Causality in Economics and Keynes' General Theory

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Abstract

It is demonstrated that Keynes' liquidity preference theory of interest, combined with his realization that expectations determine employment, output, and income directly, makes it possible to establish the temporal order in which events must occur in a dynamic analysis of economic behavior. It is argued that the ability to establish the temporal order in which events must occur makes a logically consistent, causal analysis of dynamic behavior possible within the analytical framework developed by Keynes' throughout *The 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 in general.

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1. Introduction

In November of 1936, Dennis H. Robertson proclaimed: "Ultimately, therefore, it is not as a refutation of a common-sense account of events in terms of supply and demand for loanable funds, but as an alternative version of it, that Mr. Keynes' account as finally developed must be regarded". (p.183) The following February Keynes asked Robertson to provide "at least one reference as to where this common-sense account is to be found". (p. 210) Thus began the controversy that evolved into what became known as the liquidity-preference/loanable-funds (LP/LF) debate. This debate continued long after Keynes' death in 1946 when the torch was passed from Keynes to the Keynesians.

With the Keynesians in charge the debate took a decidedly Walrasian turn. While some Keynesians continued to defend Keynes' argument from *A Treatise on Money* to the effect that the rate of interest cannot change in response to a *ceteris paribus* change in saving or investment in the absence of a change in income, the vast majority fully embraced John R. Hicks' 1936 argument to the effect that it makes no difference which theory one accepts since the static equilibrium properties of the two theories are the same. The Keynesians embraced this argument in spite of the fact that Keynes had rejected it in June of 1937.

In response to the Keynesians, Robertson and his fellow anti-Keynesians continued to insist that Keynes was wrong in his rejection of the idea that the rate of interest is determined by saving and investment through the supply and demand for loanable funds irrespective of whether the equilibrium properties of the two theories are the same. The

position of the anti-Keynesians was best summarized by Harry Johnson in 1961:

> The liquidity preference-loanable funds debate turns on the question of whether the rate of interest is better regarded as equilibrating the flow of funds onto and off the market for securities or as equilibrating the demand for and supply of the stock of cash. The answer … seems to be that … it makes no difference … provided … one is concerned only with the determination of the equilibrium level of the rate of interest…. The two theories become different, however, when applied to dynamic analysis of disequilibrium situations.… In a dynamic context, the loanable-funds theory definitely makes more economic sense; and the sustained resistance of Keynesians to admitting it, evident most notably in the prolonged defense … of the proposition that an increase in the propensity to save lowers the interest rate only by reducing the level of income, is a credit to their ingenuity rather than their scientific spirit. (1961, pp. 6-7)

And so it went until Robertson died in 1963, a point in time at which the Keynesians so dominated the discipline of economics that there seemed to be no need for them to continue to respond to the anti-Keynesians on this issue, and the controversy just petered out.

Since it made no difference to the Keynesians which theory was assumed, the Keynesians walked away from the debate confident they were victorious as they concentrated on the equilibrium properties of their models. And since the anti-Keynesians were no longer rebuffed by the Keynesians the anti-Keynesians walked away equally confident of the victorious nature of their performance. Thus, the debate ended with both sides declaring victory. As a result, the issues of the Robertson/Keynes controversy have never been resolved, for while it is generally agreed that the two theories have identical static equilibrium properties, *there exists no consensus as to the nature of*

their dynamic properties.[1]

It is the purpose of this paper to provide a definitive explanation of the fundamental difference between Keynes' and the classical/neoclassical theories of interest as put forth by Dennis Robertson, John Hicks, Bertil Ohlin, Karl Brunner, Alvin Hansen, Sho-Chieh Tsiang, Harry Johnson, George Horwich, Lawrence Klein, Axel Leijonhufvud, Meir Kohn, Ming-Yih Liang, and William Baumol and Alan Blinder—namely, that Keynes' theory is *causal* and *dynamic* while the classical/neoclassical theory is *descriptive* and *static.*

We begin by examining the fundamental relationship between expectations and employment, output, and income in Keynes' general theory and why the fundamental difference between Keynes' and the classics cannot be examined within the context of the Walrasian paradigm and can only be understood by way of Marshall's *ceteris paribus* methodology. We then examine Keynes' fundamental objection to the classical theory of interest—namely, that the classical theory 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

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[1] It is beyond the scope of this paper to undertake a survey of the voluminous LP/LF literature. With regard to the consensus on the static equivalence and lack of consensus on the dynamic properties of the two theories see Ackley, Asimakopulos, Brunner, Davidson, Fellner and Somers, Fleisher and Kopecky, Horwich, Johnson, Keynes, Klein, Kohn, Lerner, Lloyd, Modigliani, Nevin, Ohlin, Patinkin, Robertson, Robinson, Rose, Terzi, Tily, and, Tsiang. For an analysis of the early literature, see Shackle, Johnson (1962), and Blackford (2020a). For an analysis of the later literature see Bibow (2009).

his realization that expectations determine employment, output, and income, make it possible to establish *the temporal order in which events must occur* as the economic system changes through time. It is argued that it is the ability to establish *the temporal order in which events must occur* that makes it possible to separate cause and effect within the context of Keynes' general theory and that this 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 economics in general.[2]

2. Expectations and Employment, Output, and Income

Keynes took great care in constructing his definition of income as being equal to sales less user cost, where user cost "is the measure of what has been sacrificed (one way or another) to produce [sales]". The fact that this "sacrifice" is, by definition, inversely related to changes in inventories and "maintenance and improvement" means that Keynes defined income as being equal to *the value of output produced*. (1936, pp. 52-5, 63)

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[2] 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. I view the difference between these forms of causality with regard to the priority of time as being one of semantics rather than substance; even in these examples of causality the cause must exist *before* there can be an effect. Nor am I concerned with Friedman's metaphorical 'as if' methodology (see Blackford 2016) or the metaphysical arguments of unworldly philosophers with regard to the existence of causality itself. It seems to me that the existence of causality itself is an empirical issue that is easily resolved by hitting oneself on head with a hammer to see if it *causes* pain.

The significance of this definition can be seen by examining Keynes' explanation of the way in which employment and output produced are determined in his general theory:

> All production is for the purpose of ultimately satisfying a consumer. Time usually elapses, however—and sometimes much time—between the incurring of costs by the producer (with the consumer in view) and the purchase of the output by the ultimate consumer. Meanwhile the entrepreneur ... has to form the best expectations[1] he can as to what the consumers will be prepared to pay when he is ready to supply them (directly or indirectly) after the elapse of what may be a lengthy period; and he has no choice but to be guided by these *expectations* [*emphasis* added], if he is to produce at all by processes which occupy time.
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> These expectations, *upon which business decisions depend* [*emphasis* added], fall into two groups.... The first type is concerned with the price which a manufacturer can expect to get for his "finished" output at the time when he commits himself to starting the process which will produce it.... The second type is concerned with what the entrepreneur can hope to earn in the shape of future returns if he purchases (or, perhaps, manufactures) "finished" output as an addition to his capital equipment. We may call the former *short-term expectation* and the latter *long-term expectation*.
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> Thus the behaviour of each individual firm in deciding its daily[1] output will be determined by its *short-term expectations*—expectations as to the cost of output on various possible scales and expectations as to the sale-proceeds of this output.... It is upon these various expectations that the amount of employment which the firms offer will depend. The *actually realised* results of the production and sale of output *will only be relevant to employment in so far as they cause a modification of subsequent expectations* [*emphasis* added]. Nor, on the other hand, are the original expectations relevant, which led the firm to acquire the capital equipment and the stock of intermediate products and half-finished materials with which it finds itself at the time when it has to decide the

next day's output. *Thus, on each and every occasion of such a decision, the decision will be made, with reference indeed to this equipment and stock, but in the light of the current expectations of prospective costs and sale-proceeds* [*emphasis* added]. (1936, pp.46-7)

Thus, Keynes argued that whenever production takes time, at each and every point in time at which a decision must be made concerning employment and output that decision must be made with reference to existing capital equipment on the basis of currently held *expectations* with regard to the costs to be paid and the proceeds to be received in the *future* while the output is being produced and when it is to be sold. The actual costs and proceeds that result from employment and output decisions cannot have a *direct* effect on these decisions, only an indirect effect, and, even then, only to the extent they have an effect on stocks of assets and *subsequent* expectations, that is, on the stocks of assets that exist and expectations formed *after* the expected costs and proceeds are (or are not) actually realized.[3] This argument has a clear implication with regard to income.

As was noted above, Keynes constructed his definition of income in such a way that income is equal to the *value* of output produced. Whenever production takes time in-

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[3] Keynes:

   It is evident from the above that the level of employment at any time depends, in a sense, not merely on the existing state of expectation but on the states of expectation which have existed over a certain past period. Nevertheless past expectations, which have not yet worked themselves out, are embodied in the to-day's capital equipment with reference to which the entrepreneur has to make to-day's decisions, and only influence his decisions in so far as they are so embodied. It follows, therefore, that, in spite of the above, *to-day's employment can be correctly described as being governed by to-day's expectations taken in conjunction with to-day's capital equipment* [*emphasis* added]. (1936, p. 50)

come, so defined, is earned (accrues) *before* the output produced in generating income is sold. This makes income a psychological phenomenon in Keynes' general theory, determined in the minds of decision-making units, and *this value cannot be separated from the expectations of these units.* The implication is that whenever production takes time, at each and every point in time at which a decision must be made concerning income, that decision must be made on the basis of currently held expectations just as the corresponding decisions concerning the employment and output that generates that income must be made on the basis of currently held expectations. (Keynes, 1936, chaps. 5-6)

The relationship between employment, output, income, and the entrepreneurs' *expectations* is stated explicitly by Keynes in his definition of effective demand:

> Furthermore, the *effective demand* is simply the aggregate income (or proceeds) which the entrepreneurs *expect* [*emphasis* added] to receive, inclusive of the incomes which they will hand on to the other factors of production, from the amount of current employment which they decide to give. The aggregate demand function relates various hypothetical quantities of employment to the proceeds which their outputs are *expected* [*emphasis* added] to yield; and the effective demand is the point on the aggregate demand function which becomes effective because, taken in conjunction with the conditions of supply, it corresponds to the level of employment which maximises the entrepreneur's *expectation* [*emphasis* added] of profit. (1936, p. 55)

Thus, effective demand as defined in terms of the *proceeds* (i.e., *Income*) producers *expect* to receive as they maximize their *expectation* of profits through the employment of resources is assumed to be the *direct* determinant of employment, output, and, hence, *income* in Keynes' general theory.

The importance of the psychological dependence of income on expectations is emphasized again by Keynes in his discussion of the relationship between *net* income and consumption. In defining *net* income Keynes adjusted gross income (i.e., the value of output produced) for all of those factors that are either "voluntary" (i.e., user cost) or if not voluntary at least "not unexpected" (i.e., supplementary costs), and he explicitly excluded consideration of those factors that are "unforeseen" (i.e., windfalls). (1936, p. 57-8) By defining net income in this way Keynes was able to draw a distinction (at least conceptually) between the way in which net income (defined in terms of *expected* and *not unexpected* results) and windfalls (defined in terms of *unexpected* results) affect decision-making behavior with regard to consumption. Thus, decisions concerning consumption in Keynes' general theory are made with reference to existing wealth (i.e., "capital account") on the basis of *currently held expectations* with regard to net income.[4] (Keynes, 1936, ch. 6)

The psychological dependence of decisions concerning employment, output, income, and consumption on *expectations* is of the utmost importance in Keynes' general theory for it is the psychological dependence of decisions on *expectations* that provides the distinction between the way in which expected and realized results affect decision-making behavior: Expectations affect *current* decisions *directly* whether they are realized in the future or not while realized results (including windfalls) only affect decisions

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[4] See Keynes (1936, ch. 6). It is worth noting the importance of expectation is implicit in Keynes' definition of income in the *Treatise* where income is assumed to include "normal remuneration" and exclude "profits" or "windfalls" (see Keynes, 1930, Chapter 9). The concept (as opposed to the definition) of income employed by Keynes in *The General Theory* is, to a large extent, the same as the concept of income employed by Keynes in the *Treatise*. See Keynes (1936, pp.77-8).

made *after* the results are (or are not) actually realized. This distinction lies at the very core of casualty in Keynes' general theory for, as we shall see, it determines *the temporal order in which events must occur* which 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.*

When income is defined as Keynes defined it the causally significant variable becomes the value of output produced *as perceived by decision-making units in light of their current expectations.* This means that, *given the level of employment and output,* income cannot change in the absence of a change in expectations in Keynes' general theory. [5]

3. 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 the neoclassical formulation 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

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[5] For a discussion of the way in which a failure to understand this aspect of Keynes definition of income has led to misguided economic policies see Blackford (2022a).

in which the two theories predict how a *change* in 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 *decisions* are made. Real-world decisions 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 decision 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 earn income *at the point in time at which a decision must be made* has no way of affecting that decision 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 and made an impulsive purchase 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 decision 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. (Blackford, 2019a; 2020a; 2022a; 2022b; Hawtrey)

Even though the Walrasian budget constraint is called a "constraint" it does not actually constrain the choices of decision-making units at any point in time. 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 static models that *assume* the system is over-determined. (Buiter; Blackford, 1975; 1976; 2022b; Clower; Foley; Jaffe; Lavoie and Godley; May; Keen)

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

4. Marshall and Causality

It has been widely recognized that Marshall had a significant influence on the development of Keynes' thought (e.g., Blackford, 2020a; 2021; 2022a; 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* methodology to the concept of *direct causality* emphasized by Keynes throughout *The General Theory*.[6]

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

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[6] Words that refer to causality (cause, causes, causing, causal, caused, causally, causative, causation) appear over 150 times in Keynes' *General Theory*, and, yet, an examination of the nature of causality in Keynes' general theory is, for the most part, conspicuously absent in the literature inspired by this work.

new equilibrium price and quantity is achieved.

The significance of this kind of analysis is not simply that it makes it 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.[7] 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 quantity are affected in the given market. It is then possible to consider the *effects* of changes in the price and quantity exchanged in the given market on the behavior of participants in other markets (e.g., substitutes and compliments) and the feedback effects in the given market of the changes in prices and quantities exchanged in other markets.

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[7] For a comparison of the way in which the equilibrium is defined and achieved in the works of Marshall, Keynes, and neoclassical economists see Hayes (2006), Keen, and Kregel.

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 as these interactions take place *through time.* (Blackford, 2021; 2022b)

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* or *Industry and Trade* well knows. The overall contribution 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. Too large a proportion of recent "mathematical" economics are mere concoctions, as imprecise as the initial assumptions they rest on, which allow the author to lose sight of the complexities and interdependencies of the real world in a maze of pretentious and unhelpful symbols. (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.[8] There are two reasons for this:

1. The *ceteris paribus* assumption of the Marshallian methodology 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 de-

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[8] It must be noted that Marshall's supply and demand methodology is also the single most powerful analytical tool available to *misrepresent* how the economic system works by those who use this tool in a fallacious manner. See Blackford (2020a; 2022b), Davidson, Keynes (1936, ch. 19), Kwak, Kuttner, Madrick, Smith, and Schlefer.

cision-making units must respond to this change *before* a change in price or quantity can occur within the Marshallian paradigm.

It is these two characteristics of the Marshallian *ceteris paribus* methodology that make it possible to establish *the temporal order in which events must occur* which, in turn, makes it possible to provide *a logically consistent, causal analysis of dynamic behavior* within the context of the Marshallian paradigm.

5. Loanable Funds and Marshall

In writing *A Treatise on Money*, Keynes (1930, pp. 130-1) 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*. What this means is that given the *ceteris paribus* assumptions on which this argument is based Keynes could not use the Marshallian *ceteris paribus* 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 non-debt assets) are determined if it is assumed that rates of interest (or prices of non-debt assets) are determined by the flow of saving and investment, 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 *flows* of saving and investment. (Keynes, 1936, pp. 173-4; Blackford, 2019a; 2020a, 2022)

If we think of the rate of interest in terms of "the complex of the various rates of interest current for different periods of time, i.e. for debts of different maturities" (Keynes, 1936, p. 167n) "and risks" (p. 28), the inconsistency of the 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 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 this figure 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***.

Figure 1: Loanable Funds and Marshall.
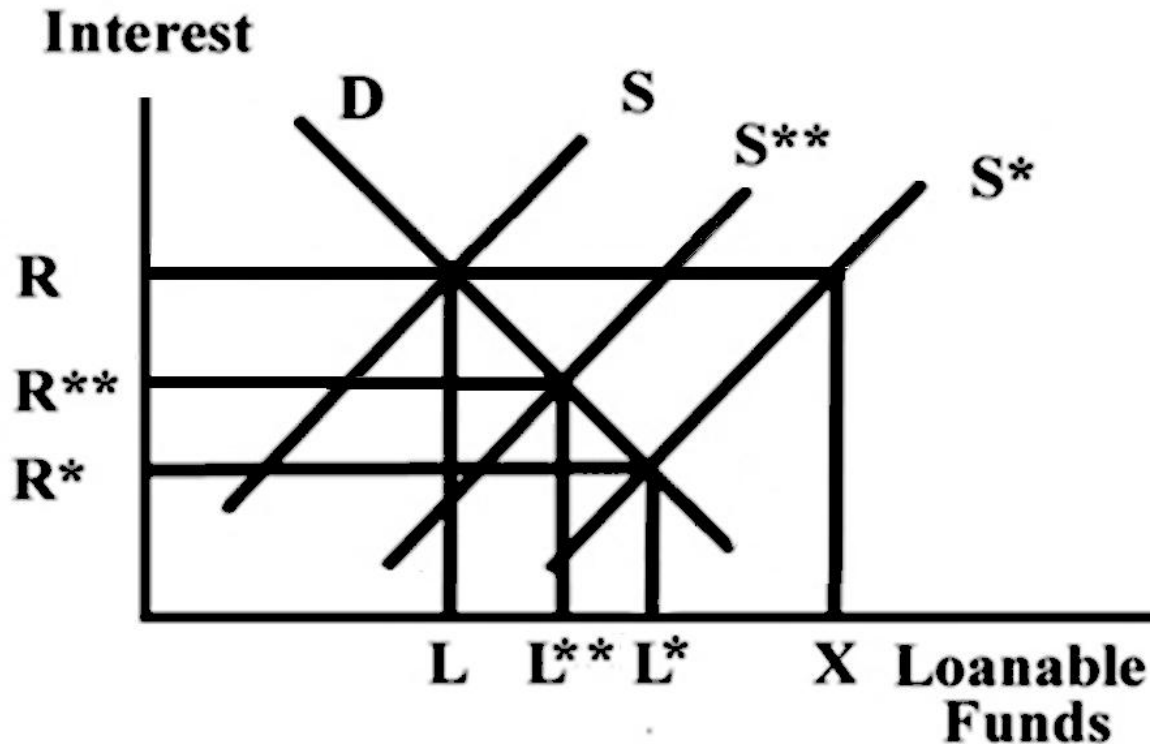
This will create a theoretical excess supply of loanable funds at the initial rate of interest **R** equal to the difference between **X** and **L**. But even though the new equilibrium rate of interest is predicted to be at **R***, it cannot be assumed the suppliers and demanders of loanable funds will 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***.

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 as these balances are expended over

time. By virtue of Keynes' old argument this means they must be willing to either borrow money or sell non-debt assets to obtain the *money* needed to meet their expenditure obligations at the same rate savers are willing to increase lending and purchase non-debt assets if the level of output and the supply and demand for money are to remain unchanged. Thus, in the absence of portfolio-balance effects, savers will be able to lend all of the money they are *willing* to lend at the initial (complex of the various) rate(s) of interest and purchase all of the non-debt assets they are *willing* to purchase at the initial (complex of the various) price(s) of non-debt assets, and investors will be able to borrow all of the money they are *willing* to borrow at the initial rate(s) of interest and sell all of the non-debt assets they are *willing* to sell at the initial price(s) of non-debt 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 a lower rate of interest or higher price of non-debt assets, and there is no way in which savers can force investors to accept a higher rate of interest or a lower price for non-debt assets. Thus, there is no reason for the market rate of interest or the price of non-debt assets to change in the *ceteris paribus* situation illustrated in **Figure 1** since *there exist no market forces that can cause either the rate of interest or price of non-debt assets to change in this situation other than portfolio-balance effects which can go either way*.[9]

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[9] Since firms have a choice between borrowing money or selling non-debt assets to obtain the needed funds in the face of an increase in thriftiness, and households have a choice between lending money and buying non-debt assets in order to dispose of their excess balances, to the extent the choices of households and firms are not compatible at the existing rates of interest

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

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and prices of non-debt assets rates of interest and prices of non-debt assets can be expected to change to make them compatible. If firms choose to borrow and households choose to purchase non-debt assets we would expect rates of interest and prices of non-debt assets to increase. If firms choose to sell non-debt assets and households choose to lend we would expect rates of interest and prices of non-debt assets to fall. 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 rates of interest and prices of non-debt assets can go either way depending on the nature of the incompatibility, and c) these kinds of changes in rates of interest and prices 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 assets.* See Keynes (1930, pp. 130-1; 1936, pp. 173-4, 166) and Blackford (2020a; 2022b).

*tensibly given by **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 **R** must also fall. At the same time, the fall in income must cause saving, and, therefore, the supply of loanable funds, to fall at the initial rate of interest **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 market 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* adjusts from **R** to **R*** with no change in income such that **S*** does not change, or if income does change and **S*** shifts to **S**** the system will *somehow* end up at **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 those 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 as the sys-

tem moves from one point of equilibrium to another *or even where the new equilibrium will be* based on the information contained in **Figure 1**. (Cf., Bibow, 2000a; 2001; Blackford, 2021; 2020a; 2022; Hayes, 2010; 2022b.)

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 finance 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 non-debt assets in order to obtain the *money* needed to finance those transactions. As a result, prices of non-debt assets and rates of interest on loans and debts cannot change in the absence of portfolio-balance effects in response to an increase in saving if income and the supply and demand for money are given.

6. 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 [*emphasis* added], 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)[10]

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.[11] The resulting fall in *income* can be

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[10] See also Keynes (1936, pp. 178-9, 181).

[11] If expectations do not 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 other-

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, 2022b; 2019a; 2020a; 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. In addition, it is the equilibrium level of income that is determined by saving and investment, not the equilibrium rate of interest, since it is the equilibrium level of income, not the equilibrium the rate of interest, that is determined at the intersection of the saving and investment schedules, and there are market forces that *ceteris paribus* can be expected to move the level of income to this equilibrium

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*.

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wise maintain their current scale of operations today and *expect* to sell at a profit tomorrow. See Keynes 1936 (pp. 46-55) and Blackford (2022a; 2020a).

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 hold as an asset*. (Keynes, 1936, p. 171; Blackford, 2019a) 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, 2022b), but what happens to the rate of interest will depend crucially on what happens to the supply and demand for money.[12]

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 assets and, thereby, lowers the prospective rates of return on assets (Fisher, 1930, pp. 14-29; Blackford, 2022b), 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 and returns on the debt and non-debt assets they choose to accumulate. At the same time, banks will be forced to either a) allow their debt assets to fall relative to their reserves or b) accept lower rates of interest on the debt assets they choose to hold.

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[12] It should, perhaps, be noted that he supply of speculative balances is not independent of the total stock of money and the other demands for money. It is simply the stock of money in existence less the amounts demanded for transactions, precaution, and finance purposes. See Blackford (2019b).

Keynes (1936, ch. 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 allow their debt assets to fall relative to their reserves 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.[13]

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[13] 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:

> 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.' (p.666) See also Keynes (1936, Chaps. 13, 15, and 17; 1937a, p.241; 1937b, p.668; 1938, p. 319).

In the text above the quantity of money is assumed to be endogenously determined by the in-

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 by the supply and demand for money* since it is the equilibrium rate of interest, not the equilibrium level of income, that is determined at the intersection of the supply and demand for money schedules, and there are market forces that *ceteris paribus* can be expected to move the rate of interest to this equilibrium.

This also means that the loanable funds view of causality as expressed by Robertson and his anti-Keynesian followers (Horwich, Johnson, Kohn, Liang, Ohlin, Tsiang, and Leijonhufvud) can find no theoretical justification within the Marshallian paradigm of supply and demand. Robertson's *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" (1940, pp. 18-9) has it backwards. Arguing that an increase in thriftiness "lowers the rate of interest quite directly"

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teractions between demanders for money and banks (given the actions of the central bank as explained in Blackford, 2019b; 2020a), 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 fundament 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, ch. 5).

implies that the rate of interest can fall *before* there is a decrease in income and an in-crease 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, chaps. 3, 5) realization that employment, output, and income are de-termined *directly* by expectations means that given the supply and demand for money the rate of interest cannot change (in the absence of portfolio-balance effects) in re-sponse to an increase in saving until *after* there has been:

1. a change in expectations, that

2. leads to a fall in employment, output, and income, that

3. decreases the demand for transactions and precautionary balances, that

4. increases the supply of speculative balances, that

5. forces wealth holders to choose between increasing their holdings of money as an as-set or debt and banks to choose between decreasing their holdings of debt relative to their reserves.

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 ex-change.* 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 transac-

tions 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 in this situation 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 brought about by a fall in income and the demand for transactions and precautionary balances. (Blackford, 2022; 2020a; 2022b and cf., Robertson, 1936.)

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. (Blackford, 2019a; 2020a)

7. 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 an increase in thriftiness that takes the form of an increase in the demand for securities (Robertson, 1936) 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 po-

sition of the money demand curve; **R** and **M** denote the initial market and equilibrium rate of interest and stock of money, respectively.

Figure 2: Liquidity Preference and Marshall.
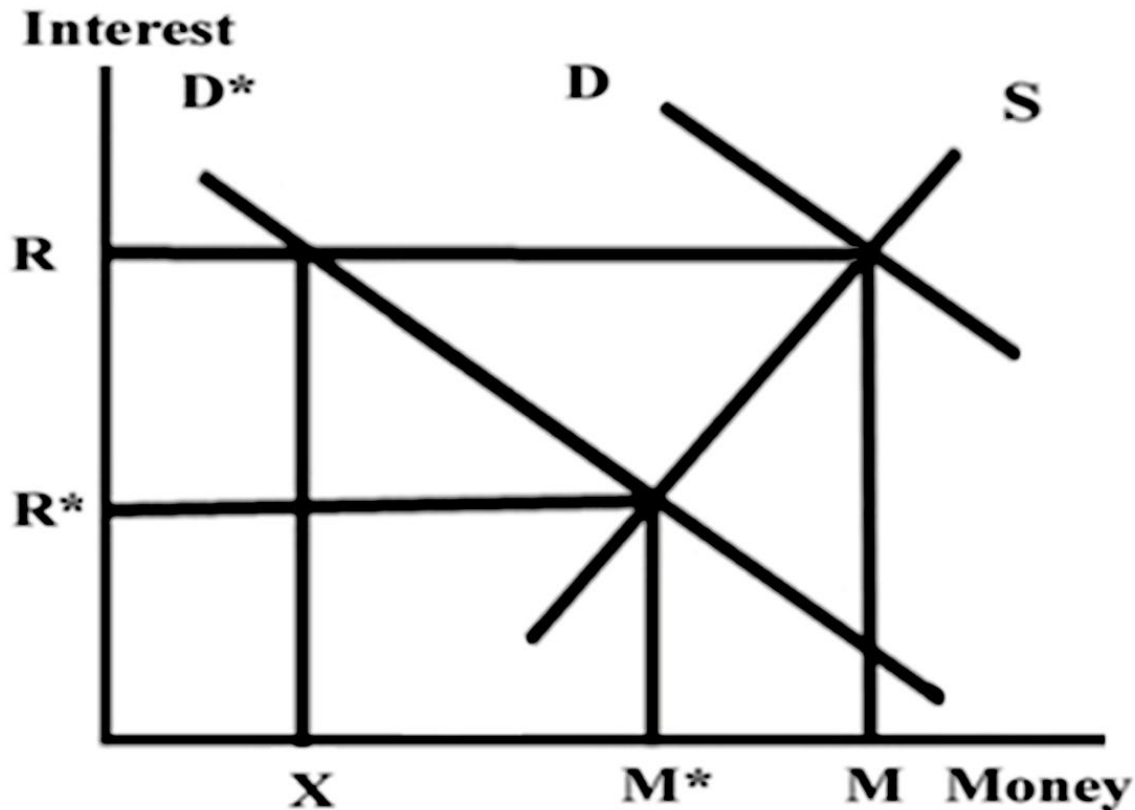
Since a *ceteris paribus* increase in thriftiness cannot have a *direct* effect on the demand or supply of money in the liquidity preference theory other than by way of portfolio-balance effects there is no reason to assume the rate of interest will either increase or decrease as a *direct* result of the increase in thriftiness. It can, however, have an *indirect* effect on the rate of interest through its effects on expectations and income. To the extent the increase in thriftiness leads to a 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 initial rate of interest **R** equal to the difference between **M** and **X**, and, unlike the loanable funds theory, there are market forces that will *cause* the market rate of interest to fall to **R*** in this *ceteris paribus* situation.

As we have seen, the fall in income will reduce the demand for transactions and pre-cautionary balances and, therefore, reduce 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. (Blackford, 2019a) 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 **M***, and only at this point, that the rate of interest **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 in this *ceteris paribus* situation.

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 **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. Thus, we cannot know the new short-run equilibrium value of the rate of interest based on the information contained in **Figure 1**; this figure 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. What they missed is that by denying the relevance of Keynes' old argument to their *intraperiod* dynamic analysis as to how this equilibrium comes about they limited the relevance of their *intraperiod* dynamic argu-

ments to the imaginary world of the Walrasian auctioneer. (Blackford, 2019b; 2020a)

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, 2022b) 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 auctioneer to the way in which the rate of interest is determined in Keynes' general theory and in the real world. 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*/re-contract 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.* (Grieve; Keen; Syll)

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. (See Blackford, 2022b and cf. Keynes, 1936, pp. 293-4)

8. Summary and Conclusion

The fact that Keynes' LP theory is consistent with the Marshallian *ceteris paribus* methodology 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 is possible to formulate *logically consistent* dynamic hypotheses within Keynes' general 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 LF theory is inconsistent with the Marshallian *ceteris paribus* methodology 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 instantaneous adjustment or *tâtonnement*/re-contract assumption to achieve 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, Keynes' liquidity preference theory is causal and dynamic in that it provides a logically consistent analytic framework in which a *causal* analysis of *dynamic* behavior

is possible, while the loanable funds theory is *descriptive* and *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.[14] 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; 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

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[14] The insistence that Keynes' theory is static is particularly incongruous in light of Keynes' explanations as to 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)

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 his analysis employs various *ceteris paribus/mutatis mutandis* assumptions, *at no point is any kind of instantaneous adjustment or tâtonnement/re-contract assumption needed to justify Keynes' analysis or conclusions.*

While Keynes' *General Theory* may be unintelligible from the perspective of Walras, it is very straightforward and easy to understand from the perspective of the basic principles of supply and demand put forth by Marshall that are explained in every first semester economics principles textbook.[15] Keynes' theory of interest makes causality possible in economics in the same way Newton's theory of gravitation makes causality possible in astrometry, and when economists ignore Keynes' theory of interest they can do

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[15] Keynes:

> 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).

See Blackford (2020a; 2022b) for an examination of the way in which Keynes' theory of interest makes a causal analyst of dynamic behavior possible within the context of his integration of monetary and value theory.

little more than add epicycles to their Ptolemaic (i.e., tâtonnement/re-contract) view of the economy. Keynes demonstrated, beginning with 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, p. 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.

Finally, I would note that by following the nineteenth century savings/investment paradigm classical economists naively managed to justify the economic policies that led to the Crash of 1929, the Great Depression of the 1930s, and the rise of populism that eventually culminated in World War II, and by clinging to this paradigm by way of the loanable-funds theory and ignoring the causal nature of Keynes' general theory neoclassical economists have also naively managed to justify the economic policies that led to the Crash of 2008, the Great Recession, and the rise of populism that we see throughout the world today. It is time for economists to start facing reality with regard to the real-world economics of Keynes before, in this nuclear age, it is too late. (Blackford 2018; 2020a; 2021; 2022a)

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