A Note on Liquidity Preference, Loanable Funds, and Marshall

by
George H. Blackford (1987)

Abstract

This note explains why the liquidity-preference theory of the rate of interest is compatible with the Marshallian supply and demand curve analysis and the loanable-funds theory is not. It is argued that the compatibility with Marshall makes causal analysis of dynamic behavior possible within the liquidity preference theory, and the lack of compatibility with Marshall limits the loanable funds theory to descriptive analysis static behavior.

Keynes argued that saving and investment, as they enter the loanable funds supply and demand functions, must be interpreted ex post and that the rate of interest cannot be "determined by saving and investment in the same way in which price is determined by supply and demand." [Keynes (February 1937, p. 249)] Ohlin (followed by a host of anti-Keynesians) argued that saving and investment, as they enter the loanable funds supply and demand functions, must be interpreted ex ante and that in order to reject the notion that the rate of interest is determined by the supply and demand for loanable funds (i.e., credit) one must "refute . . . the Marshallian supply and demand curve analysis in toto." [September 1937, p. 426] Over the years a consensus has emerged to the effect that Ohlin was right and Keynes was wrong in this regard. The purpose of this paper is to reexamine this consensus.

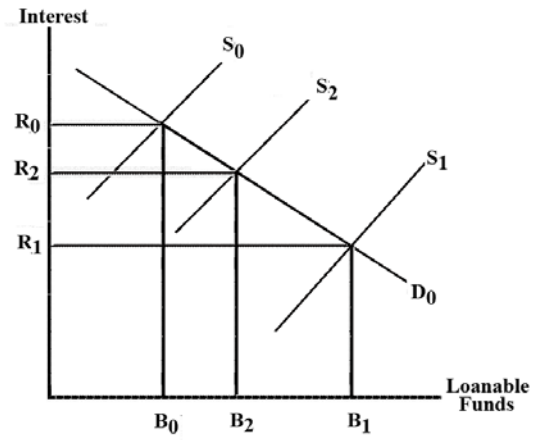
It is argued below that the loanable-funds theory put forth by Ohlin and subsequently accepted by Robertson, Tsiang, Horwich, Leijonhufvud, Patinkin, Kohn, Liang, and many others is, in fact, as Keynes suggested, "radically opposed" [Keynes (June 1937, p. 241)] to Keynes' liquidity-preference theory in that 1) Keynes' theory is consistent with the Marshallian paradigm of partial-equilibrium analysis and Ohlin's is not, and 2) Keynes' theory is dynamic in that it provides a consistent framework in which a causal explanation of dynamic behavior is possible while Ohlin's as embraced by the anti-

Keynesians (and some Keynesians alike) is static in that it can only be used to examine points of short-run equilibrium wherein *ex ante* saving and investment are equal and cannot be used to provide a *causal* explanation as to how these points of short-run equilibrium are attained.

I. Loanable Funds and an Increase in Thriftiness

That there are serious problems with the loanable-funds theory can be seen by examining the loanable funds market represented in Figure l. In this figure, S_0 represents the initial loanable funds supply curve, D_0 Represents the initial loanable funds demand curve, and R_0 and B_0 represent the initial (both market and equilibrium) rate of interest and flow of loanable funds, respectively. Consider a *ceteris paribus* increase in thriftiness (i.e., increase in the propensity to save) that is unaccompanied by a change in employment, output, and income or in the supply or demand for money. The effect of this increase on the credit market as predicted by the loanable-funds theory is indicated in Figure 1 by the increase in the supply of loanable funds from S_0 to S_1. What effect must this increase have on the rate of interest in this market?

Figure 1



With ordinary supply and demand curves we would expect this *ceteris paribus* increase in supply to create a surplus at the initial price and that competition among suppliers would cause the market price to fall until the new equilibrium price is reached at the intersection of the new supply and the original demand curves, that is, at R_1. However, this cannot be assumed with the loanable funds supply and demand curves.

a. Income and the Supply and Demand for Money Fixed

Producers in the consumption goods industries normally obtain the transactions balances demanded in order to finance their income expenditures through the sale of consumption goods. Since an increase in the propensity to save implies an equal decrease in the propensity to consume, producers in the consumption goods industries must, at the given level of income, find their money balances falling as a result of an increase in thriftiness. The only way in which these balances can be maintained (assuming an unchanged rate of expenditures) in this *ceteris paribus* situation is through an offsetting increase in the rate of borrowing by producers of consumption goods that is exactly equal to the increase in the rate of lending by savers. Since this additional borrowing is forced on producers of consumer goods *ex post* it cannot be accounted for in the *'ex ante'* formulation of the loanable funds demand function. As a result, if income and the supply and demand for money are in fact held constant in response to the increase in thriftiness in Figure l, then the loanable-funds theory must break down since, in this situation, there can be no forces operating on the market rate of interest to cause it to fall toward the equilibrium rate of interest (R_1) predicted by the loanable-funds theory.[1]

The failure of the rate of interest to adjust in this situation obviously arises from the

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[1] This is, of course, a restatement of Keynes' "old argument" of the *Treatise*. See Robertson (1936, p. 188), Keynes (1930, pp. 145-6; 1931, pp. 415-6) and also Keynes (1936, pp. 210-3; June 1937, pp. 251, 251n), Lerner (1938), and Robinson (pp.106-9). It is, undoubtedly, worth emphasizing that one cannot simply assume, within the context of the loanable-funds theory, that the loanable funds demand function has increased by the amount of the additional borrowing in this situation. To do this is, in effect, to include *ex post* investment in the demand for loanable funds, and *it is this inclusion by Keynes to which Ohlin (September 1937) and Robertson (September 1937) originally objected.* However, while Ohlin and Robertson objected to this assumption, neither explained how this *ceteris paribus* situation can be examined within the context of their *'ex ante'* formulation. In addition, Robertson (1936, p. 178; September 1937, p. 435n; 1940, p. 18n; 1958, pp. 68-9) accepted Keynes' conclusion that the rate of interest cannot fall in this situation. Unfortunately, Robertson failed to perceive the fact that Keynes' analysis implies that Ohlin's *ex ante* view of the loanable-funds theory is inconsistent with the Marshallian paradigm of partial-equilibrium analysis or to grasp the significance of this fact, namely, that *Ohlin's theory cannot explain the rate of interest when ex ante saving is not equal to ex ante investment*. Cf. Robertson (1933), Tsiang, Kohn, Hawtrey (p.704), Keynes (1936, pp. 78-9, 79n), Lerner, and Robinson in this regard.

requirement that income and the supply and demand for money be held constant. However, relaxing this requirement does not eliminate the fundamental problem with the loanable-funds theory.

b. Passive Dishoarding

If it is assumed that only income is given and that firms 'passively' dishoard by allowing their transactions balances to decline in response to the increase in thriftiness, then the increase in the willingness to lend on the part of savers will not be exactly offset by an increase in the willingness to borrow on the part of firms as in the above example, and the rate of interest must fall. However, the rate of interest need fall only while firms passively dishoard. Once firms attempt to prevent further reductions in their money balances by increasing their borrowing the fall in the rate of interest must cease since firms can prevent further reductions in their money balances in this *ceteris paribus* situation (i.e., given employment, output, and income) only by increasing their borrowing by an amount that, again, is exactly equal to the increased rate of lending by savers. Again, this additional borrowing is forced *ex post* and cannot be accounted for in the *'ex ante'* formulation of the loanable funds demand function.

In the meantime, the rate of interest need fall only sufficiently to induce other demanders of money to absorb the balances released by dishoarding firms, and there is no reason to believe that this will be accomplished at the equilibrium rate of interest predicted by the loanable-funds theory.[2] [Cf. Keynes (1931, pp. 417-8)] There simply exists no causal

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[2] Exactly what the equilibrium rate of interest predicted by the loanable-funds theory is in this situation is not clear. It would seem that the existence of passive dishoarding represents a decrease in the demand for money that should, is some sense, increase the supply of loanable funds and, thus, force the predicted equilibrium rate of interest below R_1. [Cf. Robertson (1940, pp. 2-3)] However, Tsiang (1980, pp. 475) argues that 'passive' actions of this sort cannot be thought of as affecting the demand for money in the loanable-funds theory (they must, of course, affect the demand for money in the liquidity-preference theory) which suggests that the predicted equilibrium rate of interest must remain unchanged at R_1. In either case, there is no reason to believe that, *ceteris paribus*, the new market rate of interest must go to the predicted rate whatever the

mechanism in the credit market by which, *given employment, output, and income* the rate of interest can necessarily be forced to adjust to equate the flow of *ex ante* saving and investment as is required at the intersection of the loanable funds market supply and demand curves. [3]

c. Changes in Income

Similarly, if it is assumed that the decrease in sales in the consumption goods industries has an effect on the expectations of firms that causes a reduction in employment, output, and, thus, income, then the demand for transactions balances on the part of firms must fall which, in turn, must reduce the willingness to borrow relative to the willingness to lend. The rate of interest must, of course, fall in this situation as firms reduce their demand for transactions balances. However, there is no reason to believe that this induced fall in the rate of interest must be to R_1 since the fall in income also must cause a fall in S_1, say, to S_2. This must increase the loanable funds equilibrium rate of interest from R_1 to R_2, and this increase must occur *before* the induced fall in the rate of interest can occur. Furthermore, even though S_1 falls to S_2 in this situation there is no reason to believe that the rate of interest must fall to R_2.

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predicted rate may be.

[3] This is implicitly, if not explicitly, recognized in the models of Robertson (1933), Tsiang, and Kohn in that both current period income and the rate of interest are assumed to adjust simultaneously each period both to clear the credit market and to equate current period *ex ante* saving and investment. Thus, an analysis of the rate of interest when *ex ante* saving and investment are not equal is impossible within the context of these models since their specification presupposes *ex ante* saving and investment are equal *a priori.* This was, of course, the source of Hawtrey's central criticism of Robertson's 1933 model:

[I]t is theoretically *possible* so to adjust prices that there is no change in stocks of goods. But why does Mr. Robertson persist in adopting this hypothesis? It is utterly out of accord with the facts of practical life. It implies that retail prices are exactly and instantaneously adjusted to any change in demand *every day*. The introduction of so extravagant an assumption places all his analysis on an abstract plane from which it cannot be redeemed till the assumption is modified. [Hawtrey (p.704)]

This criticism, of course, applies with equal force to the models of Tsiang and Kohn.

The problem is that if *ex ante* saving and investment are not equal at the existing rate of interest, then, in general, there must be borrowing or lending on the part of decision-making units that is forced *ex post* that is not accounted for in the *ex ante* formulation of the loanable funds supply and demand curves. As a result, the loanable-funds theory can be consistent with the *actual* behavior of decision-making units in the credit market if, and only if, *ex ante* saving and investment are equal. However, the supply and demand for loanable funds curves, in themselves, cannot tell us whether or not this condition is met. Thus, there is no reason to believe anything about the rate of interest in relation to these two curves since *there is simply not enough information in these two curves to tell us anything about the way in which the rate of interest is determined.*

II. Liquidity Preference and an Increase in Thriftiness

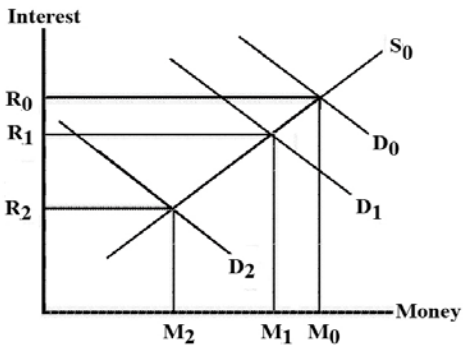
That Keynes' liquidity-preference theory is fundamentally different than the above can be seen by examining the effects of the above *ceteris paribus* increase in thriftiness on the rate of interest within the context of Keynes' theory. This situation is illustrated in Figure 2 where in this figure S_0 represents the initial position of the money supply schedule, D_0 represents the initial position of the money demand schedule, and R_0 and M_0 represent the initial (both market and equilibrium) rate of interest and stock of money in existence, respectively.

a. Income and the Supply and Demand for Money Fixed

Unlike the loanable-funds theory, there is no contradiction in the liquidity-preference theory with the fact that there can be no market forces operating on the rate of interest to cause it to change in response to an increase in thriftiness that is unaccompanied by a change in employment, output, and income and the supply or demand for money. Since there is no change in the supply or demand for money in this situation, the liquidity-preference theory predicts the rate of interest will not change.

b. Passive Dishoarding

Figure 2



In addition, the effects of 'passive' dishoarding, given income, are fully accounted for in the liquidity-preference theory. If the fall in the aggregate demand for money caused by passive dishoarding is indicated, for example, by the fall in D_0 to D_1 in Figure 2, then the fall in R_0 to R_1 indicates precisely the amount by which the rate of interest must fall in order to induce other demanders of money to absorb the balances released by dishoarding firms.

c. Changes in Income

Similarly, if the concomitant decrease in sales in the consumption goods industries has an effect on the expectations of firms that causes them to reduce employment, output, and/or prices, and, thus, income in such a way as to reduce the aggregate demand for money in the manner indicated by the fall from D_1 to D_2 in Figure 2, then the fall in R_1 to R_2 measures precisely the amount by which the rate of interest must fall in order to absorb the transactions balances freed by the given fall in income into speculative and 'finance' balances whether this fall in income is sufficient to equate *ex ante* saving and investment or not. [4]

In each of the situations examined above, the intersection of the supply and demand for money schedules yields the rate of interest at which the actual willingness to lend is equal to the actual willingness to borrow whether *ex ante* saving and investment are equal or

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[4] It should, perhaps, be noted that the issues raised by Keynes' concept of the demand for 'finance' and the possibility that the demand for money by households may be a function of the rate of saving are not considered here because they have been considered thoroughly elsewhere, and they have no bearing on the conclusions of this paper. See Blackford (1983; 1986).

not. Thus, unlike the loanable-funds theory, the liquidity-preference theory is consistent with the actual behavior of decision-making units in the credit market whether *ex ante* saving and investment are equal or not.

III. Liquidity Preference, Loanable Funds, and Marshall

The *sine qua non* of the Marshallian paradigm of partial-equilibrium analysis is the assumption that competition in the market must drive the market price to the equilibrium price as defined by the intersection of the market supply and demand curves. Given this assumption, it is possible to predict the effect of a *ceteris paribus* change in an exogenous variable (i.e., a variable which determines the position of the supply or demand curve) on the market price through an analysis of the effect of this change on the equilibrium price, and it is also possible to provide a *causal* explanation of the way in which the market price is determined in terms of the optimizing behavior of decision-making units.

a. Loanable Funds and Marshall

It is clear from the above analysis of the loanable funds supply and demand functions that Ohlin was mistaken in his assertion to the effect that to reject his view of the loanable-funds theory one must "refute also the Marshallian supply and demand curve analysis *in toto."* [Ohlin (September 1937, p. 426)] Since the loanable-funds theory can be consistent with the actual behavior of decision-making units in the credit market if, and only if, *ex ante* saving and investment are equal there is no reason to believe the equilibrium rate of interest predicted by the supply and demand for loanable funds curves must be the rate of interest which, *ceteris paribus*, competition in the market will actually establish. Thus, the loanable-funds theory can neither predict the effect of a *ceteris paribus* change in an exogenous variable on the market rate of interest nor provide a framework in which a *causal* explanation of the determination of the rate of interest is possible. It is clearly inconsistent with the Marshallian paradigm. [Cf. Lerner (1962)]

b. Liquidity Preference and Marshall

The situation is quite different with regard to the liquidity-preference theory. Not only is it possible to predict the effects of a *ceteris paribus* change in an exogenous variable on the rate of interest within the context of this theory, it is also possible to provide a causal explanation of the way in which the rate of interest is determined in terms of the optimizing behavior of decision-making units.

As was noted above, if, given employment, output, and income, firms respond to an increase in thriftiness by passively dishoarding, then the increase in the willingness to lend on the part of savers will not be exactly offset by an increase in the willingness to borrow on the part of firms. By the same token, if firms respond to an increase in thriftiness by reducing employment, and, thus, income, then the demand for transactions balances on the part of firms must fall which, in turn, must decrease the willingness to borrow relative to the willingness to lend. In both cases, the rate at which new debts are acquired must fall below the rate at which existing debts are retired forcing banks to either accept a lower rate of interest or accumulate excess reserves and/or members of the nonbank public (i.e., wealth holders) to either accept a lower rate of interest or accumulate money.

As banks/wealth holders attempt to equalize the marginal advantages of holding debt and excess reserves/money in this situation, competition for new loans and existing assets must cause the rate of interest to fall. To the extent that this fall increases the willingness of banks to hold excess reserves the stock of money supplied must fall as well, and to the extent that it increases the demands of the nonbank public for speculative balances and investment finance, [see Keynes (June 1937; December 1937; 1938) and Blackford (1983; 1986)] the stock of money demanded must increase. The rate of interest must continue to fall in this situation until the stock of money supplied is equal to the stock of

money demanded for at this point, and only at this point, l) the rate of interest equalizes the marginal advantages of holding debt and excess reserves/money, 2) the willingness to borrow is brought into equilibrium with the willingness to lend, and 3) there is no incentive for either banks or wealth holders to accept a lower rate of interest.[5]

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[5] Cf. Keynes:

Dr. Herbert Bab has suggested to me that one could regard the rate of interest as being determined by the interplay of the terms on which the public desires to become more or less liquid and those on which the banking system is ready to become more or less unliquid. This is, I think, an illuminating way of expressing the 1iquidity-theory of the rate of interest; but particularly so within the field of "finance." [Keynes (December 1937, p. 666)]

Cf. also Keynes (1936, Chapter 13, 15, 17; June 1937, p. 241; December 1937, p. 668; 1938, p. 319) and Blackford (1983; 1986). It should also be noted that it has been argued by both Keynesian (e.g., Hansen, 1951) and non-Keynesian (e.g., Horwich, Chapter X) alike that Keynes' Chapter 14 indeterminacy criticism of the classical theory of interest applies to his own theory of interest as well:

For the classical theory, as can be seen from the above quotations, assumes that it can then proceed to consider the effect on the rate of interest of (e.g.) a shift in the demand curve for capital, without abating or modifying its assumption as to the amount of the given income out of which the savings are to be made. The independent variables of the classical theory of the rate of interest are the demand curve for capital and the influence of the rate of interest on the amount saved out of a given income; and when (e.g.) the demand curve for capital shifts, the new rate of interest, according to this theory, is given by the point of intersection between the new demand curve for capital and the curve relating the rate of interest to the amounts which will be saved out of the given income. The classical theory of the rate of interest seems to suppose that, if the demand curve for capital shifts or if the curve relating the rate of interest to the amounts saved out of a given income shifts or if both these curves shift, the new rate of interest will be given by the point of intersection of the new positions of the two curves. But this is a nonsense theory. For the assumption that income is constant is inconsistent with the assumption that these two curves can shift independently of one another. If either of them shift, then, in general, income will change; with the result that the whole schematism based on the assumption of a given income breaks down. (Keynes, 1936, p. 179.)

It should be clear from the above that the notion that this argument applies to Keynes' theory arises from a failure to grasp the nature of Keynes' criticism. It is, of course, true that if either the savings or investment or the money supply or demand schedule shifts the resulting change in income will cause all of these schedules to shift (save, perhaps, the supply of money), but—*as Keynes makes perfectly clear in his discussion that follows this passage* [Keynes (1936, pp.179-83)]—this is not the essence of Keynes' criticism of the savings/investment theory.

Keynes demonstrated that it is nonsense to assume that, given employment, output, thus, income and the supply and demand for money, the rate of interest will adjust to equate *ex ante* saving and investment in response to a change in either the saving or the investment schedule because *there exists no causal mechanism whereby the rate of interest can perform this task*. Given the supply and demand for money, the rate of interest cannot change in response to a change in either saving or investment until employment, output, and income change, and a change in income must *cause* the savings schedule to shift and probably the investment schedule as well *before* the rate of interest can change.

This criticism most definitely does not apply to Keynes' liquidity-preference theory. There is nothing to prevent wealth holders from adjusting their portfolios of assets in such a way as to *cause* the rate of interest to adjust to equate the supply and demand for money (i.e., liquidity) in response to a change in one of these schedules given income, savings, investment, or any other flow variable, and as income changes and these schedules shift over time *there is nothing to prevent the rate of*

IV. Conclusion

It has been demonstrated above that while the liquidity-preference theory is consistent with the Marshallian Paradigm of partial-equilibrium analysis the loanable-funds theory is not. This demonstration brings out a fundamental difference between Keynes' theory of interest and the loanable-funds theory of Robertson and his fellow anti-Keynesians.

The fact that the liquidity-preference theory is consistent with the Marshallian paradigm makes it possible to identify those forces that operate directly and in themselves to determine the rate of interest at each point in time and to explain these forces in terms of the optimizing behavior of decision-making units. As a result, *it is possible to establish the temporal order in which events must occur within the context of the liquidity-preference theory* in that the exogenous variables that determine the positions of the supply and demand for money schedules must change, and decision-making units must react to these changes, *before* the rate of interest can change. This makes it possible to formulate a logically consistent, causal explanation as to how the rate of interest is determine in terms of the *actual* behavior of decision-making units as they react to changes in the system *over time* within the context of the liquidity-preference theory.

The fact that the loanable-funds theory is inconsistent with the Marshallian paradigm makes it impossible to identify those forces that operate directly and in themselves to determine the rate of interest at each point in time within the context of this theory or to explain these forces in terms of the optimizing behavior of decision-making units. As a result, a logically consistent, causal explanation as to how the rate of interest is determine in terms of the *actual* behavior of decision-making units as they react to changes in the

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interest from continuing to adjust in this way to equate the supply and demand for money. See Keynes (1936, pp. 178-81).

system *over time* is impossible within the context of the loanable-funds theory since this theory requires some kind of instantaneous adjustment or tatonnement/recontract assumption (to insure the equality of *ex ante* saving and investment) that is not require within the context of Keynes' liquidity-preference theory.

Thus, contrary to conventional wisdom [see, e.g., Robertson, Tsiang, Horwich, Leijonhufvud, Patinkin, Kohn, and Liang to name but a few], the fundamental difference between Keynes' liquidity-preference and the anti-Keynesian's loanable-funds theory is that Keynes' theory is dynamic in that it provides a consistent framework in which a *causal* explanation of *dynamic* behavior is possible while the anti-Keynesian's loanable-funds theory is static in that it can only be used to examine points of short-run equilibrium where *ex ante* saving and investment are equal and cannot be used to provide a causal explanation as to how these points of short-run equilibrium are attained.

The argument that Keynes' liquidity-preference theory is dynamic while the anti-Keynesian's loanable-funds theory is static may, at first, seem a bit surprising in light of the fact that the proponents of the loanable-funds theory have insisted from the beginning that the opposite is true, namely, that Keynes' theory is static and the loanable-funds theory is dynamic. However, the fact that the loanable-funds theory is static is clearly indicated by the fact that in all three major expositions of this theory [Robertson (1933), Tsiang, and Kohn] it is assumed that the economic system adjusts instantaneously each period to equate *ex ante* saving and investment. By the same token, the fact that Keynes' liquidity-preference theory is dynamic is clearly indicated by the fact that the *General Theory* is filled with dynamic analysis [see, e.g., Keynes (1936, pp. 27-32, 46-52, 71-2, 77-9, 117-9, 122-5, 147-64, 166-8, 173, 229-36, 245-54, 257-71, 292-4, 313-32)] and while this analysis depends on various *ceteris-paribus/mutatis-mutandis* assumptions, at no point is any kind of instantaneous adjustment or tatonnement/recontract assumption needed to justify Keynes' dynamic analysis.

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