

# Causality in Keynes' General Theory

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## Abstract

It is demonstrated that by adopting Marshall's *ceteris paribus*, partial-equilibrium methodology and rejecting the classical theory of interest in favor of his liquidity preference theory combined with his realization that it is expectations that determine employment, output, and income Keynes was able to establish *the temporal order in which events must occur*. It is argued that this makes *a logically consistent, causal analysis of dynamic behavior* possible within Keynes' general theory and that to reject Keynes' theory of interest is to reject any possibility of being able to provide *a logically consistent, causal analysis of dynamic behavior* in economics.

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## Causality in Keynes' General Theory

George H. Blackford

We begin by explaining why the fundamental difference between Keynes' and the classical theories of interest—namely, that Keynes' theory is *causal* and *dynamic* and the classical theory is descriptive and static—cannot be examined within the context of the Walrasian general equilibrium paradigm and can only be understood within the context of the Marshallian *ceteris paribus*, partial-equilibrium paradigm. We then examine Keynes' fundamental objection to the classical theory of interest—namely, that the classical theory of interest is inconsistent with the basic Marshallian principles of supply and demand—and how this objection led to Keynes' liquidity preference theory of interest. In the process it is demonstrated that Keynes' rejection of the classical theory in favor of his liquidity preference theory combined with his realization that expectations determine employment, output, and income makes it possible to establish *the temporal order in which events must occur* as the economic system changes *through time*. It is argued that the ability to establish the temporal order in which events must occur makes it possible to separate cause and effect within the context of Keynes' general theory and that the ability to separate cause and effect within the context of Keynes' general theory is the *sine qua non* of being able to provide a *logically consistent, causal analysis of the dynamic behavior* in Keynes' general theory and in eco-

nomics in general.<sup>1</sup>

### I. Walras and Causality

Keynes' liquidity-preference theory of interest is fundamentally different from the theory of interest envisioned in the classical tradition irrespective of whether the classical theory is formulated in terms of savings and investment or in terms of the supply and demand for loanable funds. In the classical tradition, the rate of interest is *assumed* to equate saving and investment in either case; in Keynes' theory, the rate of interest is assumed to equalize "the advantages of holding actual cash and a deferred claim on cash," (Keynes 1937, p. 245) that is, to equate the supply and demand for money (i.e., liquidity). The difference between the two theories becomes obvious when one compares the difference between the *causal* explanations of the way in which the two theories predict how a *change* in

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<sup>1</sup> I should, perhaps, note at the beginning that I am concerned here with what Hicks (1980, pp. 5-29) referred to as "sequential" causality as governed by Hume's (p. 45) principle that a cause must proceed its effect (i.e., "priority of time in the cause before the effect"). I would also note that I do not accept the notion that contemporaneous, permanencies, and reciprocal causalities as described by Hicks (1979, pp. 2-3, 18-19) are contradictions to Hume's principle. Even in these examples of causality the cause must exist *before* there can be an effect. I view the difference between these forms of causality with regard to the priority of time as being one of symantics, not of substance.

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saving will affect the rate of interest *through time*. While it may appear there are two paradigms in economics in which it is possible to make this comparison, namely, the Walrasian and the Marshallian, in fact, this comparison is only possible within the Marshallian paradigm.

The reason it is impossible to make this comparison within the Walrasian paradigm arises from the fact that the Walrasian budget constraint assumes the choices of decision-making units are made *simultaneously* at a point in time and are constrained by realized income. This may be the way in which *budgets* are created in the real world, but it is not the way in which *choices* are made. Real-world choices are made *sequentially through time*, not *simultaneously at a point in time*, and neither households nor firms are *constrained* in their choices by income, realized or otherwise, *at the point in time at which a choice must be made*. The real-world choices of decision-making units are constrained by a) the value and liquidity of their assets, b) the availability of sellers of goods and assets at various prices, c) the availability of buyers of goods and assets at various prices, and d) by their access to credit. (cf., Foley; May, p. 3; Lavoie and Godley; Clower; Blackford 1975; 1976) The *rate* at which decision-making units receive or earn income *at the point in time at which a choice must be made* has no way of affecting that choice other than through its effects on expectations as anyone who has purchased a home, a car, or has simply

walked the aisles of a supermarket knows implicitly, and as any business owner who has had to meet a payroll knows implicitly as well. Decision-making units have no alternative but to be guided by their *expectations* with regard to the income they *expect* to receive in the future and are constrained by the way in which the income they have received in the past has affected the stock of assets they hold in the present, as Keynes insisted (1936, pp. 46-7, 50), but at the point in time at which a choice must be made they are not *constrained* by the *rate* at which they actually receive or earn income in the present or in the future. (Hawtrey)

Even though the Walrasian budget constraint is called a “constraint” it does not actually constrain the choices of decision-making units. As a result, the only situation in which this constraint is relevant is when decision-making units and the system as a whole are in a state of static equilibrium. It has no relevance when the system is not in a state of static equilibrium, and even when the system is in a state of static equilibrium the Walrasian budget constraint is little more than an accounting identity that makes it possible, through aggregation, to eliminate a redundant equation in models that *assume* the system is over-determined. (Buiter; Blackford 1975; 1976; Clower; Foley; Jaffe; Lavoie and Godley; May)

There is no mystery about this. It is well known that by virtue of the simultaneity assumption implicit in the Walrasian budget constraint *a*

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*causal analysis of dynamic behavior is impossible in Walrasian models.* It is the mythical Walrasian *tâtonnement*/re-contract auctioneer that *causes* prices to change within the Walrasian paradigm, not decision-making units that actually exist in the real world. This does not mean Walrasian models are not useful or meaningful. They are, in fact, exceedingly useful and have proven to be invaluable in the analysis of economic problems *when employed in conjunction with Keynes' Marshallian methodology.* But it does mean that such models cannot be used *to establish the temporal order in which events must occur*—that is, the order in which their endogenous variables must change in response to a change in an exogenous variable—and, thus, *they cannot provide the basis for a causal analysis of dynamic behavior.*

### II. Marshall and Causality

It has been widely recognized that Marshall had a significant influence on the development of Keynes' thought (e.g., Johnson; Johnson and Johnson; Clower; Parrinello; Jensen; Leijonhufvud; Brothwell; Brady; Hayes; Lawlor; and de Vroey and Malgrange), but little if any attention has been paid to the relevance of the Marshallian *ceteris paribus*, partial-equilibrium methodology to the concept of *causality* emphasized by

Keynes throughout *The General Theory*.<sup>2</sup>

This methodology is generally explained in terms of a competitive market characterized by an upward sloping supply curve (which shows the quantities suppliers are *willing* to sell at various prices), a downward sloping demand curve (which shows the quantities demanders are *willing* to purchase at various prices), and an equilibrium price and quantity as determined by the intersection of the initial supply and demand curves. This schemata is then used to *explain* what will happen if there is a *ceteris paribus* change in either the supply or the demand curve. The result is either an excess supply or demand at the initial equilibrium price depending on the nature of the change, and it is argued that competition between suppliers and demanders will *cause* the price and the quantity produced for, and sold in the market to change in such a way as to move toward the new partial-equilibrium price and quantity as defined by the intersection of the new supply and demand curves. This movement is assumed to continue, *ceteris paribus*, until the new equilibrium price and quantity is achieved.

The significance of this kind of analysis is not simply that it makes it

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<sup>2</sup> Words that refer to causality (cause, causes, causing, causal, caused, causally, causative, causation, because) appear over 250 times in Keynes' *General Theory*.

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possible to explain and predict how a *ceteris paribus* change in supply or demand will affect the partial-equilibrium value of price and quantity in an isolated market. Its significance lies in the fact that it provides *an analytic framework* within which it is possible to identify and to isolate those factors—including the non-price factors that affect the willingness to buy and sell that determine the positions of the supply and demand curves—that *in themselves* have a *direct* effect on the determination of the quantity produced for, and traded in a given market and the price at which exchange takes place in the market at *any point in time* whether the market is in equilibrium or not.<sup>3</sup> This, in turn, makes it possible to examine systematically the *causal* interactions not only within a given market, but between the given market and other markets. That is, it provides an analytical framework in which it is possible to examine the *effects* of a change in a determinant of either supply or demand in a given market on the price and quantity produced and exchanged in that market *over time* beginning with an examination of the way in which price and quantities are affected in the given market. It is then possible to consider the *effects* of changes in the

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<sup>3</sup> For detailed comparison of the way in which the equilibrium is defined and achieved in the works of Marshall, Keynes, and neoclassical economists see Hayes (2006) and Kregel.



price and quantity exchanged in the given market on the behavior of participants in other markets and the feedback effects in the given market of the changes in prices and quantities exchanged in other markets. (Blackford 2019a)

And most important, this analytic framework makes it is possible to establish *the temporal order* in which these effects and feedback effects must occur which makes it possible to separate cause and effect.

The simple dynamics of supply and demand examined above assumes competitive markets, but even if the market is not competitive we can still use the Marshallian *ceteris paribus* methodology to examine the *cause* and *effect* implications of various kinds of non-competitive phenomena with which we are confronted as anyone who has taken an undergraduate intermediate microeconomics course or read Marshall's *Principles of Industry and Trade* well knows. And even when the assumptions underlying the analysis are not fully met, the overall contribution of the metaphorical application of this kind of analysis to the understanding of practical economic problems is such that it is an indispensable part of the economist's way of thinking. One might even say: "This is the nature of economic thinking." In any event, this was clearly the nature of Keynes' thinking as he wrote *The General Theory*:

The object of our analysis is, not to provide a machine, or method of blind manipulation, which will furnish an infallible answer, but to provide ourselves with an organized and orderly method of thinking out particular problems; and, after we have reached a provisional conclusion by isolating the complicating factors one by one, we then have to go back on ourselves and allow, as well as we can, for the probable interactions of the factors amongst themselves. This is the nature of economic thinking. Any other way of applying our formal principles of thought (without which, however, we shall be lost in the wood) will lead us into error. It is a great fault of symbolic pseudo-mathematical methods of formalizing a system of economic analysis...that they expressly assume strict independence between the factors involved and lose all their cogency and authority if this hypothesis is disallowed; whereas, in ordinary discourse, where we are not blindly manipulating but know all the time what we are doing and what the words mean, we can keep 'at the back of our heads' the necessary reserves and qualifications and the adjustments which we shall have to make later on, in a way in which we cannot keep complicated partial differentials 'at the back' of several pages of algebra which assume that they all vanish. (1936, pp. 297-8)

This is the methodology of Marshall, not Walras, and the methodology described in this passage and embodied in the simple example discussed above is the single most powerful analytical tool available to economists as a guide to understanding how the economic system actually works in the real world. There are two reasons for this:

1. The *ceteris paribus* assumption of the Marshallian, partial-equilibrium

- paradigm makes it possible to explain the determination of prices and quantities and what will *cause* prices and quantities to change in terms of the behavior of those decision-making units (e.g., buyers and sellers in the simple example discussed above) that actually have the *power* to determine and change prices and quantities bought and sold in markets.
2. There must be a change in the variables that affect the behavior of those decision-making units that actually have the *power* to determine and change prices and quantities bought and sold in markets (*i.e., supply or demand must change*) and decision-making units must respond to this change *before* a change in price or quantity can occur within the Marshallian paradigm. This is what makes it possible to establish *the temporal order in which events must occur* which makes it possible to separate *cause* and *effect* within the Marshallian paradigm.

It is these two characteristics of the Marshallian *ceteris paribus* methodology that make it possible to provide *a causal explanation of dynamic behavior* within the context of the Marshallian paradigm.

### **III. Loanable Funds and Marshall**

In writing *A Treatise on Money*, Keynes discovered that it is not enough to know what is happening to the *flows* of saving and investment

to know what is happening to the prices of assets. He also had to know what is happening to output and the supply and demand for the *stock* of money. The fact that *money or debt (i.e., borrowed money) is required as a medium of exchange in a monetary economy* implies that, given output and the supply and demand for money, an increase in the amount saved by savers must be exactly equal to the increase in the total value of assets willingly relinquished by investors. As a result, there is no way to explain why savers or investors would be willing to change the prices of assets in response to a change in either saving or investment if output and the supply and demand for money remained unchanged.

This is the essence of what Robertson (1940, p. 18n) dubbed Keynes' "old argument" in *A Treatise on Money* (pp. 130-1), and what this means is that given the *ceteris paribus* assumptions on which this argument is based Keynes could not use the Marshallian *ceteris paribus*, partial-equilibrium methodology to explain the determination of the prices of assets if he were to assume that the prices of assets are determined by savers and investors. Within the analytic framework developed by Keynes throughout *The General Theory*, this argument translates into the argument that, if the *flow* of income and the supply and demand for *stock* of money are assumed to be given, the Marshallian paradigm of supply and demand cannot be used to explain the way in which rates of interest (or

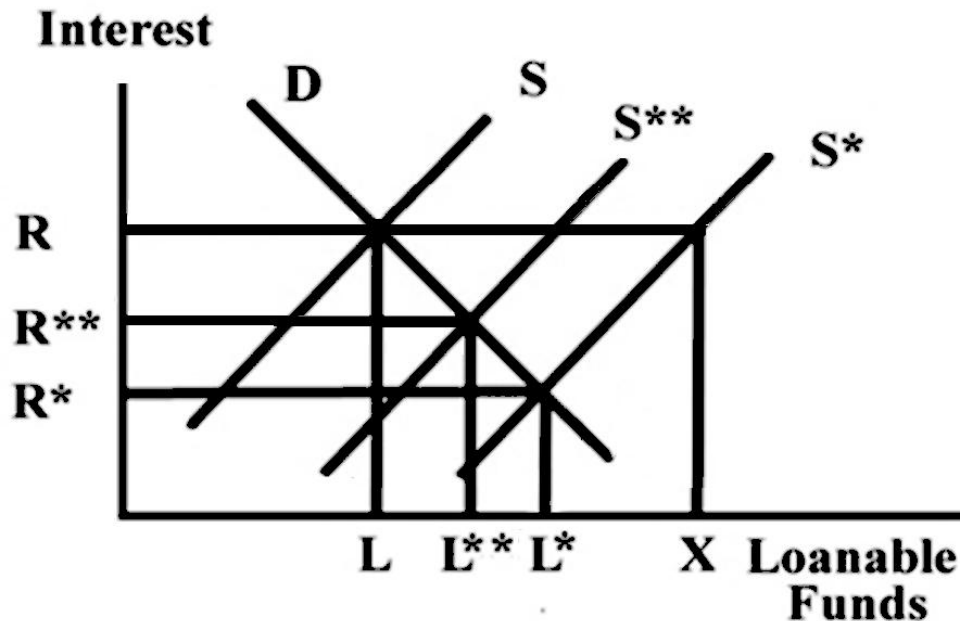
prices of assets) are determined if it is assumed that rates of interest (or prices of assets) is (are) determined by the flow of saving and investment. (Blackford 2019a) Nor can they be explained by the supply and demand for loanable funds if the supply and demand for loanable funds are defined in terms of the *flow* of saving and investment.

The inconsistency of the saving-investment/loanable-funds theory with the Marshallian paradigm of supply and demand implicit in Keynes' old argument can be explained by way of **Figure 1** which illustrates the direct effects of a *ceteris paribus* increase in the propensity to save on the rate of interest within the Marshallian paradigm. In this figure, **S** represents the initial position of the flow of loanable funds supply curve as determined by savers, and **D** represents the initial position of the flow of loanable funds demand curve as determined by investors; **R** and **L** denote the initial market and equilibrium rate of interest and the flow of loanable funds, respectively.

If it is assumed that a *ceteris paribus* increase in saving increases the supply of loanable funds by shifting **S** to **S\*** in **Figure 1** and leaves the demand for loanable funds unchanged at **D**, the new equilibrium rate of interest and flow of loanable funds predicted by these curves are given by **R\*** and **L\*** at the intersection of the initial loanable funds demand curve **D** and the new loanable funds supply curve **S\***. This will create a theoretical

excess supply of loanable funds at the initial rate of interest  $R$  equal to the difference between  $X$  and  $L$ . But even though the new equilibrium rate of interest is predicted to be at  $R^*$ , it cannot be assumed the suppliers and demanders of loanable funds will react to this excess supply at the initial rate of interest  $R$  in such a way as to drive the market rate of interest to  $R^*$ .

Figure 1: Loanable Funds and Marshall.



If the flow of income and the supply and demand for the stock of money are to remain unchanged in this *ceteris paribus* situation, producers of consumption goods will no longer be able to replenish the transactions and precautionary balances needed to maintain their scale of operations through sales. By virtue of Keynes' old argument this means they

must be willing to either borrow money or sell assets to obtain the *money* needed to meet their expenditure obligations at the same rate savers are willing to increase lending and purchase assets if the level of output and the supply and demand for money are to remain unchanged. Thus, savers will be able to lend all of the money they are *willing* to lend at the initial rate of interest and purchase all of the assets they are *willing* to purchase at the initial prices of assets, and investors will be able to borrow all of the money they are *willing* to borrow at the initial rate of interest and sell all of the assets they are *willing* to sell at the initial prices of assets. So long as the initial flow of income and the supply and demand for the stock of money are maintained in this situation, there is no way in which investors can force savers to accept lower rates of interest or higher prices of assets, and there is no way in which savers can force investors to accept higher rates of interest or lower prices of assets. Thus, there is no economic reason for the market rate of interest or the price of assets to change in the *ceteris paribus* situation illustrated in **Figure 1** since *there exist no market forces that can cause either rates of interest or prices of assets to change.*<sup>4</sup>

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<sup>4</sup> Since firms have a choice between borrowing money or selling assets to obtain the needed funds in this situation, and households have a choice between lending

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In addition, even if employment, output, and income fall, as both Robertson (1940, pp. 18-9) and Keynes (1938, p. 321) argued they must *eventually* fall in this situation, there is still no reason to believe this will *cause* the market rate of interest to fall to  $\mathbf{R}^*$ . Since income is one of the non-price factors that affect the willingness to lend that are subsumed in the functional form of the loanable funds supply curve, a change in income must cause a shift in the loanable funds supply curve and, thereby, change the equilibrium rate of interest given by the intersection of the loanable

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money and buying assets in order to dispose of their excess balances, to the extent the choices of households and firms are not compatible at the existing rate of interest and price of non-debt assets the rate of interest and the price of non-debt assets can be expected to change to make them compatible. It is important to note, however, that these are portfolio balance decisions that involve changes in the supplies and demands for money and non-debt assets, not saving and investment decisions. Since a) there is no *a priori* reason to believe that changes in saving or investment determine the nature of the incompatibility, b) the change in the rate of interest and price of assets can go either way depending on the nature of the incompatibility, and c) these kinds of changes in the rate of interest and price of assets can and do occur even when there is no change in saving or investment these changes cannot be explained in terms of changes in saving or investment; they must be explained in terms of changes in the supplies and demands for money and non-debt assets. See Keynes (1930, pp. 130-1) and Blackford (2019a; 2019c, p. 15-8).



funds supply and demand curves. If, for example, there is a fall in income that causes the loanable funds supply curve to fall from  $\mathbf{S}^*$  to  $\mathbf{S}^{**}$  in **Figure 1** the equilibrium rate of interest that is supposedly given by the intersection of the new loanable funds supply curve  $\mathbf{S}^{**}$  and the initial loanable funds demand curve  $\mathbf{D}$  must increase to  $\mathbf{R}^{**}$ . There is obviously no reason to expect the market rate of interest to fall to  $\mathbf{R}^*$  in this situation, *nor is there any reason to expect the market rate of interest to fall to the new theoretical equilibrium rate ostensibly given by  $\mathbf{R}^{**}$ .*

As employment and output fall in the consumption-goods industries the need to borrow money and sell assets to maintain transactions and precautionary balances at the initial rate of interest  $\mathbf{R}$  must also fall. At the same time, the fall in income must cause saving to fall at the initial rate of interest  $\mathbf{R}$  *by exactly the same amount as the need to borrow money and sell assets falls.* Why should we expect the rate of interest to change as saving, and, therefore, the amount of loanable funds supplied falls *by exactly the same amount* as the need to borrow money and sell assets and, therefore, the demand for loanable funds falls?

There is no reason to expect anything about *changes* in the market rate of interest with regard to the intersection of these two curves since by virtue of Keynes' old argument these two curves tell us nothing at all about the actual behavior of suppliers and demanders in the loanable funds mar-

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ket in response to a change in either saving or investment *in the absence of an explanation as to what is happening to the supply and demand for money*. The loanable funds theory simply assumes that the system will *somehow* adjust from  $\mathbf{R}$  to  $\mathbf{R}^*$  with no change in income such that  $\mathbf{S}^*$  does not change, or if income does change and  $\mathbf{S}^*$  shifts to  $\mathbf{S}^{**}$  the system will *somehow* end up at  $\mathbf{R}^{**}$ . This may make sense as a *description* of the change in the short-run static-equilibrium rate of interest without or with a negative interest rate sensitivity of the demand for money, (cf., Robertson 1940, pp. 18-9) given the assumptions, whatever these assumptions may be, on which these equilibrium positions are assumed to depend, but *this tells us nothing about how these equilibriums are obtained*. It is simply impossible to give a logically consistent, causal explanation of the dynamic behavior of the rate of interest based on the information contained in **Figure 1**. (cf., Bibow 2000a; 2001; Blackford 2019bcd; Hayes 2010)

The fundamental contradiction in the loanable funds theory with the Marshallian paradigm of supply and demand that we see in trying to analyze the dynamic behavior of the rate of interest in **Figure 1** arises from the very nature of the circular flow of the stock of money in sustaining the flows of income, credit, and expenditures in a monetary economy. Whenever decision-making units are unable to obtain the *money* needed to fi-

nance their desired transactions otherwise, they have no place to turn if they are to execute those transactions *in a monetary economy* except to the credit market or to the markets for assets in order to obtain the *money* needed to finance those transactions. As a result, prices of assets and rates of interest on loans and debts cannot change in response to a *ceteris paribus* increase in saving if income and the supply and demand for money are given.

#### **IV. Cause and Effect in Keynes' General Theory**

In his 1937 response to his critics Keynes explained the way in which he arrived at his liquidity preference theory of interest:

As I have said above, the initial novelty lies in my maintaining that it is not the rate of interest, but the level of incomes which ensures equality between saving and investment. The arguments which lead up to this initial conclusion are independent of my subsequent theory of the rate of interest, and in fact I reached it before I had reached the latter theory. But the result of it was to leave the rate of interest in the air. If the rate of interest is not determined by saving and investment in the same way in which price is determined by supply and demand, how is it determined? One naturally began by supposing that the rate of interest must be determined in some sense by productivity. . . . It was only when this line of approach led repeatedly to what seemed to be circular reasoning, that I hit on what I now think to be the true explanation. The resulting theory, whether right or wrong, is exceedingly simple—namely, that the rate of interest on a loan of given quality and maturity has to be established at the

level which, in the opinion of those who have the opportunity of choice—i.e. of wealth-holders—equalizes the attractions of holding idle cash and of holding the loan. (1937, p.250)

All that is necessary to understand what this means with regard to *causality* within Keynes' general theory is to follow *the causal chain of events* implied by Marshall's *ceteris paribus* methodology as the system adjusts *through time* to the increase in saving examined in **Figure 1**.

What is significant about the *ceteris paribus* increase in saving examined in this figure is that while there are no economic reasons for rates of interest or prices of assets to change in this situation, *there are economic reasons for employment, output, and income to change*. The accumulation of debt and depletion of marketable assets on the part of producers of consumption goods must eventually lead to a change in *expectations* with regard to the *profitability* of continuing to maintain their current scale of operations. This change in *expectations* must motivate producers in the consumption-goods industries to reduce employment and output.<sup>5</sup> The

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<sup>5</sup> If expectations donot change *before* employment output and income change there is no way to explain why firms are willing to sell at a loss today or reduce their current scale of operations if their expectations are unchanged to the effect that they can accumulate inventories and otherwise maintain their current scale of operations today and expect to sell at a profit tomorrow. See Keynes 1936 (pp. 46-55) and Blackford 2018 (pp. 18-33) and 2019d.

resulting fall in *income* can be expected to continue until the willingness to save is equal to the willingness to invest since it is at this point, and only at this point, that producers in the consumption-goods industries will be able to avoid the necessity of having to increase debt or sell assets in order to obtain the *money* needed to finance their scale of operations. (Blackford 2018, pp. 18-33; 2019cd; Keynes 1936, pp. 46-7, 50-5)

This means that in order to provide a *logically consistent, causal explanation* of the way in which a change in saving or investment affects the economic system *through time* that is consistent with Marshall's *ceteris paribus* methodology it must be assumed that income, *not the rate of interest*, is determined by saving and investment since income must change *before* the rate of interest can change in this *ceteris paribus* situation.

Furthermore, the fall in income that results from a change in expectations in response to an increase in saving must, in turn, cause a fall in the demand for money, and just as there are economic reasons for income to change in response to a *ceteris paribus* change in saving, *there are economic reasons for the rate of interest to change in response to a ceteris paribus fall in the demand for money*. Given the supply of money, a *ceteris paribus* fall in income must *cause* a fall in the demands for transactions and precautionary balances that increases the supply of what Keynes referred to as *speculative balances*, that is—*money balances decision-*

*making units have no use for other than to lend or to hold as an asset.* (Keynes 1936, p. 171; Blackford 2019c) What happens to the prices of non-debt assets in this situation will depend on the supplies and demands for non-debt assets (Keynes 1936, p. 186n; Blackford 2019a, pp. 16-21), but what happens to the rate of interest will depend crucially on what happens to the supply and demand for money.

To the extent the increase in the supply of speculative balances increases the willingness of wealth holders to purchase new and existing debt, competition for new and existing debt must, *ceteris paribus*, lead to a decrease in the rate of interest. As the resulting decrease in the rate of interest increases the capitalized value of existing non-debt assets and, thereby, lowers the prospective rates of return on non-debt assets (Fisher 1930, pp. 14-29; Blackford 2019a, pp. 16-21), members of the nonbank public (i.e., wealth holders) will be forced to either a) accumulate money balances for which they have no use other than to hold as an asset or b) accept lower rates of interest on the debt assets they choose to accumulate. At the same time, banks will be forced to either a) accumulate reserves relative to their other assets or b) accept lower rates of interest on the debt assets they choose to accumulate.

Keynes (1936, Chap. 13) argued that as rates of interest fall below the rates wealth-holders expect to be realized in the future, wealth holders will

be motivated to hold a larger portion of their wealth in the form of money (i.e., highly liquid resources) and a smaller portion in the form of debt in an attempt to minimize the risk of a capital loss on holdings of debt in the future. Thus, to the extent the resulting fall in rates of interest enhances the willingness of wealth holders to hold their wealth in the form of money—that is, to willingly accumulate speculative balances to hold as an asset—the quantity of money demanded must increase. And to the extent the resulting fall in rates of interest enhances the willingness of banks to accumulate reserves relative to their deposits the quantity of money supplied must fall. The fall in rates of interest can be expected to continue, *ceteris paribus*, in this situation until the quantity of money supplied is equal to the quantity of money demanded for it is at this point, and only at this point, that rates of interest will equalize the marginal advantage of wealth holders holding speculative balances as an asset or holding debt, and the marginal advantage of banks holding reserves or holding debt, and there is no economic reason for rates of interest or the stock of money to change.<sup>6</sup>

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<sup>6</sup> Keynes generally assumed the quantity of money to be exogenously determined by the monetary authorities in *The General Theory*, but in December of 1937 he noted that:

What this means is that in order to provide *a logically consistent, causal explanation* of the way in which a change in savings or investment affects the economic system *through time* that is consistent with Marshall's *ceteris paribus* methodology it not only must be assumed that income, not the rate of interest, is determined by savings and investment, *it must also be assumed that the rate of interest, not income, is determined*

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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 un-liquid. This is, I think, an illuminating way of expressing the liquidity-theory of the rate of interest; but particularly so within the field of 'finance.' (Dec. 1937, p.666)

See also Keynes (1936, Chaps. 13, 15, and 17; 1937a, p.241; 1937b, p.668; 1938, p. 319). The quantity of money is assumed to be endogenously determined by the interactions between demanders for money and banks given the actions of the central bank in the text above as explained in Blackford (2018, pp. 142-75; 2019c), but it can be assumed to be exogenous determined if one wishes or even that the quantity of money is determined by the financial system responding passively to the demand for money (Wray) without changing the fundamental conclusion of the argument, namely, that Keynes' assumption that the rate of interest is determined by the supply and demand for the *stock* of money (i.e., liquidity) makes it possible to establish the temporal order in which events must occur. See also Bibow (2000b; 2005; 2009, Chp. 5).



*by the supply and demand for money.*

This also means that the loanable funds view of causality as expressed by Robertson and his anti-Keynesian followers (Horwich, Kohn, Liang, Ohlin, Tsiang, and Leijonhufvud) can find no theoretical justification within the Marshallian paradigm of supply and demand. Robertson's (1940, pp. 18-9) *ad hoc* assertion that an increase in saving "lowers the rate of interest quite directly through swelling the money stream of demand for securities; and that this fall in the rate of interest increases the proportion of resources over which people wish to keep command in monetary form" has it backwards. Arguing that an increase in thriftiness "lowers the rate of interest quite directly" implies that the rate of interest can fall *before* there is a decrease in income and an increase in the supply of speculative balances in this *ceteris paribus* situation. This runs afoul of the *ante hoc, ergo propter hoc* fallacy. Such arguments only make sense to those who believe an *effect* (the fall in the rate of interest) can come *before* its *cause* (the increase in the supply of speculative balances). (cf., Hume)

Keynes' (1936, Chap. 3) realization that employment, output, and income are determined by expectations means that given the supply and demand for money the rate of interest cannot change in response to a *ceteris paribus* increase in saving until *after* there has been:

1. a change in expectations, that leads to a fall in employment, output,

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and income, that

2. decreases the demand for transactions and precautionary balances, that
3. increases the supply of speculative balances, that
4. forces wealth holders to choose between increasing their holdings of money as an asset or debt and banks to choose between increasing their holdings of reserves or debt.

This causal chain of events must occur *before* the rate of interest can fall in response to a *ceteris paribus* increase in saving in a monetary economy, that is—in an economy in which either money or debt (i.e., borrowed money) is required as a medium of exchange. The direction of causality runs from changes in saving and investment, to changes in expectations, to changes in income, to changes in the demand for transactions and precautionary balances, to changes in the supply of speculative balances, to changes in the rate of interest. In light of Keynes' old argument, it defies the laws of supply and demand (not to mention the laws of logic and reason) to argue that causality runs in the opposite direction from changes in the rate of interest to changes in the quantity of speculative balances demanded *before* there is an increase the supply of speculative balances (i.e., the supply of those balances that decision-making units have no use for other than to lend or hold as an asset) brought about by a fall in income

and the demand for transactions and precautionary balances in this *ceteris paribus* situation. (Blackford 2018, pp. 18-73; 2019d)

What this means is that it is impossible to provide a *logically consistent, causal explanation* of the way in which a change in saving or investment affects the economic system *through time* that does not fall prey to Robertson's *ante hoc, ergo propter hoc* fallacy if it is assumed that the rate of interest is determined by saving and investment. Nor is it possible to provide a *logically consistent, causal explanation* of the way in which a change in saving or investment affects the economic system *through time* if the rate of interest is assumed to be determined by the supply and demand for loanable funds if the supply and demand for loanable funds are defined in terms of the *flows* of saving and investment.<sup>7</sup> (see Blackford 2018, pp. 59-73; 2019acd)

### **V. Keynes' Indeterminacy Criticism**

The failure to understand the logical inconsistency of the classical saving-investment/loanable-funds theory with the basic principles of supply

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<sup>7</sup> It must be noted that the issue here is not simply a choice between "alternative hypotheses about the Marshallian 'law of motion'" as Leijonhufvud (2006, p. 71) has suggested. The issue here is the ability to separate *cause* and *effect*, that is, the ability to establish *the temporal order in which events occur*.

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and demand misled both Keynesians (e.g., Hansen 1951) and non-Keynesian (e.g., Horwich, Ch. X ) alike into believing that Keynes' (1936, p. 179) indeterminacy criticism of the classical theory of interest applies to Keynes' own theory as well.<sup>8</sup> It is, of course, true that if either the savings or investment curve shifts the resulting change in income will cause all of these curves to shift (save, perhaps, the supply of money) *over time*, but this is *not* the point of Keynes' criticism. The point of Keynes' criticism of the classical saving-investment/loanable-funds theory of interest is that "the assumption that income is constant is inconsistent with the assumption that these two curves can shift independently of one another," and Keynes' point is *behavioural*, not *definitional*.

As was indicated in the discussion of **Figure 1** above, the only way in which income can remain constant in the face of a *ceteris paribus* increase in the propensity to save is if the *willingness* of producers of consumption goods to borrow or sell assets increases in such a way as to make it possible for income to remain constant. But if the willingness to borrow or sell assets increases in this way there is no reason for the rate of interest or

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<sup>8</sup> See Klein (1966, Ch. IV) for an example of the kind of confusion embodied in the consensus with regard to this criticism and also Hansen's (1953) exposition of the Keynesian understanding of Keynes for an example of this confusion in the early 1950s.

prices of assets to change (other than by way of portfolio-balance effects which can go either way), and if the willingness to borrow or sell assets does not increase in this way *income must fall* “with the result that the whole schematism [of the classical theory] based on the assumption of a given income breaks down,” not only because income must change *before* the rate of interest can change, but because if income does change *the savings curve must shift* and the equilibrium rate of interest given by the intersection of the two curves must change *before* the market rate of interest can change. (cf., Nevin)

#### VI. Liquidity Preference and Marshall

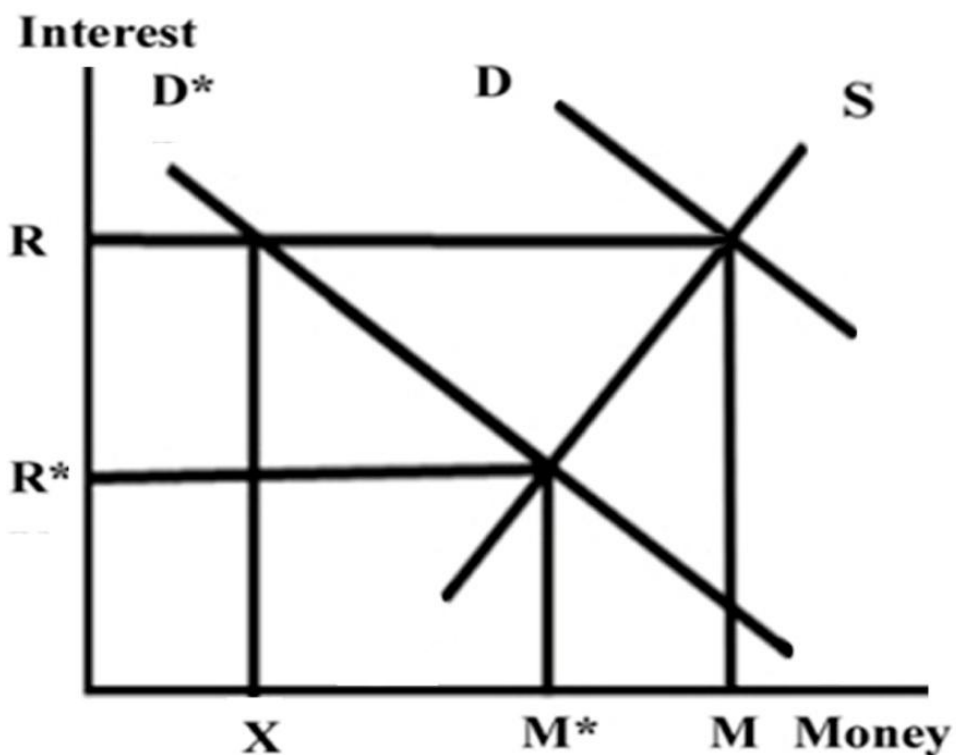
That Keynes' liquidity preference theory is fundamentally different than the above can be seen by examining the effects on the rate of interest of a *ceteris paribus* increase in thriftiness that takes the form of an increase in the demand for securities within the context of Keynes' liquidity preference theory. This situation is illustrated in **Figure 2** where **S** represents the initial position of the money supply curve and **D** the initial position of the money demand curve; **R** and **M** denote the initial market and equilibrium rate of interest and stock of money, respectively.

Since an increase in thriftiness cannot have a *direct* effect on the demand or supply of money in the liquidity preference theory other than by way of portfolio-balance effects there is no reason to assume the rate of

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interest will either increase or decrease as a direct result of the increase in thriftiness. It can, however, have an *indirect* effect on the rate of interest

**Figure 2: Liquidity Preference and Marshall.**



through its effects on expectations and income. To the extent the increase in thriftiness leads to a *subsequent* change in expectations that, in turn, causes a fall in employment, output, and *income* the demand for money must fall. This situation is represented in **Figure 2** by the shift in the demand for money curve from  $D$  to  $D^*$ . This fall in the demand for money must *cause* the equilibrium rate of interest and stock of money to fall from  $R$  and  $M$  to  $R^*$  and  $M^*$ . The result is an excess supply of money at the ini-

tial rate of interest  $\mathbf{R}$  equal to the difference between  $\mathbf{M}$  and  $\mathbf{X}$ , and, unlike the loanable funds theory, there are market forces that will *cause* the market rate of interest to fall to  $\mathbf{R}^*$  in this *ceteris paribus* situation.

As we have seen, the fall in income will reduce the demand for transactions and precautionary balances and, therefore, the willingness of decision-making units to secure or maintain these balances. Given the supply of money, this must increase the supply of speculative balances. As speculative balances accumulate, competition for new loans and existing debt must cause the rate of interest to fall until the stock of money supplied is equal to the stock of money demanded, for it is at this point  $\mathbf{M}^*$ , and only at this point, that the rate of interest  $\mathbf{R}^*$  equalizes the marginal advantages of wealth holders holding money/debt and banks holding reserves/debt, and there is no way for wealth holders to achieve a higher rate of interest and no reason for banks to accept a lower rate of interest. (Blackford 2019c)

Thus, it is possible to provide *a logically consistent, causal explanation of the dynamic behavior of the rate of interest* as it adjusts to this new point of equilibrium within the context of Keynes' liquidity preference theory by way of the supply and demand for money curves in **Figure 2**, but what is most important to observe about this example is:

1. The forces that are assumed to drive the market rate of interest from  $\mathbf{R}$

to  $R^*$  in **Figure 2** can be explained in terms of the choices of those decision-making units that actually have the *power* to affect changes in the rate of interest—that is, demanders and suppliers of money—as the existence of surpluses and shortages in the demand and supply of money affect their willingness and ability to borrow and lend money at the given rate of interest.

2. As the effects of the increase in the propensity to save work their way through the system, there is nothing to prevent demanders and suppliers of money from continuing to adjust the rate of interest *toward* the rate of interest that equates the supply and demand for money *at each point in time* as the system adjusts *through time* whether the rest of the system is in equilibrium or not.
3. There is no reason to believe the new state of short-run equilibrium that results from an increase in thriftiness will leave income unchanged.

This last point is of particular importance. If income changes in this situation we cannot know the position of the new short-run equilibrium supply of loanable funds curve  $S^{**}$  in **Figure 1** without first knowing the level of income that equates the willingness to save and invest, which is, of course, the basis of Keynes' indeterminacy criticism. Thus, we cannot know the new short-run equilibrium value of the rate of interest based on



the information contained in **Figure 1**. **Figure 1** can only tell us that the new equilibrium rate of interest will be  $R^*$  if income and, therefore, the supply of loanable funds does not change.

Robertson and his fellow anti-Keynesians dealt with this problem by assuming the equilibrium values of income and the rate of interest are determined simultaneously *within each period*. (Blackford 2019b) What they missed is that by denying the relevance of Keynes' old argument to their *intra-period* dynamic analysis as to how this equilibrium comes about they limited the relevance of their *intra-period* dynamic arguments to the imaginary world of the Walrasian auctioneer. (Blackford 2019a)

The same approach was adopted by the Keynesians as they followed Robertson's lead when they chose to adopt Hicks' (1937) IS/LM model which combines the supply and demand for money with saving and investment to arrive at the equilibrium rate of interest and level of income simultaneously. (Blackford 2019a) This simply begged the question of causality raised by Keynes since the Keynesians' method of approach was Walrasian and, therefore, descriptive and static. Even though some Keynesians defended the logic of Keynes' old argument in their debate with the anti-Keynesians, the vast majority failed to grasp the relevance of this logic to Keynes' *causal/dynamic* methodology and what this logic means with regard to the *irrelevance* of Walras' Law and the Walrasian

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auctioneer to the way in which the rate of interest is determined in Keynes' general theory. As a result, when the Keynesians adopted Hicks' IS/LM model they did not adopt Keynes' causal/dynamic methodology in spite of the fact that *there was nothing to prevent them from doing so* other than their fidelity to the *tâtonnement/recontract* methodology of Walras and their inability to grasp or to appreciate the fact that Marshall's causal/dynamic methodology is the *sine qua non* of causality in Keynes' general theory and in economics in general.

The position of the Keynesians in this regard was best summarized by Klein in 1966:

Keynes took income to be the important variable in the savings investment equation, and took interest to be the important variable in the liquidity preference equation. In the end result of the most general Keynesian system one cannot pick out cause and effect. The interest theory of this system is the solution to the entire set of equations which is based on the liquidity preference building block. (p. 97)

This completely misses the point of Keynes' liquidity preference theory, namely, that Keynes' theory makes possible what is impossible in the classical theory. Once it is realized that:

1. rates of interest and the prices of stocks of assets are determined by the supplies and demands for stocks of assets—including the stock

of money—in the markets for assets, and

2. the prices and quantities of flows of economic goods and resources are determined by the supplies and demands for flows of economic goods and resources in the markets for economic goods and resources,

it then becomes possible to establish the causal interactions within and between these two kinds of markets by way of the Marshallian paradigm. Keynes' Marshallian approach to the theories of consumption, investment, interest, and money when combined with his understanding of the way in which expectations affect economic behavior provides *an analytic framework* in which the interactions within and between these fundamentally different kinds of markets can be analyzed, understood, and explained within the context of a single, integrated paradigm in which *a logically consistent, causal analysis of dynamic behavior* is possible. This is the very essence of Keynes' general theory. (Blackford 2018; 2019a)

## **VII. Summary and Conclusion**

The fact that Keynes' liquidity preference theory is consistent with the Marshallian *ceteris paribus*, partial-equilibrium 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 those decision-making units that

actually have the *power* to determine the rate of interest *at each point in time*. As a result, a *logically consistent, causal explanation of the dynamic behavior of the rate of interest* is possible within the context of Keynes' general theory in that *it is possible to establish the temporal order in which events must occur* within this context—that is, the exogenous variables that determine the *positions* of the supply and demand for money curves must change, and decision-making units *must react* to these changes, *before* the rate of interest can change. This makes it possible to formulate logically consistent dynamic hypotheses within Keynes' theory as to how the market rate of interest is determined at each point in time in terms of the behavior of those decision-making units that actually have the *power* to determine the market rate of interest as the system evolves through time.

The fact that the loanable funds theory is inconsistent with the Marshallian *ceteris paribus*, partial-equilibrium paradigm means that it is impossible to identify those forces that operate *directly* and *in themselves* to determine the market rate of interest at any point in time by way of this theory or to explain these forces in terms of the optimizing behavior of decision-making units. As a result, it is *impossible* to provide a logically consistent, causal explanation of dynamic behavior within the context of the loanable funds theory since this theory requires some kind of instantane-

ous adjustment or *tâtonnement*/recontract assumption to achieve the equality of *ex ante* saving and investment that is not required within the context of Keynes' liquidity preference theory. Thus, contrary to conventional wisdom, Keynes' liquidity preference theory is causal and dynamic in that it provides a logically consistent analytic framework in which a *causal* explanation of *dynamic* behavior is possible while the 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 Robertson and his followers' loanable funds theory is static may seem 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 four major expositions of this theory (Robertson 1940; Horwich 1964; Tsiang 1956 and 1980; and Kohn 1981) it is assumed that the economic system adjusts instantaneously *each period* to equate *ex ante* saving and investment (Blackford 2019b). 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 (e.g., 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 tâtonnement/recontract assumption needed to justify Keynes' analysis or conclusions.*

Keynes demonstrated by way of his old argument that in a monetary economy, that is—in *an economy in which either money or debt (i.e., borrowed money) are required as a medium of exchange*—the entire Marshallian paradigm of supply and demand breaks down if it is assumed that income is determined by anything other than saving and investment or that the rate of interest is determined by anything other than the supply and demand for money. If it is assumed otherwise, the Marshallian implications with regard to *the temporal order in which events must occur* are inconsistent with the *reality* that economic transactions require money or the creation of debt as a medium of exchange. This means that anyone who argues otherwise must, to paraphrase Ohlin (1937, pp. 446), refute the Marshallian supply and demand curve analysis in *toto* and, in the process, *reject* any possibility of being able to provide *a logically consistent, causal analysis of dynamic behavior* in economics.

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