been given and therefore various measures of money supply based on them have been estimated. First, different components of money supply have been distinguished on the basis of the different functions that money performs. For example, demand deposits, credit card and currency are used by the people primarily as a medium of exchange for buying goods and services and making other transactions. Obviously, they are money because they are used as a medium of exchange and are generally referred to as $M1$. Another measure of money supply is $M3$ which includes both $M1$ and time deposits held by the public in the banks. Time deposits are money that people hold as store of value.

The main reason why money supply is classified into various measures on the basis of its functions is that effective predictions can be made about the likely effects on the economy of changes in the different components of money supply. For example, if $M1$ is increasing fastly it can be reasonably expected that pepole are planning to make a large number of transactions. On the other hand, if time deposits component of money supply measure $M3$ which serves as a store of value is increasing rapidly, it can be validly concluded that people are planning to save more and accordingly consume less. Therefore, it is believed that for monetary analysis and policy formulation, a single measure of money supply is not only inadequate but may be misleading too. Hence various measures of money supply are prepared to meet the needs of monetary analysis and policy formulation.

Recently in India as well as in some developed countries, four concepts of money supply have been distinguished. The definition of money supply given above represents a narrow measure of money supply and is generally described as $M1$. From April 1977, the Reserve Bank of India has adopted four concepts of money supply in its analysis of the quantum of and variations in money supply. These four concepts of measures of money supply are explained below.

1. Money Supply M1 or Narrow Money. This is the narrow measure of money supply and is composed of the following items:

$$M_1 = C + DD + OD$$

where C = Currency with the public

DD = Demand deposits with the public in the commercial and cooperative banks.

OD = Other deposits held by the public with Reserve Bank of India.

The money supply is the most liquid measure of money supply as the money included in it can be easily used as a medium of exchange, that is, as a means of making payments for transactions.

Currency with the public (C) in the above measure of money supply consists of the following:

(*i*) Notes in circulation.
(*ii*) Circulation of rupee coins as well as small coins
(*iii*) Cash reserves on hand with all banks.

Note that in measuring demand deposits with the public in the banks (*i.e.*, *DD*), inter-bank deposits, that is, deposits held by a bank in other banks are excluded from this measure.

In the other deposits with Reserve Bank of India (*i.e.*, *OD*) deposits held by the Central and State Governments and a few others such as RBI Employees Pension and Provident Funds are excluded. However, these other deposits of Reserve Bank of India include the following items :

(*i*) Deposits of institutions such UTI, IDBI, IFCI, NABARD etc.

(*ii*) Demand deposits of foreign central banks and foreign Governments.

(*iii*) Demand deposits of IMF and World Bank.

It may be noted that other deposits of Reserve Bank of India constitute a very small proportion (less than one per cent).

2. Money Supply *M*2

M2 is a broader concept of money supply in India than *M1*. In addition to the three items of *M*1, the concept of money supply *M2* includes savings deposits with the post office savings banks. Thus,

M 2 = *M*1 + Savings deposits with the post office savings banks.

The reason why money supply *M2* has been distinguished from *M1* is that saving deposits with post office savings banks are not as liquid as demand deposits with commercial and co-operative Banks as they are not chequable accounts. However, saving deposits with post offices are more liquid than time deposits with the banks.

3. Money Supply *M* 3 or Broad Money

*M*tis a broad concept of money supply. In addition to the items of money supply included in measure *M*1, in money supply *M*3 time deposits with the banks are also included. Thus

*M*3 = *M*1 + Time Deposits with the banks.

It is generally thought that time deposits serve as store of value and represent savings of the people and are not liquid as they cannot be withdrawn through drawing cheque on them. However, since loans from the banks can be easily obtained against these time deposits, they can be used if found necessary for transaction purposes in this way. Further, they can be withdrawn at any time by forgoing some interest earned on them.

It may be noted that recently *M*3 has become a popular measure of money supply. The working group on monetary reforms under the chairmanship of Late Prof. Sukhamoy Chakravarty recommended its use for monetary planning of the economy and setting target of the growth of money supply in terms of *M*3. Therefore, recently RBI in its analysis of growth of money supply and its effects on the economy has shifted to the use of *M*3 measure of money supply. In the terminology of money supply employed by the Reserve Bank of India till April 1977, this *M*3 was called *Aggregate Monetary Resources* (AMR).

4. Money Supply M4

The measure *M*4 of money supply includes not only all the items of M_3 described above but also the total deposits with the post office savings organisation. However, this excludes contributions made by the public to the national saving certificates. Thus, *M*4 = *M*3 + *Total Deposits* with *Post Office Savings Organisation.*

Let us summarise the four concepts of money supply as used by Reserve Bank of India in the following tabular form:

Money Supply

$M1$	$M2$	$M3$	$M4$
=	=	=	=
Currency (C)	$M1$	$M1$	$M3$
+	+	+	+
Demand Deposits (D) + Other Deposits of RBI (OD)	Savings Deposits with Post Office Savings Banks	Time Deposits with the Banks	Total Deposits of Post Office Savings Organisation (excluding NSC)

DETERMINANTS OF MONEY SUPPLY : MONEY MULTIPLIER THEORY

In order to explain the determinants of money supply in an economy we shall use $M1$ concept of money supply which is the most fundamental concept of money supply. We shall denote it simply by M rather than $M1$. As seen above this, concept of money supply is composed of currency held by the public (C_p) and demand deposits with the banks (D). Thus

$$M = C_p + D \quad ...(1)$$

where
M = Total money supply with the public
C_p = Currency with the public
D = Demand deposits held by the public

The two important determinants of money supply as described in equation (1) are (*a*) the amounts of high-powered money which is also called *Reserve Money* by the Reserve Bank of India and (*b*) the size of money multiplier. We explain below the role of these two factors in the determination of money supply in the economy.

1. **High-Powered Money (*H*).** The high-powered money which we denote by H consists of the currency (notes and coins) issued by the Government and the Reserve Bank of India. A part of the currency issued is held by the public, which we designate as C_p and a part is held by the banks as reserves which we designate as R. A part of these currency reserves of the banks is held by them in their own cash vaults and a part is deposited in the Reserve Bank of India in the Reserve Accounts which banks hold with RBI. Accordingly, the high-powered money can be obtained as sum of currency held by the public and the part held by the banks as reserves. Thus

$$H = C_p + R \quad ...(2)$$

where
H = the amount of high-powered money
C_p = Currency held by the public
R = Cash Reserves of currency with the banks.

It is worth noting that Reserve Bank of India and Government are *producers of the high-powered money* and the commercial banks do not have any role in producing this high-powered money (H). However, commercial banks are *producers of demand deposits* which are also used as money like currency. But for producing demand deposits or credit, banks have to keep with themselves cash *reserves of currency* which have been denoted by R in equation (2) above. Since these cash reserves with the banks serve as a basis for the multiple creation of demand deposits which constitute an important part of total money supply in the economy, it provides high-poweredness to the currency issued by Reserve Bank and Government. A glance at equations (1) and (2) above will reveal that the difference in the two equations, one describing the total money supply and the other high–powered money is that whereas in the former, demand deposits (D) are added to the currency held by the public, in the latter it is cash reserves (R) of the banks that are added to the currency held by the public. In fact, it is against these cash reserves (R) that banks are able to create a multiple expansion

of credit or demand deposits due to which there is large expansion in money supply in the economy.

The theory of determination of money supply is based on the supply of and demand for high-powered money. Some economists therefore call it '*The H Theory of Money Supply*'[2]. However, it is more popularly called **'Money-multiplier Theory of Money Supply'** because it explains the determination of money supply as a certain multiple of the high-powered money. How the high-powered money (H) is related to the total money supply is graphically depicted in Fig. 20.1. *The base of this figure shows the supply of high-powered money (H), while the top of the figure shows the total stock of money supply*. It will be seen that the total stock of money supply (that is, the top) is determined by a multiple of the high-powered money (H). It will be further seen that whereas currency held by the public (C_p) uses the same amount of high-powered money, that is, there is one-to-one relationship between currency held by the public and the money supply. In sharp contrast to this, bank deposits (D) are a multiple of the cash reserves (R) of the banks which are part of the supply of high-powered money. That is, one rupee of high-powered money kept as bank reserves gives rise to much more amount of demand deposits. Thus, the relationship between money supply and the high-powered money is determined by the money multiplier. The money multiplier which we denote by m is the ratio of total money supply (M) to the stock of high-powered money, that is, $m = \frac{M}{H}$. The size of money multiplier depends on the preference of the public to hold currency relative to deposits, (that is, ratio of currency to deposits which we denote by K) and banks' desired cash reserves ratio to deposits which we call r. We explain below the precise multiplier relationship between high-powered money and the total stock of money supply.

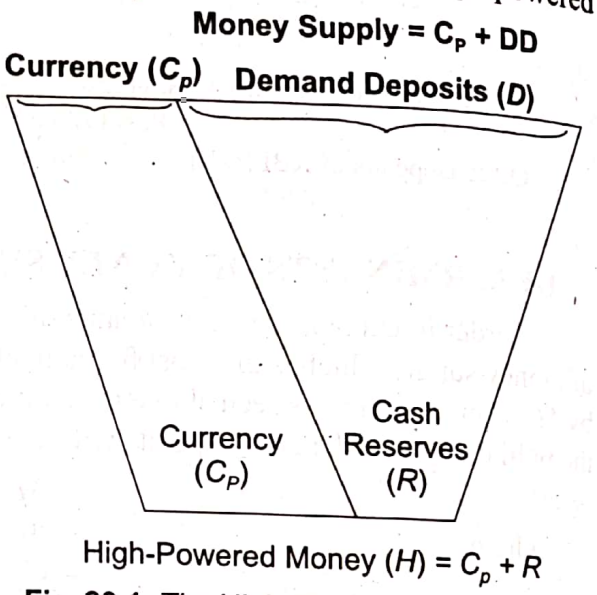

Fig. 20.1. *The High-Powered Money and the Stock of Total Money Supply*

It follows from above that if there is increase in currency held by the public which is a part of the high-powered money with demand deposits remaining unchanged, there will be a direct increase in the money supply in the economy because this constitutes a part of the money supply. If instead currency reserves held by the banks increase, this will not change the money supply immediately but will set in motion a process of multiple creation of demand deposits of the public in the banks. Although banks use these currency reserves held by the public which constitutes a part of the high-powered money to give more loans to the businessmen and thus create demand deposits, they do not affect either the amount of currency or the composition of high-powered money. The *amount of high-powered money is fixed by RBI by its past actions. Thus, changes in high-powered money are the result of decisions of Reserve Bank of India or the Government which owns and controls it.*

2. **Money Multiplier.** As stated above, money multiplier is the degree to which money supply is expanded as a result of the increase in high-powered money. Thus

$$m = \frac{M}{H}$$

2. See S.B. *Gupta, Monetary Economics: Institutions*, Theory and Policy, 3rd Edition, 1992, S. Chand & Co., New Delhi

Rearranging we have, $$M = H.m \quad ...(3)$$

Thus money supply is determined by the size of money multiplier (m) and the amount of high-powered money (H). If we know the value of money multiplier we can predict how much money will change when there is a change in the amount of high-powered money. As mentioned above, change in the high-powered money is decided and controlled by Reserve Bank of India, the money multiplier determines the extent to which decision by RBI regarding the change in high-powered money will bring about change in the total money supply in the economy.

Size of Money Multiplier

Now, an important question is : what determines the size of money multiplier ? It is the cash or currency reserve ratio r of the banks (which determines deposit multiplier) and currency-deposit ratio of the public (which we denote by k) which together determines size of money multiplier. We derive below the expression for the size of multiplier.

From equation (1) above, we know that total money supply (M) consists of currency with the public (C_p) and demand deposits with the banks. Thus

$$M = C_p + D \quad ...(1)$$

The public hold the amount of currency in a certain ratio of demand deposits with the banks. Let this currency-deposit ratio be denoted by k,

$$C_p = kD$$

Substituting kD for C_p in equation (1) we have

$$M = kD + D = (k + 1)D \quad ...(2)$$

Now take equation which defines high powered money (H) as

$$H = C_p + R \quad ...(3)$$

where R represents cash or currency reserves which banks keep as a certain ratio of their deposits and is called cash-reserve ratio and is denoted by r. Thus

$$R = rD$$

Now substituting rD for R and kD for C_p in equation (3) we have

$$H = kD + rD$$

$$H = (k + r)\,D \quad ...(4)$$

Now money multiplier is ratio of total money supply to the high-powered money, therefore we divide equation (1) by equation (4), to get the value of multiplier, which we denote by m. Thus

$$(m) = \frac{M}{H} = \frac{(k+1)D}{(k+r)D} = \frac{k+1}{k+r}$$

or, $$\text{Money multiplier } (m) = \frac{M}{H} = \frac{1+k}{r+k}$$

or $$M = H\frac{1+k}{r+k} \quad ...(5)$$

where r = Reserve ratio of the *banks*
k = Currency-deposit ratio of the *public*.

From above it follows that money supply is determined by the high-powered money (which is also called reserve money) times the *money multiplier which is equal to* $\frac{1+k}{r+k}$. Thus the following

factors determine money supply in the economy:

1. H, that is, the amount of high-powered money.
2. r, that is, *cash reserve ratio* of banks (*i.e.*, ratio of currency reserves to deposits in the banks). This cash reserve ratio of banks determines the magnitude of money multiplier. The smaller the cash reserve ratio of the banks, the larger is the money multiplier.
3. k, that is, *currency-deposit ratio of the public*. The smaller the currency-deposit ratio of the public, the larger is the size of money multiplier.

From equation (4) expressing the determinants of money supply, it follows that *money supply will increase* :

1. When the supply of high-powered money (*i.e.*, reserve money) H increases;
2. When the currency-deposit ratio (k) of the public decreases[3]; and
3. When the currency reserves-deposit ratio (*i.e.*, cash reserve ratio) of the banks (r) falls.

The Cash Reserve Ratio and the Deposit Multiplier

In a later chapter we will see that because of *fractional reserve system*, with a small increase in cash reserves with the banks, they are able to create a multiple increase in total demand deposits which are an important part of money. supply. The ratio of change in total deposits to a change in reserves is called the *deposit multiplier* which depends on cash reserve ratio. The value of deposit multiplier is the reciprocal of cash reserve ratio, $\left(d_m = \frac{1}{r}\right)$ where d_m stands for deposit multiplier. If cash reserve ratio is 10 per cent of deposits, then $d_m = \frac{1}{0.10} = 10$. Thus deposit multiplier of 10 shows that for every ₹ 100 increase in cash reserves with the banks, there will be expansion in demand deposits of the banks by ₹ 1000 assuming that no leakage of cash to the public occurs during the process of deposit expansion by the banks. In India, this currency-reserve ratio of banks is called Cash Reserve Ratio (CRR) and is regulated by RBI.

Currency-Deposit Ratio and Multiplier

However, in the real world, with the increase in reserves of the banks, demand deposits and money supply do not increase to the full extent of deposit multiplier. This is for two reasons. First, the public does not hold all its money balances in the form of demand deposits with the banks. When, as a result of increase in cash reserves, banks start increasing demand deposits, the people may also like to have some more currency with them as money balances. This means during the process of creation of demand deposits by banks, some currency is leaked out from the banks to the people. This drainage of currency to the people in the real world reduces the magnitude of expansion of demand deposit and therefore the size of money multiplier. Suppose the cash reserve ratio is 10 per cent and cash or currency of ₹ 100 is deposited in a bank A. The bank A will lend out ₹ 90 and therefore create demand deposits of ₹ 90 and so the process will continue as the borrowers use these deposits for payment through cheques to others who deposit them in another bank B. However, if

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3. It will be noted that in the equation $M = H\frac{1+k}{r+k}$, k appears both in the numerator and denominator. *While in the numerator k is added to unity, in the denominator it is added to fraction.* Mathematically, it means that a fall in k will affect the denominator relatively more than the numerator. Therefore, with fall in k, the value of multiplier term $\frac{1+k}{r+k}$, will increase. Thus, with decrease in k, the money supply with increase and *vice versa*. *

borrower of bank A withdraws ₹ 10 in cash from the bank and issues cheques of the remaining borrowed amount of ₹ 80, then bank B will have only ₹ 80 as new deposits instead of ₹ 90 which it would have if cash of ₹ 10 was not withdrawn by the borrower. With these new deposits of ₹ 80, bank B will create demand deposits of ₹ 72, that is, it will lend out ₹ 72 and keep ₹ 8 as reserves with it $\left(80\times\frac{10}{100}=8\right)$. The drainage of currency may occur during all the subsequent stages of deposit expansion in the banking system. The greater the leakage of currency, the lower will be the money multiplier. We thus see the currency-deposit ratio, which we denote by k, is an important determinant of the actual value of money multiplier.

It is important to note that deposit multiplier works both ways, positively when cash reserves with banks increase, and negatively when the cash reserves with the banks decline. That is, when there is a decrease in currency reserves with the banks, there will be multiple contraction in demand deposits with the banks.

Excess Reserves

In the explanation of the expansion of demand deposits or deposit multiplier we assumed that banks do not keep currency reserves in excess of the *required* cash reserve ratio. The ratio r in the deposit multiplier is the *required cash reserve ratio* fixed by Reserve Bank of India. However, banks like to keep with themselves some excess reserves, the amount of which depends on the extent of liquidity (*i.e.* availability of cash with them) and profitability of making investment and rate of interest on loans advanced to business firms. Therefore, the *desired reserve ratio* is greater than the statutory minimum required reserve ratio. Obviously, the holding of excess reserves by the banks also reduces the value of deposit multiplier.

Conclusion

Theory of determination of money supply explains how a given supply of high-powered money (which is also called *monetary base or reserve money*) leads to multiple expansion in money supply through the working of money multiplier. We have seen above how a small increase in reserves of currency with the banks leads to a multiple expansion in demand deposits by the banks through the process of deposit multiplier and thus causes growth of money supply in the economy. Deposit multiplier measures how much increase in demand deposits (or money supply) occurs as a result of a given increase in cash or currency, reserves with the banks depending on the required cash reserve ratio (r) if there are no cash drainage from the banking system. But in the real world drainage of currency does take place which reduces the extent of expansion of money supply following the increase in cash reserves with the banks. Therefore, *the deposit multiplier exaggerates the actual increase in money supply from a given increase in cash reserves with the banks*. In contrast, money multiplier takes into account these leakages of currency from the banking system and therefore measures actual increase in money supply when the cash reserves with the banks increase. *The money multiplier can be defined as increase in money supply for every rupee increase in cash reserves (or high-powered money), drainage of currency having been taken into account. Therefore, money multiplier is less than the deposit multiplier.*

It is worth noting that rapid growth in money supply in India has been due to the increase in high-powered money H, or what is also called Reserve Money by Reserve Bank of India, the money multiplier remaining almost constant.

The money supply in a country can be changed by Reserve Bank of India by undertaking open market operations, changing minimum required currency reserve-deposit ratio, and by varying the bank rate. The main source of growth in money supply in India is creation of credit by RBI for Government for financing its budget deficit and thus creating high-powered money. Further, though the required currency reserve-deposit ratio of banks can be easily varied by RBI, the actual currency reserve-deposit ratio cannot be so easily varied as reserves maintained by banks not only depend on minimum required cash reserve ratio but also on their willingness to hold excess reserves.

Lastly[4], an important noteworthy point is that though money multiplier does not show much variation in the long run, it can change significantly in the short run causing large variations in money supply. This unpredictable variation in money multiplier in the short run affecting money supply in the economy prevents the Central Bank of a country from controlling exactly and precisely the money supply in the economy.

FACTORS DETERMINING MONEY SUPPLY : RBI'S APPROACH

In its analysis of factors determining money supply in India and sources of variation in it, Reserve Bank of India does not follow any explicit theory of money supply such as money multiplier theory explained above. It provides only purely *accounting or ex-post analysis* of variations in money supply and the factors or sources causing these variations. Although Reserve Bank provides figures of the high-powered money in its analysis, it virtually clubs high powered money with the ordinary money to calculate the total money supply in the country and therefore does not give due importance to the high-powered money as an important factor causing variation in money supply in the economy. Further, *Reserve Bank also does not lay emphasis on the two behavioural ratios, namely, desired currency-deposit ratio (k) of the public and desired cash reserve ratio* (*r*) of the banks as determinants of money supply, though it provides *ex-post* or realised figures of these ratios. We explain below Reserve Bank's analysis of sources of variation in money supply.

Reserve Bank of India classifies factors determining money supply into the following categories:

(*a*) Government borrowing from the banking system;
(*b*) Borrowing of the private or commercial sector from the banking system;
(*c*) Changes in net foreign assets held by the Reserve Bank of India caused by changes in balance of payments position; and
(*d*) Government's currency liabilities to the public.

Bank Credit to the Government. When the Government expenditure exceeds government revenue and there is deficit in government's budget, then *it may* resort to borrowing from Reserve Bank of India which creates new currency notes for the purpose. This creation of new currency for financing the deficit of the Central Government Budget is known as *monetisation of deficit*. It was previously called *deficit financing*. Monetisation of deficit is an important source of change in money supply in the economy. It may be noted here that since 1995 when Fiscal Responsibility and Budget Management (FRBM) Act was passed Central Government fiscal deficit is financed by borrowing through selling Government bonds to the banks. This has caused a stoppage of RBI's credit to the Government through monetisation of fiscal deficit. However, for the years 2008-09 and 2009-10 the Government resorted to *directly borrowing from RBI* by selling its bonds to it and thus monetising a part of its fiscal deficit which had greatly risen due to large increase in Government expenditure incurred to prevent slowdown in economic growth. Thus, in recent years budget deficit of the Central Government has been largely financed by borrowing from the commercial banks and other financial institutions who buy government securities or bonds.

The commercial banks also lend money to the Government for purchase of foodgrains by the Food Corporation of India. The creation of credit by the banks when they lend to the Government leads to the increase in money supply in the economy. When the Government uses this bank credit for meeting its expenditure, money supply with the public increases.

Bank Credit to the Commercial or Private Sector. The private sector also borrows from the banking system when its own resources are less than its total expenditure. This also adds to the money supply with the public because when the banks lend they create credit or deposits. Bank deposits, as we have seen above, is a part of money supply in the economy. This also affects the money supply

4. Note that Reserve Bank of India calls the high-powered money as *Reserve Money* (RM). High powered money is also called *base money*.

in the same manner as the Government borrowing from the banking system. There is, however, an important difference. However, the Central Bank can influence the credit supply by the banks to the private sector by changing liquidity with the banks through making changes in cash reserve ratio.

Changes in Net Foreign Exchange Assets. Changes in the foreign exchange assets held by the Reserve Bank can also bring about a change in the money supply. The change in the net foreign assets may be caused by balance of payment situation. Suppose there is deficit in balance of payments and therefore available foreign exchange is less than the country needs to pay for its imports, both visible and invisible. In order to meet this deficit in balance of payments the country will have to dispose of some of its foreign exchange assets. If there is a net deficit in balance of payments, rupees would flow into the Reserve Bank which pays out foreign exchange reserves in return for the rupee currency. This would have the effect of reducing the *Reserve Money* (*i.e.* the high-powered money) in India and the contraction of money supply with the public. Opposite result would follow when there is a net surplus in balance of payments of a country.

It follows from above that a deficit in the balance of payments decreases the supply of rupee currency (that is, high-powered or reserve money) in the economy and thereby causes contraction in money supply with the public. On the contrary, a surplus in the balance of payments will increase the foreign exchange assets and thereby will lead to the expansion in reserve money and money supply in the economy.

It may also be noted that apart from surplus in balance of payments foreign exchange reserves or assets may also come through *capital inflows* by either foreign aid or deposits in Indian banks by NRI or foreign direct investment made by foreign companies in India or by portfolio investment by foreign institutional investors (FII). For example, in years 2005 to 2008 there had been a large-scale inflow of foreign exchange through investment made by foreign companies in India. As a result, our foreign exchange reserves substantially went up which resulted in the issue and expansion of rupee currency in circulation. But RBI neutralised its monetary impact to a large extent by mopping up liquidity of the banks through open market operations by selling them Government bonds.

The plenty of foreign exchange received posed a problem of its optimal use during 2005-2008. One proposal was to use foreign exchange reserves to finance the infrastructure projects which are crucial for accelerating economic growth. But argument against this was that the use of foreign exchange reserves will lead to expansion in money supply which would cause higher rate of inflation. The other proposal was that these foreign exchange reserves should be used to import goods in short supply which help in lowering inflation rate. But since September 2008, the opposite problem of *capital outflows* arose due to foreign institutional investors selling shares in Indian stock market and repatriating dollars abroad following the global financial crisis. These capital outflow was increased the demand for dollars and caused depreciation of Indian rupee. In order to prevent the rapid depreciation of rupee, RBI sold dollars from its reserves and in return got rupees resulting in decline in the number of rupees in circulation, that is, decrease in money supply.

(*d*) **Government's Currency Liabilities to the Public.** Changes in money supply in the economy are also brought about by Government's currency liabilities to the public. Coins and one-rupee notes represent Government's currency liabilities to the public. On January 28, 2005, there were ₹ 7374 crores of coins and one-rupee notes as compared to ₹ 7296 crores on March 31, 2004. If Government's currency liabilities increase, the money supply also increases.

BUDGET DEFICITS AND MONEY SUPPLY

A budget deficit is also an important source of expansion of money supply in the economy. There are two possible links between budget deficit and growth in money supply. First, when following an expansionary fiscal policy the government raises its expenditure without financed by extra taxation and thereby causing a budget deficit, it will tend to raise interest rate. This happens when budget deficit

is financed through borrowing from the market. As a result, demand for money or loanable funds increases which, given the supply of money, causes interest rate to rise. Rise in interest rate tends to reduce or crowd out private investment. If the Central Bank is following the policy of a fixed interest rate target, when the government resorts to borrowing to finance the budget deficit, then to prevent the rise in interest rate the Central Bank will take steps to increase the money supply in the economy.

The second link between budget deficit and expansion in money supply is direct. This occurs when the Central Bank itself purchases government securities when the government resorts to borrowing.[5] The Central Bank is said to *monetise* budget deficit when it purchases government securities as it prints new notes for the purpose and gives it to the government for meeting public expenditure. In some countries such as the US, Federal Reserve (which is the Central Bank of the USA) enjoys a good deal of independence from the Treasury (*i.e.*, the Government) and voluntarily decides when and how much to purchase government securities to finance its budget deficit.

Central Bank's Dilemma

The Central Bank of a country faces a dilemma in deciding whether or not to monetise budget deficit. If the Central Bank does not monetise budget deficit to meet its increased expenditure, the government will borrow from the market and in the absence of any accommodating monetary policy this will tend to raise interest rate and thereby *reduce or crowd out private investment.* Referring to the policy of Federal Reserve of the United States, Dornbusch, Fischer and Startz write, " There is accordingly a temptation for the Federal Reserve to prevent crowding out by buying government securities thereby increasing the money supply and hence allows an expansion in income without a rise in interest rates".[6]

But the policy of monetisation of budget deficit by the Central Bank involves a risk. If the economy is working near full-employment level, that is, at near full-production capacity, monetisation of budget deficit will cause inflation in the economy. However, if the economy is in the grip of a severe depression, the risk of causing inflation through monetisation of budget deficit and consequent growth in money supply is not much there.

It follows from above that in any particular case the Central Bank, if it enjoys freedom from the Government, has to judge whether it should adopt accommodatory monetary policy to achieve its goal of interest-targeting or allow fiscal expansion through monetisation of budget deficit accompanied by the tight monetary policy to check inflation. It is the latter course of action that was adopted by Reserve Bank of India before 1995 when government's fiscal deficit was high and a good part of it was monetised by it.

MONEY SUPPLY AND THE OPEN ECONOMY

The transactions of an open economy also affect the growth of money supply in it. In the open economy there is free flow of goods and services through trade with foreign countries. Besides, in the open economy there are flows of capital between countries. The impact of transactions of an open economy on the money supply can be letter understood from national income identity of an open economy. National income of the open economy is written as

$$Y = C + I + G + NX \quad ...(1)$$

or

$$NX = Y - (C + I + G) \quad ...(2)$$

where NX stands for net exports or trade balance. In the trade balance if we also include exports and imports of services (*i.e.*, invisibles), then NX can be taken as current account balance.

The current account balance (NX) can be either positive or negative. If in equation (2) above aggregate expenditure ($C + I + G$) exceeds national output (Y), current account balance or NX will

5. It is important to note that when government borrows from the market, it does so through sale of its securities (i.e. bonds)
6. Dornbusch, Fischer, and Startz, *op.cit.* 9th edition, 2004, p.275.

21 DEMAND FOR MONEY AND KEYNES'S LIQUIDITY PREFERENCE THEORY OF INTEREST

Introduction

Why people have demand for money to hold is an important issue in macroeconomics. The level of demand for money not only determines the rate of interest but also prices and national income of the economy. *Classical economists considered money as simply a means of payment or medium of exchange*. In the classical model, people therefore demand money in order to make payments for their purchase of goods and services. In other words, they want to keep money for transactions purposes. *On the other hand, J.M. Keynes laid stress on the store of value function of money*. According to him, money is an asset and people want to hold it so as to take advantage of changes in the price of this asset, that is, the rate of interest. Therefore, Keynes emphasised another motive for holding money which he called speculative motive. As will be explained in detail below, under speculative motive people demand to hold money balances to take advantages from the future changes in the rate of interest, or what means the same thing, from the future changes in bond prices.

An essential point to be noted about people's demand for money is that what people want is not *nominal* money holdings but *real money balances* (This is also referred to as simply *real balances*). This means that people are interested in the purchasing power of their money holdings, that is, the value of money balances in terms of goods and services which they could buy. Thus, people would not be interested in merely nominal money holdings irrespective of the price level, that is, the number of rupee notes and bank deposits. If with the doubling of price level, nominal money holdings are also doubled, their *real money balances* would remain the same. If people are merely concerned with nominal money holdings irrespective of the price level, they are said to suffer from *money illusion*.

The demand for money has been a subject of lively debate in economics. Interest in the study of demand for money has been due to the important role that monetary demand plays in the determination of the price level, interest and income. Till recently there were three approaches to demand for money, namely, transactions approach of Fisher, Cash-balance approach of Cambridge economists, Marshall and Pigou, and Keynes theory of demand for money. However, in recent years Baumol, Tobin and Friedman have put forward new theories of demand for money. We critically examine below all these theories of demand for money.[1]

FISHER'S TRANSACTIONS APPROACH TO DEMAND FOR MONEY

In his theory of demand for money Fisher and other classical economists laid stress on the medium of exchange function of money, that is, money as a means of buying goods and services. All transactions involving purchase of goods, services, raw materials, assets require payment of money as value of the transaction made. If accounting identity, namely value paid must equal value received is to occur, value of goods, services and assets sold must be equal to the value of money paid for them. Thus, in any given period, the value of all goods, services or assets sold must equal to the number

1. Irving Fisher, *Purchasing Power of Money*, Macmillan, 1911.

of transactions T made multiplied by the average price of these transactions. Thus, the total value of transactions made is equal to PT.

On the other hand, because value paid is identically equal to the value of money flow used for buying goods, services and assets, the value of money flow is equal to the nominal quantity of money supply M multiplied by the average number of times the quantity of money in circulation is used or exchanged for transactions purposes. The average number of times a unit of money is used for transactions of goods, services or assets is called *transactions velocity of circulation* and we denote it by V.

Symbolically, Fisher's equation of exchange is written as under :

$$MV = PT \quad \text{...(1)}$$

where
M = the quantity of money in circulation
V = transactions velocity of circulation
P = Average price
T = the total number of transactions.

The above equation (1) is an identity, that is true by definition. However by taking some assumptions about the variables V and T, Fisher transformed the above identity into a theory of demand for money.

According to Fisher, the nominal quantity of money M is fixed by the Central Bank of a country (note that Reserve Bank of India is the Central Bank of India) and is therefore treated as an exogenous variable which is assumed to be a given quantity in a particular period of time. Further, the number of transactions in a period is a function of national income; the greater the national income, the larger the number of transactions required to be made. Further, since Fisher assumed that full employment of resources prevailed in the economy, the level of national income is determined by the amount of the fully employed resources. Thus, with the assumption of full employment of resources, the volume of transactions T is fixed in the short run.

But most important assumption which makes Fisher's equation of exchange as a theory of demand for money is that velocity of circulation (V) remains constant and is independent of M, P and T. This is because he thought that *velocity of circulation of money (V) is determined by institutional and technological factors involved in the transactions process*. Since these institutional and technological factors do not vary much in the short run, the transactions velocity of circulation of money (V) was assumed to be constant.

As we know that for money market to be in equilibrium, nominal quantity of money supply must be equal to the nominal quantity of money demand. In other words, for money market to be in equilibrium

$$M_s = M_d = M$$

where M is fixed by the Central Bank of a country.

With the above assumptions, Fisher's equation of exchange can be rewritten as

$$M_d = \frac{PT}{V}$$

or

$$M_d = \frac{1}{V}.PT \quad \text{...(2)}$$

or

Thus, according to Fisher's transactions approach, demand for money depends on the following three factors:

(1) the number of transactions (T)
(2) the average price of transactions (P)
(3) the transaction velocity of circulation of money

It has been pointed out that Fisher's transactions approach represents some kind of a mechanical relation between demand for money (M_d) and the total value of transactions (PT). Thus Prof. Suraj Bhan Gupta says that in Fisher's approach the relation between demand for money M_d and the value of transactions (PT) "betrays some kind of a mechanical relation between it (*i.e.* PT) and M_d as PT represents the total amount of *work to be done* by money as a medium of exchange. This makes demand for money (M_d) a technical requirement and not a behavioural function"[2].

In Fisher's transactions approach to demand for money some serious problems are faced when it is used for empirical research. First, in Fisher's transactions approach, not only transactions involving current production of goods and services are included but also those which arise in sales and purchase of capital assets such as securities, shares, land etc. Due to frequent changes in the values of these capital assets, it is not appropriate to assume that T will remain constant even if Y is taken to be constant due to full-employment assumption.

The second problem which is faced in Fisher's approach is that it is difficult to define and determine a general price level that covers not only goods and services currently produced but also capital assets just mentioned above.

The Cambridge Cash-Balance Theory of Demand for Money

Cambridge Cash-Balance theory of demand for money was put forward by Cambridge economists, Marshall and Pigou[3]. This Cash-Balance theory of demand for money differs from Fisher's transaction approach in that it *places emphasis on the function of money as a store of value or wealth* instead of Fisher's emphasis on the use of money as a medium of exchange. It is worth noting that the exchange function of money eliminates the need to barter and solves the problem of double coincidence of wants faced in the barter system. On the other hand, the function of money as a store of value lays stress on holding money as a general purchasing power by individuals over a period of time between the sale of a good or service and subsequent purchase of a good or service at a later date. Marshall and Pigou focussed their analysis on the factors that determine individual demand for holding cash balances. Although, they recognised that current interest rate, wealth owned by the individual's, expectations of future prices and future rate of interest determine the demand for money, they however believed that changes in these factors remain constant or they are proportional to changes in individuals' income. Thus, they put forward a view that individual's demand for cash-balances (*i.e.* nominal money balances) is proportional to the nominal income (*i.e.* money income). Thus, according to their approach, aggregate demand for money can be expressed as

$$M_d = kPY$$

where

Y = real national income

P = average price level of currently produced goods and services

PY = nominal income

k = proportion of nominal income (PY) that people want to hold as cash balances

Cambridge cash-balance approach to demand for money is illustrated in Fig. 21.1 where on the X-axis we measure nominal national income (PY) and on the Y-axis the demand for money (M_d). It will be seen from Fig. 21.1 that *demand for money* (M_d) *in this Cambridge cash-balance approach is a linear function of nominal income*. The slope of the function is equal to k, that is, $k = \frac{M_d}{P_y}$. Thus

2. S.B. Gupta, *Monetary Economics, Theory Policy and Institutions*, 4th edition, 1997, p. 183.
3. A.C. Pigou, "Value of Money," *Quarterly Journal of Economics*, Vol. 32, 1917, pp. 38-65.

important feature of cash-balance approach is that *it makes the demand for money as function of money income alone*. A merit of this formulation is that it makes the relation between demand for money and income as behavioural in sharp contrast to Fisher's approach in which demand for money was related to total transactions in a mechanical manner.

Although, as mentioned above, Cambridge economists recognised the role of other factors such as rate of interest, wealth as the factors which play a part in the determination of demand for money but these factors were not systematically and formally incorporated into their analysis of demand for money. In their approach, these other factors determine the proportionality factor *k*, that is, the proportion of money income that people want to hold in the form of money, *i.e.* cash balances. It was J.M. Keynes who later emphasised the role of these other factors such as rate of interest, expectations regarding future interest rate and prices and formally incorporated them explicitly in his analysis of demand for money. Thus, Glahe rightly writes, "*Cambridge approach is conceptually richer than the transactions approach, the former is incomplete because it does not formally incorporate the influence of economic variables just mentioned on the demand for cash balances... John Maynard Keynes first attempted to eliminate this shortcoming.*"[4]

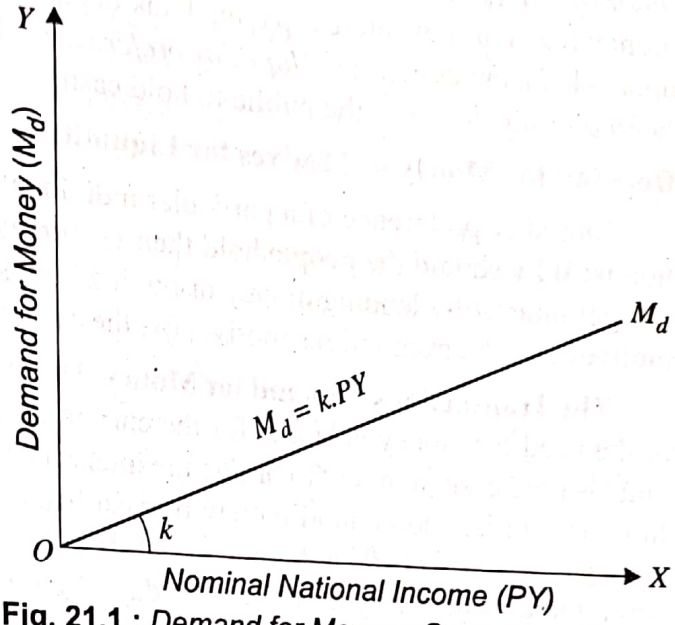

Fig. 21.1 : *Demand for Money : Cambridge Cash-Balance Approach*

Another *important feature of Cambridge demand for money function is that the demand for money is proportional function of nominal income* ($M_d = kPY$). Thus, it is proportional function of both price level (P) and real income (Y). This implies two things. First, income elasticity of demand for money is unity and, secondly, price elasticity of demand for money is also equal to unity so that any change in the price level causes equal proportionate change in the demand for money.

Criticism. It has been pointed out by critics that other influences such as rate of interest, wealth, expectations regarding future prices and rate of interest have not been formally introduced into the Cambridge theory of the demand for cash-balances. These other influences remain in the background of the theory. "It was left to Keynes, another Cambridge economist, to highlight the influence of the rate of interest on the demand for money and change the course of monetary theory."[5]

Another criticism levelled against this theory is that income elasticity of demand for money may well be different from unity. Cambridge economists did not provide any theoretical reason for its being equal to unity. Nor is there any empirical evidence supporting unitary income elasticity of demand for money. Besides, price elasticity of demand is also not necessarily equal to unity. In fact, changes in the price level may cause non-proportional changes in the demand for money. However, these criticisms are against the mathematical formulation of cash-balance approach, namely, $M_d = kPY$. They do not deny the important relation between demand for money and the level of income. Empirical studies conducted so far point to a strong evidence that there is a significant and firm relation between demand for money and level of income.

4. Fred R. Glahe, *Macroeconomics: Theory and Policy*, 2nd Edition, 1977, Harcourt, p. 164.
5. S.B. Gupta, *op. cit.*, p. 184.

KEYNES'S THEORY OF DEMAND FOR MONEY

In his well-known book[6], Keynes propounded a theory of demand for money which occupies an important place in his monetary theory.

It is also worth noting that for demand for money to hold Keynes used the term what he called *liquidity preference*. How much of his income or resources will a person hold in the form of ready money (cash or non-interest-paying bank deposits) and how much will he part with or lend depends upon what Keynes calls his "*liquidity preference*." Liquidity preference means the *demand for money to hold* or the desire of the public to hold cash.

Demand for Money or Motives for Liquidity Preference : Keynes's Theory

Liquidity preference of a particular individual depends upon several considerations. The question is: Why should the people hold their resources liquid or in the form of ready money when they can get interest by lending money or buying bonds? The desire for liquidity arises because of three motives : (*i*) the transactions motive, (*ii*) the precautionary motive, and (*iii*) the speculative motive.

The Transactions Demand for Money. The transactions motive relates to the demand for money or the need for money balances for the current transactions of individuals and business firms. Individuals hold cash in order "to bridge the interval between the receipt of income and its expenditure". In other words, people hold money or cash balances for transactions purposes, because receipt of money and payments do not coincide. Most of the people receive their incomes weekly or monthly while the expenditure goes on day by day. A certain amount of ready money, therefore, is kept in hand to make current payments. This amount will depend upon the size of the individual's income, the interval at which the income is received and the methods of payments prevailing in the society.

The businessmen and the entrepreneurs also have to keep a proportion of their resources in money form in order to meet daily needs of various kinds. They need money all the time in order to pay for raw materials and transport, to pay wages and salaries and to meet all other current expenses incurred by any business firm. It is clear that the amount of money held under this business motive will depend to a very large extent on the turnover (*i.e.*, the volume of trade of the firm in question). The larger the turnover, the larger, in general, will be the amount of money needed to cover current expenses. It is worth noting that money demand for transactions motive arises primarily because of the use of money as a medium of exchange (*i.e.* means of payment).

Since the transactions demand for money arises because individuals have to incur expenditure on goods and services during the receipt of income and its use for payment of goods and services, money held for this motive depends upon the level of income of an individual. A poor man will hold less money for transactions motive as he spends less because of his small income. On the other hand, a rich man will tend to hold more money for transactions motive as his expenditure will be relatively greater.

The demand for money is a demand for *real* cash balances because people hold money for the purpose of buying goods and services. The higher the price level, the more money balances a person has to hold in order to purchase a given quantity of goods. If the price level doubles, then the individual has to keep twice the amount of money balances in order to be able to buy the same quantity of goods. Thus the demand for money balances is demand for *real* rather than *nominal* balances.

According to Keynes, the transactions demand for money depends only on the real income and is not influenced by the rate of interest. However, in recent years, it has been observed empirically and also according to the theories of Tobin and Baumol transactions demand for money also depends on the rate of interest. This can be explained in terms of *opportunity cost* of money holdings. Holding one's asset in the form of money balances has an opportunity cost. The cost of holding money

6. J.M. Keynes, *General Theory of Employment, Interest and Money*, Macmillan, 1936.

balances is the interest that is foregone by holding money balances rather than other assets. The higher the interest rate, the greater the opportunity cost of holding money rather than non-money assets. Individuals and business firms economise on their holding of money balances by carefully managing their money balances through transfer of money into bonds or short-term income yielding non-money assets. Thus, at higher interest rates, individuals and business firms will keep less money holdings at each level of income.

Precautionary Demand for Money. Precautionary motive for holding money refers to the desire of the people to hold cash balances for unforeseen contingencies. People hold a certain amount of money to provide for the danger of unemployment, sickness, accidents, and the other uncertain perils. The amount of money demanded for this motive will depend on the psychology of the individual and the conditions in which he lives.

Speculative Demand for Money. The speculative motive of the people relates to the desire to hold one's resources in liquid form in order to take advantage of market movements regarding the future changes in the rate of interest (or bond prices). The notion of holding money for speculative motive was a new and revolutionary Keynesian idea. Money held under the speculative motive serves as a store of value as money held under the precautionary motive does. But it is a store of money meant for a different purpose. The cash held under this motive is used to make speculative gains by dealing in bonds[7] whose prices fluctuate. If bond prices are expected to rise which, in other words, means that the rate of interest is expected to fall, businessmen will buy bonds to sell when their prices actually rise. If, however, bond prices are expected to fall, *i.e.*, the rate of interest is expected to rise, business-men will sell bonds to avoid capital losses. Nothing is certain in the dynamic world, where guesses about the future course of events are made on precarious basis, businessmen keep cash to speculate on the probable future changes in bond prices (or the rate of interest) with a view to making profits.

Given the expectations about the changes in the rate of interest in future, less money will be held under the speculative motive at a *higher current* rate of interest and more money will be held under this motive at a *lower current* rate of interest. The reason for this inverse correlation between money held for speculative motive and the prevailing rate of interest is that at a lower rate of interest less is lost by not lending money or investing it, that is, by holding on to money, while at a higher current rate of interest holders of cash balance would lose more by not lending or investing.

Thus the demand for money under speculative motive is a function of the current rate of interest, increasing as the interest rate falls and decreasing as the interest rate rises. Thus, demand for money under this motive is a decreasing function of the rate of interest. This is shown in Fig. 21.2. Along *X*-axis we represent the speculative demand for money and along the *Y*-axis the current rate of interest The liquidity preference curve *LP* is downward sloping towards the right signifying that the higher the rate of interest, the lower the demand for money for speculative motive, and *vice versa*. Thus at the high current rate of interest *Or*, a very small amount *OM* is held for speculative motive. This is because at a high current rate of interest more money would have been

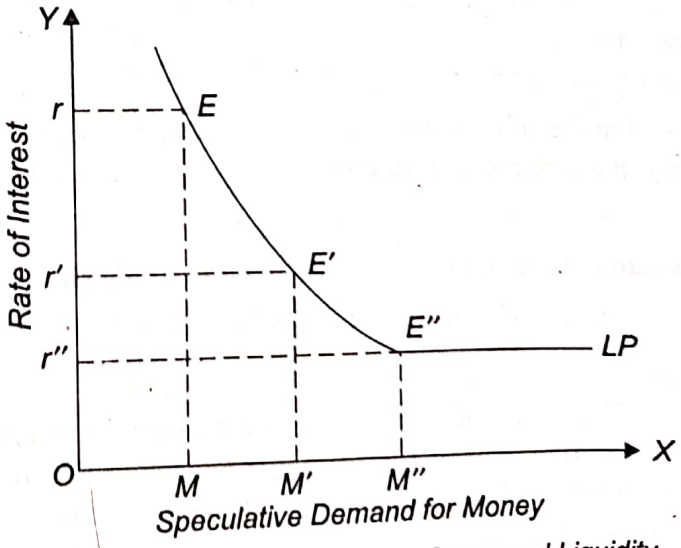

Fig. 21.2. *Liquidity Preference Curve and Liquidity Trap*

7. All securities and other such papers as yield a fixed and known rate of interest over a period of time are known as bonds.

lent out or used for buying bonds and therefore less money would be kept as inactive balances. If the rate of interest falls to Or', then a greater amount of money OM' is held under speculative motive. With the further fall in the rate of interest to Or'', money held under speculative motive increases to OM.

Liquidity Trap. It will be seen from Fig. 21.2 that the liquidity preference curve LP becomes quite flat *i.e.*, perfectly elastic at a very low rate of interest; it is horizontal line beyond point E'' towards the right. This perfectly elastic portion of liquidity preference curve indicates the position of *absolute liquidity* preference of the people. That is, at a very low rate of interest people will hold with them as inactive balances any amount of money they come to have. This portion of liquidity preference curve with absolute liquidity preference is called *liquidity trap* by the economists because expansion in money supply gets trapped in the sphere of liquidity trap and therefore cannot affect rate of interest and therefore the level of investment. According to Keynes, it is because of the existence of liquidity trap that monetary policy becomes ineffective to tide over economic depression.

But the demand for money to satisfy the speculative motive does not depend so much upon what the current rate of interest is, as on expectations about changes in the rate of interest. If there is a change in the expectations regarding the future rate of interest, the whole curve of demand for money or liquidity preference for speculative motive will change accordingly. Thus, if the public on balance expect the rate of interest to be higher (*i.e.*, bond prices to be lower) in the future than had been previously supposed, the speculative demand for money will increase and the whole liquidity preference curve for speculative motive will shift upward.

Aggregate Demand for Money : Keynes's View

If the total demand for money is represented by M_d we may refer to that part of M held for transactions and precautionary motive as M_1 and to that part held for the speculative motive as M_2. Thus $M_d = M_1 + M_2$. According to Keynes, the money held under the transactions and precautionary motives, *i.e.*, M_1, is completely interest-inelastic unless the interest rate is very high. The amount of money held as M_1, that is, for transactions and precautionary motives, is mainly a function of the size of income and business transactions together with the contingencies growing out of the conduct of personal and business affairs. We can write this in a functional form as follows:

$$M_1 = L_1(Y) \qquad \text{...(i)}$$

where Y stands for income, L_1 for demand function, and M_1 for money demanded or held under the transactions and precautionary motives. The above function implies that money held under the transactions and precautionary motives is a function of income.

On the other hand, according to Keynes, money demanded for speculative motive, *i.e.*, M_2, as explained above, is primarily a function of the rate of interest. This can be written as:

$$M_2 = L_2(r) \qquad \text{...(ii)}$$

where r stands for the rate of interest, L_2 for demand function for speculative motive.

Since total demand of money $M_d = M_1 + M_2$, we get from (*i*) and (*ii*) above

$$M_d = L_1(Y) + L_2(r)$$

Thus, according to Keynes's theory, total demand for money is an *additive demand function* with two separate components. The one component, $L_1(Y)$, representing the transactions demand for money arising out of transactions and precautionary motives is an increasing function of the level of money income. The second component of the demand for money, that is, $L_2(r)$ representing the speculative demand for money. Which depends upon rate of interest, is a decreasing function of the rate of interest. Keynes' additive form of demand for money function has now been rejected by the modern economists. It has been pointed out that money represents a single asset, and not the several ones. There may be more than one motive to hold it and the same unit of money can serve several motives. Therefore, the demand for money cannot be divided into separate compartments independent of each.

Critique of Keynes's Theory. By introducing speculative demand for money, Keynes made a significant departure from the classical theory of money demand which emphasized only the transactions demand for money. It has been argued by Tobin and Baumol, the transactions demand for money also depends upon the rate of interest. Others have explained that speculative demand for money is an increasing function of the total assets or wealth. If income is taken as a proxy for total wealth then even speculative demand for money will depend upon the size of income, apart from the rate of interest. In view of all these arguments, the Keynesian total demand for money function is written in the following modified form

$$M_d = L(Y, r)$$

where it is conceived that demand for money function (M_d) is increasing function of the level of income, and is a decreasing function of the rate of interest. The presentation of the demand for money function in the above revised and modified form, $M_d = L(Y, r)$ has been a highly significant development in monetary theory.

Further, as seen above, Keynes' theory of speculative demand for money has been challenged. The main drawback of Keynes' speculative demand for money is that *it visualises that people hold their assets in either all money or all bonds*. This seems quite unrealistic as individuals hold their financial wealth in some combination of both money and bonds. This gave rise to portfolio approach to demand for money put forward by Tobin, Baumol and Freidman. The portfolio of wealth consists of money, interest-bearing bonds, shares, physical assets etc. Further, while according to Keynes' theory, demand for money for transaction purposes is insensitive to interest rate, the modern theories of money demand put forward by BaUmol and Tobin show that money held for transaction purposes is interest elastic. We will discuss in the next chapter the Post-Keynesian theories of demand for money put forward by Tobin, Baumol and Friedman.

Further, *Keynes additive form* of demand for money function, namely, $M_d = L_1(Y) + L_2(r)$ has now been rejected by the modern economists. It has been pointed out that *money represents a single asset*, and not the several ones. There may be more than one motive to hold money but the same units of money can serve several motives. Therefore, the demand for money cannot be divided into two or more different departments independent of each other.

In view of all these arguments, the Keynesian total demand for money functions is written in the following modified form

$$M_d = L(Y, r)$$

where it is conceived that demand for money function (M_d) is increasing function of the level of income, it is a decreasing function of the rate of interest. The presentation of the demand for money function in the above revised and modified form, $M_d = L(Y, r)$, has been a highly significant development in monetary theory.

KEYNES'S LIQUIDITY PREFERENCE THEORY OF RATE OF INTEREST

In his epoch-making book "*The General Theory of Employment, Interest and Money*", J.M. Keynes gave a new view of interest. According to him, the rate of interest is a purely monetary phenomenon and is determined by demand for money and supply of money. According to him "*interest is a reward for parting with liquidity for a specified period.*" Since people prefer liquidity or want to hold money to meet their various motives, they need to be paid some reward for surrendering liquidity or money. And this reward is the rate of interest that must be paid to them in order to induce them to part with liquidity or money. Further, according to Keynes, rate of interest is determined by liquidity preference or demand for money to hold and the supply of money known as *Liqudity Preference Theory*.

The Demand for Money in a Two-asset Economy. In order to explain the demand for money and interest-rate determination. Kenyes assumed a simplified economy where there are two assets which people can keep in their portfolio balance. These two assets are : (1) money in the form of currency and demand deposits in the banks which earn no interest, and (2) long term bonds. It is important to note that rate of interest and bond prices are inversely related. When bond prices go up, rate of interest rises and *vice versa*. The demand for money by the people depends upon how they decide to balance their portfolios between money and bonds. This decision about the portfolio balance can be influenced by two factors.

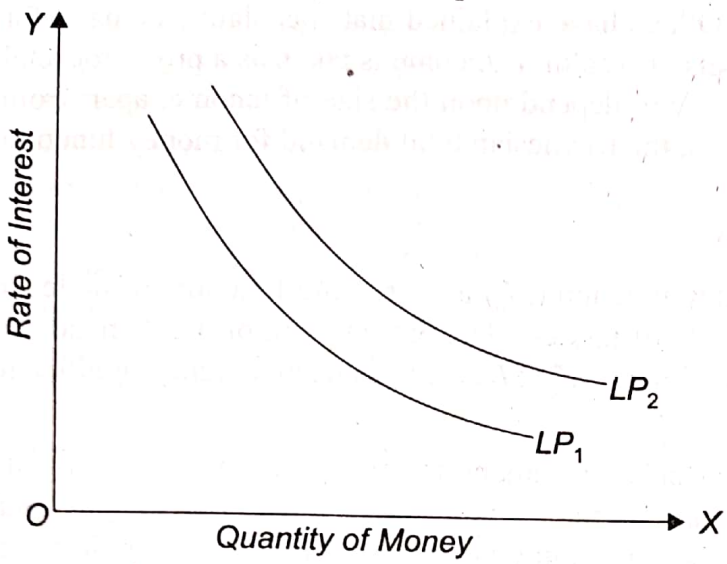

Fig. 21.3. *Demand for Money (Liquidity Preference) depends on Rate of Interest and Level of Income.*

First, the higher the level of nominal income in a two-asset economy people would want to hold more money in their portfolio balance. This is because of transactions motive according to which at the higher level of nominal income, the purchases by the people of goods and services in their daily life will be relatively larger which require more money to be kept for transactions purposes.

Second, the higher the nominal rate of interest, the lower the demand for money for speculative motive. This is, firstly, because a higher nominal rate of interest implies a higher opportunity cost for holding money. At higher rate of interest holders of money can earn more incomes by holding bonds instead of money. Secondly, if the current rate of interest is higher than what is expected in the future, the people would like to hold more bonds and less money in their portfolio. On the other hand, if the current rate of interest is low (in other words, if the bond prices are currently high), the people will be reluctant to hold larger quantity of bonds (and instead they could hold more money in their portfolio) for the fear that bond prices would fall in the future causing capital losses to them.

Money Demand Curve. It follows from above that quantity of money demanded increases with the fall in the rate of interest or with the increase in level of nominal income. At a given level of nominal income, we can draw a money demand curve showing the quantity of money demanded at various rates of interest. As demand for money is inversely related to the rate of interest, the money demand curve at a given level of income say, will be downward-sloping as is shown by the curve LP_1 in Figure 21.3. When the level of money income increases, suppose from Y_1 to Y_2, the curve of demand for money shifts upward to the new position LP_2.

Determination of Rate of Interest : Equilibrium in the Money Market

The rate of interest, according to J.M. Keynes, is determined by demand for money (liquidity preference) and supply of money. The factors which determine demand for money have been explained above. The supply of money, at a given time, is fixed by the monetary authority of the country. In Figure 21.4 *LP* is the demand curve for money at a given level of nominal income. *MS* is the money supply curve which is a vertical straight line showing that 200 crores of rupees is the money supply fixed by the monetary authority. It will be seen that quantity demanded of money equals the given money supply at 10 per cent rate of interest. So the money market is in equilibrium at 10 per cent rate of interest. There will be disequilibrium if rate of interest is either higher or lower than 10 per cent.

Suppose the rate of interest is 12 per cent. It will be seen from Figure 21.4 that at 12 per cent rate of interest, supply of money exceeds the demand for money. The excess supply of money reflects the fact that people do not want to hold as much money in their portfolio as the monetary authority has made it available to them. The people holding assets in the present two-asset economy would react to this excess money supply with them by buying bonds and thus replace some of money in their portfolios with bonds. Since the *total money supply* at a given moment remains fixed, it cannot be reduced by buying bonds by individuals. This bonds-buying spree would lead to the rise in prices of bonds. The rise in bond prices means the fall in the rate of interest. As will be seen from This Figure 21.4 that with the fall in the interest rate from 12 per cent to 10 per cent, quantity demand of money has increased to be once again equal to the given supply of money and the excess supply of money is entirely eliminated and money market is in equilibrium.

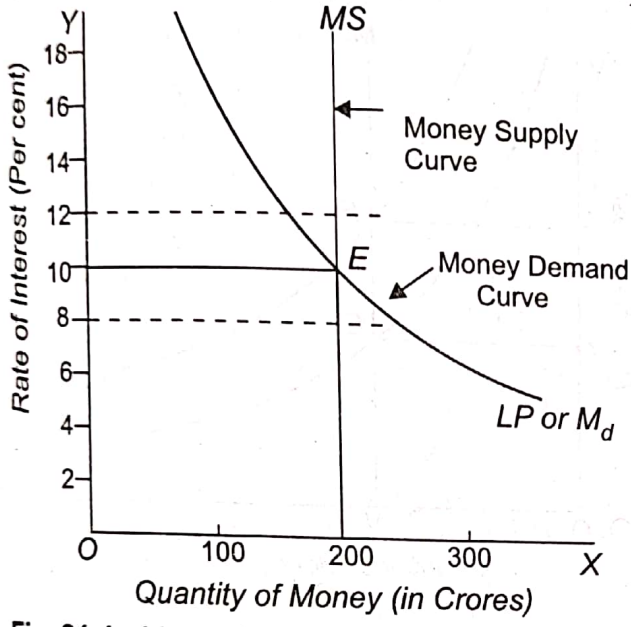

Fig. 21.4. *Money Market Equilibrium*

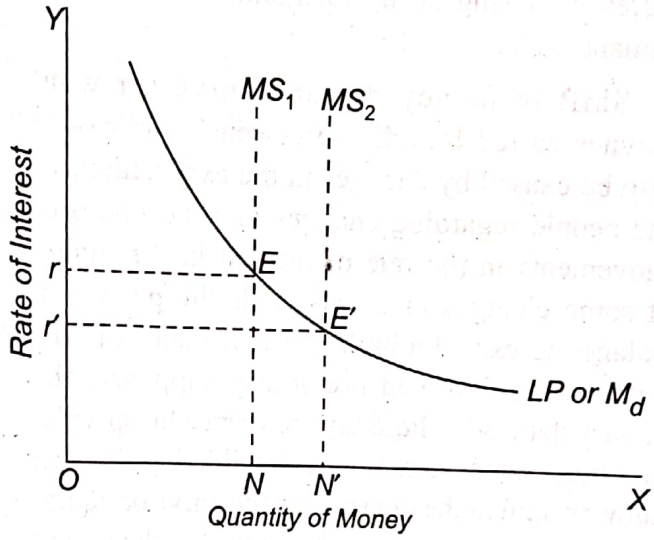

Fig. 21.5. *Effect of Increase in Money Supply on the Rate of Interest.*

On the other hand, if the rate of interest is lower than the equilibrium rate of 10 per cent, say it is 8 per cent, then as will be seen from Figure 21.4 there will emerge *excess demand for money*. As a reaction to this excess demand for money, people would like to sell bonds in order to obtain a greater quantity of money for holding at lower rate of interest. The stock of money remaining fixed, the attempt by the people to hold more money balances at a rate of interest lower than the equilibrium level through sale of bonds will only cause the bond prices to fall. The fall in bond prices implies the rise in the rate of interest. Thus, the process started as a reaction to the excess demand for money at an interest rate below the equilibrium will end up with the rise in the interest rate of the equilibrium level.

Effect of an Increase in Money Supply

Let us now examine the effect of increase in money supply on the rate of interest. In Fig. 21.5, *LP or* M_d is the demand for money for satisfying various motives. To begin with, *ON* is the quantity of money available. Rate of interest will be determined where the demand for money is in balance or equal to the fixed supply of money *ON*. It is clear from Fig. 21.5 that demand for money is equal to *ON* quantity of money at *Or* rate of interest. Hence *Or* is the equilibrium rate of interest. Assuming no change in expectations and nominal income, an increase in the quantity of money (through buying securities by the Central Bank of the country from the open market), will lower the rate of interest. In Fig. 21.5, when the quantity of money increases from *ON* to *ON'*, the rate of interest falls from *Or* to *Or'* because the new quantity of money *ON'* is in balance with the demand for money at *Or'* rate of interest. In this case we move down on the curve. Thus, given the money demand curve or curve of liquidity preference, an increase in the quantity of money brings down the rate of interest.

Let us see how increase in money supply leads to the fall in the rate of interest. With initial equilibrium at *Or*, when the money supply is expanded from *ON* to *ON'*, there emerges excess supply of money at the initial *Or* rate of interest. The people would react to this excess quantity of money supplied by buying bonds. As a result, the bond prices will go up which implies that the rate of interest will decline. This is how the increase in money supply leads to the fall in rate of interest.

Shifts in Money Demand or Liquidity Preference Curve

The position of money demand curve depends upon two factors: (1) the level of nominal income, (2) the expectations about the changes in bond prices in the future which implies changes in rate of interest in future. As has been explained above, a money demand curve is drawn by assuming a certain level of nominal income. With the increase in nominal income, money demand for transactions and precautionary motives increase causing an upward shift in the money demand curve.

Shift in money demand curve (or what Keynes called liquidity preference curve) can also be caused by changes in the expectations of the people regarding changes in bond prices or movements in the rate of interest in the future. If some changes in events leads the people on balance to expect a higher rate of interest in the future than they had previously supposed, the money demand or liquidity preference for speculative motive will increase which will bring about an upward shift in the money demand curve or liquidity preference curve and this will raise the rate of interest.

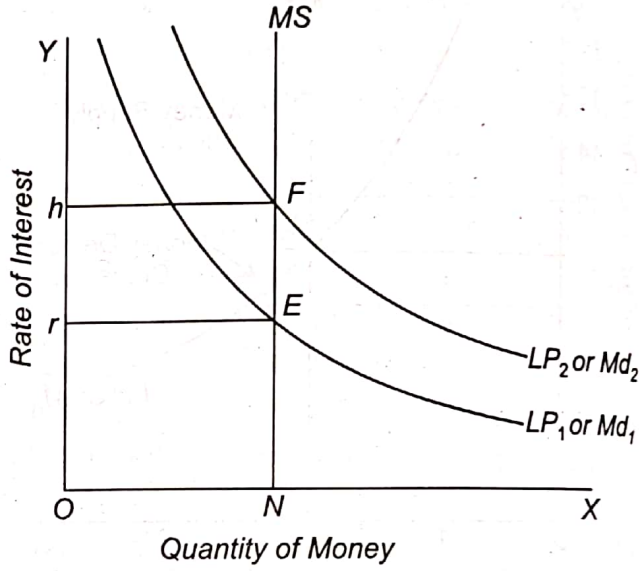

Fig. 21.6. *Effect of Increase in Liquidity Preference (i.e., Demand for Money) on the Rate of Interest.*

In Fig 21.6 assuming that the quantity of money remains unchanged at *ON*, the rise in the money demand or liquidity preference curve from LP_1 to LP_2, the rate of interest rises from *Or* to *Oh* because *at Oh*, the new speculative demand for money is in equilibrium with the supply of money *ON*. It is worth noting that when the liquidity preference curve rises from LP_1 to LP_2, the amount of moneyheld does not increase; it remains *ON* as before. Only the rate of interest rises from *Or* to *Oh* to equilibrate the new liquidity preference or money demand with the available quantity of money *ON*.

Thus we see that Keynes explained interest in terms of purely monetary forces and not in terms of real forces like productivity of capital and thrift which formed the foundation-stones of both classical and loanable fund theories. According to him, demand for money for speculative motive together with the supply of money determines the rate of interest. He agreed that the marginal revenue product of capital tends to become equal to the rate of interest but the rate of interest is not determined by marginal revenue productivity of capital. Moreover, according to him, interest is not a reward for saving or thriftiness or waiting but for parting with liquidity. Keynes asserted that it is not the rate of interest which equalises saving an investment. But this equality is brought about through changes in the level of income.

Critical Appraisal of Keynes's Liquidity Preference Theory of Interest

1. *Keynes ignored the role of real factors in the determination of interest.* Firstly, it has been pointed out that rate of interest is not purely a monetary phenomenon. Real forces like productivity of capital and thriftiness or saving also play an important role in the determination of the rate

of interest. Keynes makes the rate of interest independent of the demand for investment funds. In fact, it is not so independent. The cash balances of the businessmen are largely influenced by their demand for capital investment. This demand for capital investment depends upon the marginal revenue productivity of capital. Therefore, the rate of interest is not determined independently of the marginal revenue productivity of capital (marginal efficiency of capital) and investment demand. When investment demand increases due to greater profit prospects or, in other words, when marginal revenue productivity of capital rises, there will be greater demand for investment funds and the rate of interest will go up. But Keynesian theory does not account for this. Similarly, Keynes ignored the effect of the availability of savings on the rate of interest. For instance, if the propensity to consume of the people increases, savings would decline. As a result, supply of funds in the market will decline which will raise the rate of interest.

2. *Keynesian theory is also indeterminate*. Now, exactly the same criticism applies to Keynesian theory itself on the basis of which Keynes rejected the classical and loanable funds theories. Keynes's theory of interest, like the classical and loanable funds theories, is indeterminate.

According to Keynes, rate of interest is determined by liquidity preference (*i.e.* demand for money) and supply of money. However, as we have seen, liquidity preference, especially demand for money for transactions motive, depends on level of income. Now, when income increases, liquidity preference curve (that is, money demand curve will shift to the right and, given the supply of money, new equilibrium rate of interest will be obtained. Thus at different levels of income there will be different liquidity preference curve or money demand curve. As a result, at different levels of income, there will be different equilibrium rates of interest. Thus, we cannot know the rate of interest unless we know the liquidity preference curve, and also we cannot know the liquidity preference curve unless we know the level of income. However, we cannot know the level of income unless we first know the rate of interest. This is because rate of interest influences investment which in turn determines the level of income. Thus, Keynes's theory is indeterminate, that is, we are not able to arrive at a single determinate rate of interest; rate of interest varies as income varies.

Thus, Keynes's analysis at the most help as to obtain *LM* curve which shows what will be the rate of interest at different levels of income and not any unique or particular rate of interest. Thus, the Keynesian theory, like the classical theory, is indeterminate. "In the Keynesian case the supply and demand for money curves cannot give the rate of interest unless we already know the income level, in the classical case the demand and supply schedules for saving offer no solution until the income is known. Precisely the same is true of loanable funds theory. Keynes' criticism of the classical and lonable funds theories applies equally to his now theory"[8].

3. *No liquidity without savings*. According to Keynes, interest is a reward for parting with liquidity and in no way a compensation and inducement for saving or waiting. But without saving how can the funds be available to be kept as liquid and how can there be the question of surrendering liquidity if one has not already saved money ? Jacob Viner rightly maintains, "*Without saving there can be no liquidity to surrender*." Therefore, the rate of interest is vitally connected with saving which is neglected by Keynes in the determination of interest.

It follows from above that Keynesian theory of interest is also not without flaws. But the importance Keynes gave to liquidity preference as a determinant of interest is correct. A valid and an adequate explanation of interest must incorporate this important factor of demand for money to hold.

8. A. H. Hansen, *Guide to Keynes*. p. 141