

Theories of demand for money and empirical works



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The demand for money theory is the main element of the monetary economics theory and an essential part in the macroeconomic theory. At the same time, each country's government, policy maker and economist takes it seriously on economic control. From the 1970, the western countries experienced a worse situation of increasing inflation. A lot of economists considered that demand for money function was unstable due to financial innovation, and it became difficult to control by monetary department. Then, it led to a rush of research the demand for money which includes the Keynes system, monetary system, rational expected system and so on. In this part, I will discuss three theories of the demand for money. They are the classics theory, the modern quantity theory and Keynes theory. In additional, two empirical works will be looked into – An economic analysis of UK money demand by Milton Friedman and Anna J. Schwartz; and the demand for broad money in the United Kingdom by Hendry, Ericsson and Prestwich.

The classic theory

At present of the money theory came from two different theories: one is quantity theory which belongs to the classic theory; the other is Keynesian theory. (Handa, 2000, p25). In the classic theory, the economy always keeps the full-employment level and price can adjust any time to keep the balance in the market. Although the classic theory did not mention the demand for money, it was noticed on transactions velocity of circulation of money.

Irving Fisher's version of the quantity theory

In 1911 Irving Fisher's published a book- " power of money" which emphasized money's function was the medium of exchange. (Fisher, 1911).

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The book shows the equation about the quantity of commodity transaction being equal to the quantity of currency transaction. Fisher tried to use the quantity equation to discuss the quantity theory in that book. In the equation (1): M is the quantity of money, V is the number of times it turns over, P is the price level, and T is the volume of transaction. PT is the total value of commodity transaction or nominal national income; MV is the total value of currency transaction. “ The quantity of money (M) is determined independently of any of the three other variables and at any time can be taken as given.” (Laidler, 1985, p. 44). In the long run, economy with full employment level, the T can be taken as given too. Fisher assumes that it has a fixed ratio between volume of transactions and level of output. The V is also treated like M , that is, independently of any other variables. Therefore, the value of variable P is dependent on the interaction of other variables. In another word, according to Laidler (1985, p45): “ The demand for nominal money depends on the current value of the transaction to be conducted in the economy and is equal to a constant fraction of those transactions.”

$$MV = PT \quad (1)$$

Cambridge approach

The British economists Marshall and Pigou analyzed the demand for money in another way. Rather than discussing function provided by Fisher’s work, they discussed what decision people wish to hold the amount money in the trading. They emphasized that peoples’ behavior when they choosing.

In the Pigou’s article “ the value of money” shows he analyzed the legal tender which included the currency and demand deposits in the banks. He <https://assignbuster.com/theories-of-demand-for-money-and-empirical-works/>

considered that people hold the currency and demand deposits because it has two purposes. Firstly is the “provision of convenience”. When people hold cash, they can easily do their daily business. Secondly is the “provision of security”. It can prevent him to face the unexpected demand or the some commodities price increasing. (Handa, 2000, p. 31). Therefore, the two purposes would bring the demand for currency and deposit.

The demand for money determined by the proportion of wealth that the people choose it. Hence, Pigou (1971) considered that people direct concerned about the proportion of cash in their whole resources, and not the demand for the currency and deposit. Further, “this ration of money demand to resources is a function of the internal rate of return on investment and of the marginal satisfaction forgone form less consumption.” (Handa, 2000, p31). Under the other thing constant, the nominal money demand and nominal expenditure became a proportion. The equation is :

$$M_d/Y = k(r) \quad (1)$$

The r represents the internal rate of return on investment. Y is nominal expenditure, M_d nominal money demand.

The equation can change to : $M_d = k(r)Y$ (2)

Also $Y = py$. P is the price, y is the real amount of goods

$$M_d = k(r)py \quad (3)$$

$$M_d \cdot 1/k(r) = py \quad (4)$$

Use $V = 1/k(r)$, (5) the V means velocity. In the equation (5) shows the Velocity determined by the interest rate “ r ”. In the Cambridge model, it already showed the interest rate a variable has an important factor for the demand for money.

Keynesian theory

Keynes showed the liquidity preference theory in 1936. He advanced the problem of demand for money from Cambridge approach and made a more careful analyzed about motivation that people to hold money. (Laidler 1985, p50). He considered that people like to hold money because it can keep the flexibility on payment. He stressed the role of interest rate and gave up the classic theory about velocity. The Keynesian theory divided into transaction demand, precautionary demand and speculative demand.

The transaction demand for money indicated when people hold money to make daily trading; it brought the demand for money. Keynesian considered that higher output and income would expend the daily trading size, so it led the higher level of transaction demand for money. However, he ignored role of interest rate in transaction demand for money. In fact, it was consistent with the classic currency quantity theory. Hence, quantity of transaction demand for money only depends on income level and not interest rate. Let transaction demand for money $M_t = f(Y)$, it has a positive relationship with national income (Y).

The precautionary demand for money indicated “ people find it prudent to hold some cash in case they are not able to realize other assets quickly

enough to be of use to them.”(Laidler, 1985, P50). Keynes thought it has a positive relationship with Y , it shows on $M_p = f(Y)$

The speculative demand for money indicated that people hold money waiting for the good investment opportunity. Keynes assumed people hold finance capital divided by currency and bonds. If people hold the currency, they did not get the income; however, the bond got it. The bond price change followed the interest rate. If the interest rate increased, the bond price would decrease and vice versa. Therefore for the bondholder, the interest rate change induced the asset profit or loss, but it could not change value of the currency. The bond provided some profits, but cash did not, like interest earning and asset profit when expected interest rate decrease. However, bond is subject to a risk when expected interest rate increase, the holder will lose their profits and interest earning. In conclusion, when the expected interest rate decreased, the demand for money would decrease. The reason is that people expected to have asset profit when they hold the bonds. However, when the expected interest rate increased, the demand for money would increase. The reason is that people want to avoid the loss from their bonds. This phenomenon can be explained with the help of this equation which shows: $M_{ps} = f(r)$

We put the three motives together which show on:

$$M_d = M_t + M_p + M_{ps} \quad (2)$$

$$M_d = f(r, Y) \quad (3)$$

The equation (3) shows the demand for money depend on interest rate (r) and income (Y) . In addition, it has a positive relationship with (Y) and negative relationship with (r).

The Keynesian's liquidity preference theory has a great advancement relative to the Fisher's classical theory and Marshall's Cambridge approach. He agreed that one point from classic theory that the transactions demand for money is stable, and introduced that the current income and interest rate has a relationship with the demand for money.

Friedman and modern quantity theory

Friedman

In 1956, Milton Friedman wrote a dissertation about monetary quantity theory which advanced the Modern quantity theory. Friedman did not only focus on analyze the motivation of people hold money; he also analyze the determinant the quantity of people hold it under different situations, and mentioned the money is an asset in the wealth. Friedman considered that money was a substitute for bond, stock and commodity. In additional, the demand for money depended on quantity of all wealth, but the wealth can not to be measure; so let use permanent income instead of it. Generally, the higher income or wealth increased the demand for money. However, Friedman thought the permanent income of people was stable, so the consumption would not change when the current income increases.

Modern quantity theory

The modern quantity theory introduced the capital portfolios. The portfolio included Multi-financial asset like: bond, cash, stock and so on. The demand for money was regard as the demand for assets. Therefore, the demand for money theory became the demand for diversified portfolios theory. This theory developed the Friedman's modern quantity theory and it reflected the diversified finance asset portfolios and the uncertainty of investment income induced the rational choice. It also developed the Keynes's asset choice from two simple assets to diversified portfolios theory. Moreover, the Tobin and Baumol developed the research of demand for money from limited money market to diversified finance market.

The development of liquidity preference theory

The Baumol and Tobin have advanced the Keynes theory on transactions demand for money and precautionary demand for money in 1950. They show the demand for money not only depends on current income, but also on the sensitivity of interest rate. (Handa, 2000, p. 86). In addition, they introduced the opportunity cost . Their model's basic view is people's opportunity cost when they hold the cash, and the advantage was avoiding the transaction cost. In the daily trading, the opportunity cost of people from holding cash was higher than transactions cost it they hold bond, so they will give up a part of cash to turn to the bond, and vice versa. It also indicated the demand for money has sensitivity to the interest rate. The model could shows by the mathematics: = (4)

In the equation (4), b represent the transaction cost of the bonds, the Baumol calls brokerage fee (Laidler, 1985, p. 60). T represent the real

income of trader, r represents the interest rate. K represents the real value when bond turns to cash. The equation also shows some different result when the variables change. If the income increases, people will get more cash and hold it; if the b (transactions cost) increase, people will hold more cash, the demand for bond will decrease at same time. If the interest rate increases, the demand for bond will increase. In the Laidler (1985, p61-63) book introduced a “ wage” in the transaction demand and its effect on the demand for money . He considered the “ b ” will change for the different people in a certain time. It is because “ b ” came from time when people change profit asset to cash, so its value will change along with people in different times. In addition, the transaction cost depended on individual’s wage rate. If people have a higher wage, it means they need more time to change profit asset to cash. Baumol and Tobin advanced demand for money depends on allocate and level of earning.

An American economist Whalen introduced the interested rate in precautionary demand for money in 1966(Handa, 2000, p. 130). Whalen considered that the uncertainty determined the precautionary demand for money. People were not guarantee of the same payout and earning at a certain time, so they hold cash for emergency. Therefore, people hold cash always higher than projected net payout, the excess part was came from the precautionary demand for money. He thought there are two major factors determining the size of precautionary demand for money: the cost of holding cash and the status of earning and payout. The cost of holding cash is divided into illiquid cost and lost interest rate cost. The status of earning and payout: when only the net payout exceeds precautionary holding cash, it

need the non-monetary asset turn to the monetary. Therefore, the status of payout and earning aroused change of precautionary demand for money.

The Whalen advanced the maximization formula.

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In the speculative demand for money, Tobin applied the diversified portfolios theory to it. Tobin assumes investors are all risk averse, and they sought the balance between income and risk, made the maximum utility. In addition, he assumes investors only have two diversified portfolios: cash and bond. Cash is risk free asset, but bond is risky asset. Under other conditions fixed, when the interest rate increased, the bond is more attractive for the investor, so the quantity of demand for bond would increase, the demand for money would decrease at same time. Although Keynes and Tobin analyzes the different demand for money, but they both showed the same result which is the demand for money has a negative relationship with interest rate.

The empirical works on money demand for money in UK

In 1982, Milton Friedman and Anna Schwarz show a wealth of empirical finding as support for a range of economic hypotheses which use the phase-average data to find the relationship between income, price, interest rate and money trends from 1871 to 1975 in United Kingdom. They built four models which use money, nominal income, price and output. The data from Freidman and Schwartz are broad money stock (M), real net national income (I), short run nominal interest rate (RS), long run nominal interest rate (RI) and high-powered money (H), and price level (p^*). However, the Hendry and Ericsson raise difficulties for the final model cause the price model was be

invalid due to p and M not stationary. Then Hendry and Ericsson tested constancy by Chow test which shows that has a broke point because t -statistic exceeds the 1% point of the F -distribution. The T -ratio is biased, therefore the conclusions which Friedman and Schwartz draw from their regression would be invalid and their model is non-stationary. Moreover, Friedman and Schwartz failed on the phase-average data that induced their result invalid, the same as model is not constancy and test hypotheses include: price homogeneity and the absence of trends. "The procedure of averaging data over business-cycle phases did not notably reduce the serial correlation in the data series but did lose information, leading to rather badly fitting equation." (Hendry & Ericsson, 1989, p. 29). Therefore, the Hendry and Ericsson consider that used the annual data better than the averaging data on the model.

Hendry and Ericsson developed the Friedman and Schwartz's model on different data and add some conditions. The data choose annual series from 1870 to 1970. The variable as same as Friedman and Schwartz's model. Hendry and Ericsson let money demand conditional on other variables and simplified to an ECM. The money demand function (1) and contingent planning model (2)

(1)

(2)

Then HE found the long relationship between demand money and variables, so they begin with the co-integration regression for V_t and RSt :

(3)

There is no RESET, heteroscedastic and ARCH, the residual are normally distributed nearly. In fact, the model is better than the Friedman and Schwartz. However, Hendry and Ericsson found the weak exogeneity of \hat{I} pt can being consistent with model better than price. Therefore the model shows on constancy and consistent with demand for money which determined by conditional price, income and interest rate. However, they still found the model existed non-constancy between 1971 and 1975. The reason why is the UK economic altered dramatically that “ competition and credit control regulations and of floating exchange rates” was introduced after 1970. (Hendry & Ericsson, 1989, p. 30)

In earlier period, the economics developed many different empirical models to analyze the demand for money. However, all of them considered the interested rate was the important for the demand for money, ignored the opportunity cost. In the Hendry and Ericsson model who added the opportunity cost and credit detestations to test demand for money. They considered that a measure of opportunity cost would show the altered of demand for broad money and financial innovations. Therefore, they built a model for demand money function:

$$M_d = g(P, I, R) \quad (4)$$

The model (4) shows nominal demand for money M_d depends on price level (P), a scale variable (I), inflation (π) and a vector (R) of rates of returns on various assets. The original model (4) increases the vector R to measure the opportunity cost.

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In 1992, Hendry and Ericsson built three empirical models of demand for broad money from 1878 to 1970, 1971 to 1975, 1878 to 1993. They used a mechanistic extension of HE's model in the third periods. However they find the non-stationary data in the second period, so they use new samples and re-evaluation the model.

In the first period, they test the model by “dynamic equilibrium correction model-EqCM” (Hendry & Ericsson & Prestiwich, 1997, p7) and regression by Engle-Granger. They have chosen the annual value of data from Freidman and Schwartz which are broad money stock (M), the deflator (P), real net national income (I), short run nominal interest rate (RS), long run nominal interest rate (RI) and high-powered money (H). Hendry and Ericsson also considered some effects from World War I and II, so they add the dummy variables in the model which are D1 and D2. As a result, the first period equation is constant empirically model by recursive least squares. (Hendry & Ericsson & Prestiwich, 1997, p8). The second period: they entered the coefficient on $D4t \hat{i}$ in the model. As a result, the second period is constant too.

In the third periods, HE add the new data in the second periods equation, but it was be rejects by chow test and some residual test show insignificant. According to the Hendry , Ericsson and Prestiwich (1997, p. 10) mentioned that the insignificant of period third equation because their simplistic to updating the data.

Moreover, they used the short interest to measure the opportunity cost, but it is difficult to find the precise data because the financial innovation.

Therefore, they used a fraction of RS which denoted RN . ($RN = (H/M) RS$. (Hendry & Ericsson & Prestiwich, 1997, p. 14). They proved the model is stationary and no residual diagnostic by the EqCM and least squares.

In conclusion, the Hendry, Ericsson and Prestiwich indicated the war, opportunity cost, financial innovation and deregulation have effect on demand for broad money. In additional, they use different data on the model, try to find a constancy model. They found the RN data rather than the RS , using the dummy variable to explain the finance innovation and war.