The value of money or general price level was first of all explained in the sixteenth century by Mercantilists followed by John Locke and David Hume in terms of the quantity theory of money. More elaborate expositions of the theory, however, were given by Mill, Ricardo and Irving Fisher. These writers tried to establish a direct and proportionate relation between quantity of money (M) and price level (P) or an inverse proportionate relationship between M and the value of money. To quote J.S. Mill: "The value of money, other things being the same, varies inversely as its quantity ; every increase of quantity lowers the value and every dimunition raises it in a ratio exactly equivalent."

David Ricardo expressed exactly similar views regarding the relationship between the value of money and M. Irving Fisher presented the theory in a more refined way in his book, *The Purchasing Power of Money,* in 1911. This exposition became most widely known, when it was offered as an explanation of the effects of the great inflations of the 1920's on the value of money. **Fisher** stated the relationship between M and P in these words, "The

quantity theory asserts that [provided the velocity of circulation and the volume of trade are unchanged] if we increase the number of dollars whether by renaming coins or by increasing coinage, prices will be increased in the same proportion.''

The special points in Fisher's analysis of quantity theory were as follows : *Firstly,* he made a distinction between bank deposits and common money : and, *secondly,* he presented the relation between M and P in the form of an algebraic equation called the *Equation of Exchange* which is written as

$$MV = PT$$

where M is the total quantity of money including coins and bank notes ; V is the velocity of circulation of money (the average number of times that a unit of money changes hands during a specified period); P is the general price level which is the weighted average of the average sale prices of all individual commodities and services ; and T refers to the total volume of transactions.

Since PT represents the total value of transactions or the value of goods sold out and MV is the amount of money paid out for them, MV = PT simply states that the demand for money is equal to the supply of money. Thus, the exchange equation is a mere truism. The general price level $(P) = \frac{MV}{T}$ and the value of money $\left(\frac{1}{P}\right)$ is equal to $\frac{T}{MV}$.

If M = Rs. 100 crore, V = 5 and T = Rs. 200 crore, then MV = 100 × 5 = Rs. 500 crore and

$$P = \frac{MV}{T} = \frac{Rs.500\,crore}{Rs.200\,crore} = Rs.\ 2{\cdot}5$$ and the value of

money or $\frac{1}{P} = \frac{\text{Rs. 200 crore}}{\text{Rs. 500 crore}} = \frac{2}{5} = 0{\cdot}4$

The exchange equation MV = PT is called as the *transactions cash equation*, since M refers to the primary money (coins and bank notes). The credit money or demand deposits with banks also help in affecting transactions in the same way as currency. Fisher, therefore, extended the cash transactions equation to include also the bank deposits. The extended equation of exchange can be expressed as:

$$MV + M'V' = PT$$

In this equation M′ is the amount of bank money and V′ is the velocity of circulation of bank money. The price level is determined as:

$$P = \frac{MV + M'V'}{T}$$

or Value of money or $\frac{1}{P} = \frac{T}{MV + M'V'}$

If V, V′ and T remain constant and the ratio of M to M′ also remains the same, the price level will change in direct proportion to the quantity of money and the value of money in an inverse proportion to it. Suppose M = Rs. 200 crore, M′ = Rs. 300 crore, V = 5 V′ = 6 and T = Rs. 200 crore.

$$P = \frac{MV + M'V'}{T} = \frac{200 \times 5 + 300 \times 6}{200}$$

$$= \frac{1000 + 1800}{200} = \frac{2800}{200} = \text{Rs. } 14$$

$$\frac{1}{P} = \frac{T}{MV + M'V'} = \frac{200}{2800} = \frac{1}{14}$$

If now M is doubled to Rs. 400 crore and to maintain the ratio of M and M′, the demand deposits of banks go up to Rs. 600 crore, while V, V′ and T′ remain unchanged, P will be :

$$P = \frac{MV + M'V'}{T} = \frac{400 \times 5 + 600 \times 6}{200}$$

$$= \frac{2000 + 3600}{200} = \text{Rs. } 28$$

$$\frac{1}{P} = \frac{T}{MV + M'V'} = \frac{2000}{5600} = \frac{1}{28}$$

Thus; a doubling of M results in a doubling of the price level and value of money is reduced to one half of what it was before.

Fisherine relation between M and P can also be explained through Fig. 1.

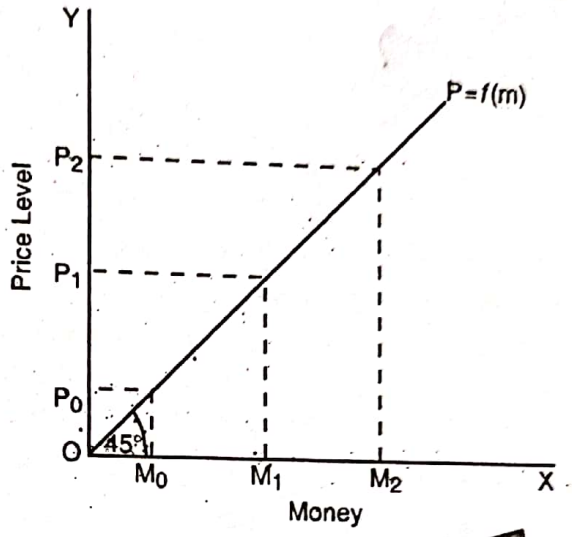

Fig. 1

Fig. 1 shows equi-proportionate changes between M and P. As quantity of money increases from M_0 to M_1, price level rises from P_0 to P_1. Since quantity of money function OM traverses a 45° line, $OM_0 = OP_0$ and $OM_1 = OP_1$ and δM or $(M_1 - M_0) = \delta P$ or $(P_1 - P_0)$, the proportionate change in money $\frac{M_1 - M_0}{M_0}$ is equal to the proportionate change in the price level $\frac{P_1 - P_0}{P_0}$. Similarly when the quantity of money increases from M_1 to M_2 and price level from P_1 to P_2, the proportionate change in money, *i.e.*, $\frac{M_2 - M_1}{M_1}$ is equal to the proportionate change in the price level $\frac{P_2 - P_1}{P_1}$.

2. ASSUMPTIONS OF FISHER'S TRANSACTIONS VELOCITY MODEL

The equi-proportionate relation between M and P postulated in Fisher's model assumes that 'other things' should remain equal. The main assumptions of this analysis are given below :

(*i*) The general price level (P) is a passive element. It is determined by other elements or variables and it does not determine them.

(*ii*) The bank money (M′) remains in a fixed relation with M. The inclusion of M′ does not normally disturb the quantitative relation between money and price.

(*iii*) V, the velocity of circulation of money, is constant and is an independent element in the exchange equation. Fisher believes that a change in M is unlikely to affect the velocity of circulation of money, since it is determined by the subjective factors like people's saving and spending habits and the objective factors like the state of banking and financial institutions, methods of payment, growth and composition of population, central bank credit policy and government's policy in respect of taxes and public spending. A mere increase in M, in the opinion of Fisher, will therefore leave V unchanged. Similarly V′ remains constant and is independent of M′.

(*iv*) The volume of transactions T, is also assumed as constant and independent of M in the short period. The magnitude of T depends not upon M but the state of technology, the quantity and quality of the productive factors, the proportions in which the factor inputs are employed, degree of labour specialisation, extent of integration or disintegration of the business units and the levels of employment. A special mention needs to be made of the level of employment. Fisher implicitly assumes that there is full employment of all resources in the economy. Since the level of output cannot by stepped up further at full employment, the volume of transactions too is unlikely to change.

(*v*) Fisher's theory assumes a highly monetised economic system where all transactions take place through the medium of money and the barter transactions are completely absent.

(*vi*) Money acts only as a medium of exchange and no part of it is hoarded by the people.

(*vii*) The theory assumes that money-price relationship is a long run phenomenon.

(*viii*) There is full employment of resources in the economic system.

(*ix*) The demand for money is proportional to the value of transactions.

(*x*) The supply of money is exogenously given.

Given these assumptions, Fisher established a direct and proportional relation between the quantity of money and price level. To quote him, "One of the normal effects of an increase in the quantity of money is an exactly proportional increase in the general level of prices.... we find nothing to interfere with the truth of the quantity theory that variations in money (M) produce normally proportional changes in prices."

Taussig has given expression to Fisher's money-price relation in this way : "Double the quantity of money and, other things being equal, prices will be twice as high as before, and the value of money one half. Halve the quantity of money and, other things being equal, prices will be one half of what they were before and the value of money double."

3. CRITICAL EVALUATION

The traditional quantity theory of money has been severely criticised by many writers on the following grounds :

(*i*) ***Truism*** : The equation of exchange fails to prove anything. MV = PT is a mere truism since what it states is that the amount of money paid out for the goods and services is equal to the value of goods sold out. Thus, by definition, there is an identity between MV and PT and as such there is no practical or analytical usefulness of this equation. To quote Keynes, "The quantity theory of money is a truism which holds though without significance."

(*ii*) ***Over-simplifying assumptions*** : Fisher's model is based on over-simplifying '*ceteris paribus*' assumptions. It assumes that T, V, V′ and the relation between M and M′ remain unchanged which is unrealistic. These elements undergo variations not only in the long period, but also over relatively shorter periods. The business conditions, payment practices, consumers' and producers' expectations, banking policies etc., do change from time to time, and, therefore, no sound basis exists for assuming the constancy of T, V and V′.

(*iii*) ***Independence of variables*** : The transactions model assumes that the variables involved in the equation of exchange are independent of each other so that P changes in exact proportion to M. But as a matter of fact, P is influenced in a significant way by V, V′ and T and the price level may change more or less than proportionately

compared with the change in the quantity of money. For instance, during the German hyper-inflation of 1923, the phenomenal rise in price index was not so much due to the increased supply of money as to the increase in the velocity of circulation of money (V). Similarly during the Great Depression (1929-33), the cause of fall in price index was not so much a contraction in the supply of money as the sharp decline in the velocity of circulation of money. P, in addition, is influenced by the volume of transactions. During the period of prosperity, the price level may be pushed up by an increase in T and vice-versa. Thus it is wrong to assume that the only influence upon the price level or the value of money is the quantity of money.

(*iv*) ***Technical inconsistency*** : The importance of Fisher's exchange equation is limited by the technical inconsistency implicit in it. M refers to the stock of money at a *point* of time whereas V refers to its velocity of circulation over a *period* of time. George N. Halm considers it technically inconsistent to multiply these two non-comparable factors, unless M is treated as an average amount of money in circulation over the period in question. But such an assumption is not compatible with Fisher's transactions model.

(*v*) ***P is not a passive factor*** : The price level, P, is not a passive factor as has been assumed in this analysis. It is a very active and dynamic force. An increase in the price level provides profit incentive to the businessmen. The volume of transactions may, as a result, increase which in turn may push up the velocity of circulation of money. Thus P can influence all the variables involved in Fisher's exchange equation.

(*vi*) ***Constant ratio between M and M'***: Fisher's theory assumes that the ratio between currency and demand deposits remains constant and an increase in currency by 50 % will involve a 50% increase in demand deposits too. But this assumption is also unrealistic. During the period of brisk business activity, there is an expansion both in currency and demand deposits but the change in the two is not equi-proportional. During depression, there is a general lack of confidence in the banking system. Therefore, bank deposits and currency may move in the opposite directions. Even if the currency is expanded, demand deposits may fail to rise.

(xiii) ***Neglect of short run equilibrium*** : Fisher's transactions approach cannot explain the short run price phenomenon. It can, no doubt, be regarded as a useful attempt to explain the long run equilibrium. Even Fisher admitted that the assumption of the constancy of V and T may not be true in the short periods. As the economy achieves the long run equilibrium, these magnitudes tend to become constant. But it must be noted that long run