Analysis of Money Demand Theory

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1. Quantity Theory Of Money Demand

The clearest exposition of the classical quantity theory approach is found in the work of the American economist Irving Fisher. Fisher wanted to examine the link between the total quantity of money $M$ and the total amount of spending on final goods and services produced in the economy $P \times Y$, where $P$ is the price level and $Y$ is aggregate output, $V$ is the velocity of money. Velocity $V$ is defined more precisely as total spending $P \times Y$ divided by the quantity of money $M$:

$$V = \frac{P \times Y}{M}$$

By multiplying both sides of this definition by $M$, we obtain the equation of exchange, which relates nominal income to the quantity of money and velocity: $MV = PY$. The equation of exchange thus states that quantity of money multiplied by the number of times that this money is spent in a given year must be equal to nominal income. When $M$ changes, nominal income $P \times Y$ changes in the same direction. To convert the equation of exchange into a theory of how nominal income is determined requires an understanding of the factors that determined velocity.

Irving Fisher believed that velocity is determined by the institution in an economy that affect the way individuals conduct transactions. He thought the institutional and technological features of the economy would affect velocity only slowly over time, so velocity would normally be reasonably constant in the short run. Fisher’s view that velocity is fairly constant in the short run transforms the equation of exchange into the quantity theory money, which states that nominal income is determined solely by movements in the quantity of money. For the classical economists, the quantity theory of money provided an explanation of movements in the price level.

In fact, the quantity theory of money is a theory of the demand for money. We can see this by dividing both sides of the exchange by $V$, thus rewriting it as

$$M = \frac{1}{V} PY$$

When the money market is in equilibrium, the quantity of money $M$ that people hold equals the quantity of money demand $M^d$, so we can replace $M$ in the equation by $M^d$. using $k$ to represent the quantity $1/V$, we can rewrite the equation as

$$M^d = k \times PY$$

Because $k$ is a constant, the level of transaction generated by a fixed level of nominal income $PY$ determines the quantity of money $M^d$ that people demand. Therefore, Fisher’s quantity theory of money suggests that the demand for money is purely a function of income, and interest rates have no effect on the demand for money. Fisher believed that people hold money only to conduct transactions and have no freedom of action in terms of the amount the want to hold, so he came to above conclusion. The demand for money is determined (1) by the level of transactions generated by the level of nominal income $PY$ and (2) by the institutions in the economy that affect the way people conduct transactions that determine velocity and hence $k$. 


2. Cambridge Approach To Money Demand

While Fisher was developing his quantity theory approach to the demand for money, a group of classical economists in Cambridge, England, which included Alfred Marshall and A.C. Pigou, were studying the same topic. Although their analysis led them to an equation identical to Fisher’s money demand equation, their approach differed significantly. Instead of studying the demand for money by looking solely at the level of transactions and the institutions that affect the way people conduct transactions as the key determinants. In Cambridge model, individuals are allowed some flexibility in their decisions to hold money and are not completely bound by institutional constraints such as whether they can use credit cards to make purchases. Accordingly, the Cambridge approach did not rule out the effects of interest rates on the demand for money.

The classical Cambridge economists thought that two properties of money make people want to hold it: (1) its utility as a medium of exchange; (2) its utility as a store of wealth. Cambridge economists agreed with Fisher that demand for money would be related to the level of transactions and there would be a transactions component of money demand proportional to nominal income. As far as money functions as a store of wealth, the Cambridge economists suggest that the level of people’s wealth also affects the demand for money. They believed that wealth in nominal terms is proportional to nominal income, they also believed that wealth component of money demand is proportional to nominal income. Cambridge economist also expressed the demand for money function as

\[ M^d = k \times PY \]

Where k is the constant of proportionality. Although the Cambridge economists often treated as k as constant and agreed with Fisher that nominal income is determined by the quantity of money, the Cambridge approach allowed individuals to choose how much money they wished to hold. This approach allowed for the possibility that k could fluctuate in the short run because the decisions about using money to store wealth would depend on the yields and expected returns on other assets that also function as stores of wealth.

3. Keynes’s Liquidity Preference Theory

In his famous 1936 book *The General Theory of Employment, Interest, and Money*, Keynes developed a theory of money demand which he called liquidity preference theory. Keynes abandoned the classical view that velocity was a constant, emphasized the importance of interest rates. He postulated that there are three motives behind the demand for money: the transactions motive, the precautionary motive, and the speculative motive.

**Transactions motive.** Keynes emphasized that this component of the demand for money is determined primarily by the level of people’s transactions. The transactions demand for money arises from the lack of synchronization of receipts and disbursements. In other words, people aren’t likely to get paid at the exact instant you need to make a payment, so between paychecks people keep some money around in order to buy stuff. Keynes believed that these transactions were proportional to income, like the classical economists, he considered the transactions component of the demand for money to be proportional to income.

**Precautionary motive.** Keynes also recognized people hold money not only to carry out current transactions, but also as cushion against an unexpected need. Because people are uncertain about the payments the might want, or have, to make. If people don’t have money with which to pay, they will incur a loss. When you are holding precautionary money balances, you can take advantages of the sale. Keynes believed that the amount of precautionary money balances people want to hold is determined primarily by the level of transactions that they expected to make in the future and that these
transactions are proportional to income. So he considered the demand for precautionary money balances to be proportional to income.

**Speculative motive.** The transactions motive and the precautionary motive for money emphasized medium-of-exchange function of money, for each refers to the need to have money on hand to make payments. Keynes agreed with the classical Cambridge economists that money is a store of wealth and called this reason for holding money the speculative motive. He also considered that wealth is tied to closely to income, the speculative component of money demand would be related to income. Keynes believed that interest rates have an important role to play in influencing the decisions regarding how much money to hold as a store of wealth.

Keynes divided the assets that can be used to store wealth into two categories: money and bonds. He also asked why individuals would decided to hold their wealth in the form of money rather than bonds. Keynes assumed that the expected return on money was zero in his time, unlike today. For bonds, there are two components of the expected return: the interest payment and the expected rate of capital gains. As we know, when interest rates rise, the price of a bond falls. If you expected interest rates to rise, you expect the price of the bond to fall and suffer negative capital gains. In this case, people would want to store their wealth as money because its expected return is higher; its zero return exceeds the negative return on the bond.

Keynes assumed that individuals believe that interest rates gravitate to some normal value. When interest rate are below the normal value, people expect the interest rate on bonds to rise in the future and so expect to suffer capital loss on them. Therefore, people will be more likely to hold their wealth as money rather bonds, and the demand for money will be high. And contrariwise, they will be more likely to hold bonds than money, and the demand for money will be quite low. Therefore, money demand is negatively related to the level of interest rates.

Keynes carefully distinguished between nominal quantities and real quantities. He reasoned that people want to hold a certain amount of real money balances (an amount that the three motives indicated would be related to real income Y and to interest rates i. Keynes developed the following demand for money equation, known as the liquidity preference function, which says that the demand for real money balances M\(^d\)/P is a function of i and Y:

\[
\frac{M^d}{P} = f(i, Y).
\]

Where the minus sign below i in the liquidity preference function means that the demand for real money balances is negatively related to the interest rate, and plus sign below Y means that the demand for real money balances and real income Y are positively related. Keynes thought that the demand for money is related not only to income, but also to interest rates.

Because the transactions motive and precautionary motive demand for money is positively related to real income Y, speculative motive demand for money is negatively related to interest rate i, the demand for real money balances M\(^d\)/P can be rewritten as

\[
\frac{M^d}{P} = L_1(Y) + L_2(i)
\]

where L\(_1\) means the transactions demand for money; L\(_2\) means the speculative demand for money.

By deriving the liquidity preference function for velocity PY/M, we can see that Keynes’s theory of the demand for money implies that velocity is not constant but instead fluctuates with movements in interest rates. The liquidity preference equation can be rewritten as
Multiplying both sides of this equation by \( Y \) and recognizing that \( M^d \) can be replaced by \( M \) because they must be equal in money market equilibrium, we solve for velocity:

\[
V = \frac{PY}{M} = \frac{Y}{F(i,Y)}
\]

Keynes’s liquidity preference theory of the demand for money indicates that velocity has substantial fluctuations as well.

4. Further Developments In The Keynesian Approach

Economists developed more precise theories to explain the three Keynesian motives for holding money. A key focus of this research was to understanding better the role of interest rates in the demand for money.

**Transactions demand.** William Baumol and James Tobin independently developed similar demand for money models, which demonstrated that even money balances held for transactions purposes are sensitive to the level of interest rates. They considered a hypothetical individual who receives a payment once a period and spends it over the course of this period in developing their models. In their models, money which earns zero interest, is held only because it can be used to carry out transactions. The conclusion of the Baumol-Tobin analysis is as follows: as interest rates increase, the amount of cash held for transaction purposes will decline, which in turn means that velocity will increase as interest rates. The transactions component of the demand for money is negatively related to the level of interest rates.

**Precautionary demand.** We know that there are lots of benefits of holding precautionary money balances, but weighed against these benefit must be the opportunity cost of the interest forgone by holding money. The more money an individual holds, the less likely be or she is to incur the costs of illiquidity. But the more money the person holds, the more interest he or she is giving up. As interest rates rise, the opportunity cost of holding precautionary balances rises, and so the holdings of these money balances fall. Therefore, the precautionary demand for money is negatively related interest rates.

**Speculative demand.** Tobin developed a model of the speculative demand for money that attempted to avoid the shortcoming of Keynes’s analysis. His basic idea was that not only do people care about the expected return on one asset versus another when of the returns from each asset. Tobin assumed that most people are risk-averse, and the return of money is zero. Bonds can have substantial fluctuations in price, and their returns can be quite risky and sometimes negative. When the expected returns on bonds exceeds returns on money, people might want to hold money as a store wealth because it has less risk. Tobin analysis also show that people can reduce the total amount of risk in a portfolio by diversifying(by holding both bonds and money). His model suggests that people will hold bonds and money simultaneously as stores of wealth. Tobin attempted to improve on Keynes’s rationale for the speculative demand for money, but he was only partly successful.

5. Friedman’s Modern Quantity Theory Of Money

Milton Friedman developed a theory of the demand for money in his famous article, “The Quantity Theory of Money: A Restatement”, in 1956. Friedman’s analysis of demand for money is close to Keynes and the Cambridge economist than it is to fisher’s. Friedman considered that the demand for money must be influenced by the same factors that that influence the demand for any asset. Friedman
then applied the theory of asset demand to money.

The demand for money is a function of the resources available to individuals and expected returns on other assets relative to the expected return on money. Friedman regarded his model of the demand for money as follows:

\[
\frac{M^d}{P} = f \left( Y_p, r_b, r_m, r_e, \pi_e, w, u \right)
\]

or

\[
\frac{M^d}{P} = f \left( Y_p - r_b - r_m, r_e - r_m, \pi_e - r_m \right)
\]

where \( \frac{M^d}{P} \) = demand for real money balances; \( Y_p \) = permanent income, Friedman’s measure of wealth; \( r_m \) = expected return on money; \( r_b \) = expected return on bonds; \( re \) = expected return on equity (common stock); \( \Pi_e \) = expected inflation rate; \( w \) = proportion of human wealth and non-human wealth; \( u \) = other factors influencing demand for money.

The demand for an asset is positively related to wealth, money demand is positively related to Friedman’s wealth concept (permanent income). Permanent income has much smaller short-run fluctuations because many movements of income are transitory. Friedman regarded permanent income as a determinant of the demand for money is that the demand for money will not fluctuate much with business cycle movements. Friedman categorized them into three types of assets: bonds, equity, and goods. The incentives for holding these assets rather than money are represented by the expected return on each of these assets relative to the expected return on money. The expected return on money \( r_m \) is influenced by (1) the services provided by banks on deposits; (2) the interest payments on money balances.

In Friedman’s money demand function, the \( r_b - r_m \) and \( r_e - r_m \) mean the expected return on bonds and equity relative to money; when they rise, the relative expected return on money falls, and the demand for money falls. \( \Pi_e - r_m \) means the expected return on goods relative to money. When it rises, the expected return on goods relative to money rises, and the demand for money falls.

6. Concluding remarks

Irving Fisher developed the transaction-based theory of the demand for money in which the demand for real balances is proportional to real income and is insensitive to interest rate movements. The most important feature of this theory is that it suggests that interest rates have no effect on the demand for money. Fisher thought velocity of money is fairly constant in the short run and nominal income is determined solely by movements in the quantity of money. The core concept of Fisher’s theory is that velocity is constant. He emphasized technological factors and ruled out any possible effect of interest rates on the demand for money in the short run.

The Cambridge money demand equation is identical to Fisher’s. The classical Cambridge approach tried to answer the question of how much money people want to hold. The Cambridge economists often treat as velocity of money as a constant and agreed with fisher that nominal income is determined by the quantity of money. Both Irving Fisher and Cambridge economists developed a classical approach to the demand for money in which the demand for money is proportional income. However, the two approaches differ in that fisher’s emphasized technological factors and ruled out any possible effect of interest rates on the demand for money in the short run, whereas the Cambridge approach emphasized individual choice and did not rule out the effects of interest rates.

John Maynard Keynes extended the Cambridge approach by suggesting three motives for holding money. His liquidity preference theory views the transaction s and precautionary component of money
demand as proportional to income, he reasoned that the speculative motive would be negatively related to the level of interest rates. However, the speculative component of money demand is viewed as sensitive to interest rate as well as to expectations about the future movements of interest rates. Keynes’s model of the demand for money has the important implication that velocity is not a constant but instead is positively related to interest rates, which fluctuate substantially. Keynes rejected the constancy of velocity, thought the velocity is unstable. The Keynes’s liquidity preference theory casts doubt on the classical quantity theory that nominal income is determined by movements in the quantity of money.

Milton Friedman used a similar approach to that of Keynes and the Cambridge economists in his money demand theory. Friedman treated money like any other asset, he used the theory of asset demand to derive a demand for money that is a function of the expected return on money and permanent income. In contrast to Keynes, Friedman viewed money and goods as substitutes, people choose between them when deciding how much money to hold. The assumption that money and goods are substitutes indicates that changes in the quantity of money may have direct effect on aggregate spending. Friedman did not take the expected return on money to be a constant as Keynes did. Unlike the Keynes’s theory, Friedman’s theory suggests that changes in interest rates should have little effect on the demand for money, and random fluctuations in the demand for money are small and that the demand for money can be predicted accurately by the money demand function. He believed that the demand for money is stable and insensitive to interest rate movements.

**Main References**
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