VOLUME XXII NUMBER 2

# Kyoto University Economic Review

MEMOIRS OF THE FACULTY OF ECONOMICS
IN
THE KYOTO UNIVERSITY

OCTOBER 1952



PUBLISHED BY
THE FACULTY OF ECONOMICS
THE KYOTO UNIVERSITY
KYOTO, JAPAN

# A NOTE ON TWO MONETARY THEORIES OF INTEREST

By *Noboru Kamakura*

## § 1. Professor Hicks' attempt to reconcile two monetary theories of interest

The controversy of present concern is that between the liquidity preference theorists and the loanable funds theorists. There are two questions :—

( 1 ) Are the two theories equivalent?

( 2 ) If they are not equivalent, which theory is better?

There have been many attempts in the literature to answer these questions, among which the attempt of Professor Hicks is most interesting. His argument is very simple and straight forward. He argued that interest, like all other prices, is determined as a solution of general equilibrium system of $n$ equations,

$$(1.1) \qquad X_i(p_1, \cdots, p_{n-2}, r) = 0 \quad (i = 1, 2, \cdots, n-2)$$

$$(1.2) \qquad X_{n-1}(p_1, \cdots, p_{n-2}, r) = 0$$

$$(1.3) \qquad X_n(p_1, \cdots, p_{n-2}, r) = 0$$

where $X_i$ $(i = 1, 2, \cdots, n-2)$ is excess demand for goods and service (in which money and securities are not included), $X_{n-1}$ is excess demand for securities, and $X_n$ is excess demand for money. $p_j$ $(j = 1, 2, \cdots, n-2)$ is the price of goods and service, and $r$ is the rate of interest.

He made the old argument that one equation follows from all the rest and that it can be eliminated.[1] Because there is so-called " Walras' Law "

$$(1.4) \qquad -X_n \equiv p_1X_1 + p_2X_2 + \cdots + p_{n-2}X_{n-2} + X_{n-1}$$

which is an identity holding for any value of the $p$'s, we can eliminate one of $n$ equations (1. 1), (1. 2) and (1. 3). Equation (1. 4) states that

[1] J. R. Hicks, *Value and Capital*, 1939, chapt. XII.

the excess supply of cash balance is always equal to the aggregate value of the excess demand for goods and service and the excess demand for securities.[1]

Professor Hicks then has the choice of eliminating either equation (1. 2) or equation (1. 3). If he decides to eliminate equation (1. 3), then he can think of prices and the rate of interest being determined in the markets for goods and services, and the market for loanable funds. If he chooses to eliminate equation (1. 2), the money equation plays an effective part. In his opinion, the former correspondes the " loanable funds " theory of interest, and the latter corresponds the " liquidity preference theory ". Then he concludes that it makes no difference whether we follow the loanable funds theorists, or we follow those writers who adopt the liquidity preference theory, and that the choice between them is purely a matter of convenience.

## § 2. Reformulation of the Hicksian argument in aggregate cathegories

It may be convenient to restate Professor Hicks' argument in macro terms, because both liquidity preference theory and loanable funds theory are usually discussed in macro terms. For brevity I wish to concentrate our attention to the following simple three equations model.

The equilibrium condition of market for goods and services is

$$Y = C + I \tag{2.1}$$

where $Y, C$ and $I$ are respectively national income, consumption and investment.

The equilibrium condition of money market is

$$M = L \tag{2.2}$$

where $M$ is existing stock of money and $L$ is demand for cash balance.

The equilibrium condition of loan market is

$$B^S = B^D \tag{2.3}$$

where $B^S$ is supply of securities and $B^D$ is demand for securities.

In this model, unknowns are national income and the rate of interest, which are respectively designated as $Y$ and $r$. There are three equations and two unknowns. If one equation is dependent on

1) O. Lange, *Price Flexibility and Employment*, 1944, p. 6.

the rest, we can eliminate one equation among them.

In this connection, Walras' Law can be formulated as

$$(2.4) \qquad M-L \equiv (C+I-Y)+(B^D-B^S)$$

that is, the excess supply of cash balance is always equal to the sum of aggregate value of the excess demand for goods and services and the excess demand for securities. As (2.4) holds for any value of $Y$ and $r$, we can eliminate one of those three equations. Then we have just two equations to determine two unknowns.

We can eliminate any one of them. If we eliminate (2.3), then (2.1) and (2.3) play effective parts. This is so-called simplified Keynsian model.[1] Alternatively if we eliminate (2.2), we have loanable funds theory model. The choice between them is purely a matter of convenience. This is the bare out-line of the Hicksian argument.

## § 3. The main defect of the Hicksian reconcillation

Professor Hicks was quite correct in stating that the same rate of interest can be obtained as a solution to the system of equations, no matter what one equation is eliminated. But nothing has been proved by this argument which factor, demand for and supply of loanable funds or demand for and supply of cash balances, plays important role to determine the rate of interest.

It will be useful to formulate these two monetary theories of interest in the form of Samuelson's differential equations.[2] Liquidity preference theory can be written as

$$(3.1) \qquad \dot{r} = f(L-M)$$

where $f(0)=0$ and $f'>0$. Loanable funds theory can be formulated as

$$(3.2) \qquad \dot{r} = \phi(B^S-B^D)$$

where too $\phi(0)=0$ and $\phi'>0$. To prove that there is no difference between liquidity preference theory and loanable funds theory, we must show that (3.1) and (3.2) are equivalent. But it is clear that there is no equivalency between them. If we substitute Walras' Law (2.4) into (3.1), we can get

---

1) L. R. Klein, *The Keynsian Revolution*, 1947, pp. 75—90.

2) P. A. Samuelson, *Foundations of Economic Analysis*, 1948, pp. 260 ff.

$$\dot{r} = f(Y - C - I + B^S - B^D) \tag{3.3}$$

as alternative formulation of liquidity preference theory. According to loanable funds theory (3.2), when $B^S = B^D$ holds, $\dot{r}$ becomes zero, that is, the rate of interest arrives at its equilibrium level and does not tend to change. But according to (3.3), even if $B^S = B^D$ holds, unless $Y = C + I$ holds, the rate of interest tend to move.

If the relation

$$Y \equiv C + I \tag{3.4}$$

holds identically and some other conditions are satisfied, these two monetary theories of interest can be taken as equivalent. But to take the relation (3.4) hold identically is nothing but to postulate Say's Law.[1] As is pointed out by Lange, Don Patinkin[2] and other writers, to postulate Say's Law makes the system indeterminate. This is the reason why I cannot take those two theories of interest as equivalent.

## § 4. Loanable funds theory as synthesis of real and monetary theories of interest

Loanable funds theory often claims to be the synthesis of the real and monetary theories of interest. But why can it claims that?

In other hand, as is well known, Mr. Keynes criticized interest theory of neo-classical school and wrote[3];—

"Thus the classical school have had quite a different theory of the rate of interest in Volume I dealing with the theory of value from what they have had in Volume II dealing with the theory of money. They have seemed undisturbed by the conflict and have made no attempt, so far as I know, to build a bridge between the two theories. The classical school proper, that is to say; since it is the attempt to build a bridge on the part of the neo-classical school which has led to the worst muddle of all."

Is it correct to deem the attempt on the part of loanable funds theorists to have led to the worst muddle of all? I wish to examine.

Walras' Law (2.4) can be rewritten as

---

1) O. Lange, Say's Law: A Restatement and Criticism, *Studies in Mathematical Economics and Econometrics, In Memory of Henry Schultz*, 1942.

2) Don Patinkin, Indeterminancy of Absolute Prices in Classical Economics, *Econometrica*, Jan. 1949.

3) J.M. Keynes, *The General Theory of Employment, Interest and Money*, 1936, pp. 182-3.

(4.1) $$B^S - B^D = (C+I-Y)+(L-M).$$

If we define saving $S$ as

(4.2) $$S \equiv Y-C,$$

Walras Law (4.1) becomes

(4.3) $$B^S - B^D = (I-S)+(L-M).$$

Substituting (4.3) into (3.2), we get

(4.4) $$\dot{r} = \phi[(I-S)+(L-M)]$$

as an alternative formula of loanable funds theory. In this formula (4.4), the equilibrium condition of the rate of interest is

(4.5) $$I+L = S+M.$$

In (4.5), the left hand side indicates demand for loanable funds, and the right hand side the supply of loanable funds. $I$ and $S$ are real factors, and $L$ and $M$ are monetary factors. Marginal efficiency of capital takes its part in determining $I$ schedule, and time-preference enters as determining factor of $S$ schedule.

So far this is satisfactory enough; but it must be emphasized that so far I only concern with loanable funds theory in Professor Hicks' sense. In other words I take the demand for and supply of loanable funds identical with the supply of and demand for securities in Professor Hicks' sense. If we come back to the traditional formulation of loanable funds theory, there occures some ambiguousness and inconsistency. I wish to examine this in next section.

## §5. Defects in traditional formula of loanable funds theory.

Loanable funds theory usually formulated as[1]

(5.1) $$\text{Saving} + \text{New creation of Money} = \text{Investment} + \text{Net hoarding}.$$

The left hand side of (5.1) is the supply of loanable funds, and the right hand side is the demand for loanable funds. And as is shown in (5.1), when the demand for loanable funds is equalized with the supply of them, there is equilibrium and the rate of interest can be determined.

---

[1] Y. Takata, *Shin-Rishi-Ron*, (*New Theory of Interest*) 1946.
G. Haberler, *Prosperity and Depression*, 2nd ed., 1946, chapt. 8.

It will be convenient to symbolize (5.1). Saving and investment can be denoted respectively as $S$ and $I$. New creation of money can be written as $\Delta M$.

Net hoarding is excess of hoarding over dishoarding. Hoarding money is not equivalent with holding money. $L$ means the demand for holding money. Hoarding or dishoarding during given period means not an increase or decrease of cash balance, but an increase or decrease of idle cash balance. It may be convenient to explain the meaning of hoarding with reference to Mr. Keynes' terminology. As is well known, Mr. Keynes divided the demand for cash balance into two parts, $L_1$ and $L_2$, of which the first part $L_1$ is demand for cash balance to satisfy the transaction and precautionary motive and the second part $L_2$ is demand for cash balance to satisfy the speculative motive.[1] $L_1$ may be called demand for active or circulating money, whilst $L_2$ is demand for idle money or hoarding. Thus net hoarding can be denoted by $\Delta L_2$. (5.1) can be written as

$$S+\Delta M=I+\Delta L_2\,. \tag{5.2}$$

Are those two formulations of lonable funds theory--*i.e.* the traditional one (5.2) and the Hicksian one (4.5)—can be taken as equivalent? If not equivalent, what is the main difference between these two formulation? I wish to answer these questions.

As

$$\Delta L_2=L_2-\bar{L}_2 \tag{5.3}$$

where $\bar{L}_2$ is initial hoarding (or hoarding at the end of the last period), and

$$\Delta M=M-\bar{M} \tag{5.4}$$

where $\bar{M}$ is initial quantity of money (or quantity of money at the end of the last period), (5.2) can be written as

$$S+M-\bar{M}=I+L_2-\bar{L}_2\,. \tag{5.5}$$

As we can assume that at the end of the last period there was equilibrium between demand for and supply of money, *i.e.*

$$\bar{M}=\bar{L}\,,$$

(5.5) reduces to

---

[1] J. M. Keynes, *ibid.*, pp. 170 ff. Mr. Keynes' classification between industrial circulation and financial circulation in his *Treatise on Money* is interesting in this connection.

$$S+M=I+L_2 . \tag{5.6}$$

Thus the difference between this and (4.5) is clear. The point of departure is in the demand side. In one formulation we add demand for money (or holding) to investment, whilst in the other expression add only demand for idle cash balance (or hoarding) to investment.

Equation (4.5) can be derived from the axiomatic identity, Walras' Law. But (5.6) or (5.2), the traditional formulation of loanable funds theory, can not be derived from Walras' Law. It means that the traditional formulation contains some logical inconsistency in it. The main defect of the traditional formulation is to assume implicitly

$$\Delta L_1=0 . \tag{5.7}$$

It means that new created money is demanded by public only to hoard. If this assumption is necessary, it is nothing but defect for the traditional formulation of loanable funds theory.*

* This paper was read to the third annual meeting of the Japanese branch of the Econometric Society, at Nagoya University, November 1952.