SOME NOTES ON THE THEORY OF MONEY*

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I

At its best the Quantity Theory of money is an identity condition of price formation. There is nothing in it that can strictly be called a theory. What is significant in it is not any particular conclusion which it draws from $MV = PT$ and the assumption of unit elasticity of demand for money but the general idea that the quantity of money has some relation with the price-level. If it should be an important tool of monetary analysis it will have to prove that there is such a definite and certain causal connexion between money and price-level that, *cet. par.*, price-level is determined by the volume of money. In that case the reasoning should run from the quantity of money to the price-level: the equation cannot be $MV = PT$ but $P = f(M)$.

As there can be no such definite relationship between money and price-level, Keynes reformulates the Quantity Theory thus: 'So long as there is unemployment, *employment* will change in the same proportion as the quantity of money; and when there is full employment, *prices* will change in the same proportion as the quantity of money.' Keynes himself confesses that his version assumes perfect elasticity of supply of output as long as there is unemployment and perfect inelasticity of supply as soon as full employment is reached. It also assumes that effective demand, *i.e.*, the demand for output as a whole, changes in the same proportion as the quantity of money. No doubt Keynes emphasises the part which the assumption of full employment plays in the Quantity Theory. But he has only dragged the assumptions lurking behind the traditional theory into the light of day. This is itself a great contribution to the theory of money though it is not the whole of Keynes’s work in connexion with monetary theory.

The most important idea which Keynes has sponsored is that the rate of interest, being a simple function of the money-price of a monetary asset, is not causally determined at the margin by supply and demand. It throws the hint that the rules of the game are the same for every asset: that the

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rules governing the prices of monetary assets must also apply to the
determination of the prices of other assets.

But why is it that no price is causally determined at the margin by
supply and demand? The reason is the continuous revaluation of the
price of existing assets by the market, due to changes in expectations.
An expectation links two points of time. And the importance attached to
money is the concrete expression of the prevailing state of expectation.
Thus, money enters into the economic scheme when it co-operates with
liquidity-preference in fixing the rate of interest.

A given amount of resources can initiate three kinds of activities: con-
sumption, investment, and the holding of resources in the form of money.
The price which equilibrates the desire to retain wealth in the form of money
with the available quantity of money is the rate of interest. The rate of
interest measures the marginal preference for the community as a whole
for holding money in hand over money for deferred delivery, i.e., it measures
the marginal efficiency of money measured in terms of itself as a unit. It
is the excess of liquidity-premium of money over its carrying-cost which is
negligible and its yield which is nil. It measures the premium which has to be
offered to induce people to hold their wealth in some form other than hoarded
money. The marginal efficiency of money in terms of itself is a
function of its quantity (though not of its quantity alone) just as in the case
of other assets. Its function is to modify the money-prices of other assets in
such a way as to equalise the attractions of holding them and of holding
money.²

The traditional theory of money regards the marginal efficiency of money
as wholly different in character from the marginal efficiency of other assets.
It postulates that the volume of money holdings is independent of its mar-
ginal efficiency—the rate of interest: i.e., it assumes that at least part of the
demand for money is independent of its price. This postulate cannot be true
except in “conditions of long-period equilibrium, ... a state of expectation
which is both definite and constant and has lasted long enough for there to
be no hangover from a previous state of expectation”.³ Because of this
special assumption regarding expectations the traditional theory is at home
only in a world of cash or perfect substitutes for cash, viz., securities. It
formulates an equilibrium based on the struggle to maximise the advantage
from the ownership of assets. This struggle on the part of the market

² Keynes, “Alternative Theories of the Rate of Interest,” EJ, 47/2, p. 250.
³ Keynes, “The Theory of the Rate of Interest,” in Lessons of Monetary Experience,
Ed. by Gayer, p. 149.
results in a tendency for assets to exchange at values proportionate to their marginal efficiency in terms of a common unit. Prices move until the marginal efficiency of money—the rate of interest—falls into line with the marginal efficiency of other assets as determined by other forces and as measured in the same unit.

The traditional theory postulates that the common value of the marginal efficiency of various assets is determined independently of money. In other words, every good is a substitute for money. This slightly complicates the explanation of the effects of changes in the quantity of money. The price of an asset is the ratio of its marginal utility to the marginal utility of money. An increase in the quantity of money will lower its marginal utility, though its liquidity remains intact—which is due to the perfect market and perfect divisibility which money enjoys. This fall in the marginal utility of money lowers the value of the denominator in the expression for price, and raises or lowers the value of the numerator according as the asset in question is a complement or substitute for money. An increase in the quantity of money will cause all asset prices to rise—those of complements most and those of substitutes least. In the limiting case, the price of a perfect substitute for money would remain unchanged because both the denominator and numerator of the expression for its price would fall in the same proportion.4

If the marginal efficiency of money in terms of itself is always equal to the marginal efficiency of other assets, irrespective of their prices, the price system becomes indeterminate in terms of money. What results is a perfectly determinate price system floating in a perfectly indeterminate ether of monetary values. This is why the Quantity Theory is only an identity condition. No doubt it produces a logically consistent price system: but it is indeterminate and non-persistent in time. Hence it has very little bearing on the difficult art of getting the best of both worlds—the world of money and the world of relative prices.

The root cause of the confusion lies in the bundle of assumptions which forms the backbone of the traditional theory. The traditional economic landscape is a jig-saw puzzle: perpetual full employment—zero elasticity of supply of output; no doubt and uncertainty—no opportunity for holding idle balances; price always settling at such a level that the whole stock of money is worth a rate of interest equal to the marginal efficiency of assets measured in terms of the same unit. Though the case for its realisation is

4 See, Hicks, Value and Capital, Chs. XII, XIII and XIX; Kafka, "Professor Hicks's Theory of Money Interest," AER, 31/2, p. 327; Robertson, Essays in Monetary Theory, p. 23.
powerful, the real world is not rigid and simple. The desire to hold liquid balances and the supply of output as a whole are elastic. That is why the march of events is a matter of degrees and elasticities: the 'normal' is an intermediate situation which is neither desperate nor satisfactory.

II

Every exchange value is relative and any computation and comparison of sets of value assumes a money of account into which relative values can be reduced. As people hold assets for security and safety, assets acquire monetary attributes in different degrees. In spite of the absence of legal tender, the assets so held will possess liquidity-premium, i.e., an amount reckoned in terms of the asset itself which people are ready to pay for the potential convenience or security given by this power of disposal (exclusive of yield or carrying-cost attaching to the asset).\(^5\) As all assets do not possess a uniform degree of liquidity, some assets will drive out others as liquid holdings, largely though not wholly. From the point of view of the theory of value, here is a monetary economy in all its essentials of which the existence of legal tender is not one. The quintessence of a monetary economy is the existence of at least one asset whose liquidity-premium is always in excess of its carrying-cost.\(^6\) It will become generally acceptable and acquire monetary attributes. It will modify the values which it is used to reckon and is money for the purposes of value theory. The theory of value in a capitalist economy—an economy in which people employ hired factors for future profit—cannot abstract from the misbehavior of money. It inevitably becomes the theory of money-prices.

Any asset which should be exchanged at all must live long enough to witness the completion of the transaction. It has a value to hold for future exchange—for precaution or for speculation. Every asset suffers wastage by the mere passage of time apart from any change in its relative price, irrespective of its being used to produce an yield or not. This is the cost of carrying the asset from one point of time to another and it is measured in terms of the asset itself. And money has no such carrying-cost attached to it. The power of disposal over an asset during a period of time offers a potential convenience or security. This power of disposal is unequal for assets of different kinds, though the assets themselves may be of equal initial value. It is a psychic fact: there is nothing to show for this at the end of the period in the form of output. Yet it is something for which everybody

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\(^5\) Keynes, *o.c.*, p. 294.

\(^6\) *ib.*, p. 239.
is ready to pay something or other. The amount, measured in terms of the asset itself, which people are ready to pay for the potential convenience or security given by this power of disposal (excluding the yield and/or carrying-cost attached to the asset) is its liquidity premium. The liquidity premium of money much exceeds its carrying-cost which is negligible and its yield which is zero. It is the money-price of money or the rate of interest. The carrying-cost of most assets exceeds their liquidity-premium which is often negligible, while their yield normally exceeds their carrying-cost.

Like exchange value itself, liquidity-premium is a strictly relative concept, representing “the net balance in the minds of wealth owners between the conflicting desires to retain purchasing-power (in any form) and to exercise it.”\(^7\) It is causally independent of its present exchange value, being determined by, and changing with, expectations. According to Marshall, the price of a pre-existing unit of an asset—held or exchanged—and that of a newly produced unit of the same asset must be equal: that is, both must be influenced by expectations.

The liquidity-premium attached to an asset with a high elasticity of supply or substitution, e.g., a short-lived asset, is negligible. An asset with low elasticity of substitution and with an inelastic supply has a high liquidity-premium. In the case of an asset with a low elasticity of supply and/or substitution expectations regarding the degree of liquidity-premium attaching to its existing stock (relatively to money) at any moment of time influence the supply and demand schedules for new units. These two schedules react at the margin so as to produce the required equality of price of the old and the new units. Which means that the liquidity-premium of an asset is assessed, like all values, relatively to other values—the liquidity-premium of other assets in general and money in particular. The value of liquidity-premium in relation to money influences the price of the asset. The degree of this influence is governed by the length of the asset’s life. The longer the life of an asset, the greater will be the influence of liquidity-premium as the price-determinant: the shorter the life of the asset the less will be its influence on price and it becomes the price-determinate.

A change in expectations may change the liquidity-premium of the existing stock of an asset (relatively to money or any other asset). If price changes in this way, then, in time, the length of which depends on the elasticity of supply, a compensating factor, due either to a change in production or to wear and tear of the asset, will come into play. This tendency on

the supply side is only a corrective to relative maladjustments between assets, whose price-level may fluctuate quite consistently with the equality of price of the old and new units. The compensating forces of demand and supply cannot fall in line with the changes in liquidity-premium attaching to the existing stock of an asset. Changes in supply take time. Even a simultaneous adjustment of supply cannot offset the effects of changes in expectations attaching to the existing stocks. This is the result of the fact that not all assets’ prices are equally affected by changes in expectations. The relative importance of the two factors varies according to the nature of the asset.

Thus, prices cannot be wholly and causally determined by supply and demand at the margin. Even perfect competition cannot guarantee an equality between selling price and money cost of production at the margin. This indeterminacy at the margin comes about through the continuous revaluation of the money-price of existing assets by the market, due to changes in psychological expectations—revaluations influenced it is true, by the marginal conditions of supply and demand for new similar assets, but never wholly governed or causally “determined” by them, save in the hypothetical limiting case of assets of infinitely high elasticity of supply or of substitution.

Marshallian price theory runs in terms of the conditions of supply and demand at the margin. Its basic assumption, viz., that they determine the conditions of exchange of the pre-existing units of the asset, overlooks the variable factor—the price-level (or the complex of relevant price-levels)—which is common both to forces of demand and supply. There is no reason why the new units of an asset should affect the prices of the existing units. This is because the actual price of an asset is quite indeterminate unless the money-price of at least one asset is given, i.e., unless there is a convention of stability. A theory of value which does not explicitly assume a convention of stability conceals one implicitly. In spite of the convention of stability the actual price of an asset is indeterminate to the extent to which it is influenced by unknown changes in liquidity-preferences. If there is a change in the liquidity-premium of an asset, the resulting price-change can be causally distinguished from the price-change brought about by a change in expectations of profitability. The conditions of supply and demand of new units of the asset act and react

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8 More on this problem in Kaldor, “Speculation and Economic Stability, and the discussion on it,” RES, 7/1 and 7/3.

9 Townshend, l.c., p. 165.
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through the system of changing price-levels: their effect on expectations will be such that the exchange value of the pre-existing units will be equal to that of the new units. In other words, what rendered money powerless in the traditional theory of value is the parrot-complex of the economists: their conviction that what really matters is relative price and money can go hang.

Traditional economic thought is stratified in theoretical layers of increasing abstraction. The impressiveness of the traditional value theory is strengthened by the realistic yet non-monetary picture of the world which it draws. Most of the non-monetary assets have so little liquidity-premium relatively to money and monetary assets that their liquidity-premium makes no difference in practice. When a break is effected with the tradition of abstracting from the behavior or misbehavior of money, with due reverence to its great torch-bearers, the theory of value can be extended to include the value of monetary assets. Until Keynes so generalised the traditional theory as to take into account liquidity-premium, a satisfactory theory of the price of monetary assets—the rate of interest—could not be built. Keynes’s generalisation of Marshallian theory takes into account the effects of liquidity-premium on the price of an asset. It explains the effect on exchange value of monetary phenomena which are always present in a capitalist economy. The difference between the Keynesian and traditional theories is most important in the case of monetary assets, i.e., long-period assets to the determination of the price of which the traditional theory is hardly applicable at all. It is considerable in the case of durable assets with low elasticities of supply and substitution. It is negligible in the case of short-lived assets with very high elasticities of substitution and supply.

When liquidity-premium makes its debut in the traditional theory, its chief defect will be overcome. Undoubtedly some assets have little liquidity-premium with no significant effect on their prices. But variations in the liquidity-premium of money will affect the conditions of production of new units of every asset—Marshall’s ‘supply side’. Another reform of Keynes is that he sets a new convention of stability. Marshall took money to be the convention of stability. This evaded the problem of liquidity-premium. Keynes adopts money-wage (the money-price of labor) as the convention of stability. In fact, money-wage is the best convention of stability as there is maximum resistance to any change in the money-wage. As long as the employers cannot own laborers as their galley-slaves labor acquires no liquidity-premium. Hence the money-value of labor is undisturbed by psychological changes represented by fluctuations in liquidity-premium.
III

Propensity to hoard or liquidity-preference demands a slight change in the application of the supply-and-demand apparatus to the theory of money. Money is an asset of which large stocks are continuously in existence. In the supply-and-demand analysis of an ordinary good, supply is a flow of output and demand is a flow of purchasing power (usually consumers'). Both supply and demand are functions of price and their equality determines the equilibrium and the equilibrium level of output. This approach is irreproachable in the case of a good which cannot be stored up or the stocks of which are small and independent of price. When the stock of the good is a function of price and is large relatively to current additions to it, the current supply of the good will no longer be equal to the current additions to the existing stock. It will temporarily decrease by an increase or temporarily increase by a decrease, of stocks. This is the case with money. Hoarding may become so important relatively to current additions to the stock of money that the short-period theory of price may become incorrect, if not misleading.

Liquidity-preference is a very complicated function of the money-price of money and it involves derivatives with respect of time and relative prices at different points of time. What follows is couched in terms of the rate of interest, which is a special case of the general theory of pricing. It assumes that the form of liquidity-function is precisely the same as an ordinary demand function, i.e., liquidity-preference is a decreasing function of the rate of interest.\(^{10}\) It starts from a situation in which the rate of interest equates the current addition to money stock with the current demand.\(^{11}\)

In the absence of monetary stocks not equated with current demand, a change in demand would immediately change the rate of interest. Current supply would change and a fresh equilibrium position would come into being representing the new point of intersection of the curves of current demand and current supply for money. When stocks not equated with current demand by interest exist, the establishment of the new equilibrium position will be obstructed by the adjustment of stocks to the new rate of interest, which is given by the change in current demand. A decreased current demand for money will be temporarily offset by the demand of hoarders who want to increase their hoards as interest falls. This will check the fall in the rate of interest and the resulting adjustment in current supply. Likewise,

\(^{10}\) For evidence supporting this assumption see Brown, "The Liquidity-Preference Schedules of the London Clearing Banks," *OEP*, 1, pp. 49 ff.

\(^{11}\) Hayes, "Hoarding and Competitive Equilibrium," *AER*, 28/1, pp. 89 ff.
an increased current demand will be temporarily met by dishoarding and this impedes the rise in interest and an increase of current supply. Hence, the existence of hoards sets a limit to the rate at which interest can change and this limit depends on the size of hoards and their interest-elasticity.

To every change in the rate of interest there corresponds a quantity of hoards, which will be held or released before the new rate of interest comes into play. Given the change in the rate of interest, the quantity of hoarding or dishoarding will directly vary with the elasticity of demand for hoards and with the size of the total quantity of hoards. The length of the time required for adjustment (i.e., the establishment of new equilibrium) will depend on the quantity of hoards relatively to the difference between the current supply of money and the increased current demand for money which is not immediately closed by the necessary change in interest. This is because hoards can be released or accumulated only through this gap between current supply and current demand. If it is very large, say, because hoards are very large, then the adjustment of interest will be so slow that the influence on interest of changes in hoarding or dishoarding is negligible in the short-period. Then it will be correct to say that the rate of interest does not depend on the quantity of hoards and that it is determined by the point of intersection of the curves of current demand and current supply for money.

Sometimes the existence of hoards keeps the rate of interest temporarily at a level where current demand and current supply of money are not equal. They will then be equated by a change in the level of income. The way in which this takes place is described by the theory of the Multiplier. Any difference between current demand and current supply of money for any firm produces a similar but opposite change in the rest of the economy. This will frustrate the expectations of that firm and induce it to change its current demand for money and with it the current supply of money which it pays out to other firms. This process is cumulative and continues as long as the disequilibrium in the first firm persists, i.e., until current demand for and the current supply of money are equated in that firm. This dogged persistence of disequilibrium is due partly to a change in money-income (i.e., current supply of money) and partly to the change in the rate of interest—to the extent to which hoards have adjusted themselves in the meanwhile.

This is a generalisation of Keynes's theory of interest. When there are hoards besides current supply of money, the rate of interest is an index of

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their relative prices which is a function of their relative quantities. It is a function of the hoards relatively to the current supply of money. The rate of interest will rise equally whether the volume of hoards is increased relatively to the current addition to the stock of money or the current addition to the stock of money is diminished relatively to that of hoards. For the Keynesian short-period (during which changes in expectations are negligible, if not absent), it is better to regard the rate of interest as a function of the current supply of money simply because a change in current supply is easily conceivable within the short run, while a significant change in the volume of hoards is impossible without a definite change in expectations.

IV

It may be a matter of surprise that the much-debated elasticity of demand for money is (perhaps?) the only link that connects the traditional and Keynesian theories of money.

The demand for money cannot be so easily dismissed by a unit elasticity as traditional theory seems to assume. It has two elasticities: an interest-elasticity which is negative and an income-elasticity which is positive. These two elasticities fashion the relation of the rate of interest to changes in the marginal-efficiency schedule and in the propensity to consume. Any relation of the rate of interest to the propensity to consume and marginal-efficiency schedule is due to the influence which any change in income brought about by them exerts on liquidity-preference. The greater the income-elasticity of demand for money the more the liquidity-preference curve shifts when income changes, the greater is the influence of the rate of interest. This shift of the liquidity-preference curve changes the demand for money corresponding to any given rate of interest. When there is a fixed supply of money, the rate of interest must change so as to equate the demand for money with the available supply. ‘A rise in the rate of interest is a means alternative to an increase of hoards for satisfying an increased liquidity-preference.’  


14 “The Rate of Interest and the Optimum Propensity to Consume,” Eca, 5/1, pp. 18 ff.

15 Lange mentions two special cases in the inter-relationships of money, income and interest. When the income-elasticity of demand for money is
zero, the rate of interest does not respond to changes other than in the quantity of money. The demand for money thus becomes a function of the rate of interest alone. There will be only one liquidity-preference curve and the quantity of money fixes the rate of interest independently of the level of money-income. Changes in the marginal-efficiency schedule and in the propensity to consume have no effect on the rate of interest at all. The burden of such changes will fall on the other variables. An infinite interest-elasticity of demand for money will produce precisely the same results. Even in this case the rate of interest will remain unaffected by changes in the marginal-efficiency schedule and in the propensity to consume. This is the result of the fact that the change in the rate of interest required to offset a given change in the demand for money consequent on a change in income is zero. This is Keynes's theory. As he recognises the dependence of the demand for money on money-income, it is the second possibility, *viz.*, an infinite interest-elasticity of demand for money, which he has in mind.\(^{16}\)

The second special case is that of a zero interest-elasticity of demand for money. This makes the demand for money solely a function of income when both income and the quantity of money are measured in terms of a common unit (Keynesian wage-unit or Marshallian wheat), this function states the proportion of the real income which people retain in the form of cash—\(k\). If \(k\) is constant, the function becomes the Cambridge Quantity Equation. When the money-price of the *numéraire* is given, income is determined by the quantity of money. When income is given, the rate of interest is determined by the propensity to consume, marginal-efficiency schedule and the equality of saving and investment. This is the traditional theory, which tries to determine income without interest just as labor theory of value tried to determine price without output.

But traditional theory is not without followers who are suspicious of the success of Keynesian theory. One of them is Robertson who challenges that liquidity-preference is the reflection of less ghastly forces than those portrayed by Keynes.\(^{17}\) This is in a sense true because the threefold explanation of the disposal of resources can be traced back to the days of Lavington’s *English Capital Market* and Pigou’s *Essays in Applied Economics*. They have discussed the significance of the three margins. Pigou says that the three uses, *viz.*, holding resources for convenience and security, investing them in the production of future goods, and spending them on

\(^{16}\) *o.c.*, pp. 171-2; 199 ff.

\(^{17}\) *o.c.*, “Mr. Keynes and the Rate of Interest”. 
immediate consumption, are rival to one another. Lavington explains it further. The quantity of resources which a person holds in the form of money will be ‘such that the unit of resources which is just and only just worth while holding in this form yields him a return of convenience and security equal to the yield of satisfaction derived from the marginal unit spent on consumables, and equal also to the net rate of interest’. At every constellation of prices, which, to the individual, are given, there is an optimum distribution of resources between the three uses, which involves the exact amount of risk and illiquidity which he is willing to bear and at the same time maximises his average yield.

Robertson accuses the Keynesian rate of interest to be ashamed of any connexion with its less adventurous but more scholarly relation, the rate of interest of the marginal productivity theory. He suspects that the transactions-motive for liquidity is, dollar for dollar, the marginal productivity of investment and reproaches Keynes for his unwillingness to regard the rate of interest as the reward for the marginal productivity of capital.

But Keynes’s reluctance is not unfounded. The return to capital—the reward for marginal productivity—is a quasi-rent and the rate of interest determines how the quasi-rent will be divided between individuals who have claim to a fixed rate of remuneration out of the quasi-rent and those who receive the residue. In spite of Marshall’s famous declaration, interest and quasi-rent do not belong to the same genus. The value of an asset will depend on the expected quasi-rents and the rate of interest at which it will be discounted. This value will rise if quasi-rent rises or if the rate of interest falls. Their variations have exactly opposite results which surely would not have been the case if they belonged to the same genus.

Robertson again argues that from the long-period point of view the most important things to be said regarding the rate of interest are not things about liquidity-preference and the quantity of money, but things about what Marshall calls productiveness and prospectiveness. This is instructive in so far as it points out the limit to the powers of liquidity-preference to influence the rate of interest. The longer the period, the less persistent will be the influence of liquidity-preference on the rate of interest. This is because there is such an elasticity in liquidity-preference that there will be a successive decline in the rate of yield equated in the minds of holders with the successive doses of convenience and security so obtained. The rate of interest, as

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20 Bauer, “Interest and Quasi-Rent,” EJ, 49/1, p. 156.
determined by liquidity-preference, fails to equate the incomes of convenience and security from holding the $n$th unit of money in the mind of the marginal holder for a considerably long time. Liquidity-preference does not function in a vacuum but itself depends on the rates of return obtainable from alternative uses. Liquidity-preference schedule loses its status as the chief determinant of the rate of interest. It becomes a secondary planet in the economic universe revolving around a larger one, *viz.*, the marginal productivity schedule. Even when it does not change with a growth of wealth, it will be a faithful reproduction of the desire not to hold so much money but to hold so much command over so many real goods in the form of money. *In the long run*, the liquidity-preference schedule will determine the price-level but not the rate of interest. Surely, is not Robertson groping his way toward a return to the Cambridge Quantity Equation? Or has the mere lapse of time altered some of the things which he had put into the pound?

But there is one small point to be raised. The idea of one set of forces working in the short-period and a different set operating in the long-period is wide of the mark. It leads to the wrong scent that the forces which operate in the long- and short-periods are different. It may also suggest that the short- and long-period forces are of a cat-and-dog nature. The fact of the matter is that the same forces operate from the beginning, but their effects are not immediately manifest. Short- and long-period theory does not explain different processes, but different sections of the same process.\(^{21}\)

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\(^{21}\) In this paper the following abbreviations are used:—  
*AER*: American Economic Review; *Eca*: Economica; *EJ*: Economic Journal; *OEP*: Oxford Economic Papers; *QJE*: Quarterly Journal of Economics; *RES*: Review of Economic Studies; *RESt*: Review of Economic Statistics. Of the two numbers immediately following the abbreviation for a journal (e.g., *Eca*, 7/2) the first denotes the volume and the second the number of the journal.