

# A Note on Robertson and Tsiang versus Keynes

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## Abstract

This paper examines the incongruous nature of Sho-Chieh Tsiang's reconciliation of the controversy surrounding John M. Keynes' liquidity-preference (LP) theory of interest and Dennis H. Robertson's loanable-funds (LF) theory, a reconciliation that made a major contribution to the resurrection of the LF theory in neoclassical economics textbooks—a theory that Keynes clearly demonstrated to be a “nonsense theory”. It is demonstrated that the arguments of Robertson and his neoclassical followers misrepresented what Keynes actually said with regard to his theory of interest and ignored the fundamental difference between Robertson and Keynes—namely, that the analytical framework developed by Keynes throughout *The General Theory* is *causal* and *dynamic* while the analytical framework employed by Robertson and throughout Walrasian neoclassical economics is *descriptive* and *static*. It is argued that the static nature of the LF theory makes it impossible to use this theory to provide a rational explanation of dynamic behavior in the way Ben Bernanke has attempted to do in his analysis of the “savings glut”.

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### I. Introduction

Keynes argued that the rate of interest is a purely monetary phenomenon, determined by the supply and demand for the *stock* of money (i.e., liquidity); Robertson argued that the rate of interest is a real phenomenon, determined by the *flow* of saving and investment by way of the supply and demand for loanable funds.

In his attempted reconciliation of the controversy surrounding this issue in favor of Robertson,<sup>1</sup> Tsiang argued that

in the post-*General Theory* writings of Keynes, he had already made an important concession to traditional monetary theory, which, if carried to its logical conclusion, would completely erode away his original revolutionary stand.<sup>2</sup> Unfortunately, few people managed to press this concession to its logical conclusion. As a result, certain mistaken ideas have been retained in the Keynesian theory that has come to be firmly established in most post-war textbooks and classrooms. On the other hand, traditional monetary theory, as expounded by Robertson in particular, who more than anybody else correctly perceived the wrong turn taken by Keynes, and who had strenuously tried to call attention to it, was practically banished from all textbooks and classrooms in the United Kingdom as well as in the United States. (1980 pp. 467-8)

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<sup>1</sup> For a sample of the literature surrounding this issue see Ackley, Asimakopulos, Brunner, Davidson, Fellner and Somers, Fleisher and Kopecky, Holmstrom and Tirole, Horwich, Johnson, Keynes, Klein, Kohn, Lerner, Lloyd, Modigliani, Ohlin, Patinkin, Robertson, Robinson, Rose, Stauffer, Terzi, and Tsiang. For surveys of the early literature see Haberler, Shackle, and Johnson (1962). For an analysis of the later literature see Bibow (2009).

According to Tsiang:

The crucial concession made by Keynes to the critics of his liquidity preference theory of interest rate is his acknowledgment of the so-called "finance" demand for liquidity, or the demand for "finance" for planned investment yet to be carried out. (1980 pp. 468)

As a result of Tsiang's efforts to discredit Keynes in this controversy, and with the help of Axel Leijonhufvud, Meir Kohn, George Horwich, Belton Fleisher and Kenneth Kopecky, Ming-Yih Liang, Paul Samuelson and William Nordhaus, Robert Stauffer, Gregory Mankiw, and innumerable others, the LF theory is no longer banished from textbooks and classrooms in spite of the fact that a few heterodox economists have continued to point out the illogical nature of this theory. (Bibow; Hayes 2010; Blackford 2019a,d; 2020) The fact that Robertson approved of Tsiang's 1956 analysis of the Robertson/Keynes controversy (see footnote 6 below) suggests that by examining Tsiang's analysis of this controversy it may be possible to gain a better understanding of the nature of the issues that separated Robertson and Keynes, and, by extension, to clarify the static nature of the LF theory of interest in neoclassical economics and its irrelevance to dynamic analysis.

We begin by examining Tsiang's attempt to derive Robertson's LF model from Keynes' monetary equilibrium condition and show that, in spite of the claims to the contrary, the rate of interest is a purely monetary phenomenon in Tsiang's model, determined by the supply and demand for the *stock* of money, not by the *flows* of saving and investment. Tsiang's failure to properly specify Keynes' money demand function is examined next along with the nature of Robertson's comparative static methodology. It is argued that it is impossible to examine the *dynamic* issues of *direct causality* raised by Keynes within the context of the static Robertsonian models, and that herein lies the fundamental difference between Keynes and Robertson: Keynes' analysis is *causal and dynamic* in that Keynes identified those factors that *in themselves* determine each variable at each point in time and drive each variable *toward* its equilibrium value; Robertson's analysis

along with that of his neoclassical followers is *descriptive and static* in that the static equilibrium values just suddenly appear out of nowhere each period as if by magic in their models, and how those equilibrium values change from one period to the next is simply described without a rational explanation as to how or why they came into being in the first place. It is further argued that this kind of magical thinking is the source of Ben Bernanke's suggested solution to the "savings glut" problem to the effect that "increasing U.S. national saving from its current low level would support productivity and wealth creation and help our society make better provision for the future"—a solution for which there is no rational justification and for which there is every reason to believe the real-world effects would be the exact opposite of those asserted by Bernanke. Finally, it is concluded that comparative static analysis can be an extremely valuable analytic tool in economics *when used in conjunction with the kind of causal, dynamic analysis employed by Keynes throughout The General Theory* to explain how and why the static equilibrium values are obtained and change *through time*, and when it is not used in this way the result is policies that lead to the kinds of economic, political, and social catastrophes that led to and followed the Crash of 1929 and 2008.

## II. Deriving Tsiang's Robertsonian LF Model

Tsiang argued that Keynes' LP theory can be summarized by the monetary equilibrium condition:

$$(1) \quad M_t^S = L(C_t^P + I_t^P, r_t, \pi_t, W_t, \dots),$$

where  $L(C_t^P + I_t^P, r_t, \pi_t, W_t, \dots)$  is Tsiang's interpretation of Keynes' money demand function,  $C_t^P$  and  $I_t^P$  the current planned consumption and investment expenditures, respectively, and are functions of the previous period's income  $Y_{t-1}$  (Tsiang 1980, p. 472n),  $r_t$  the current rate of interest,  $\pi_t$  the current expected rate of price inflation,  $W_t$  the current value of total wealth, and "[t]he dots following these variables indicate that we shall keep our mind open as to the question

whether more arguments should be introduced into the demand for money function [ $L$ ]. Tsiang then asserted, without explanation, that “the equilibrium condition that had already been established in the preceding period” is given by:

$$(2) \quad M_{t-1}^S = L(C_{t-1} + I_{t-1}, r_{t-1}, \pi_{t-1}, W_{t-1}, \dots),$$

“where the planned expenditures have already been carried out and become actual expenditures of the period” and “ $C_{t-1} + I_{t-1}$  is therefore the income received of the preceding period, i.e.,  $Y_{t-1}$ ”. He then expanded (1) around  $r_{t-1}, \pi_{t-1}$ , and  $W_{t-1}$  to obtain:

$$(1a) \quad M_t^S = L(C_t^P + I_t^P, r_{t-1}, \pi_{t-1}, W_{t-1}, \dots) + L_r(r_t - r_{t-1}) \\ + L_\pi(\pi_t - \pi_{t-1}) + L_w(W_t - W_{t-1}) \\ + \textit{higher orders of differentials and derivatives},$$

and by way of “the reasonable assumption that”  $L$  is linear in planned expenditures Tsiang wrote his specification of Keynes’ money demand function  $L$  as:

$$(3) \quad L(C^P + I^P, r, \pi, W, \dots) = k(r, \pi, W, \dots)(C^P + I^P) + L^*(r, \pi, W, \dots).$$

He then substituted (3) “with appropriate subscripts” into (1a) and (2), and taking the difference he obtained his equations (4) and (4a):

$$(4) \quad \Delta M_t^S = k(r_{t-1}, \pi_{t-1}, W_{t-1}, \dots)(C_t^P + I_t^P - C_{t-1} - I_{t-1}) + L_r \Delta r_t \\ + L_\pi \Delta \pi_t + L_w \Delta W_t \\ + \textit{higher orders of differentials and derivatives}$$

$$(4a) \quad \Delta M_t^S = k_{t-1} I_t^P - k_{t-1}(Y_{t-1} - C_t^P) + \Delta L_t^*,$$

where  $\Delta M_t^S = M_t^S - M_{t-1}^S$ ,  $k_{t-1} = k(r_{t-1}, \pi_{t-1}, W_{t-1}, \dots)$ ,  $Y_{t-1}$  is the income received in the previous period (which Tsiang assumed to be equal to  $C_{t-1} + I_{t-1}$ ), and “all the terms in differentials and derivatives constitute net hoarding” where, to simplify the notation in what follows, I have denoted the sum of these terms as

$L_t^*$  and the change in this sum as  $\Delta L_t^* = L_t^* - L_{t-1}^*$ . Tsiang then concluded:

It can be immediately recognized that (4a) is nothing but the equilibrium condition for the loanable funds market as stipulated by Robertson.  $(Y_{t-1} - C_t^P)$  is exactly what he defined as planned saving, which is not what is expected to be saved out of income accruing in the future, but what is planned to be saved out of disposable income (i.e., income received in the preceding period). (Tsiang 1980, p. 473) <sup>2</sup>

Thus, it would appear that through this sleight-of-hand Tsiang has derived Robertson's LF equilibrium condition from Keynes' LP equilibrium condition and that the equilibrium rate of interest is determined by "planned saving". That this conclusion is unwarranted can be demonstrated with little more than high school algebra.

### III. The True Nature of Tsiang's LF Model

Replacing  $\Delta M_t^S$  and  $\Delta L_t^*$  in (4a) by their counterparts  $M_t^S - M_{t-1}^S$  and  $L_t^* - L_{t-1}^*$ , rewriting Tsiang's equilibrium condition (4a) as:

$$(4b) \quad M_t^S - M_{t-1}^S = k_{t-1}I_t^P - k_{t-1}Y_{t-1} + k_{t-1}C_t^P + L_t^* - L_{t-1}^*,$$

and rearranging terms yields:

$$(4c) \quad M_t^S - M_{t-1}^S = k_{t-1}(I_t^P + C_t^P) + L_t^* - (k_{t-1}Y_{t-1} + L_{t-1}^*).$$

Given Tsiang's linearization of Keynes' money demand function (3) and his assumption that  $Y_{t-1}$  is equal to  $C_{t-1} + I_{t-1}$ , substituting this definition of income into Tsiang's "equilibrium condition that had already been established in the pre-

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<sup>2</sup> Cf. Robertson (1940, pp. 2-3) and Tsiang (1956, p. 548).

ceding period” (2) yields Tsiang’s definition of  $M_{t-1}^S$  in terms of these values:

$$(2a) \quad M_{t-1}^S = k_{t-1}(C_{t-1} + I_{t-1}) + L_{t-1}^* \\ = k_{t-1}Y_{t-1} + L_{t-1}^*.$$

Thus, if we substitute Tsiang’s definition of  $M_{t-1}^S$  from (2a) into his current period equilibrium condition (4c),  $M_{t-1}^S$  and  $k_{t-1}Y_{t-1} + L_{t-1}^*$  cancel, and his current period equilibrium condition (4c) reduces to:

$$(4d) \quad M_t^S = k_{t-1}(I_t^P + C_t^P) + L_t^*.$$

This is the *true* equilibrium condition in Tsiang’s derived LF model, and it is worth noting that all of the magnitudes in this equilibrium conditions— $M_t^S$ ,  $k_{t-1}(I_t^P + C_t^P)$ , and  $L_t^*$ —are *stocks* of money; none of these magnitudes are *flows* of savings or investment.<sup>3</sup> This means that the theory of interest in Tsiang’s LF theory of interest as embodied in (4a) through (4d) implicitly assumes that *the rate of interest is a purely monetary phenomenon*, determined solely by the supply and demand for the *stock* of money; it is not determined by the *flows* of savings or investment or by the supply and demand for the *flow* of loanable funds.

It is also worth noting that neither  $k_{t-1}(Y_{t-1} - C_t^P)$  nor  $Y_{t-1} - C_t^P$  appear in this equilibrium condition. Thus neither of these two magnitudes plays a role in determining the equilibrium values in Tsiang’s LF model whether  $Y_{t-1} - C_t^P$  “is exactly what he [Robertson] defined as planned saving” or not; subtracting the previous period’s supply of money  $M_{t-1}^S (=k_{t-1}(I_t^P + C_t^P) + L_t^*)$  from both sides of Tsiang’s monetary equilibrium condition (4d) by way of (2a) and substituting  $\Delta M_t^S$  and  $\Delta L_t^*$  for their counterparts to obtain (4a) does not change the fact that the rate of interest in Tsiang’s and Robertson’s models is not determined by saving

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<sup>3</sup> The same situation exists with regard to the equilibrium conditions in Tsiang’s 1956 (pp. 548-9) model in that there are no flow magnitudes in the equilibrium conditions, only stocks of money.

and investment.<sup>4</sup>

#### IV. Tsiang's LP Model versus Keynes' LP Model

Tsiang's LP model can be compared with Keynes' LP model by substituting Tsiang's linear specification of Keynes' money demand function (3) "with appropriate subscripts" into Tsiang's LP equilibrium condition (1) to obtain:

$$(1b) \quad M_t^S = k_t(C_t^P + I_t^P) + L_t^*,$$

where, in accordance with Tsiang's notation,  $k_t(r_t, \pi_t, W_t, \dots)$  is abbreviated as  $k_t$ .

The most important characteristic of Tsiang's LP model that is particularly noteworthy is the fact that planned consumption  $C_t^P$  and investment  $I_t^P$  expenditures in Tsiang's LP equilibrium condition (1b) are explicitly assumed to be a function of the previous period's income  $Y_{t-1}$  and not current income  $Y_t$  (Tsiang 1980, p. 472n), and the stock of money demanded for the purpose of financing planned consumption  $C_t^P$  and investment  $I_t^P$  expenditures—that is,  $k_{t-1}(I_t^P + C_t^P)$ —is also explicitly assumed to be a function of the previous period's income  $Y_{t-1}$  (Tsiang 1980, p. 472n) and not current income  $Y_t$ . This, in itself, makes Tsiang's analysis irreconcilable with Keynes' since Keynes was explicit on his insistence that  $C_t^P$ , and  $I_t^P$  are functions of current income  $Y_t$  as defined by the value of output produced; previous values of income  $Y_{t-1}$  cannot have a direct effect on current decisions with regard to  $C_t^P$  and  $I_t^P$ , only an indirect effect, and, even then, only to the extent they have an effect on current stocks of capital assets and subsequent expectations. (Keynes 1933, pp. 699-701, 1936, pp. 46-55, 63, 78, 90)

This distinction lies at the very core of Keynes' general theory in that it makes it

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<sup>4</sup> The same is true of Kohn's model and that of Horwich.



possible to establish *the temporal order in which events must occur* within the analytical framework developed by Keynes' throughout *The General Theory* and thereby makes it possible to separate *cause* and *effect*. It is the ability to separate cause and effect that makes *a causal analysis of dynamic behavior* possible in Keynes' general theory, something that is impossible in neoclassical Walrasian economics.<sup>5</sup>

## V. Tsiang on an Increase in Thrift

In attempting to demonstrate the importance of Keynes' "crucial concession" Tsiang argued that Keynes' denial that a decision by the public "to spend more of

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<sup>5</sup> Cf., Hawtrey (1933) and Hayes (2010). That it is the ability to separate cause and effect that makes *a causal analysis of dynamic behavior* possible in Keynes' general theory is explained in detail in Blackford (2019a; 2020). It should also be noted that Keynes was quite explicit in stating the dynamic nature of his general theory:

When I began to write my Treatise on Money I was still moving along the traditional lines of regarding the influence of money as something so to speak separate from the general theory of supply and demand. When I finished it, I had made some progress towards pushing monetary theory back to becoming a theory of output as a whole. But my lack of emancipation from preconceived ideas showed itself in what now seems to me to be the outstanding fault of the theoretical parts of that work (namely, Books III and IV), that I failed to deal thoroughly with the effects of *changes* in the level of output .... the dynamic development, as distinct from the instantaneous picture, was left incomplete and extremely confused. This book, on the other hand, has evolved into what is primarily a study of the forces which determine *changes* in the scale of output and employment as a whole.... [*emphasis added*] (1936, pp. vi-vii)

And again:

We can consider what distribution of resources between different uses will be consistent with equilibrium under the influence of normal economic motives in a world in which our views concerning the future are fixed and reliable in all respects;—with a further division, perhaps, between an economy which is unchanging and one subject to change, but where all things are foreseen from the beginning. Or we can pass from this simplified propaedeutic to the problems of the real world in which our previous expectations are liable to disappointment and *expectations concerning the future affect what we do to-day*. It is when we have made this transition that the peculiar properties of money as a link between the present and the future must enter into our calculations. But, although *the theory of shifting equilibrium* must necessarily be pursued in terms of a monetary economy, it remains a theory of value and distribution and not a separate 'theory of money'. [*emphasis added*] (1936, pp. 293-4).

their incomes on securities and less on consumable goods" (Robertson 1938, p. 318) would have a direct effect on the rate of interest is "untenable" since by virtue of Tsiang's LF equilibrium condition (4a):

Everything that Robertson tried to tell us is quite right. In particular, what has become the central issue of contention, via, the question whether a change in thrift (or propensity to save) will have a direct effect on the rate of interest [emphasis added], should clearly be decided in favor of Robertson. From equation (4a) it is clear that an increase in thrift, which lowers the schedule of planned consumption, will certainly bring about a decline in interest rate in order to redress the current money market equilibrium without operating indirectly through the multiplier effect, Pigou effect, the real balance effect, and whatnot, which modern economists find necessary to invoke to reconcile the classical view with the Keynesian doctrine. (p. 474) <sup>6</sup>

There are two problems with Tsiang's argument in this passage.

The first concerns the fact that Tsiang explicitly refused to consider the possibility that money may be demanded for the purpose of financing planned financial expenditures. (Tsiang 1956, pp. 336-7; 1966, pp. 336-7, 337n) The importance of this refusal can be seen if we "keep our mind open as to the question whether more arguments should be introduced into the demand for money function" and note that if we include money demanded for this purpose then Tsiang's LF equilibrium condition (4d) becomes:

$$(4e) \quad M_t^S = k_{t-1}(I_t^P + C_t^P + F_t^P) + L_t^*$$

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<sup>6</sup> In commenting on this passage in 1980, Tsiang noted that:

The essence of the above argument had already been presented in my September 1956 article. Although I wrote it without any prior consultation with Robertson, it must have met his general approval. Within a month of its publication, I received an unsolicited letter from him dated 22 October, 1956, written in longhand, which started by saying: "I have just read your recent article in *AER* with great interest and appreciation. So far as I can judge, it really clears these matters up completely ...." (p. 474n)

where  $F_t^p$  is the *flow* of planned financial expenditures of households. (cf. Blackford 2019c; 2020) Given this equilibrium condition there can be no direct effect of a change in thrift  $\Delta C_t^p$  that takes the form of an increase in the demand for securities  $\Delta F_t^p$  in Tsiang's extended model since, by assumption,  $\Delta F_t^p = -\Delta C_t^p$ . As a result, any effect that arises from a change in planned consumption  $\Delta C_t^p$  in (4e) must be exactly offset by the concomitant change in planned purchases of financial assets  $\Delta F_t^p$  in Tsiang's model.

The only way in which an increase in thrift could have an effect on the demand for money in Tsiang's model is if the rate of turnover of money in financing planned financial expenditures  $F_t^p$  is different from the rate of turnover of money in financing planned consumption expenditures  $C_t^p$ . It is not exactly clear how Tsiang would incorporate this difference in his Robertsonian model since, by assumption, the rate of turnover of money in a Robertsonian model ( $k_t$ ) defines the length of the time period, (Robertson and J.M.K. 1938, p.317) but this difference is easily incorporated in Keynes' LP model since Keynes' model is not defined in terms of an interval of time but, rather, at "a moment of time".

Robertson's LP equilibrium condition (1b) can be used to represent Keynes' LP equilibrium condition if it is assumed that the variables in this equation are all functions of the current values of  $r_t$ ,  $\pi_t$ ,  $W_t$  and  $Y_t$  (Blackford 2019a,d; 2020) rather than previous values, and different  $k_t$ s are assigned to each of the individual sources of the demand for money to obtain:

$$(1c) \quad M_t^s = k_t^c C_t^p + k_t^i I_t^p + k_t^f F_t^p + L_t^*$$

It is clear from (1c) that the net direct effect of a decision by the public "to spend more of their incomes on securities and less on consumable goods" will depend on the relationship between  $k_t^c \Delta C_t^p$  and  $k_t^f \Delta F_t^p$  in Keynes' LP theory as represented by (1c), and since, by assumption,  $\Delta F_t^p = -\Delta C_t^p$  in this *ceteris paribus* ex-

ercise it will depend on the relative magnitudes of  $k_t^c$  and  $k_t^f$ : if  $k_t^c = k_t^f$  there can be no net direct effect, but if  $k_t^c < k_t^f$  the net direct effect must be to *increase* the demand for money and thereby the rate of interest; only if  $k_t^c > k_t^f$  will the net direct effect be to decrease the demand for money and rate of interest. Thus, the meaningfulness of Tsiang's argument depends, at the very least, on his justification for assuming that money is *not* demanded for the purpose of financing planned financial expenditures.

Tsiang attempted to justify this assumption in 1966 by asserting:

This type of Robertsonian period analysis also implies that trading in financial assets will always take place at the very beginning of the period. For as soon as each individual makes his decision as to how much to spend during the coming period, he will know how much of his accumulated cash holding can be spared from his own requirement for finance, or how much further finance he must procure for his planned expenditures. It is to his interest that such adjustments of his cash holding should be carried out right at the beginning of the period. (pp. 336-7)<sup>7</sup>

This argument is far from convincing for financial investment decisions involve both information and transactions costs.

In general, it takes *time* to gather the necessary information and/or to find a convenient opportunity to execute a financial investment decision in the real world even after one knows how much cash can be spared for the investment, and there are money costs associated with these decisions as well. Given these constraints, there is just as much (if not more) reason to believe it is in the interest of each individual to allow his spare cash to remain idle for a period of time (and, perhaps, to accumulate to a respectable sum) in order to gather the necessary information required to make a wise investment decision, or to find a convenient

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<sup>7</sup> See also Tsiang (1966, p. 337n) and cf. Tsiang (1956).

opportunity to execute this decision, or to justify its money cost as there is to believe it is in the interest of each individual to adjust his or her cash holding immediately upon discovery of the existence of spare cash (i.e., "right at the beginning of the period"). Since this version of Tsiang's *a priori* justification for assuming that money is not demanded for the purpose of financing planned financial expenditures presupposes the absence of transactions and information costs it cannot provide a meaningful basis for his argument that a decrease in planned consumption expenditures *must* have the direct effect of decreasing the demand for money notwithstanding Tsiang's (1966, pp. 334, 337n) *a priori* rationalization to the contrary.<sup>8</sup>

Tsiang also attempted to justify his assumption that money is not demanded to finance planned financial transactions in 1957 by arguing that:

Judging from the enormous fluctuations in the volume of transactions per calendar day that are capable of happening on the stock, bond and money markets combined, we must conclude that the speed of adjustment of aggregate idle cash holdings is also extremely variable in accordance with the aggregate magnitude of adjustments that are desired. That is why it seemed to me as reasonable an assumption as any that whatever changes in the stocks of idle cash may be desired can be carried out instantaneously when we are dealing with a minimum time unit, the Robertsonian "day," which is presumably much longer than a calendar day. (pp. 674-5)

This rationalization is also far from convincing in that it ignores the

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<sup>8</sup> Tsiang's *a priori* rationalization for assuming that money is not demanded for the purpose of financing planned financial expenditures is particularly incongruous in light of the fact that Tsiang delineated some of the costs of financial transactions just three pages before he assumed them away:

There is usually an overhead element in the cost of making an exchange of financial assets which does not vary proportionately to the amount of money involved, e.g., the minimum brokers' charge, the psychological cost of trouble and bother, etc., in addition to cost that varies in proportion to the amount of transaction involved. These costs of exchange would make the investment of cash in earning assets in very small amount, or for a very short period, quite uneconomical. (1966, p. 333)

fact that “the enormous fluctuations in the volume of transactions per calendar day that are capable of happening on the stock, bond and money markets combined” has to be financed, and a portion of that financing is to be found in the accounts of the broker/dealers who facilitate these transactions. And Tsiang’s addition in 1966 that “transactions in securities are generally settled by clearings; only the net balances need to be settled with cash” (p. 337) ignores the fact that “clearings” between brokers is not the end of the story. In the real world the individual accounts of the sellers must be credited and of the buyers debited *for the total amounts of the transactions involved*. It is not just the clearings between brokers that must be accounted for; the sum of the demands for money by the individuals who deal with those brokers must be accounted for as well.<sup>9</sup>

Tsiang simply *assumed* that no money is demanded for the purpose of financing financial transactions in his model and that the *stock* of money demand for this purpose is not related to the size of the *flow* of these transactions, but assuming this source of demand for money does not exist in his model does not change the fact that it does exist in the real world. (Blackford 2019c; 2020)

But even if one were to accept Tsiang's *a priori* justifications for assuming money is not demanded for the purpose of financing planned financial transactions, there is a second, more fundamental objection to Tsiang's argument, namely, that Tsiang's argument is in fact irrelevant to Keynes' actual position on this issue. In December 1937 Keynes' stated quite clearly:

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<sup>9</sup> It should also be noted that Tsiang’s Robertsonian methodology does not allow for the possibility that decision-making units accumulate (i.e., demand) money for the purpose of purchasing financial assets in future periods in his model, *a possibility that Tsiang has ruled out by assumption*.

Now, I readily admit the intention to save may sometimes affect the willingness to become unliquid meanwhile. This factor should certainly be included in the list of motives affecting the state of liquidity-preferences. But it is only one amongst many, and, in practice (I should have thought), one of the least important. (p. 665)

In this passage, Keynes "readily" admitted that "the intention to save may sometimes affect the willingness to become unliquid meanwhile" and that this "factor should certainly be included in the list of motives affecting the state of liquidity-preferences." Thus, Tsiang clearly failed to grasp the nature of Keynes' position in this regard for it is clear from this passage that Keynes did not deny the fact that an increase in planned saving may have a direct effect on the demand for money. The issue raised by Keynes is whether or not "in practice" this phenomenon is "important." Tsiang may disagree with Keynes on this issue, but his disagreement can only be on the practical importance of this phenomenon not on its possibility or even on its probability. Such a disagreement can be settled only on the basis of empirical evidence, and since Tsiang has provided no empirical evidence in support of his view, he has provided no basis for his assertion that Keynes' position in this regard is "untenable". (cf. Keynes June 1937, pp. 246-8; December 1937, pp. 663-9; 1938; 1939)

## **VI. Keynes on the Demand for Money**

Toward the beginning of his final attempt to explain his theory of interest to Robertson, Keynes summarized his concept of the demand for money as follows:

The total demand [for liquidity] falls in two parts: the inactive demand due to the state of confidence and expectation on the part of the owners of wealth, and the active demand due to the level of activity established by the decisions of the entrepreneurs. The active demand in its turn falls in two parts: the demand due to the time-lag between the inception and execution of the entrepreneurs' decisions, and the part due to the time-lags between the receipt and disposal of income by the public and also between the receipt by entrepreneurs of their sale-proceeds and the payment of them of wages, etc.

(1938, p. 319)

According to Tsiang:

The second element of what he [Keynes] classifies as the active demand really does not deserve this title. It should rather be called the "passive acceptance of money;" for these sums are not what the public or entrepreneurs plan to keep in the form of money, but are merely what they passively accept for services rendered or goods sold pending rational disposal later on at a more appropriate time. All transactions balances start out as demand for finance either for investment or for consumption expenditures, and end up as passive acceptance of cash toward the end of a cycle of money circulation to await reallocation at the beginning of a new cycle either as finance required for new expenditure plans again or as inactive hoards (asset balances). (1980, p. 475)

Tsiang's statement to the effect that the second element of the active demand for money as explained by Keynes should be called "passive acceptance of money" rather than a demand for money clearly demonstrates confusion on Tsiang's part regarding the nature of the active demand for money in the real world. In Tsiang's own model,  $k_{t-1}^c C_t^P$  in equation (4e) is, in fact, money demanded "due to the time-lag between receipt and disposal of income by the public" as is  $k_t^f F_t^P + k_t^c C_t^P$  in the extension of Keynes' equilibrium condition (1c).

Furthermore, Tsiang's inability to understand the demand for money "due to the time-lag . . . between the receipt by entrepreneurs of their sale-proceeds and the payment by them of wages, etc." within the context of his model is not surprising in view of the fact that the demand for money on the part of firms that arises from the need to finance expenditures on wages, intermediary goods, interest and dividend payments, and other kinds of expenditures that arise from the need to finance the *production* of goods is ignored in that, at the point in time at which the demand for money is measured in Tsiang's model (i.e., at the beginning of the period), there is no demand for money on the part of firms to finance these kinds of expenditures. But there is just as much reason to assume entrepreneurs demand



money for the purpose of financing expenditures that arise from the need to finance the *production* of goods as there is to assume that consumers and investors demand money for the purpose of financing expenditures that arise from the need to finance the *purchase* of goods. The only reason this demand for money is “passive” in Tsiang’s model is that it is simply ignored.

In the real world the demand for money that arises from the need to finance the *production* of goods cannot be ignored, and it is hardly appropriate to simply dismiss as “passive acceptance of money” the demand for money on the part of firms to meet their payrolls and finance their accounts payable as anyone who has actually had to meet a payroll or finance an accounts payable will readily affirm.

The relevance of Tsiang's omission in this regard can be seen by assuming that the demand for money that arises from the need to finance the production of goods depends on the value of output produced as given by  $Y_t$  and rewriting Keynes’ equilibrium condition (1c) so as to include the need to finance the production of goods as well as the need to finance the purchase of goods and financial assets:

$$(1d) \quad M_t^S = k_t^i I_t^P + k_t^y Y_t + (k_t^f F_t^P + k_t^c C_t^P) + L_t^*,$$

where  $k_t^y$  denotes the  $k$  that applies to  $Y_t$ , and  $k_t^y Y_t$  denotes the demand for money needed to finance the *production* of goods. When this is done, the aggregate demand for money in Keynes’ theory as given by the right-hand side of (1d) is easily interpreted in terms of Keynes’ description of the total demand for liquidity in the passage quoted above: The “inactive demand due to the state of confidence and expectation on the part of the owners of wealth” is given by  $L_t^*$ ; that part of the active demand “due to the time-lag between the inception and execution of the entrepreneurs’ decisions” is given by  $k_t^i I_t^P$ ; that part of the active demand due to “re-

ceipt by entrepreneurs of their sale-proceeds and the payment of them of wages, etc." is given by  $k_t^y Y_t$ ,<sup>10</sup> and that part of the active demand "due to the time-lags between the receipt and disposal of income by the public" is given by  $(k_t^f F_t^p + k_t^c C_t^p)$ .<sup>11</sup>

Thus, when Tsiang's specification of Keynes' demand for money function is extended in such a way as to incorporate the need to finance the production of goods as well as to finance financial and other planned expenditures there is no difficulty in understanding Keynes' description of the total demand for liquidity.<sup>12</sup>

## VII. The Supply of Finance

In his final attempt to explain his concept of 'finance' to Robertson, Keynes concluded:

It is Mr. Robertson's incorrigible confusion between the revolving fund of money in circulation and the flow of new saving which causes all his difficulties. Saving has no special efficacy, as compared with consumption, in releasing cash and restoring liquidity. . . . Consumption does just as well. . . . A given level of activity and income will

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<sup>10</sup> When investors produce their own investment goods there is, of course, an overlap between the demand for money for the purpose of financing planned investment expenditures and the demand for money for the purpose of financing the production of investment goods. The point is that when investors do not produce their own investment goods these two demands are distinct, and, in either case, there must be a demand for money that arises from the need to finance the production of investment goods and other kinds of goods as well. This demand is missing in Tsiang's model.

<sup>11</sup> The need to finance the production of goods would, perhaps, have been clearer to Robertson and Tsiang if they had chosen the end of the period as the point in time at which decisions had to be made with regard to financing both obligations committed to in the past as well as obligations planned for the future. See Blackford (2020c).

<sup>12</sup> It must be noted that simply including  $k_t^y Y_t$  and money demanded for planned expenditures  $k_t^f I_t^p + (k_t^f F_t^p + k_t^c C_t^p)$  in Keynes' demand for money function does not capture the essence of Keynes' concept of the demand for 'finance' as is explained by Bibow (1995) or the essence of Keynes' LP theory of interest as is explained in Blackford (2019a,c,d; 2020).

involve the same active demand for cash, if the technical conditions governing the time-lags are the same, irrespective of the current rate of net investment and saving. . . . In short, I accept the usual view that the demand for cash in the active circulation is a function of income and of business habits, not of saving. The 'finance,' or cash, which is tied up in the interval between planning and execution, is released in due course after it has been paid out in the shape of income, whether the recipients save it or spend it. There is, therefore, just as much reason for adding current consumption to the rate of increase of new bank-money in reckoning the flow of cash becoming available to provide new 'finance,' as there is for adding current saving.<sup>1</sup> Until Mr. Robertson understands that, he will not grasp what I am driving at, however carefully I attempt to reword it. (1938, pp. 321-2)

In commenting on this passage, Tsiang observed that "Robertson failed completely to understand Keynes' strange logic that would make both consumption and savings equally the components of the supply of finance" and that "[h]ow Keynes could have arrived at such an amazing conclusion is indeed an historical puzzle." (1980, p. 476) Tsiang then noted that  $C_{t-1}$  and  $I_{t-1}$  (the sum of which is equal to  $Y_{t-1}$  in Tsiang's model) have signs opposite to the signs of  $C_t$  and  $I_t$  in (4) and suggested that:

This is perhaps what Keynes had in mind when he wrote: "Finance is a revolving fund. . . . As soon as it is used in the sense of being expended, the lack of liquidity is automatically made good...". That is, consumption and investment expenditures actually carried out,  $C_{t-1}$  and  $I_{t-1}$  appear to provide the finance for the new consumption and investment expenditures planned,  $C_t$  and  $I_t$ . . . .

So far, it seems to be all right. However, when Keynes went on to assert with equanimity that "consumption is just as effective in liquidating short-term finance as saving is," he was clearly wrong about timing. . . . At the moment of decision for the current period . . .  $C_{t-1}$  is already a given datum of the past. It is no longer a decision variable. Only current consumption  $C_t$ , or its complement, saving ( $Y_{t-1} - C_t$ ), is still to be decided together with the current investment plans. From equation . . . (4a), it is obvious that  $C_t$  would be competing with current investment,  $I_t$  for available finance.

It is only  $(Y_{t-1} - C_t) = S_t$  that can properly be said to provide the finance for investment apart from dishoarding or money creation. (1980, pp. 476-7)

Aside from the fact that  $Y_{t-1} - C_t$  cancels out of Tsiang's equilibrium condition (4d) and plays no role in his LF model so that there can be no issue of timing with regard to this variable, the above was written with a total disregard for what Keynes actually said on this subject.

Keynes stated quite clearly in the passage quoted above that "given the level of activity and income," and "if the technical conditions governing the time-lags are the same," and if one accepts "the usual view that the demand for cash in the active circulation is a function of income and of business habits, not of saving" then it can be assumed that changes in saving do not have a *direct* effect on the supply or demand for money. (Keynes 1930, pp. 140-6; 1931, p. 415-9; 1936, pp. 179-81; June 1937 p. 250-1; 1938; 1939.) In this *ceteris paribus* situation, finance balances can always be replenished as they are spent irrespective of the individual *rates* of consumption and saving by households since all money received by households in the form of income payments, *by pure logic*, must be returned to firms *at a constant rate* through the credit and goods markets. The only thing that a change in saving can accomplish in this *ceteris paribus* situation is to change the *individual* rates at which money is returned to firms through the individual markets but not the rate at which money is returned to firms through the two markets combined. Given the supply and demand for money, a change in saving cannot change the rate at which money is made available to investors to replenish their 'finance' balances—only a change in one of the other demands for money or in the supply of money can change this rate.

Thus, in the specific *ceteris paribus* situation posited by Keynes in the above passage it is *logically impossible* for an increase in saving to have a direct effect on the amount of money available to meet an increase in the demand for finance in the same sense that given the generally accepted rules of arithmetic it is *logically impossible* for two plus two to equal five. (Lerner 1944; Robinson 1950, pp. 106-9;

Bibow 2000a; 2001; Blackford 2019a,c,d; 2020; cf. Robertson 1936, p. 178; 1937, p. 435n; 1940, pp. 18; 1959, p. 68-9)

Keynes' statement to the effect that the "'finance,' or cash, which is tied up in the interval between planning and execution, is released in due course after it has been paid out in the shape of income" clearly indicates the mechanism by which Keynes assumed money "tied up in the interval between planning and execution" becomes available to be tied up again in the *ceteris paribus* situation posited by Keynes—namely, by being spent on either goods or securities *after* being paid out in the shape of income. There is no reason to believe that Keynes' statement to the effect that "consumption is just as effective in liquidating short-term finance as saving is" means anything other than what is stated above—namely, that once *money* has been *received* in the shape of income, it makes no difference whether it is spent on consumption goods or saved and, thus, (given the supply and demand for money) spent on securities in that in either case the *money* so received and spent continues on as part of the revolving fund of *money* in circulation *without affecting the size of this fund*.

This does not mean that a decision with regard to saving cannot, or even will not have an effect on the supply or demand for money and, thereby, on "the flow of cash becoming available to provide new 'finance'" if "the technical conditions governing the time-lags are [not] the same"—that is, if, for example,  $k_t^c$  is not equal to  $k_t^f$  in (1d). It only means that a decision with regard to the *flow* of saving cannot have an effect on the rate of interest that is *independent* of its effects, *either direct or indirect*, on the supply or demand for the *stock* of money. (Blackford 2019a; 2020)

To the extent a change in the flow of saving does have an effect on the supply or demand for the *stock* of money, there must, of course, be an effect on the rate at which money is made available to firms to replenish their finance balances. Nevertheless, *given the premises of Keynes' ceteris paribus argument* in the above

passage, Keynes' argument is *logically* valid, and Tsiang's objection to Keynes argument is nothing more than a straw man that has nothing to do with what Keynes actually said.

### VIII. Robertson's and Tsiang's Confusion

Keynes argued that income is determined by saving and investment, the rate of interest by the supply and demand for money (i.e., liquidity), and that a *ceteris paribus* increase in saving cannot, in itself, have a *direct* effect on the rate of interest in the absence of an effect on the supply and demand for money. (Keynes 1930, pp. 130-1; 1936, pp. 165-74, 245-56; June 1937, p. 249-50) Even though Keynes' argument in this regard is rather straightforward and easy to understand to anyone who actually tries to understand it from the prospective of Marshall, (Blackford 2019a; 2020) the inability of Tsiang and Robertson to understand this argument within the context of Tsiang's Robertsonian model is not surprising given Tsiang's assumption that equation (2) is "the equilibrium condition that had already been established in the preceding period".

The actual previous period equilibrium condition in Tsiang's Robertsonian model is in fact given by:

$$(5) \quad M_{t-1}^S = L(C_{t-1}^P + I_{t-1}^P, r_{t-1}, \pi_{t-1}, W_{t-1}, \dots),$$

not by (2) as asserted by Tsiang. In order to get from (5) to (2) Tsiang had to adopt the Walrasian assumption that planned expenditures are always realized—that is, that  $C_{t-1}^P = C_{t-1}$ ,  $I_{t-1}^P = I_{t-1}$ , and, thus, that  $Y_{t-1} = C_{t-1} + I_{t-1} = C_{t-1}^P + I_{t-1}^P$ . This means that income  $Y_t$ , consumption  $C_t$ , investment  $I_t$ , and the rate of interest  $r_t$  are all implicitly assumed to be determined *simultaneously* at the beginning of each period in Tsiang's model. (Keen)

As a result, it is impossible to consider the affects of a *ceteris paribus* change in

saving given income  $Y_t$  in Tsiang's model (even if the demand for money were specified properly) because it is impossible to hold income  $Y_t$ , (and therefore the demand for money that depends on  $Y_t$  which equals  $C_t + I_t$  in Tsiang's model) constant in the face of a change in saving since income  $Y_t$  and all of the other endogenous variables in Tsiang's model are implicitly assumed *a priori* to adjust simultaneously to their equilibrium values at the beginning of each period in response to a change in saving or any other exogenous variable or parameter. Thus, it is impossible to understand the nature of Keynes', or any other argument that attempts to identify those factors that, *in themselves*, determine the individual variables *at each point in time* within the context of Tsiang's model since *all of the variables in his model are implicitly assumed to be determined simultaneously by way of some form of mythical tâtonnement/re-contract auctioneer*. (Blackford 2019a; 2020; Sill; Keen; Grieve)

What this means is that Robertson's and Tsiang's method of analysis is that of comparative statics in that they assumed a state of static equilibrium with regard to  $r_t$ ,  $C_t$ ,  $I_t$ , and  $Y_t$  is achieved each period; they then *describe* how these states of static equilibrium change from one period to the next without explanation as to how these equilibriums are achieved other than by way of some kind of mythical *tâtonnement/re-contract* assumption.<sup>13</sup>

## IX. Consequences of this Confusion

Robertson's and his followers' (e.g., Tsiang, Kohn, Horwich, Fleisher and Kopecky, Leijonhufvud, Liang, Samuelson and Nordhaus, Stauffer, and Mankiw) confused analysis of the theory of interest lies at the very core of the inability of mainstream economists to understand the static nature of the LF theory of interest and the dynamic nature of Keynes' LP theory. This inability is endemic throughout the dis-

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<sup>13</sup> See Keynes (1936), Blackford (2019a,b,d; 2020), and Pernecky and Wojcik; cf., Leijonhufvud, Kohn, Horwich, Fleisher and Kopecky, Liang, Samuelson and Nordhaus, Stauffer, and Mankiw.

cipline of economics today and is particularly relevant to the logical inconsistency of dynamic analysis in economics, that is, analysis of the way in which economists assume the economic system changes through time. (Keen; Grieve)

The inability to understand the static nature of the LF theory is obvious from the reaction of mainstream economists to Bernanke's proclamation that "textbook analysis suggests that, with desired saving outstripping desired investment, the real rate of interest should fall to equilibrate the market for global saving". There was, in fact, no reaction to this nonsense by mainstream economists in spite of the fact that Keynes (1936) demonstrated that given the supply and demand for money only a fall in income can equilibrate desired saving and investment and that given income and the supply and demand for money *it is logically impossible for the rate of interest, real or otherwise, to achieve this end*. (Blackford 2019a) At the very least the supply of money must increase in this situation if employment, output, and income are to be sustained in the short-run according to Keynes' general theory, and this is not the end of the story.

Keynes (1936) explained in rather straightforward and simple language why there is no reason to believe that a continual increase in the supply of money can sustain employment, output, and income in either the short run or the long run in the face of the kind of increase in the propensity to save described by Bernanke. (Blackford 2019a,b,d; 2020; 2021) If Keynes is right (and I have yet to hear a *rational* explanation as to why Keynes is not right) Bernanke's suggested solution to this problem to the effect that "increasing U.S. national saving from its current low level would support productivity and wealth creation and help our society make better provision for the future" is not only utter nonsense, it is diametrically opposed to the solution implied by Keynes' general theory. And, yet, I am not aware of any systematic, wide-spread reaction against Bernanke's analysis of this problem within the discipline of economics in spite of the fact that *there is no rational explanation as to why an attempt to increase saving will have Bernanke's asserted effects, and there is every reason to believe that the real-world effects will be the exact opposite of those asserted by Bernanke*. (Blackford 2019a,b,d; 2020;



2021)

## X. Summary and Conclusion

It has been demonstrated that the rate of interest is a purely monetary phenomenon in Tsiang's Robertsonian model, determined solely by the supply and demand for the *stock* of money and that much of Robertson's and Tsiang's confusion with regard to Keynes' discussion of the way in which the rate of interest is determined can be resolved by expanding Keynes' money demand function as defined by Tsiang in (1) to include terms to account for the demands for money to finance financial transactions and the production of goods as given by (1d). It has been further demonstrated that Robertson's and Tsiang's method of analysis is that of comparative statics in that they, in the spirit of Walras, assumed that all of the endogenous variables in their analysis are determined simultaneously at the beginning of each period and then *describe* how the states of static equilibrium established at the beginning of each period change from one period to the next without explanation as to how these equilibriums are achieved. (cf., Kohn, pp. 861-5)

It is argued that herein lies the fundamental difference between Keynes' and Robertson's methods of analysis where Keynes' analysis is *causal and dynamic* in that Keynes identified those factors that *in themselves* determine each variable at each point in time and explained how those factors that determine each variable drive each variable *toward* its equilibrium value while Robertson's analysis along with that of his neoclassical followers is *descriptive and static* in that the static equilibrium values just suddenly appear out of nowhere each period in their Walrasian models as if by magic, and how those equilibrium values change from one period to the next is simply described without a rational explanation as to how or why they came into being in the first place. (Blackford 2019a,b,d; 2020; 2021)

If there is "strange logic" to be found in the LP/LF controversy that separated Robertson and Keynes it is to be found in the belief that it is possible to refute

Keynes' arguments as to how the rate of interest is determined at each point in time whether the system is in equilibrium or not by way of a comparative static analysis that simply assumes the system is always in equilibrium from one period to the next without explanation as to how these equilibriums are obtained. (Blackford 2019a,b,d; 2020)

Comparative static analysis can be an extremely valuable analytic tool in economics *when used in conjunction with the kind of causal, dynamic analysis employed by Keynes throughout *The General Theory* to explain how and why the static equilibrium values are obtained and change through time.* When it is not used in this way the result is the kind of arguments employed by Robertson in his controversy with Keynes, arguments that are, at best, semantic, (Keynes 1936, p. 7-9; 1933; Hawtrey 1933; Robertson 1933) and, at worst, border on ideological sophistry (Romer; Keen; Grieve; Syll; Davidson 2012)—arguments that lead to policies that create the kinds of economic, political, and social catastrophes that followed the Crash of 1929 and the Crash of 2008 (Blackford 2018; 2019b; 2020; 2021).

## List of Equations

### II. Deriving Robertson's LF Model

- (1)  $M_t^S = L(C_t^P + I_t^P, r_t, \pi_t, W_t, \dots)$
- (2)  $M_{t-1}^S = L(C_{t-1} + I_{t-1}, r_{t-1}, \pi_{t-1}, W_{t-1}, \dots)$
- (1a)  $M_t^S = L(C_t^P + I_t^P, r_{t-1}, \pi_{t-1}, W_{t-1}, \dots) + L_r(r_t - r_{t-1})$   
 $+ L_\pi(\pi_t - \pi_{t-1}) + L_w(W_t - W_{t-1})$   
*+ higher orders of differentials and derivatives*
- (3)  $L(C^P + I^P, r, \pi, W, \dots) = k(r, \pi, W, \dots)(C^P + I^P) + L^*(r, \pi, W, \dots)$
- (4)  $\Delta M_t^S = k(r_{t-1}, \pi_{t-1}, W_{t-1}, \dots)(C_t^P + I_t^P - C_{t-1} - I_{t-1}) + L_r \Delta r_t + L_\pi \Delta \pi_t$   
 $+ L_w \Delta W_t + \text{higher orders of differentials and derivatives}$
- (4a)  $\Delta M_t^S = k_{t-1} I_t^P - k_{t-1} (Y_{t-1} - C_t^P) + \Delta L_t^*$

### III. The True Nature of Tsiang's LF Model

- (4b)  $M_t^S - M_{t-1}^S = k_{t-1} I_t^P - k_{t-1} Y_{t-1} + k_{t-1} C_t^P + L_t^* - L_{t-1}^*$

$$(4c) \quad M_t^S - M_{t-1}^S = k_{t-1}(I_t^P + C_t^P) + L_t^* - (k_{t-1}Y_{t-1} + L_{t-1}^*)$$

$$(2a) \quad M_{t-1}^S = k_{t-1}(C_{t-1} + I_{t-1}) + L_{t-1}^* \\ = k_{t-1}Y_{t-1} + L_{t-1}^*$$

$$(4d) \quad M_t^S = k_{t-1}(I_t^P + C_t^P) + L_t^*$$

#### IV. Tsiang's LF Model versus Keynes' LP Model

$$(1b) \quad M_t^S = k_t(C_t^P + I_t^P) + L_t^*$$

#### V. Tsiang on an Increase in Thrift

$$(4e) \quad M_t^S = k_{t-1}(I_t^P + C_t^P + F_t^P) + L_t^*$$

$$(1c) \quad M_t^S = k_t^c C_t^P + k_t^i I_t^P + k_t^f F_t^P + L_t^*$$

#### VII. Keynes on the Demand for Money

$$(1d) \quad M_t^S = k_t^i I_t^P + k_t^y Y_t + (k_t^f F_t^P + k_t^c C_t^P) + L_t^*$$

#### IX. Robertson's and Tsiang's Confusion

$$(5) \quad M_{t-1}^S = L(C_{t-1}^P + I_{t-1}^P, r_{t-1}, \pi_{t-1}, W_{t-1}, \dots)$$

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