

Quantity Theory of Money and Prices

1. THE QUANTITY THEORY OF MONEY AND PRICES

Quantity theory of money attempts to explain the changes in the value of money (or the general price level) by the changes in the quantity of money. According to this theory, the value of money varies inversely with the quantity of money and the price level varies directly with the quantity of money. If, for example, the quantity of money is doubled, the price level will also be doubled and the value of money halved. Conversely, if the value of money is halved, the price level will be halved and the value of money doubled.

A distinction should be made between the crude and sophisticated versions of the quantity theory of money :

According to the crude version of the quantity theory of money, there is strict proportional relationship between changes in the price level and the quantity of money. Symbolically, the crude version is expressed as $P = kM$, i.e., price level (P) has a fixed (k) relationship with the quantity of money (M). This is supported to hold in the long run.

According to the sophisticated version of the quantity theory of money, there is a functional relationship between the price level and the quantity of money. Symbolically, the sophisticated version is expressed as $P = f(M)$, i.e., price level (P) is a function (f) of the quantity of money (M). Changes in the quantity of money invariably lead to changes in the price level. But there exists no fixed proportional effect on the price level.

2. FISHER'S TRANSACTIONS APPROACH

The transactions version of the quantity theory of money was provided by the American economist Irvin Fisher in his book, *The Purchasing Power of Money* (1911). According to Fisher, "Other things remaining unchanged, as the quantity of money in circulation increases, the price level also increases in direct proportion and the value of money decreases and vice versa". Fisher's quantity theory is explained with the help of his famous equation of exchange :

$$MV = PT \quad \text{or} \quad P = MV/T$$

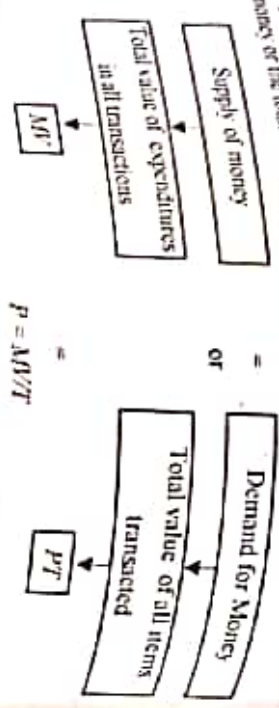
This equation tells as that if V and T are given, then P is directly determined by M .

1. **Supply of Money.** The supply of money consists of the quantity of money in existence (M) multiplied by the number of times this money changes hands, i.e., the

velocity of money (V) In Fisher's equation, V is the transactions velocity of money which means the average number of times a unit of money turns over or changes hands in effective transactions during a period of time. Thus, MV refers to the total volume of money in circulation during a period of time. Since money is only to be used for transactions in all transactions in the economy during a period of time, the total value of money expenditures in all transactions must be equal to the total value of money used for expenditures in all transactions. Money is demanded not for its own sake but for transaction purposes. The demand for money is equal to the total market value of all goods and services transacted (PT) by average price level (P).

2. Demand for Money. Money is demanded not for its own sake but for transaction purposes. The demand for money is obtained by multiplying total amount of goods and services transacted (PT) by average price level (P).

Thus Fisher's equation of exchange represents equality between the supply of money or the total value of all items transacted



where M is the quantity of money, V is the transactions velocity, P is the price level, T is the total goods and services transacted.

The equation of exchange is an identity i.e., MV is identically equal to PT (or $MT = PT$). It means that in the exact or factual sense the equation must always be true. The equation states the fact that the actual total value of all money expenditures (MV) always equals the actual total value of all items sold (PT). What is spent for purchases (MV) and what is received for sale (PT) are always equal; what someone spends must be received by someone. In this sense, the equation of exchange is not a theory but rather a truism.

Irving Fisher used the equation of exchange to develop the classical quantity theory of money, i.e., a causal relationship between the money supply and the price level. On the assumptions that in the long run, under full-employment conditions, total output (Y) does not change and the transactions velocity of money (V) is stable, Fisher was able to demonstrate a causal relationship between money supply and price level. In this way, Fisher concludes, "... the level of price varies directly with the quantity of money in circulation provided the velocity of circulation of that money and the volume of trade which it is obliged to perform are not changed." Thus, the classical quantity theory of money states that V and T being unchanged, changes in money cause direct and proportional changes in the price level.

Irving Fisher further extended the equation of exchange so as to include demand (bank) deposits (M_d) and their velocity (V_d) in the total supply of money. Thus, the equation of exchange becomes :

$$MV + M_d V_d = PT$$

$$P = \frac{MV + M_d V_d}{Y}$$

Thus, according to Fisher, the level of general prices (P) depends exclusively of three definite factors : (a) the volume of money in circulation (M); (b) its velocity of circulation (V); (c) the volume of bank deposits M_d; (d) its velocity (V_d); and (e) the volume of trade (T). The transactions approach to the quantity theory of money, which states that other things remaining the same, i.e., if V, M_d, and T remain unchanged, a direct and proportional relation between M and P; if the quantity of money is doubled, the price level will also be doubled and the value of money halved, the price level will also be halved and the value of money doubled.

The effects of a change in money supply on the price level and the value of money are graphically shown in Figures 16.1-A and B respectively.

(i) In Figure 16.1-A, when the money supply is doubled from OM to OM₁, the price level is also doubled from OP to OP₁. When the money supply is halved from OM to OM₂, the price level is halved from OP to OP₂. The price curve, P = f(M), is a 45° line showing a direct proportional relationship between the money supply and the price level.

(ii) In Figure 16.1-B, when the money supply is doubled from OM to OM₁, the value of money is halved from OQ₁P to OQ₂P₁ and when the money supply is halved from OM to OM₂, the values of money is doubled from OQ₂P to OQ₁P₂. The value of money curve, 1/P = f(M), is a rectangular hyperbola curve showing an inverse proportional relationship between the money supply and the price level.

Assumptions of Fisher's Quantity Theory

Fisher's transactions approach to the quantity theory of money is based on the following assumptions :

1. Constant Velocity of Money. According to Fisher, the velocity of money (V) is constant and is not influenced by the changes in the quantity of money.

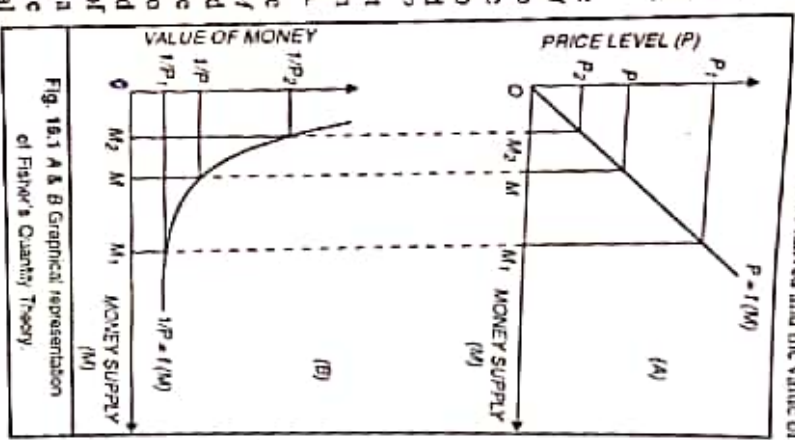


Fig. 16.1 A & B Graphical representation of Fisher's Quantity Theory.

velocity of money depends upon exogenous factors like population, trade activities, habits of the people, interest rate, etc. These factors are relatively stable and change very slowly over time. Thus, V tends to remain constant so that any change in supply of money (M) will have no effect on the velocity of money (V).

2. Constant Volume of Trade or Transactions. Total volume of trade or transactions (T) is also assumed to be constant and is not affected by change in the quantity of money. T is viewed as independently determined by factors like natural resources, technological development, population, etc., which are outside the equation and change slowly over time. Thus, any change in the supply of money (M) will have no effect on T . Constancy of T also means full employment of resources in the economy.

3. Price Level is a Passive Factor. According to Fisher, the price level (P) is a passive factor which means that the price level is affected by the other factors of the equation, but it does not affect them. P is the effect and not the cause in Fisher's equation. An increase in M and V will raise the price level. Similarly, an increase in T will reduce the price level.

4. Money is only a Medium of Exchange. The quantity theory of money assumes money only as a medium of exchange. Money facilitates the transactions. It is not hoarded or held for speculative purposes.

5. Constant Relation between M and M' . Fisher assumes a proportional relationship between currency money (M) and bank money (M'). Bank money depends upon the credit creation by the commercial banks which, in turn, is a function of the currency money (M). Thus, the ratio of M' to M remains constant and the inclusion of M' in the equation does not disturb the quantitative relation between quantity of money (M) and the price level (P).

6. Long Period. The theory is based on the assumption of long period. Over a long period of time, V and T are considered constant.

Thus, when M' , V , V' and T in the equation $MV + M'V' = PT$ are constant over time and P is a passive factor, it becomes clear that a change in the money supply (M) will lead to a direct and proportionate change in the price level (P).

Conclusion of Fisher's Quantity Theory

Given the demand for money, changes in money supply lead to proportional changes in the price level. Since money is only a medium of exchange, changes in the money supply change absolute (nominal), and not relative (real) prices and thus leave the real variables such as employment and output unaltered. Money is neutral. The monetary authorities, by changing the supply of money, can influence and control the price level and the level of economic activity of the country. There is no scope for the use of monetary policy in a freely functioning market economy.

Criticism of Quantity Theory of Money

The quantity theory of money as developed by Fisher has been criticised on the following grounds :

1. Interdependence of Variables. The various variables in transactions equation are not independent as assumed by the quantity theorists :

(i) M influences V . As money supply increases, the prices will increase. Fearing further rise in prices in future, people increase their purchases of goods and services. Thus, velocity of money (V) increases with the increase in the money supply (M).

(ii) M influences V' . When money supply (M) increases, the velocity of credit money (V') also increases. As prices increase because of an increase in money supply, the use of credit money also increases. This increases the velocity of credit money (V').

(iii) P influences T . Fisher assumes price level (P) as a passive factor having no effect on trade (T). But, in reality, rising prices increase profits and thus promote business and trade.

(iv) P influences M . According to the quantity theory of money, changes in money supply (M) is the cause and changes in the price level (P) is the effect. But, critics maintain that a change in the price level occurs independently and this later on influences money supply.

(v) T influences V . If there is an increase in the volume of trade (T), it will definitely increase the velocity of money (V).

(vi) T influences M . During prosperity, growing volume of trade (T) may lead to an increase in the money supply (M), without altering the prices.

(vii) M and T are not Independent. According to Keynes, output remains constant only under the condition of full employment. But, in reality less-than-full employment prevails and an increase in the money supply increases output (T) and employment.

2. Unrealistic Assumption of Long Period. The quantity theory of money has been criticised on the ground that it provides a long-term analysis of value of money. It throws no light on the short-run fluctuations in the value of money. Keynes has aptly remarked that "in the long-run we are all dead." Actual problems are short-run problems. Thus, quantity theory has no practical value.

3. Unrealistic Assumption of full Employment. Keynes' fundamental criticism of the quantity theory of money was based upon its unrealistic assumption of full employment. Full employment is a rare phenomenon in the actual world. In a modern capitalist economy, less-than-full employment, and not full employment, is a normal feature. According to Keynes, as long as there is unemployment, every increase in money supply leads to a proportionate increase in output, thus leaving the price level unaffected.

4. Static Theory. The quantity theory assumes that the values of V , V' , M' and T remain constant. But, in reality, these variables do not remain constant. The assumption of constancy of these factors makes the theory a static theory and renders it inapplicable in the dynamic world.

5. Simple Truism. The equation of exchange ($MV = PT$) is a mere truism and proves nothing. It is simply a factual statement which reveals that the amount of money paid in exchange for goods and services (MV) is equal to the market value of goods and services received (PT). Or, in other words, the total money expenditure

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made by the holders of the commodities. The equation does not tell anything about the causal relation between money and prices; it does not indicate which is the cause and which is the effect.

6. **Historically Inconsistent.** Prof. Halm considers the equation of exchange as reversible. In the equation M is a stock concept; it refers to the stock of exchangeable money at a point of time. V , on the other hand, is a flow concept; it refers to the velocity of circulation of money over a period of time. M and V are non-comparable factors of exchange and cannot be multiplied together. Hence the left-hand side of the equation $M \cdot V = P \cdot Y$ and cannot be increased.

7. **Fails to Explain Trade Cycle.** The quantity theory does not explain the cyclical fluctuations in prices. It does not tell why during depression the prices fall even with the increase in the quantity of money, and during the boom period the prices continue to rise at a faster rate in spite of the adoption of tight money, and credit policy. The proper explanation for the decline in prices during depression is the fall in the velocity of money, and for the rise in prices during boom period is the increase in the velocity of money. Thus, the quantity theory fails to explain the trade cycle. Crowther has remarked, "The quantity theory is at best, an imperfect guide to the causes of the cycle."

8. **Ignores Other Determinants of the Price Level.** The quantity theory maintains that price level is determined by the factors included in the equation of exchange (i.e. by M , V and Y), and unrealistically establishes a direct and proportionate relationship between the quantity of money and the price level. It ignores the importance of many other determinants of prices, such as income, expenditure, investment, saving, consumption, population, etc.

9. **Fails to Integrate Monetary Theory with Price Theory.** The classical quantity theory falsely separates the theory of value from the theory of the general price level. Since money is considered neutral, changes in money supply are believed to affect the absolute prices, but not relative prices. In classical view, the absolute prices are determined in the real sector. Keynes criticises this view and maintains that money plays an active role and both the theory of money and the theory of value are essential parts of the general theory of output, employment and money. He integrated the two theories through the rate of interest.

10. **Money as a Store of Value Ignored.** The quantity theory of money considers money only as a medium of exchange and completely ignores its importance as a store of value. Keynes recognised the store of value function of money and laid emphasis on the demand for money for speculative purpose as against the classical emphasis on the transactions and precautionary demand for money.

11. **No Discussion of the Velocity of Money.** The quantity theory of money does not discuss the concept of velocity of circulation of money, nor does it throw light on the factors influencing it. It regards the velocity of money to be constant and thus ignores the variations in the velocity of money which are bound to occur in the long period.

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12. **One-Sided Theory.** Fisher's transactions approach is one-sided. It takes into consideration only the supply of money and its effects and assumes the demand for money to be constant. It ignores the role of demand for money in causing changes in the value of money.

13. **No Direct and Proportionate Relation between M and P.** Keynes criticised the classical quantity theory of money on the ground that there is no direct and proportionate relationship between the quantity of money (M) and the price level (P). A change in the quantity of money influences prices indirectly through its effects on the rate of interest, investment and output. The effect on prices is also not predictable and proportionate. It all depends upon the nature of the liquidity preference function, and precaution function and the consumption function. The quantity theory does not define the process of causation between M and P .

14. **A Redundant Theory.** The critics regard the quantity theory as redundant and unnecessary. In fact, there is no need of a separate theory of money. Like all other commodities, the value of money is also determined by the forces of demand and supply of money. Thus, the general theory of value which explains value determination of a commodity can also be extended for explanation of the value of money.

15. **Why does the value of money fluctuate?** Prof. Crowther has criticized the quantity theory of money on the ground that it explains only 'how it works' of the fluctuations in the value of money and does not explain 'why it works' of these fluctuations. As he says, "The quantity theory can explain the 'how it works' of fluctuations in the value of money... but it cannot tell the 'why it works', except in the long period".

3. THE CAMBRIDGE CASH-BALANCE APPROACH

During almost the same period when Fisher was developing his equation of exchange in America, Marshall, Pigou, Robertson, Keynes, at the Cambridge University popularised the classical Cambridge cash-balance approach to the quantity theory of money. While Fisher's transactions approach emphasised the medium of exchange function of money, the cash-balance approach was based on the store of value function of money.

According to the cash-balance approach, the value of money is determined by the demand for and supply of money. This new approach, however, considers the demand for money and supply of money at a particular moment of time, rather than over a period of time as considered by the transactions approach. Since, the supply of money at a particular moment is fixed, it is the demand for money which largely accounts for the changes in the price level. In this sense, the cash-balance approach is also called the demand theory of money.

The Cambridge economists viewed the term 'demand for money' in a different manner. The demand for money arises not because of transactions (as assumed in Fisher's approach), but because of its being a store of value. The real demand for money comes from those who want to hold it for various motives and not from those

1. G. Crowther : An Outline of Money (1942), p. 135.
2. A. Marshall : Money, Credit and Commerce, p. iv.