

# THE QUANTITY THEORY OF MONEY : A SURVEY OF LITERATURE

Dissertation in part fulfilment of  
M. Phil. Degree Course in  
UNIVERSITY OF POONA

*Submitted by*  
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Gokhale Institute of Politics and Economics

PUNE 411 004

1978-79

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## ACKNOWLEDGEMENTS

This purports to be a brief review of the main literature on 'The Quantity Theory of the Value of Money'. The secondary objective was to trace the interlinking ways of thinking of the great economists whose literature we reviewed. It is thought that these links show the inherent continuity and evolution of the main elements of the quantity theory.

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## INTRODUCTION

An attempt is made here to make a critical review of the literature on the quantity theory of money. Almost over a period of three centuries, the controversy about the relationship between the quantity of money and the price level has continued unabated. Any quantity theory of money is related to the demand for money in the first instance. Determination of the general price level and of the fluctuations in it, is possible with the help of the quantity theory of money. But it does not explain the changes in the relative prices.

The paper is divided into seven chapters. First Chapter attempts a brief but critical explanation of pre-Fisherian quantity theory, mainly with reference to John Locke and Richard Cantillon. The Second Chapter discusses at length Fisherian quantity theory. The views of A. C. Pigou and D. H. Robertson are taken as representative of the Cambridge School and are examined in Chapter III. The analysis of the relationship between price level and money supply given by J. M. Keynes is examined in Chapter IV. Milton Friedman's views on quantity theory are explained briefly in Chapter V followed by a brief review of Don Patinkin's views in Chapter VI. Concluding remarks are given in Chapter VII.

## CHAPTER I

### 1. JOHN LOCKE

Most of the Mercantilist thinkers believed that 'money stimulates trade'. The introduction of money removes the lack of double coincidence of wants which hinders trade. This trade stimulating effect of money is evident in the economy where monetisation is taking place at a fast pace. Locke expressed the principle in the following words. "This shows the necessity of some proportion of money to trade; but what proportion this is, is hard to determine; because it depends not barely on the quantity of money, but the quickness of its circulation."<sup>1</sup>

Here, Locke argued that money is necessary for trade, in proportion to trade. But, he failed to determine the precise proportion and hence, the money demanded for trade. He stated that, it is difficult and complex to determine this proportion. Actual quantity of money required for trade will depend upon its velocity or quickness of circulation.

The following statement reveals a cash balance approach in Locke's theory. "Every man must have at least so much money, or so timely recruits, as may in hand or in a short distance of time, satisfy his creditor who supplies him with the necessities

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<sup>1</sup> John Locke, "Consequences of the Lowering of Interest and Raising the Value of Money" (1691) in Douglas Vickers, Studies in the Theory of Money (1690-1776), Chilton Company, Book Division, Philadelphia, 1959, p.67.

of life, or of his trade... so that it is requisite to trade, that there should be so much money, as to keep up the landlord's, labourer's and broker's credit; and therefore ready money must be constantly exchanged for wares and labour, or follow within a short time after."<sup>2</sup>

From the above statement we can note Locke's following views on money:

1) Money is essential to every person for exchange of consumer goods in general. This component reflects consumers' demand for money.

2) Money must be in hand in cash or it must be expected to be so within a short period of time.

3) Money is used as (a) medium of exchange and (b) means of repayment of loans.

4) The money claims of landlords, labourers and brokers determine the level of money supply.

John Locke explained the relationship between the quantity of money and the price level or the value of money as follows: "the value of money in respect of those (commodities) depends only on the plenty, or scarcity of money, in proportion to the plenty and scarcity of those things."<sup>3</sup>

From the above statement it follows that, with a given supply of commodities, the value of money will increase if money supply decreases and vice versa.

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2 Ibid., p.58.

3 Ibid., p.62.



Further, he pointed out that the money is not a consumable commodity, but it can fetch commodities in the market. This idea is evident from the following quotation of Locke. "Money has a value, as it is capable by exchange, to procure us the necessaries or conveniences of life, and in this it has the nature of a commodity; only with this difference, that it serves us commonly by its exchange, never almost by its consumption."<sup>4</sup>

## 2. Richard Cantillon

Richard Cantillon wrote an essay entitled, "Essai Sur la nature du commerce en general". In this essay, he stated that an increase in the quantity of money supply increases the price level in the market. His original statement is as follows. "If mines of gold or silver be found in a state and considerable quantities of minerals drawn from them, the proprietor of these mines, the undertakers, and all those who work there, will not fail to increase their expenses in proportion to the wealth and profit they make; they will also lend at interest the sums of money which they have over and above what they need to spend.

All this money, whether lent or spent, will enter into circulation and will not fail to raise the price of products and merchandise in all the channels of circulation which it

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<sup>4</sup> Ibid., p.63.

enters. Increased money will bring increased expenditure and this will cause an increase of market prices."<sup>5</sup>

We have seen John Locke's argument that, if the quantity of money supply is greater than the demand for money, the value of money decreases, and vice-versa. But, the process by which it happens, was not explained by him. Cantillon explained this process systematically. From the quotation given above, we can derive following propositions:

- 1) The increased income due to increased wealth and profits leads to increase in consumption expenditure.
- 2) The total increased money income will not be spent on consumption purposes. There is a division of use of income as follows: (a) some part of income for consumption and (b) the remaining portion of income for lending.
- 3) Therefore, the demand for goods increases, hence, the market prices increase further.

The indirect and direct relationship between quantity of money and the price level as suggested by Cantillon, may be explained in the following manner.

First, we consider his discussion of the indirect relationship, because, Cantillon himself gave more importance to it than the direct one. If the increased money supply initially passes

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<sup>5</sup> R. Cantillon, "Essai sur la nature du commerce en general" (1755), in Douglas Vickers, Studies in the Theory of Money (1690-1776), Chilton Company, Book Division, Philadelphia, pp.204-05.

through investors, the resulting effects on the price level, are, indirect and if it initially passes through consumers, the resulting effects are direct.

a) Indirect Relationship

Suppose a gold or silver mine is found. The discovery and actual operation of the mine requires sizeable investment. This leads to the increase in money supply. This will lead to increased profits and increased wage bill. Therefore, it is an increased money supply through investment (in mining). First it increases the income of that industry. This leads those engaged in that industry to consume more of consumable goods. Therefore, the profits of agricultural producers increase. But real wages decrease. So, there is pressure from the workers to increase money wages.

In this case, according to Cantillon, there is expansion of employment along with increased income. He argued here that the change in demand is not merely quantitative, but structural also; because pattern of consumption also changes. People demand superior commodities. This we can call the income effect.

b) Direct Relationship

In this case the increased money supply initially passes through the consumers. So, automatically demand for consumption goods increases, which leads to increase in the prices of those commodities.

For example, suppose a foreign embassy is started in the country. The embassy will employ some persons in its office. Therefore some additional workers will get income. This money income is in the hands of consumers. It will directly affect the price level in the market. It should be noted that in this case, the increase in money supply was due to an activity which is non-productive. Hence, its effects on price level are via consumption activity and thus direct.

In short, the supply of money raises the prices as also the incomes. But Cantillon said that it is not possible to determine exactly the extent of these effects. He categorically stated that due to increments in money supply the prices of commodities increase; but not those of all. In his opinion, prices of superior commodities increase due to rise in demand and the prices of inferior commodities fall because a decrease in demand for them. Cantillon also supported the view that the demand for money depends upon the "rapidity of circulation". This view is the same as that of Locke and Petty who spoke about 'quickness of circulation'. The only difference is in the approach. The approach of Locke and Petty is really the cash balance approach while Cantillon's approach is transaction approach.

## CHAPTER II

### IRVING FISHER

Prof. Irving Fisher wrote a book on "The Purchasing Power of Money" in 1911. In this book he attempted a critical and detailed examination of the variations in the price level, and the causes thereof. He divided his explanation regarding price level variations into three categories. There are,

- a) crop seasonal variations,
- b) credit cyclical variations, and
- c) secular variations

#### a) Crop Seasonal Variations

In each harvesting season, the price level falls sharply due to temporary but considerable increase in the supply of agricultural produce. On the other hand, in the off-season, the price level rises sharply due to significant decrease in the supply of the same. The intensity of this effect is obviously more in an economy where agricultural sector predominates. Fisher has not elaborated this type of effect in detail. This is as it should be, because, price fluctuations of this type are not due to changes in the quantity of money, though seasonal price fluctuations lead to seasonal fluctuations in the value of money. But according to Fisher, the change in the quantity

of money is the main cause of the change in the purchasing power of money.

**b) Credit Cyclical Variations**

The variations of the remaining two types, arise generally due to variations in the income flow from wealth and property.

The short period (transitional period) variations i.e. the credit cyclical variations and the long period variations, i.e. secular variations in the price level are explained with the help of the familiar equation of exchange.

$$MV + M'V' = \sum PQ$$

Here,

M - the quantity of actual money

V - the velocity of actual money in circulation

M' - total deposits subject to transfer by cheque

V' - the velocity of circulation of bank deposits

p - the average price of sale of any particular good, purchased in the given community during the given year

Q - the total quantity of it purchased

$\Sigma$  - symbol of summation.

The equation has a money side and a goods side. The left hand side i.e. the money side is the total money paid, which equals the product of the quantity of money multiplied by its velocity of circulation. The right hand side of the equation

is the sum of products of quantities of goods exchanged multiplied by their respective prices.

He classified all goods into three groups; i.e. money, deposit currency or deposits; and all other goods. Exchange between these three goods takes place in six ways. These are

- i) Money against money,
- ii) Deposits against deposits,
- iii) Goods against goods,
- iv) Money against deposits,
- v) Money against goods, and
- vi) Deposits against goods

In Fisher's opinion, exchanges of the first and third group represent money changing and barter respectively. Similarly, the exchanges of the second and fourth group merely represent banking transactions. As such, they do not constitute the circulation of currency, the factor which mainly affects the price level. Therefore, the exchanges of the last two groups are considered as affecting the price level through changes in the circulation of *money*.

The credit cyclical variations are short period variations (according to Fisher the period is near about 10 years). In transitional period, other components of the equation of exchange i.e.  $M'$ ,  $V$ ,  $V'$  and  $Q$ 's also change along with  $P$  after a change in  $M$ . According to Fisher these short period variations are due to

- a) Variations in the price level or in the purchasing power of money, and

**b) Variations in the rate of interest.**

First, we have to understand the effect of rising or falling prices on the rate of interest and also the peculiar behaviour of the rate of interest, with the help of hypothetical example.

Suppose that the prices are rising at the rate of 3 per cent per year. Then, the person who lends Rs.100 at the beginning of the year must get the interest on the actual purchasing power. Let the rate of interest be 5 per cent per annum. Therefore, he must receive back the total amount with interest which is Rs.103 plus 5 per cent interest on this amount, which is equal to Rs.108.15. Therefore, in the above example, the individual must earn Rs.8.15 not Rs.5.00 if he has to earn a real interest rate of 5 per cent which is calculated on the purchasing power in view of 3 per cent increase in the price level.

Suppose prices are falling at the rate of 3 per cent per year. It means that at the end of the year the purchasing power of Rs.97 will be equal to Rs.100 at present. Therefore, in this case, the lender must earn Rs.4.85 only if he has to earn a real interest rate of 5 per cent. From this it is clear that the real rate of interest is the nominal (money) rate of interest corrected for the price level changes. From the above explanation we get the following conclusions.

1) During the period of rising prices the real rate of interest is lower than the money rate of interest.



2) During the period of falling prices the real rate of interest is greater than the money rate of interest.

With the help of the variations in the price level and variations in the rate of interest, Fisher explains cyclical variations as follows.

If money supply slightly increases from the initial level, the price level also rises in the same proportion. Businessmen get the increased money profit in the same proportion and the real profits should remain constant, if we assume the same proportion of increased prices for the things he purchases and the things he sells. But, as a matter of fact, the traders' profits will rise more than this because the real rate of interest (which is a part of total cost) is less than the money rate of interest. This stimulates the traders to increase their profits further by investing more. So, their demand for loans increases further. This is a boom period or expansion phase. The rise in price level becomes cumulative.

Before analysing the following stages, we have to study the changes in other components of the equation of exchange.

In the boom period, bank deposits ( $M'$ ) increase relatively to  $M$  because, as we have already seen, the real rate of interest is less than the money rate of interest. As a result, the profits of the businessmen increase more than proportionately. In response to increasing business demand for loans, the banking sector provides more loans to the businessmen. Therefore, price level ( $p$ ) will rise in that ratio further. The reason is that

$M+M'$  constitute the total money supply and the price level changes in the same proportion and in the same direction as money supply ( $M+M'$ ) changes. Other factor (T) i.e. volume of trade also changes in the same direction, because of easy terms for loans. The rising prices accelerate the circulation of money further. This is so because in such situations (the rising prices) the tendency of the people is to hold smaller amount of real quantity of money. They prefer to hold more commodities rather than money. As a result, the demand for commodities increases leading to a further rise in the price level.

In this way, in the transition period, a rise in price level induced by a slight increase in money supply, becomes cumulative in the subsequent period. But this rise in prices continues upto a particular point and after that comes a turning point. The following causes are responsible for the turning point.

a) After a particular point, the rise in the interest rate is more progressive than the rise in prices. For example, if the prices are rising at the rate of 3 per cent per annum, the boom will continue only upto the point where the rate of rise of interest rate becomes 3 per cent per annum.

b) The legal restriction on the banks to maintain a minimum reserve ratio in order to meet the depositors' demand for cash.

c) Due to rise in the rate of interest; value of certain

collateral securities such as bonds, falls down. As a result, the loans against them also decrease.

d) Some psychological factors are also operative. But, here we exclude non-monetary factors, such as over consumption and over-investment.

e) Velocity of circulation of money also becomes low because of contraction in loans and deposits.

Here, the further rise in the price level comes to an end. This turning point is the beginning of falling trend in the price level. It is called recession. In this phase, the fall in prices becomes gradually significant. This fall in prices continues for some time, but at a certain point the further decrease in prices and bank loans is arrested by the increasing profitability of borrowing. The reason is that, the fall in the rate of interest is higher than the fall in the price level. Here begins the gradual movement to the phase of prosperity.

In the transition period, a sudden change in the quantity of money and deposits will temporarily affect their quickness of circulation and the volume of trade. But, the essence of the quantity theory is that the price level is affected only by the changes in the quantity of money ( $M+M'$ ) and not by  $V$  or  $T$ . Therefore, the quantity theory does not hold true in the transition period, although, the equation of exchange is satisfied.

### c) Secular Trend or Variations

In the long run (here, the long run may be defined as the period to which the effects of the causes like changes in  $V$ ,  $V'$  and  $T$  on price level do not extend.<sup>1</sup>), the equation of exchange i.e.  $MV + M'V' = \sum pq$  is true in the sense that one of the normal effects of an increase in the quantity of money is an exactly proportional increase in the general level of prices. In other words, the components of equation of exchange other than  $(p)$  remain constant, after, change in the quantity of money.

If legal tender money i.e.  $(M)$  is doubled, the bank deposits i.e.  $(M')$  also double. This is the normal i.e. the long run effect. But this increase of  $M$  does not normally affect  $V, V'$  or the  $Q$ 's. Fisher argued that in the long run "the ratio of expenditure to (money) stock on hand would be unaffected."<sup>2</sup> It is because people are ready to pay double price for the same commodity for which they are ready to keep more money on hand.

The increase in velocity ( $V$ ) depends upon density of population, closer settlement, availability of transportation facilities, which are outside of the Fisherian equation. Velocity of money also depends on technical conditions rather

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1 See for example, Irving Fisher, The Purchasing Power of Money, Reprints of Economic Classics, Augustus M. Kelley, Bookseller, New York, 1963, p.159. Fisher says, "the strictly proportional effect on prices of an increase in  $M$  is only the normal or ultimate effect after transition periods are over. The proposition that prices vary with money holds true only in comparing two imaginary periods for each of which prices are stationary or are moving alike upward or downward and at the same rate."

2 Ibid., p.153.

than change in the quantity of money. Here the velocity of circulation is defined as the average rate of 'turnover', which depends on the individual rates of turnover. Individual's turnover depends on his habits. Everybody regulates his turnover according to his convenience. The average rate of turnover depends on the density of population, commercial customs, rapidity of transport and communication etc. Quantity of trade (T) is a function of natural resources and technical conditions. It may be thought that the high prices will diminish trade (T). But if all prices increase including those of services, then, there is no reason why trade should be reduced.

It is important to note that in the long period analysis, price level is considered a passive element in the equation of exchange. Similarly, change in price level is an effect and not a cause of changes in money supply. Therefore, in the long period analysis, expectations about price changes have no role. Here it should be repeated that the change in the price level is proportionate to the change in the quantity of money. In the transition period, changes in the price level and interest rate play an important role. Similarly, long run output is not subject to the influences of changes in money supply. In fact Fisher maintained that, "an inflation of the money cannot increase the output of farms and factories."<sup>3</sup> This statement indicates that the output is not related to the quantity of money. On the contrary, the long run changes in output may affect the price level.

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3 Ibid., p.155.

Fisher says that "Improvements in the production will affect price levels simply as they affect the volume of business transacted. Any rational study of the influence of improvements in methods of production upon the level of prices should, therefore, fix attention, first, on the resulting volume of trade, and should aim to discover whether this, in turn, carries prices upwards or downwards."<sup>4</sup>

It clearly shows that, in the long run there is a possibility of improvement in production methods which affect the volume of trade (T). If 'T' increases, the price level (p) will fall and vice-versa. So, this is the second important factor which can affect the price level.

If, the quantity of money is increased, the general price level also increases in the same direction and in the same proportion. It does not mean that the rise in the prices of all commodities is in the same proportion. Prices of some commodities may rise more than, equal to or less than the increase in the money supply, but it is the general price level which changes in the same proportion as the money supply changes. Fisher explained this in the following manner. "Besides the dispersion of price changes produced by the fact that some prices respond more readily than others to changes in the factors determining price levels,  $M$ ,  $M'$ ,  $V$ ,  $V'$ , and the  $Q$ 's, a further dispersion is produced by the fact that the special

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<sup>4</sup> Ibid., p. 179.

forces of supply and demand are playing on each individual price, and causing relative variations among them. Although these forces do not, as we have before emphasised, necessarily affect the general price level, they do affect the number and extent of individual divergencies above and below that general level. Each individual price has a fluctuation of its own."<sup>5</sup>

In Fisherian quantity theory of money, the effect of money supply is on the price level. It does not affect output and employment in the economy. The determination of output (in the long run) is separated from the monetary sector. In a secular trend, the rate of interest has nothing to do with changes in price level, because, in the long run the increase in the rate of interest is equal to the rise in rate of price level change.

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5 Ibid., p. 192.

## CHAPTER III

### CASH BALANCE APPROACH

The transaction approach highlights the implications of money's role in avoiding the necessity of double coincidence of wants for exchange. In cash balance approach, money is viewed as a temporary dwelling place of purchasing power in between sale and purchase. The main difference between these two approaches is that, the transaction approach considers the function of money as a medium of exchange only; whereas cash balance approach considers, in addition to it, the function of money as a store of value.

Both the approaches are essentially similar theoretically. They focus on the two opposite sides of the one and the same object, viz. the demand for money. In this part of the paper, we propose to analyse the views of two economists who, actually belong to the school, conducting the quantity theory discussion from the cash balance approach.

#### 1) Prof. A. C. Pigou

In the article, 'The Value of Money', Prof. Pigou discusses the value of money in two ways,

- a) with the help of the equation of exchange
- b) with the help of demand-supply analysis.



First, he defines the value of money, as 'the exchange value' of a unit of it. He expresses the exchange value of money in terms of 'commodities in general'.

a) The Value of Money (Discussion in terms of the equation of exchange)

People hold money with two objectives, viz., the provision of convenience and the provision of security. The first provision is to satisfy daily needs, while the second provision is meant to face the unexpected demands when they arise.

People keep their resources in two alternative forms; i.e. in legal tender money and in bank balances. The total demand for legal tender money is explained with the following equations.

$$P = \frac{KR}{M} \quad (1)$$

of

$$M = \frac{KR}{P} \quad (2)$$

The second equation shows the demand for money.

Here  $M$  - is the number of titles to units of legal tender money. It includes, actual legal tender (token coins also part of it) plus bank notes, plus balances against which cheques can be drawn.

$P$  - is the value, or price, per unit of these titles, in terms of any economic good; e.g. wheat.

$R$  - is the total resources expressed in terms of, say, wheat.

$K$  - the proportion of these resources that the community chooses to keep in the form of titles to legal tender.

Pigou has given the total demand for actual legal tender money as under.

$$P = \frac{KR}{M} \{c + h(1 - c)\} \quad (3)$$

or

$$\bar{M} = \frac{KR}{P} \{c + h(1 - c)\} \quad (4)$$

Where  $\bar{M}$  stands for actual legal tender money and  $c$  stands for proportion of titles to legal tender and  $h$  stands for proportion of cash reserves to bank notes and bank balances.

In equations (1) and (2),  $M$  is not only the number of units of actual legal tender but it also includes other constituents of titles to legal tender, such as bank notes and chequeable bank deposits.

So, we divide this  $M$  into two forms.

$\bar{M}$  be the actual units of legal tender.

$\bar{\bar{M}}$  be the volume of other titles to legal tender  
(i.e. bank money)

$$\text{So } \bar{M} + \bar{\bar{M}} = M \quad (5)$$

But banks do not keep whole of  $\bar{\bar{M}}$  in the form of cash. Only a part of this is kept in the form of ready cash.

Suppose, if  $h$  is the proportion of cash to bank notes and bank balances, then

$h \cdot \bar{M}$  is the demand for actual legal tender by the bankers.

In other words, if  $c$  is the proportion of titles to legal tender, ( $M$ ), which the people choose to keep in the form of actual legal tender, then  $1 - c$  is the proportion of titles to legal tender ( $M$ ), which is the  $\bar{M}$ , but bankers need only  $h \cdot \bar{M}$  as actual legal tender.

∴ Total demand for actual legal tender i.e. (both by the people and the banks), is

$$= c \cdot M + h \cdot \bar{M} \quad (6)$$

but  $\bar{M} = (1 - c) (M)$  (7)

Therefore, substituting  $(1 - c) (M)$  for  $\bar{M}$  we get, total demand for actual legal tender =  $c \cdot M + h \cdot (1 - c) \cdot (M)$

By solving this we get,

The total demand for actual legal tender

$$\begin{aligned} &= cM + (h - hc) M \\ &= cM + hM - hcM \\ &= M (c + h - hc) \\ &= M \{ c + h (1 - c) \} \end{aligned}$$

but we have seen that  $M = \frac{KR}{P}$  from the equation (1) above.

Substituting  $\frac{KR}{P}$  for  $M$ , we get the total demand for actual legal tender as given in equation (4) above.

People keep their resources in the form of titles to legal tender for three uses.

- i) the production of convenience and security,
- ii) the production of commodities, and
- iii) the direct consumption.

These three uses of titles to legal tender are mutually competitive. If these titles to legal tenders are less attractive for production use, the value of  $K$  (cash-balances) increases. Consequently other uses are more attractive. The attractiveness of the production use depends on the expected prosperity of industrial activity. Therefore, the attractiveness of money balance depends on technological progress and rise in prices.

According to Pigou, the attractiveness of cash holding for these uses depends upon different reasons which are complex. These reasons are,

- 1) The convenience to the holder in the ordinary business of life, which depends on the periodicity of his receipts, and the extent of in-kind settlement of debt allowed by the industrial organisation.

- 2) The expected purchasing power of money. According to Pigou, if the prices are expected to fall, then desire of the people to hold titles to legal tender increases and vice-versa.

In short, in Fisherian quantity theory, the demand for loan or credit money is mostly dependent upon the expected change in the price level and the rate of interest. According

to Pigou the demand for bank money depends not only on the expected changes in price level and the rate of interest, but also on technological change.

b) The Value of Money (Discussion of changes in price-level through demand-supply analysis)

In pure economic theory, the value of any economic good is determined by the demand and supply forces. As already seen, according to Pigou, the demand for money depends on the quantum of total real resources, periodicity of receipts, industrial organisation and also the marginal utility of consumption, the expected as well as actual changes in the price level, the rate of interest and technological change.

Pigou explained the supply side of the value of money in a very brief manner. In his opinion, the supply of money depends basically on two factors: (1) the kind of monetary system adopted by the country and (2) the monetary policy pursued by the government. He visualises many forms which the monetary system may have and accordingly, explains, how money supply will change. In a monetary system based on inconvertible paper currency, at any given point of time, the money supply is constant and it is arbitrarily determined by the government. Here the supply curve of money is vertical to the horizontal axis. Some times, only a part of the total quantity of legal tender money is arbitrarily fixed as in the case, when a part of the money supply, is fixed in the form of gold coins, which remain constant in number but along with which some other forms of money

(e.g. silver coins, green backs, and other treasury notes issued against the deposits of certain precious metals etc.) also circulate freely as full legal tender. In this case, the curve of money supply shifts further, to the right and becomes slightly less inelastic. Under pure gold standard, the money supply is beyond the control of the government, because it is determined by the forces of international trade and changes in the stock of the gold. More precisely, the supply of money in a country at a given point of time is determined by world stock of gold minus its use for other purposes including the coining by other countries. In fact, in this case also, the money supply is almost constant, because the additions to the stock of gold of the world are almost negligible, which means, additions to the gold stock of a country, will be more negligible. Under bi-metallic or symmetrical, again the money supply will be similarly constant with the difference that it will be slightly larger. Under gold exchange standard, the government will have to vary the money supply in order to maintain gold exchange rate between its currency and currencies of other countries. In this case, the money supply will increase, if wheat price of foreign currency falls and vice-versa. Finally, the money supply of a country may be changed in such a manner (as suggested by Fisher) so that its commodity price remains constant. After discussing these various possibilities regarding money supply, Pigou argues that it is not only the demand for money, but also the supply of money, which together affect the value of money. He also

emphasises the fact that any one of the factors determining either demand for or the supply of money, may affect more or less, either of them at the same time.

## 2) Prof. D. H. Robertson

Prof. Robertson's definition of the value of money is similar to that of Prof. Pigou. According to Robertson, value of money is "the amount of things in general which will be given in exchange for a unit of money." In his view the money is used for buying the flow of goods and services i.e. for consumption; and the purchase of goods like machinery, building, raw materials, etc. In short, Robertson clearly shows the division of commodities between consumer goods and capital goods.

Robertson explains the value of money in four ways.

a) Consumption Value - This is the value of money in terms of consumable goods and services.

b) Income Value - This is the value of money in terms of the newly created things.

c) Transaction Value - This is the value of money in terms of all kinds of goods and services which are exchanged with its help.

d) Labour Value - This is the amount of labour of a given quality that can be purchased with a unit of money.

According to Robertson, index numbers which are supposed to measure the value of money, do not provide an accurate measurement, because the construction of index number is not always

precise. The index numbers get distorted, if the following points are not taken into consideration properly.

1) Clear cut statement of the purpose of the construction of the index number, i.e. specification of the class for which the index number is constructed.

2) The selection of a normal year as the base year.

3) Selection of commodities representative of the consumption of that class.

4) Proper choice between retail and wholesale prices from the relevant area.

5) Appropriate weightage to commodities according to their importance in the consumption mix.

The demand for money varies as variations in the volume of transactions. The changes in the volume of transactions are due to:

- i) Fluctuations in the flow of finished goods and services.
- ii) Changes in the degree of speculative activity.
- iii) Changes in the organisation of industry.
- iv) Fluctuations in the exchange of capital goods like houses and securities.

In other words, if transactions increase the demand for money also increases and vice-versa. It is evident that an increase in the flow of finished goods and services increases consumption and thereby transactions. Increasing speculative



activities change the peoples' expectations about future prices. The reverse is also true. If speculation increases, people may think that prices may increase and therefore they purchase more commodities and as a result the volume of transactions increases. Similarly, if speculative activities becomes dull, prices will fall and thereby the volume of transaction will decrease. Sometimes organisation of industry changes in such a way that some commodities change hands more times or less times, for example, the monopoly purchase of cotton will reduce the number of transactions. A public demand for ceiling on urban housing may lead to a sudden increase in the sale of houses. This also will increase transactions.

Therefore, it is evident that changes in the volume of transactions will be followed by similar changes in the demand for money.

The value of money depends not only on its quantity but also on its average velocity of circulation.

Prof. Robertson has given more importance to income-value of money rather than transaction value of money. The difference between income value of money and transaction value of money is as follows.

Firstly, in income-value of money, only the final goods and services are considered, which are the part of real income. In transaction value of money, all types of goods and services i.e. primary, intermediate, finished or capital goods, are taken into consideration. Secondly, in income value of money, the

velocity of circulation of money is the average number of times money is spent in purchase of goods and services which are the part of real income; while in transaction value of money the velocity of money circulation is the average number of time it is spent for any kind of transaction. Therefore, Robertson stated, income velocity is always less than transaction velocity.

In Robertson's view, the income value approach explains the underlying psychological forces which determine the value of money, while the transaction value approach explains the real life changes in the actual price level and thereby the changes in the value of money.<sup>1</sup>

Robertson's equations showing the income-value approach and the transaction value approach to the changes in the value of money (or changes in the price level) are as under.

#### 1) Income-Value Approach

$$P = \frac{M}{KR}$$

where,

Let M be the quantity of money in existence.

Let R be the real annual national income.

Let K be the proportion of R which people wish to have enough money on hand to purchase.

This equation shows that the income-price level changes directly to the quantity of money in existence but inversely related to the product of K and R.

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<sup>1</sup> D.H. Robertson, Money, Nisbet & Co., Cambridge, Revised Ed. 1948, pp. 38-39.

Alternatively the income-value equation is

$$P = \frac{MV}{R}$$

Here P, R and M are the same as in the above equation.

Let V be the average velocity of circulation of money against the constituents of real income.

It shows that the income price level changes directly and in the same direction to the product of M and V but inversely to the R.

## 2) Transaction Value Approach

$$P' = \frac{M}{K'T}$$

Where M be the quantity of money in existence.

T be the real annual volume of transactions.

K' be the proportion of T which people wish to have enough money on hand to conduct.

P' be the transaction-price level.

This equation shows that transaction-price level directly changes with change in the M and in the same direction. But inversely to the product of K' and T.

Alternatively the transaction value equation is

$$P' = \frac{MV'}{T}$$

Where P', T and M are same as in the above equation.

Let V' be the average velocity of circulation of money against the constituents of real transactions.

It shows that the transaction-price level changes directly and in the same direction as that of the product of  $M$  and  $V'$ . But it is inversely related to  $T$ .

Long Period and Short Period Versions  
of Robertson's Theory

The relationship between the change in the quantity of money and the price-level, in the long period and short period is a different one.

In the long run it is seen that money supply gradually increases. Similarly, the monetary habits of the people change in such a manner that use of money in different forms, becomes more and more indispensable. Therefore, the price-level shows a secular rising trend.

But in the short period changes in the price-level are sharp and sudden. The changes in the price level in the short period are called the business cycle or trade cycle which are tied up with sharp fluctuations in output, employment and consumption.

Suppose there is an invention in the economy (i.e. innovation in Schumpeterian terminology). As a result, the producers intend to speed up their rate of output. But for this, they require circulating capital. Hence, they will demand more credit. Similarly, banks are willing to provide loans with a view to sharing in the increased profits of innovation. Banks do this by creating additional loans. As a result the prices increase.

This increase in prices reduces the purchasing power in the hands of people. This enforced saving is in fact the result of inflationary pressure. This rise in prices become cumulative because there is a time lag between investment decision and actual production. The length of this time lag is known as gestation period. Therefore, a mild price rise in the beginning becomes faster subsequently because the velocity of circulation of money increases, the reason being that the public loses confidence in the money. Therefore, the rise in price level is more than proportionate to the rise in the quantity of money. This is called inflation in the economy.

There will be a turning point to this rising trend after a certain time due to the following factors.

- a) The capacity of the existing producing plants is limited.
- b) Supply of labour force is quantitatively restricted in the short period.
- c) Producers and retailers hold the stock of goods for profit maximisation in future by rise in prices. Everybody prefers to hold commodities rather than money. But in this process, producers and retailers demand more credit money from banks as circulating capital. But there is a limit to the expansion of loans due to the restriction of reserve ratio. Also, banks become doubtful about the recovery of loans. At this point banks start asking for speedy repayment of loans. All these factors are responsible for the reversal in the price-level change. Once

there is a fall in price-level it also becomes cumulative. It is called a recession in the economy. There will be again a turning point caused by new invention.

In short, according to Robertson, the value of money is determined by the demand for money. The demand for money depends upon the changes in transactions which affect the velocity of circulation of money, which brings about changes in the quantity of money.

## CHAPTER IV

J. M. KEYNES

The theory of value is the study of price or value of any scarce and useful commodity in terms of any other commodity. For a long period, the economists were accustomed to express the theory of value with the help of demand and supply analysis. In this analysis, the prominent factors are the changes in marginal cost and the elasticity of short period supply as also the demand situation as reflected by the marginal and average revenue curves. But when it comes to the theory of value of money and the fluctuations in the price level, the analysis assumes a different complexion and perhaps content. Here it is maintained variously that changes in the value of money or which is the same as changes in the price level, are determined by factors like the quantity of money, its income or transaction velocity, and changes in the volume of transactions etc. In this case supply and demand elasticities are not taken into consideration. According to Keynes, this switch in the expression of the theory of value is due to the faulty division of economics, between Theory of Value and Distribution on the one hand and the Theory of Money on the other hand. So, Keynes himself suggested a dichotomy of a division of economics as follows. "The right dichotomy is, I suggest, between the theory of the individual industry or firm and of the

rewards and the distribution between different uses of a given quantity of resources on the one hand, and the theory of output and employment as a whole on the other hand."<sup>1</sup>

According to Keynes, the study of individual industry or firm is possible without considering the significant characteristics of money, with certain assumptions, namely that there is full employment in the economy and that there is no further possibility of change in the resources. If these assumptions do not hold, then changes in the level of employment and resources become themselves the factors which affect the study of the industry or the firm. But for the determination of employment and output the study of the influence of money becomes essential. On the other hand the classical economists considered real output and employment separately from monetary sector. R. L. Teigen stated, "In addition, in the classical model, real output and employment are determined independently of the monetary sector...."<sup>2</sup>

Keynes developed the idea of the general price-level with the help of the dichotomy suggested by himself. For the determination of the general price-level, he considered first the price of the product of a single industry, which depends partly

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1 J.M.Keynes, *The General Theory of Employment Interest and Money*, Mac. and Co.Ltd., London, 1936, p.293.

2 Ronald L. Teigen, "Demand for and Supply of Money," in *Readings in Money, National Income and Stabilisation Policy* (ed.) W.L.Smith and R.L.Teigen (Revised Ed.), The Irwin Series in Economics, Richard D. Irwin, Homewood, Illinois, 1970, p.78.



on the rate of remuneration of the factors of production, and partly on the scale of output. By analogy, he argued that, the general price level, also, depends partly on the rate of remuneration of the factors of production and partly on the scale of output as a whole. In short, his study of the general price-level is an extension of the conclusions from the study of single industry or firm to the price of output as a whole.

He explained that, in the case of the product of a single industry, its price depends on two factors, the rate of remuneration of the factors of production and the scale of output of that industry. It is assumed that the rates of remunerations of all the different factors of production change in the same proportion. Therefore, the price of product depends partly on the wage unit<sup>3</sup> and partly on the scale of output of that industry. In the same manner, the general price level also depends partly on the wage unit and partly on the volume of employment. So, the effect of change in the quantity of money on the price level would not be direct. But, it would be the ultimate result of the effects on the above two factors, i.e. wage unit and volume of employment.

According to Keynes, people hold cash on hand for the transaction purpose, the precautionary purpose and the speculative purpose. The short explanation of these three motives is essential for our discussion.

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3 "The unit in which the quantity of employment is measured is called the labour unit; and the money wage per labour unit, we shall call the wage unit."

See also J. M. Keynes, p.41.

### 1) The Transaction Motive

This motive is further subdivided into two parts, i.e. the income motive and the business motive.

1) The Income Motive - To bridge the interval between the receipt of income and its disbursement, is one reason for holding cash on hand. For this motive, the cash holding depends on income of the individual and interval between receipt and its disbursement.

ii) The Business Motive - Every businessman has to hold cash on hand, to bridge the time gap between the incurring of the business costs and the receipt of the sale proceeds. Holding cash on hand for this purpose depends on current income and the number of hands through which output passes or on the number and duration of production processes required for the final production i.e. on the number and duration of the stages of production.

### 2) The Precautionary Motive

Every individual has to keep some ready money for unforeseen contingencies and sudden requirement for the fulfilment of wants.

### 3) The Speculative Motive

People keep some ready money in order to realise more money income from the variations in bond values due to the change in the rate of interest. Keynes has not considered in detail the whole causation in which the values of assets change.

According to Keynes, this type of motive is more important in transmitting the effects of a change in the quantity of money.<sup>4</sup>

Therefore, the total demand for money is nothing but only an aggregation of money held for the three motives. This is called the liquidity preference. The total demand for money can be shown in the form of following mathematical equation.

$M$  - is the total demand for money

$M_1$  - is the demand for money for transaction and precautionary motives

$M_2$  - is the demand for money for the speculative motive

$$M = M_1 + M_2 \quad (1)$$

The first component of the demand for liquidity ( $M_1$ ) mainly depends on the level of income ( $Y$ ), and the second component of the demand for liquidity mainly depends on the relation between the current rate of interest and the expected rate of interest. So,

$$M_1 = L_1 (Y) \quad (2)$$

$$\text{and } M_2 = L_2 (r) \quad (3)$$

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<sup>4</sup> J. M. Keynes, op.cit., p.196.

"There remains the speculative motive - This needs a more detailed examination than the others, both because it is less well understood and because it is particularly important in transmitting the effects of a change in the quantity of money."

Now, with the help of the above three equations, the total demand for money is shown in one equation as;

$$M = M_1 + M_2 = L_1 (Y) + L_2 (r) \quad (4)$$

Equation (4) shows that the total demand for money depends on income and the rate of interest. But the demand for money directly depends on income (Y), while, it is inversely related to the rate of interest. At this stage, we have to investigate three matters.

1) The relation of changes in money to income and rate of interest.

2) The factors which determine the shape of liquidity preference curve regarding transaction motive and precautionary motive.

3) The factors which determine the shape of the liquidity preference curve regarding the speculative motive.

#### 1) The Relation of Changes in M to Y and r

Suppose that, M consists of gold coins and changes in M are possible only by the gold mining activities. Then, changes in M are directly associated with changes in Y; because the new gold accrues as someone's income. Exactly, the same will happen, when the change in M is due to government printing money to meet the Government's current expenditure. In this case also the new money accrues as someone's income. There will be a new level of income. At this higher income level, whole portion of increased money will not be absorbed for  $M_1$  because in the short

run, the consumption patterns, nearly remains unaltered. And it is on this consumption pattern that absorption of increased money in  $M_1$  (transaction and precautionary motives) depends. Therefore, some portion of increased money must be diverted to the speculative motive i.e.  $M_2$  for intended buying of government securities. This will cause the rate of interest to fall from its initial level. As a result of decreased costs of capital, investment increases in the economy. Therefore, income (Y) increases which leads to further increase in  $M_1$ . In this way, the rate of interest (r) is an important factor in the determination of employment and price level. This process is described by Keynes as follows. "A change in M can be assumed to operate by changing r, and change in r will lead to a new equation partly by changing  $M_2$  and partly by changing Y and therefore  $M_1$ ."<sup>5</sup>

In this regard, effects of increased public expenditure by the sale of government securities on  $M_1$  and  $M_2$  may also be considered. The sale of government securities will reduce the  $M_2$  money of the rich class. But at the same time it may cause a fall in the security prices in general leading to a rise in the rate of interest. Similarly, this kind of increased public expenditure, due to either increased employment or increased transfer payments, will contribute to a rise in the income of the average class. As a result, the  $M_1$  money may increase.

On the other hand, if new money is due to increased credit

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5 Ibid., pp.200-01.

supply to the commercial sector, it may lead to an increase in inventories leading to a higher demand and thus a higher price-level. This may also increase  $M_1$  money. The increasing price level may lead to larger speculative activity and larger quantum of  $M_2$  money.

## 2) What Determines the Shape of $L_1$ ?

The income velocity of money is defined as the ratio of  $Y$  to  $M$ . But according to Keynes, it should be the ratio of  $Y$  to  $M_1$ .

So,

$$\frac{Y}{V} = M_1 = L_1 (Y) \quad (5)$$

where,

$V$  is the income velocity of money.

$M_1$  is the demand for money for transaction and precautionary motive.

$Y$  is the income,

and  $L_1$  is the liquidity preference for  $M_1$ .

Now, it is not correct to suppose that income velocity is constant, because, its value depends on the character of banking and industrial organisation, on social habits, the distribution of income among the different classes, and the effective cost of holding the idle cash.

### 3) What Determines the Shape of $L_2$ ?

As mentioned earlier, the rate of interest is the most prominent factor in the determination of the cash on hand held for the speculative motive ( $M_2$ ). The relation between the rate of interest and the speculative demand for money is inverse. But the change in the rate of interest (i.e. rise or fall) is dependent on the  $M_1$ . We have seen that total demand for money in the above equation (1) is  $M = M_1 + M_2$ . If,  $M_1$  is increasing relative to  $M$ , it clearly indicates that the portion for  $M_2$  is decreasing, so, the rate of interest will increase.

With the help of the earlier explanation, it is clear that the primary effect of a change in the quantity of money on demand for money is through its effect on the rate of interest. This quantitative effect is to be determined on the basis of following three factors, which are,

- i) the schedule of liquidity preference;
- ii) the schedule of marginal efficiency of capital; and
- iii) the investment multiplier.

The above three factors interact among themselves. The process of interaction is described in short as follows:

As stated earlier, the change in money supply (whether in the form of gold coins or paper currency) will result into a new level of income in the economy. The new level of equilibrium income will be established after the absorption of whole increased money in the economy either as  $M_1$  and  $M_2$  or both. If, some

portion of increased money is diverted for speculative purpose, the rate of interest will fall. So investment increases. It means that, with the increased money, a particular person may invest it for the purchase of bonds, securities or investment in business. But, this fall in the rate of interest increases profit of investment in business. This stimulates investment further. Therefore, the demand for money for  $L_2$  purposes becomes more important. Through investment multiplier the initial increased investment leads to increased effective demand<sup>6</sup> as a whole. The new level of equilibrium income will be established after the absorption of whole of the increased money either as  $M_1$  or  $M_2$  or in both. The price-level will not rise in proportion to the rise in the quantity of money, because the increased supply of money increases output and employment in the economy through increased investment via changes in  $L_2$ .

The above result is true in an economy where there is less than full employment. But, after the attainment of full

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6 Let  $D$  be the proceeds which entrepreneurs expect to receive from the employment of  $N$  men the relationship between  $D$  and  $N$  being written  $D = f(N)$ , which can be called the Agg.  $D$ . Function.

The volume of employment is given by the point of intersection between the aggregate demand function and the aggregate supply function; for it is at this point that the entrepreneurs' expectation of profits will be maximised. The value of  $D$  at the point of the aggregate demand function, where it is intersected by the aggregate supply function, will be called the effective demand.

Similarly, let  $Z$  be the aggr. supply price of the output from employing  $N$  men, the relationship between  $Z$  and  $N$  being written  $Z = g(N)$ , which can be called the Agg. supply function.

See also J. M. Keynes, General Theory, p.25.



employment in the economy, the result will be as follows, as explained by Keynes. "So long as there is unemployment, employment will change in same proportion as the quantity of money; and when there is full employment prices will change in the same proportion as the quantity of money."<sup>7</sup>

In the above statement, Keynes explains the relationship between the change in the quantity of money and the price-level in less than full employment and in full employment economy. It is necessary to explain in detail above mentioned relationship.

When there is less than full employment in the economy, the increased money supply increases the profit of investors by fall in rate of interest. There is unemployment in the economy, and it is assumed that, the supply of productive factors is perfectly elastic at given and constant wage unit. Therefore, the employment and output increases in the same proportion as the rise in the quantity of money upto the point of full employment in the economy.

Once, full employment is attained in the economy, then increased money supply is fully diverted to the increase in the cost unit, because there is no further increment in output. It indicates that after the attainment of full employment in the economy, increased money supply is fully diverted towards  $M_1$  and <sup>not</sup> to  $M_2$ . Hence, after the full employment in the economy, prices change in the same proportion as change in the quantity of money.

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7 J. M. Keynes, op.cit., p.296.

Long-run

In the long-run the relationship between the change in the quantity of money and price-level is not a simple one as in the short period.

According to Keynes, the liquidity preference shows a long term uniformity so far as it is expressed as ratio of money supply to national income. The quantity of this money supply may well be determined as the average of quantities of money required in the periods of pessimism and optimism together. Keynes thought that, this is a fairly constant ratio of the national income. If in the initial period the money supply is greater than this proportion, then the rate of interest will fall to the minimum level of the rate of interest which is determined by psychological forces. The falling rate of interest, other things remaining constant, will increase the effective demand and the price-level. On the other hand, if the money supply is less than this proportion, the rate of interest will increase much beyond the psychological minimum and will reduce the effective demand and the price level will fall.

The relationship between the change in the quantity of money and price-level in the long run is explained by Keynes as follows. "Thus the very long-run course of prices has almost always been upward. For when money is relatively abundant, the wage unit rises; and when money is relatively scarce, some means is found to increase the effective quantity of money."<sup>8</sup>

8 Ibid., p.307.

The above quoted statement explains that in the long-run relationship between the quantity of money and price-level is connected with the supply of money. Suppose that, initially there is a certain ratio of money supply to the productive means. Now, suppose, the supply of money is higher relative to the availability of productive means. The effect would be a rise in the wage unit and prices in the same proportion. But if the supply of money is less relative to the available resources then the reverse will happen. These available but unutilised resources need some amount of money.

In short, the result will be, in Keynes' words; "To return to our immediate subject, the long-run relationship between the national income and the quantity of money will depend on liquidity preferences. And the long run stability or instability of prices will depend on the strength of the upward trend of the wage unit (or, more precisely, of the cost unit) compared with the rate of increase in the efficiency of the productive system."<sup>9</sup>

The above quoted statement is a conclusion regarding the relationship between the quantity of money and the price-level in the long run. There are two points to be noted from the above statement.

The first part of the quotation explains that, the holding of cash on hand is proportionate to the national income. This proportion of cash on hand to national income depends upon the

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9 Ibid., p.309.

liquidity preferences i.e.  $L_1$  and  $L_2$  together taken as an average over periods of inflation and deflation.

The second conclusion is that the stability and instability of prices depends upon the rate of change of efficiency of productive factors and the rate of change of their remuneration. If the rate of change of remuneration is higher than the rate of change of efficiency, instability of prices will result.

## CHAPTER V

### MILTON FRIEDMAN

There may be a controversy among the economists regarding whether, monetary changes are passive or price changes are passive. Such type of controversy is nothing but a hen-and-egg controversy, which has no end. Milton Friedman accepted the view that price changes are passive. In other words he accepted that the direction of the causal relationship is from changes in the stock of money to changes in the price-level; both the changes being in the same direction i.e. increasing stock of money leading to increasing price-level and decreasing stock of money leading to decline in the price-level. Therefore, Milton Friedman holds the view that instability of the price level can be controlled if we could control the changes in the stock of money. According to Milton Friedman, the distortions in this relationship viz. changes in stock of money leading to similar changes in price-level are due mainly to two reasons.

1) Changes in output, and

ii) Changes in the amount of money that public desires to hold relative to its income.

#### 1) Changes in Output

If the stock of money remains the same as at the initial

level for some time and during that period the output increased, then the price level would decrease. It is clear that this decrease in the price-level is due to the increase in output without any change in the stock of money. In other words, the same amount of money performs its work at a lower price-level.

Friedman supported this argument on the basis of U.S. experience<sup>1</sup> in the period between 1865 to 1879, during which the prices almost halved even though the stock of money remained constant. The simple reason was the doubling of output during this period. This empirical evidence is tantamount to saying that output can grow even without increase in money supply in conditions of less than full employment. It almost goes against the Keynesian claim that in condition of less than full employment other things remaining constant, increased money supply is required to augment production. (See Footnote No.7 of Chapter IV).

## 2) The Ratio of Cash-Balances to Income

According to Friedman the ratio of cash-balances to income is the second factor which may generate a discrepancy between the changes in the stock of money and the changes in the price level. According to him the peoples desire to hold cash-balances depends on the income as well as price level. Presumably increases in income will make the people hold larger cash balances and vice-versa. Similarly, with a rise in the price level,

<sup>1</sup> Milton Friedman, The Optimum Quantity of Money and Other Essays, MacMillan, London, 1969, p.174.

demand for nominal cash balances also rises. In more detail, he maintained that the ratio of these cash balances to income depends on

- 1) The change in real income per capita.
- ii) The cost of holding money.

As real per capita income increases the real cash holdings also increase. The cost of holding money depends on the rate of interest on alternative assets and the rate of change in the price level.

An increase in the rate of interest or an anticipated fall in the price level results in increased cost of holding leading to a decrease in demand for real cash balances. On the contrary, a decrease in the rate of interest or an anticipated rise in the price level reduces the cost of holding money, resulting in increased demand for real cash balances. People desire to hold a cash balance for two reasons.

- 1) money serves as a medium of circulation and removes the drawback of the barter economy regarding double coincidence of wants. and

- ii) money serves as a reserve for future emergencies.

Cash balance, i.e. nominal units of money or legal tender, is one form in which people hold a part of their wealth. In this context it is important to examine the different forms in which people keep their total wealth, because, in Friedman's quantity theory of value of money, demand for money is determined by three

factors which are discussed shortly, but before this discussion it is necessary to understand in what way Friedman tries to restate the traditional quantity theory.

In the restatement, Friedman analyses the demand for money by assuming that individual wants to keep his total wealth in different forms of wealth taking into consideration.

- i) the size of the total wealth,
- ii) the price of and return on different forms of wealth, and
- iii) the taste and preferences of wealth owner.

In this context, after discussing the demand function for money as given by

$$Y = v(r_b, r_e, \frac{1}{P} \cdot \frac{dP}{dt}, w, \frac{Y}{P}, u) M$$

He comes to the conclusion that this is usual quantity theory form. Where  $v$  is income velocity (Other notations are explained in a subsequent paragraph).

According to Friedman, the proponents of the quantity theory maintain the empirical hypothesis that, the demand function for money is highly stable. It does not mean that the real quantity of money demanded per unit of output or the velocity of circulation of money is to be regarded as numerically constant over time. In fact, it is the functional relation between the quantity of money demanded and the variables that determine it which is suppose remain constant.



The quantity theory based on this stable demand function for money considers that it plays a vital role in determining the level of money income, or of prices.

Another important aspect of the quantity theory is that, it recognises some important factors which affect the supply of money and do not affect the demand for money. These are the technical conditions regarding the supply of specie and political or psychological condition, which affect the monetary policies of the government and the banking system.

Friedman makes a reference to the so-called the real bills doctrine which maintains that changes in demand for money necessarily change the supply of money. On this is based the criticism that traditional quantity theory cannot explain large price rises, because such large price rises produces increase in the demand for money and also, the increase in the supply of money to meet it.

According to Keynesian under-employment analysis the demand for money is set to be infinitely elastic at a small positive rate of interest which is expected to prevail under under-employment condition. In this situation changes in the real supply of money produce either by changes in prices or the changes in nominal stock of money, have no effect on anything. This means, that the stock of money and the demand for money determine only the rate of interest and nothing else.

It is on this background that we discuss below three factors which determine the form in which wealth is held by individual

and which in turn determine the demand for money in Friedman's restatement of the quantity theory.

**1) Total Wealth to be Held in Various Forms**

According to Friedman this is similar to the budget constraint to the consumer's demand for commodities. The choice of different forms of wealth will be limited by the size of total wealth which the consumer holds.

- 2) The price of these different forms of wealth and the returns from them.
- 3) The tastes and preferences of wealth owning units i.e. the individuals.

Friedman classifies wealth holding of individuals into the following categories.

i) Money (M). is a commodity unit which is generally accepted in payment of debt. It has a fixed nominal value;

ii) Bonds (B). These are claims to time streams of incomes. These are fixed in nominal units and are received annually, (coupon). Similarly he may get a positive or negative income from these bonds due to the change in price of bonds over time due to the changes in market rate of interest.

iii) Equities (E). These are defined by Friedman as claims to a permanent stream of income of constant real value. From this type of wealth, the holder gets (a) constant nominal amount if price level is assumed to remain constant. (b) Increased or decreased nominal amount in order to adjust for price level

changes. (c) Change in the nominal price of the equity due either to changes in price level or the rate of interest.

iv) Physical non-human goods (G). Income from it is similar to equities, but the difference is that, it is in terms of kind and not in money.

v) Human capital (H). According to Friedman, income from non-human wealth (wealth as commonly understood) has, at a given time, a particular ratio to human wealth (income). Therefore, in this regard, ratio of wealth to income is the indicator of human capital. Considering the returns on different forms of wealth, as outlined above, Friedman writes the demand function for money as follows:<sup>2</sup>

$$\frac{M}{P} = f(y, v; r_m, r_b, r_o, \frac{1}{P} \cdot \frac{dP}{dt}; u)$$

Where,

M = the stock of money

P = the price index implicit in estimating national income at constant prices

y = national income in constant prices

v = the fraction of wealth in non-human form (or, alternatively, the fraction of income derived from property).

$r_m$  = the expected rate of return on money.

$r_b$  = the expected rate of return on "standard" bonds.

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<sup>2</sup> Milton Friedman, "Quantity Theory of Money," Indian Economic Journal, Vol. XVII, No. 485, April-June 1970, p. 425.

$r_e$  = the expected rate of return on equities.

$\frac{1}{P} \cdot \frac{dP}{dt}$  = the expected rate of change of prices of goods  
and hence the expected rate of return on real  
assets;

$u$  = a portmanteau symbol, standing for whatever  
variables other than income which may affect  
the utility attached to the services of money.

According to Friedman, changes in the stock of money per unit of output over longer periods, dominate the changes in the price level. Such effects over the shorter periods consisting of fluctuations which constitute the business cycles are not so dominating. In Friedman's opinion this weaker connection between changes in the stock of money and the price level is due to smaller magnitude of their changes. In the secular sense disturbances in the relation between desire to hold cash balances, real income and the cost of holding cash balances are smoothed out by the cumulative movements of the stock of money and prices. These disturbances in the above relations in the short run are relatively more important than the movements in the money and prices.

However, Friedman maintains that there is a close link between changes in money supply and the price level even during the business cycles, similar to changes in the money supply over longer period and during war time. For this he gives the

historical evidence of the fact<sup>3</sup> that in U.S.A. there have been cycles during which the movements in the price level were directly related either to faster or lower rate of expansion of money supply and absolute contraction of money supply during deep depression. Notwithstanding this observation Friedman was cautious enough to point out three important considerations regarding formulation of the monetary policy in this context.

1) The direction of the influence of the changes in the money stock, income and the price level is more complex during short periods of the business cycle than in case of longer period. In his opinion this complexity of process is related to the character of monetary and banking system. By the character of monetary and banking system he means the response of the banking system and the people at large to either the expansion phase through increasing cash ratio and decreasing cash holding or to contraction phase by decreasing the cash ratio and increasing cash-holding.

2) Friedman also emphasised the significance of the timing of the changes in money supply. From the historical examination of business cycles he has found out that changes in the money supply affect the economic activity only after a lag of 12 to 16 months on average.<sup>4</sup> Therefore from a policy point of view any

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3 Milton Friedman, The Supply of Money and Changes in Prices and Output in The Optimum Quantity of Money and Other Essays, p. 178.

4 Ibid., p.180.

decision regarding a money supply must be based of this lagging nature of monetary influence.

3) He also highlighted the fact that at any time there are other economic forces which enhance or mitigate the influence of moderate changes in money supply in a short period. As a result the movements of money supply and price level may not be evidently synchronized. Therefore, it is not only the timing but also the quantum of change in money supply taken together which will specify the effect of monetary policy. In the absence of this, it is always seen that a severe inflation or depression follow only sizeable increase or decrease of money supply.

## CHAPTER VI

### DON PATINKIN

Don Patinkin explained the relationship of the quantity of money and price level in his well known book, "Money, Interest and Prices". This explanation was developed by him in three stages. First, he defines and explains the excess demand functions in the economy. Secondly, with the help of excess demand functions, he explains how the equilibrium prices are determined. And thirdly, he explains changes in these equilibrium prices on the basis of changes in the quantity of money. According to Patinkin, there are two types of money and hence two types of prices.

1) An Abstract Unit of Account: It is for the purpose of record keeping but it has no physical existence. This type of money gives accounting prices.

ii) Fiat Paper Money: It serves as the actual physical medium of exchange and store of value. The prices expressed in terms of fiat paper money are called 'money prices' or 'absolute prices' or simply as prices. There is a third kind of prices. When we express the prices of one commodity in terms of other commodities, they are known as relative prices.

For the study of the quantity theory of money, he classifies markets into four kinds, viz.

- 1) Labour market,
- 2) Commodity market,
- 3) Money market, and
- 4) Bond market

These four markets are interlinked.

After explaining the equilibrium prices in the market consisting of commodities inclusive of money, on the basis of Walrasian approach, Patinkin, explains the effect of changes in money supply on these equilibrium prices in the following manner.

#### A) Excess Demand Function

Individual's excess demand function for a given commodity depends on the relative prices of all commodities, his real income and his real balances. If there is an equiproportionate change in all prices, it does not affect the relative prices and so, there is no change through the substitution effect in the composition of wealth held. But it changes in opposite direction the real value of initial money holdings. Therefore, it generates the wealth effect.

The term "individual's amount of money demand" shows that individual has made a plan at a particular point of time to hold an amount of money in order to meet his planned expenditure on commodities. So the excess demand for money is the difference between the amount of money demanded for a particular further plan period and the initial holding of money.



Really the excess demand function for money is a positive ingredient of the individual's economic behaviour. The value of the amount of excess demand for any one commodity is equal to aggregate value of the amount of excess supplies of all other commodities, plus the amount of excess supply of money. So, the aggregate money value of the amounts of the individuals excess demands for all goods is equal to zero.

The money value of the amounts of excess supplies of commodities, and hence the amount of excess demand for money change in the same proportion.

An individual is free from money illusion if an equiproportionate change in accounting prices does not affect his demands for any of the commodities, because the relative prices remain same.

B) If we assumed that the goods market is in equilibrium condition then the value of the market excess demand function is equal to zero.

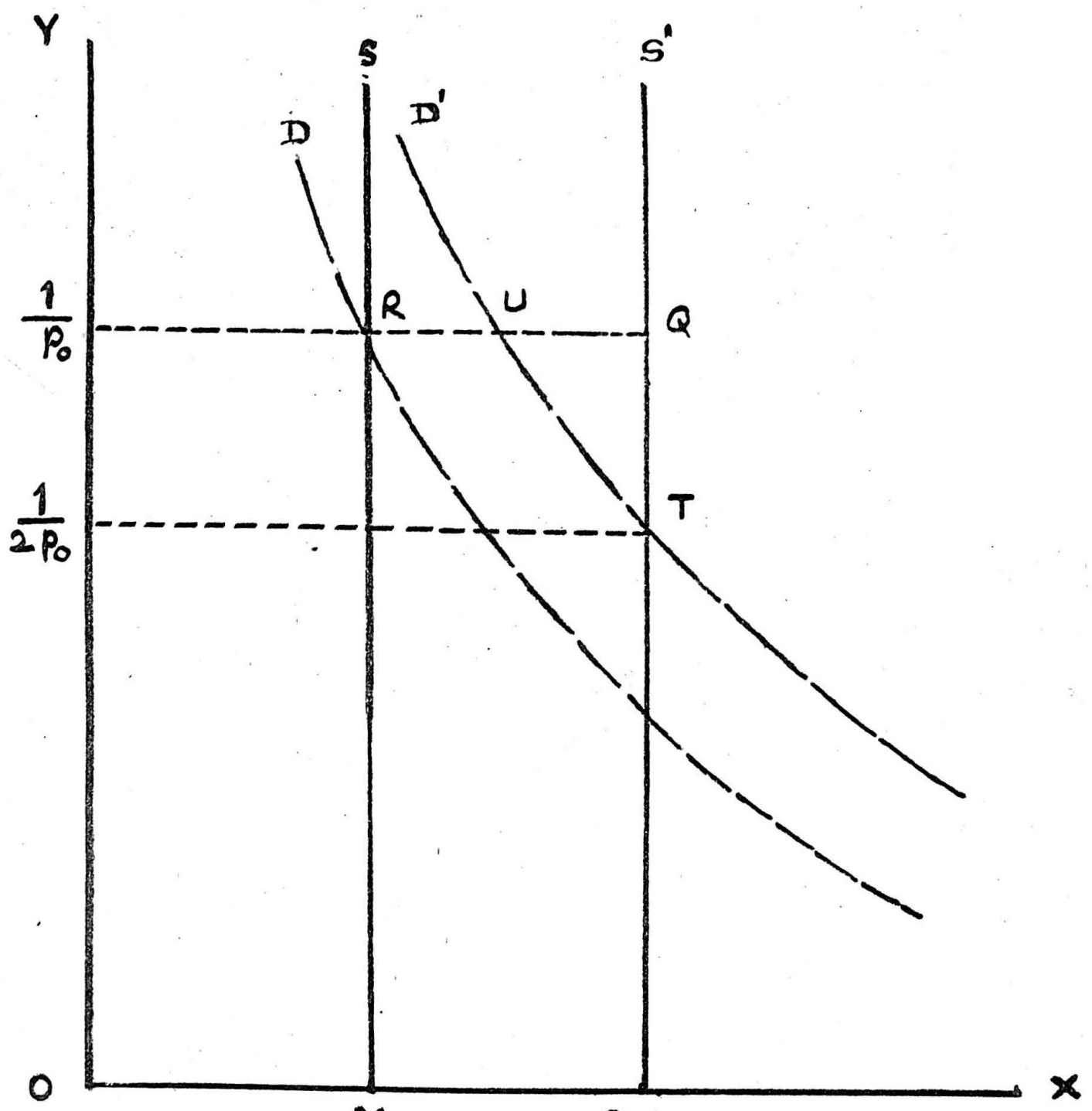
Now suppose, there are 'n' commodities (including paper money) in the economy. Therefore there are 'n' market excess demand equations. Out of these n equations, n-1 equations are independent. Whenever, any set of prices satisfies n-1 market excess demand equations, it will also satisfy the nth equation. We have to accept the assumption that one and the same set of money prices can simultaneously create equilibrium in each and every market.

From Diagram No.1 (given on Page No.61) taken from Don Patinkin's Money Interest and Prices (p.47) it can be explained how the changes in the quantity of money affect the price of money (purchasing power) which is the same as value of money. In this diagram quantities of money demanded and supplied are shown on OX axis, and the price of money or the purchasing power of money ( $\frac{1}{P}$ ) is shown on OY axis.

It is assumed that, prices change in an equiproportionate manner in case of all commodities. The initial supply of money is shown by the vertical line MoS, and initial demand schedule for money is given by curve D which is negatively sloping down from left to right. In this situation it is clear that, that the initial supply of nominal money holding is equal to OMo. Patinkin assumes that it is distributed among individuals in a given way. It is clear that, the point of intersection between D and S i.e. R gives us the equilibrium, where the value of money is given as  $\frac{1}{P_0}$ .

Suppose, the initial nominal money holdings are doubled. It means the money supply in the economy increases to 2Mo. This is indicated by a vertical line 2MoS'. According to Patinkin, this increase in money supply is not fully spent on commodities, a part of it each individual may add to his money balances, but as relative prices have remained same (we have assumed equiproportionate change in prices) there is a real balance effect in the money market. Consequently, there is a rightward shift

Value of money.



Nominal amount of money demanded and supplied.

Diagram No. 1

in the demand curve, which represents a higher level of desired liquidity.

Now it is clear that the new equilibrium point is T which is the point of intersection between  $D'$  and  $2M_0S'$ . It means, that there is a proportionate fall in the price of money which is same as the value of money.

This movement from R to T can be explained on the basis of the fact that at  $\frac{1}{P_0}$  price of money and  $2M_0$  supply of money there exists an excess supply of money equal to  $UQ$ . This excess supply of money means an excess demand for commodity. As a result, the prices in the commodity markets increase; which in turn means that, the price of money goes down to  $\frac{1}{2P_0}$ .

## CHAPTER VII

### SUMMARY AND CONCLUSIONS

This brief review of the important watershed in the evolution of the quantity theory of money, shows the fascinating and perplexing nature of this theory. It is due to these attributes of it that the enigmatic theory of the value of money, attracted the best of the brains of the contemporary times.

An examination of the literature on the quantity theory of money, sufficiently brings out the essential similarities and variations in the approaches to the understanding of the sterling question - What determines the value of money and changes therein?

Different approaches to the quantity theory of money which we have briefly reviewed, show some very evident and some not so evident similarities and dissimilarities regarding the analysis of the value of money and changes in it. We give below the summary of the quantity theory of money as propounded by different economists.

John Locke basically had a cash-balance approach. According to him people hold cash balances for mainly transaction and business purposes. In other words, the demand for money will be determined by the volume and the frequency of transactions and also the nature of business. The frequency aspect of transactions can be considered as the seed from which the concept of

velocity of circulation evolved. According to his theory the value of money or the price level depends on the quantity of money relative to the quantity of goods.

Cantillon's quantity theory of money is the direct predecessor of Fisherian quantity theory. According to his changes in the price level result directly from changes in money supply, which operate through changes in spending either in the form of consumption (direct effect) or in the form of lending (indirect effect). It is important to note here that Cantillon makes a direct reference to the improving terms of trade of agriculture consequent upon an increase in money supply. Similarly, his explanation of increasing prices of superior goods and decreasing prices of inferior goods resulting from increased money supply, is perhaps the first attempt in highlighting the pattern of price changes.

Fisher's quantity theory of money can be considered as an elaborate refinement of Cantillon's approach. But Fisher introduces some important considerations explicitly for the first time. His critical formulation and analysis of the velocity of circulation of money, the explanation of the effects of changes in the rate of interest and a beautiful elucidation of the turning points in the business cycles, are some of the important additions to the quantity theory of money, because they throw light on the dynamics of causal relation between a change in the money supply and the price-level. Fisher's analysis suffers

mainly from the unrealistic assumptions regarding the constancy of  $V$ ,  $V'$  and  $T$ .

Pigou and Robertson are two important economists, who amplified Marshall's monetary analysis into a full blown theory of the value of money which is styled as the cash-balance approach. In this approach, a systematic theory of the demand for money is neatly presented. The point of departure is the recognition of the store of value function of the money, in addition to the medium of exchange function. From this emerges the central concept of  $K$  and the explanation of factors which determine it. In a sense, Pigou's exposition of convenience and security purposes, for which people desire to hold cash, is an anticipation of two of Keynesian motives. Similarly his explanation regarding the effects of the rate of interest, technological change and expectations about the changing price-level are a distinct contribution to the quantity theory. Although Pigou gave a brief analysis of changes in the price-level on the usual demand-supply pattern, he provides interesting insights regarding how different monetary systems and policies affect money supply and hence the price level. From this side of analysis it becomes clear that in this context changes in money supply due to changes in monetary systems and policy, are dependent largely on the government's discretion.

Two important points which deserve special mention in Robertson's approach are (a) his explanation of the turning points in the business cycles and, (b) his concept of the labour

value of money. According to Robertson the upward trend in the price-level is halted by .

the minimum requirement of the reserve ratio, whereas downward trend is halted by technological change. Incidentally, his concept of labour value of money is defined as the amount of labour a unit of money can purchase, which is the inverse of Keynes' concept of the wage unit which is defined as money wage per labour unit.

In his *General Theory of Employment, Interest and Money*, Keynes also adopts a macro approach to the analysis of the value of money. His basic premise is that study of money is important in understanding the forces which determine the employment and output because value of money is determined as part of this general process. According to Keynes the liquidity preference that is demand for money depends on transaction motive, precautionary motive and speculative motive. This is in a sense a crystallisation of earlier thinking of Locke and Pigou. With the help of speculative motive he introduces expectations about changes in the rate of interest and thus weaves into the whole analysis time element and thus makes it dynamic in nature. Similarly, he establishes nexus between employment and changes in demand for money in the form of his concept of wage unit. According to him a change in the quantity of money affects the price-level through its effects on wage unit and employment. It can be argued that an increase in the quantity of money will



divide itself into increase in the wage unit and increase in the employment. If the diversion to the former is relatively greater than the latter the rise in the price-level will be greater than when the latter diversion is greater. Is this the seedling which grew into Phillips curve? The explanation regarding the relationship between current rate of interest, the expected rate of interest, marginal efficiency of capital and the speculative demand for money highlights for the first time the round-about relationship between the changes in money supply and the changes in investment, employment and output and prices. According to Keynes the velocity of circulation of money, contrary to the Fisherian assumption of its constancy is not constant.

According to Keynes the effect of increased quantity of money on price-level, before the full employment level is reached, will be dampened because of simultaneously increasing output made possible by the availability of unutilised productive factors. But after full employment is reached the increased quantity of money will increase only the wage-unit and not the employment and will thus proportionately increase the price-level. Fundamentally in the Keynesian scheme the cause of the changes in the price-level is the discrepancy between the rate of change of productivity and the rate of change of factor remuneration.

Milton Friedman, who rehabilitated the quantity theory of money, is of the firm belief that the quantity theory of money is essentially a theory of demand for money. According to him, if the demand for money ( $K$ ) and output remain constant, then

increase in the quantity of money will lead to a proportionate increase in the price-level. In practice, this simple relationship gets distorted due to changes in output and changes in  $K$ . The changes in  $K$  depend upon the change in income per capita and the cost of holding money. The cost of holding money depends upon the rate of interest and the rate of change in the price level. According to him people hold cash balances because (1) money serves as a medium of exchange, and (2) provides a protection against future emergencies. He maintains that it is not the total quantity of money but stock of money per unit of output which dominates the long run price-level changes. He highlights that the direction of the influence of the changes in the money stock on income and price-level is relatively more complex during short period, (business cycles) than in case of longer period. The most important thing about Friedman's quantity theory is his claim that the causal relationship between quantity of money and the price-level which runs from money to price-level is one of the most important empirically proved economic laws.

Patinkin's quantity theory of the value of money is based mainly on the concept of excess demand functions in the economy. His elaboration of the four kinds of markets explains clearly, how the labour, commodity, money and bond markets constitute demand for money. He defines excess demand for money as the difference between the amount of money demanded for a particular

future plan period and the initial holding of money. In the absence of the money illusion, the excess demand for money changes in the same proportion as the money value of the amounts of the excess supplies of the commodities. Assuming that prices change in an equiproportionate manner for all goods, Patinkin shows that an increase in money supply results in some increase in money balances. But relative prices remain constant. Therefore, there is a real balance effect in the money market. This shifts the demand curve for money to a higher level. But at this level an excess supply of money exist which brings down the value of money.

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