

UNIT III

Theories of Demand of Money: Tobin's Portfolio

By introducing speculative demand for money, Keynes made a significant departure from the classical theory of money demand which emphasized only the transactions demand for money. However, as seen above, Keynes' theory of speculative demand for money has been challenged.

The main drawback of Keynes' speculative demand for money is that it visualises that people hold their assets in either all money or all bonds. This seems quite unrealistic as individuals hold their financial wealth in some combination of both money and bonds.

This gave rise to portfolio approach to demand for money put forward by Tobin, Baumol and Freidman. The portfolio of wealth consists of money, interest-bearing bonds, shares, physical assets etc. Further, while according to Keynes' theory, demand for money for transaction purposes is insensitive to interest rate, the modern theories of money demand put forward by Baumol and Tobin show that money held for transaction purposes is interest elastic.

We discuss below the Post-Keynesian theories of demand for money put forward by Tobin, Baumol and Friedman.

1. Tobin's Portfolio Approach to Demand for Money:

An American economist James Tobin, in his important contribution explained that rational behaviour on the part of the individuals is that they should keep a portfolio of assets which consists of both bonds and money. In his analysis he makes a valid assumption that people prefer more wealth to less.

According to him, an investor is faced with a problem of what proportion of his portfolio of financial assets he should keep in the form of money (which earns no interest) and interest-bearing bonds. The portfolio of individuals may also consist of more risky assets such as shares.

According to Tobin, faced with various safe and risky assets, individuals diversify their portfolio by holding a balanced combination of safe and risky assets.

According to Tobin, individual's behaviour shows risk aversion. That is, they prefer less risk to more risk at a given rate of return. In the Keynes' analysis an individual holds his wealth in either all money or all bonds depending upon his estimate of the future rate of interest.

But, according to Tobin, individuals are uncertain about future rate of interest. If a wealth holder chooses to hold a greater proportion of risky assets such as bonds in his portfolio, he will be earning a high average return but will bear a higher degree of risk. Tobin argues that a risk averter will not opt for such a portfolio with all risky bonds or a greater proportion of them.

On the other hand, a person who, in his portfolio of wealth, holds only safe and riskless assets such as money (in the form of currency and demand deposits in banks) he will be taking almost zero risk but will also be having no return and as a result there will be no growth of his wealth. Therefore, people generally prefer a mixed diversified portfolio of money, bonds and shares, with each person opting for a little different balance between riskiness and return.

It is important to note that a person will be unwilling to hold all risky assets such as bonds unless he obtains a higher average return on them. In view of the desire of individuals to have both safety and reasonable return, they strike a balance between them and hold a mixed and balanced portfolio consisting of money (which is a safe and riskless asset) and risky assets such as bonds and shares though this balance or mix varies between various individuals depending on their attitude towards risk and hence their trade-off between risk and return.

Tobin's Liquidity Preference Function:

Tobin derived his liquidity preference function depicting relationship between rate of interest and demand for money (that is, preference for holding wealth in money form which is a safe and "riskless" asset. He argues that with the increase in the rate of interest (i.e. rate of return on

bonds), wealth holders will be generally attracted to hold a greater fraction of their wealth in bonds and thus reduce their holding of money.

That is, at a higher rate of interest, their demand for holding money (i.e., liquidity) will be less and therefore they will hold more bonds in their portfolio. On the other hand, at a lower rate of interest they will hold more money and less bonds in their portfolio.

This means, like the Keynes's speculative demand for money, in Tobin's portfolio approach demand function for money as an asset (i.e. his liquidity preference function curve) slopes downwards as is shown in Fig. 19.1, where on the horizontal axis asset demand for money is shown. This downward-sloping liquidity preference function curve shows that the asset demand for money in the portfolio increases as the rate of interest on bonds falls.

In this way Tobin derives the aggregate liquidity preference curve by determining the effects of changes in interest rate on the asset demand for money in the portfolio of individuals. Tobin's liquidity preference theory has been found to be true by the empirical studies conducted to measure interest elasticity of the demand for money.

As shown by Tobin through his portfolio approach, these empirical studies reveal that aggregate liquidity preference curve is negatively sloped. This means that most of the people in the

economy have liquidity preference function similar to the one shown by curve M_d in Fig. 19.1.

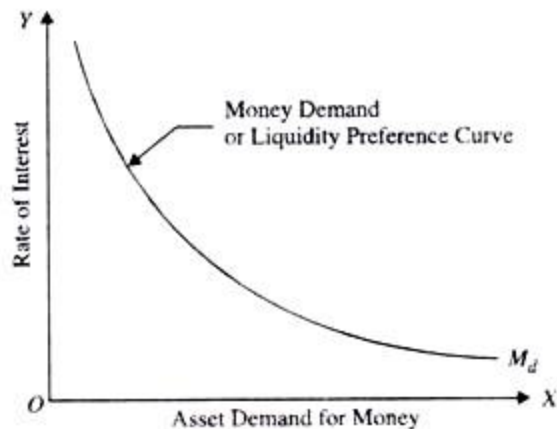


Fig. 19.1. *Tobin's Liquidity Preference Curve*

Evaluation:

Tobin's approach has done away with the limitation of Keynes' theory of liquidity preference for speculative motive, namely, individuals hold their wealth in either all money or all bonds. Thus, Tobin's approach, according to which individuals simultaneously hold both money and bonds but in different proportion at different rates of interest yields a continuous liquidity preference curve.

Further, Tobin's analysis of simultaneous holding of money and bonds is not based on the erroneous Keynes's assumption that interest rate will move only in one direction but on a simple fact that individuals do not know with certainty which way the interest rate will change.

It is worth mentioning that Tobin's portfolio approach, according to which liquidity preference (i.e. demand for money) is determined by the individual's attitude towards risk, can be extended to the problem of asset choice when there are several alternative assets, not just two, of money and bonds.

2. Baumol's Inventory Approach to Transactions Demand for Money:

Instead of Keynes's speculative demand for money, Baumol concentrated on transactions demand for money and put forward a new approach to explain it. Baumol explains the

transaction demand for money from the viewpoint of the inventory control or inventory management similar to the inventory management of goods and materials by business firms.

As businessmen keep inventories of goods and materials to facilitate transactions or exchange in the context of changes in demand for them, Baumol asserts that individuals also hold inventory of money because this facilitates transactions (i.e. purchases) of goods and services.

In view of the cost incurred on holding inventories of goods there is need for keeping optimal inventory of goods to reduce cost. Similarly, individuals have to keep optimum inventory of money for transaction purposes. Individuals also incur cost when they hold inventories of money for transactions purposes.

They incur cost on these inventories as they have to foregone interest which they could have earned if they had kept their wealth in saving deposits or fixed deposits or invested in bonds. This interest income foregone is the cost of holding money for transactions purposes. In this way Baumol and Tobin emphasised that transaction demand for money is not independent of the rate of interest.

It may be noted that by money we mean currency and demand deposits which are quite safe and riskless but carry no interest. On the other hand, bonds yield interest or return but are risky and may involve capital loss if wealth holders invest in them.

However, saving deposits in banks, according to Baumol, are quite free from risk and also yield some interest. Therefore, Baumol asks the question why an individual holds money (i.e. currency and demand deposits) instead of keeping his wealth in saving deposits which are quite safe and earn some interest as well.

According to him, it is for convenience and capability of it being easily used for transactions of goods that people hold money with them in preference to the saving deposits. Unlike Keynes

both Baumol and Tobin argue that transactions demand for money depends on the rate of interest.

People hold money for transaction purposes “to bridge the gap between the receipt of income and its spending.” As interest rate on saving deposits goes up people will tend to shift a part of their money holdings to the interest-bearing saving deposits.

Individuals compare the costs and benefits of funds in the form of money with the interest-bearing saving deposits. According to Baumol, the cost which people incur when they hold funds in money is the opportunity cost of these funds, that is, interest income forgone by not putting them in saving deposits.

Baumol’s Analysis of Transactions Demand:

A Baumol analysis the transactions demand for money of an individual who receives income at a specified interval, say every month, and spends it gradually at a steady rate. This is illustrated in Fig. 19.2. It is assumed that individual is paid Rs. 12000 salary cheque on the first day of each month.

Suppose he gets it cashed (i.e. converted into money) on the very first day and gradually spends it daily throughout the month. (Rs. 400 per day) so that at the end of the month he is left with no money. It can be easily seen that his average money holding in the month will be $\text{Rs.} = 12000/2 = \text{Rs.} 6,000$ (before 15th of a month he will be having more than Rs. 6,000 and after 15th day he

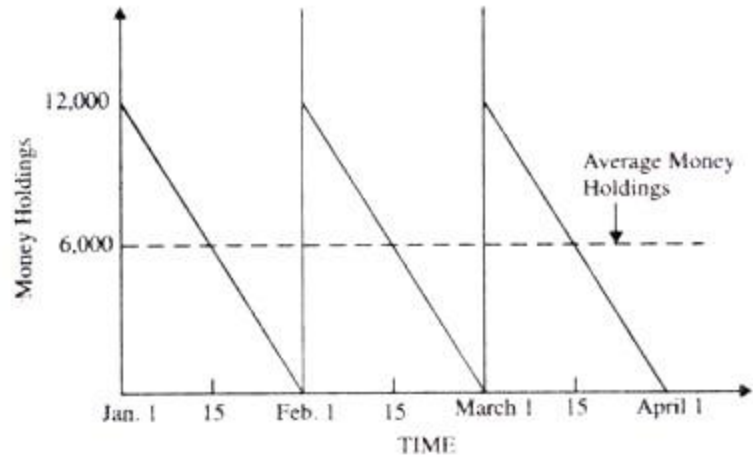


Fig. 19.2. Stream of Cash Payments and Transactions Demand for Money

will have less than Rs. 6,000).

Average holding of money equal to Rs. 6,000 has been shown by the dotted line. Now, the question arises whether it is the optimal strategy of managing money or what is called optimal cash management. The simple answer is no. This is because the individual is losing interest which he could have earned if he had deposited some funds in interest-bearing saving deposits instead of withdrawing all his salary in cash on the first day.

He can manage his money balances so as to earn some interest income as well. Suppose, instead of withdrawing his entire salary on the first day of a month, he withdraws only half of it i.e. (Rs. 6,000 in cash and deposits the remaining amount of Rs. 6,000 in saving account which gives him interest of 5 per cent, his expenditure per day remaining constant at Rs. 400.

This is illustrated in Fig. 19.3. It will be seen that his money holdings of Rs. 6,000 will be reduced to zero at the end of the 15th day of each month. Now, he can withdraw Rs. 6,000 on the morning of 16th of each month and then spends it gradually, at a steady rate of 400 per day for the next 15 days of a month. This is a better method of managing funds as he will be earning interest on Rs. 6,000 for 15 days in each month. Average money holdings in this money management scheme is $\text{Rs. } \frac{6000}{2} = 3000$

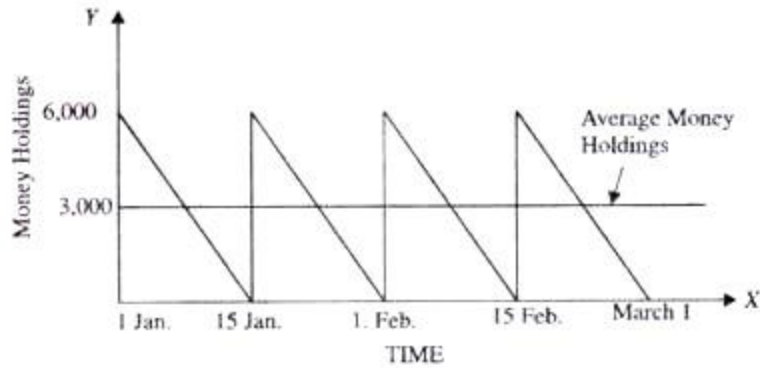


Fig. 19.3. Transactions Demand for Money and Stream of Cash Payments

Likewise, the individual may decide

to withdraw Rs. 4,000 (i.e., 1/3rd of his salary) on the first day of each month and deposits Rs. 8,000 in the saving deposits. His Rs. 4,000 will be reduced to zero, as he spends his money on transactions, (that is, buying of goods and services) at the end of the 10th day and on the morning of 11th of each month he again withdraws Rs. 4,000 to spend on goods and services till the end of the 20th day and on 21st day of the month he again withdraws Rs. 4,000 to spend steadily till the end of the month. In this scheme on an average he will be holding $\text{Rs. } 4000/2 = 2000$ and will be investing remaining funds in saving deposits and earn interest on them. Thus, in this scheme he will be earning more interest income.

Now, which scheme will he decide to adopt? It may be noted that investing in saving deposits and then withdrawing cash from it to meet the transactions demand involves cost also. Cost on brokerage fee is incurred when one invests in interest-bearing bonds and sells them.

Even in case of saving deposits, the asset which we are taking for illustration, one has to spend on transportation costs for making extra trips to the bank for withdrawing money from the Savings Account. Besides, one has to spend time in the waiting line in the bank to withdraw cash each time from the saving deposits.

Thus, the greater the number of times an individual makes trips to the bank for withdrawing money, the greater the broker's fee he will incur. If he withdraws more cash, he will be avoiding some costs on account of brokerage fee.

Thus, individual faces a trade-off problem-, the greater the amount of pay cheque he withdraws in cash, less the cost on account of broker's fee but the greater the opportunity cost of forgoing interest income. The problem is therefore to determine an optimum amount of money to hold. Baumol has shown that optimal amount of money holding is determined by minimising the cost of interest income forgone and broker's fee. Let us elaborate it further.

Let the size of the pay cheque (i.e. salary) be denoted by Y, the average amount of the cash he withdraws each time the individual goes to the bank by C, the number of times he goes to the bank to withdraw cash by T, broker's fee which he has to bear each time he makes a trip to the bank by b. In the first scheme of money management when he gets his whole pay-cheque cashed on the first day of every month he incurs broker's fee only once since he makes only a single trip to the bank.

Thus T in our first case is equal to one $T = Y/C = 12000/12000 = 1$ because in this case $C = Y$. In the second, case, $T = 12000/6000 = 2$ and in the third case $T = 12000/4000 = 3$.

Interest income lost by holding money is the average amount of money holding multiplied by the interest rate. As seen above, average money held is one half of cash withdrawn each time (i.e., $C/2$).

Thus, interest income lost in the first case is $rC/2 = 5/100 \times 1200/2 = \text{Rs. } 300$, in the second case interest lost $= r.C/2 = 5/100 \times 6000/2 = 150$ and in the third case it is $5/100 \times 4000/2 = 100$.

Thus the total cost incurred on broker's fee and interest income forgone is given by

$$\text{Total Cost} = bT + r.C/2$$

Where b stands for broker's fee

As seen above, $T = Y/C$

Therefore, Total Cost = $Y/Cb + r.C/2$

Baumol has shown that average amount of cash withdrawal which minimises cost is given by

$$C = \sqrt{2bY/r}$$

This means that average amount of cash withdrawal which minimise cost is the square root of the two times broker's fee multiplied by the size of individual's income (Y) and divided by the interest rate. This is generally referred to as Square Root Rule.

For this rule, it follows that a higher broker's fee will raise the money holdings as it will discourage the individuals to make more trips to the bank. On the other hand, a higher interest rate will induce them to reduce their money holdings for transaction purposes as they will be induced to keep more funds in saving deposits to earn higher interest income. That is, at a higher rate of interest transactions demand for money holdings will decline.

Keynes thought that transactions demand for money was independent of rate of interest. According to him, transactions demand for money depends on the level of income. However, Baumol and Tobin have shown that transactions demand for money is sensitive to rate of interest.

As explained above, interest represents the opportunity cost of holding money instead of bonds, saving and fixed deposits. The higher the rate of interest, the greater the opportunity cost of holding money (i.e. the greater the interest income forgone for holding money for transactions).

Therefore, at a higher rate of interest people will try to economise the use of money and will demand less money for transactions. At a lower interest rate on bonds, saving and fixed deposits, the opportunity cost of holding money will be less which will prompt people to hold more money for transactions.

Therefore, according to Baumol and Tobin, transactions demand curve for money slopes downward as shown in Fig. 19.4. At higher interest rates, bonds, savings and fixed deposits are more attractive relative to money holding for transactions.

Therefore, at higher interest rates people tend to hold less money for transaction purposes. On the other hand, when the rates of interest are low, opportunity cost of holding money will be less and, as a consequence, people will hold more money for transactions. Therefore, the curve of

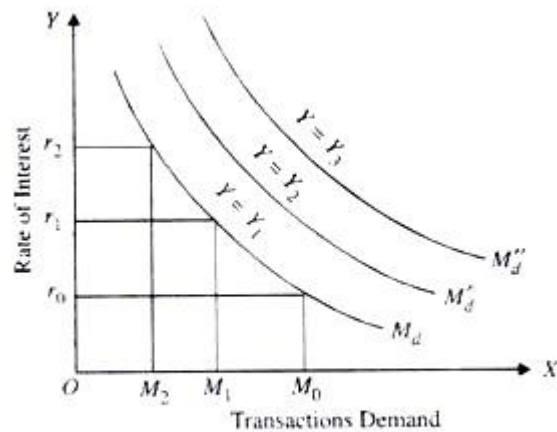


Fig. 19.4. Transactions Demand for Money : Baumol-Tobin Approach

transaction demand for money slopes downward.

It

will be observed from the square root rule given above that transactions demand for money varies directly with the income (Y) of the individuals. Therefore, the higher the level of income, the greater the transactions demand for money at a given rate of interest.

In Fig. 19.4. the three transactions demand curves for money M_d , M_d' and M_d'' , for three different income levels, Y_1 , Y_2 , Y_3 are shown. It will be known from the square root rule that optimum money holding for transactions will increase less than proportionately to the increase in income. Thus, transactions demand for money, according to Baumol and Tobin, is function of both rate of interest and the level of income.

$$M_{td} = f(r, Y)$$

Where M_{td} stands for transactions demand for money, r for rate of interest and Y for the level of income.

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