



## Mr. Keynes and Traditional Theory

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## MR. KEYNES AND TRADITIONAL THEORY

By R. F. HARROD

IN THIS PAPER I do not propose to ask or answer the question, has Mr. Keynes succeeded in establishing the propositions which he claims to have established? nor again, what kind of evidence is required to establish or to refute those propositions? I shall confine myself to a narrower question, namely, what are the propositions which Mr. Keynes claims to have established? And in order to restrict my subject matter still further, I propose to confine myself to those propositions, which he claims to have established, that are in conflict with the theory of value in the form in which it has hitherto been commonly accepted by most economists. In other words, my question is what modifications in the generally recognized theory of value would acceptance of the propositions that Mr. Keynes claims to have established entail?

In order to clarify the issues involved it may be well to divide commonly accepted theory into the general theory and its specialised branches. The general theory consists primarily of a number of functional equations expressing individual preference schedules and a number of identities, such as that supply must be equal to demand, and the elucidation of such questions as whether there are as many equations as there are unknowns and whether the solutions are single or multiple. The result of these enquiries should make it clear whether the equilibrium of the system as a whole is stable or unstable or undetermined, whether there are alternative positions of equilibrium, etc. There may be some clues as to the general form of some of the functional equations, provided by such principles as the Law of Diminishing Utility, to use old-fashioned terminology, which may make it possible to predict the direction of changes in the values of the various unknowns due to a given change in one of them. More precise prediction can only be achieved if or when it becomes possible, as a result of the labors of such investigators as Dr. Schultz, to write down the actual terms of the functional equations. Within the corpus of this general theory may be included the formulation of the market conditions that are required for the realisation of some kind of maximum. Thus if one individual *A* is indifferent whether he produces commodity *X* or commodity *Y* for a certain consideration, and another individual *B* prefers *X* to *Y*, the maximum is not realised if the market so operates that *A* normally produces *Y* and not *X* for *B*. On this condition the maxim of Free Trade is fairly securely founded, the more general maxim of *laissez faire* much less securely so.

In contrast with the theory of value in this very general form, may be set the special theories formulated to deal with specific problems

such as interest, profit, joint production, discriminating monopoly, etc. The normal method used in dealing with these departmental studies is to assume that certain terms, which appear as variables in the general system of equations, may be treated as constants for the special purpose in hand. For instance in studying the behaviour of duopolistic producers of a given commodity, it may be assumed that the duopolists can obtain the services of factors of production at rates the determination of which in the market will not be appreciably affected by the duopolists' behaviour. Such methods constitute short cuts to the unravelling of particular problems and they are often perfectly legitimate. In the minds of most economists, other than those who stand, so to speak, at the philosophical end of the economic array, the conclusions reached by these short-cut methods constitute the main findings of economic theory.

I may say at once that in my opinion Mr. Keynes' conclusions need not be deemed to make a vast difference to the general theory, but that they do make a vast difference to a number of short-cut conclusions of leading importance. Thus to those whom I may perhaps call without offence the ordinary working economists they ought, if accepted, to appear to constitute quite a revolution. Whether they entail a substantial modification of the more general theory depends on how that is stated. I need hardly observe that there is no authorised version. Those whose main interest is in the general theory, may, if they have laid their foundations well and carefully, be able to look down with a smile of indifference on the fulminations of Mr. Keynes. Pavilioned upon their Olympian fastness, they are not likely to show much irritation.

It is convenient to take Mr. Keynes' theory of interest as the starting point of this exposition. In the commonly accepted short-cut theory there are two unknowns and two equations. The two unknowns are the volume of saving (=the volume of investment) and the rate of interest. Of the new-fangled view, sponsored by some out-of-the-way definitions in Mr. Keynes' *Treatise on Money*, that the volume of saving may be unequal to the volume of investment, it is not necessary to say anything, since it has played no part in the standard short-cut formulations of interest theory (although it has figured in recent writings concerned with practical monetary problems). The commonly accepted interest theory from the time of the early classical writers onward entails that saving is always and necessarily equal to investment.

The two equations in the traditional theory of interest correspond to the demand and supply schedules relating to a particular commodity. First there is the demand equation:

$$y = f(x),$$

$y$ , the marginal productivity of capital, depending on  $x$ , the amount of capital invested per unit of time. So much capital will be invested that its marginal productivity is equal to the rate of interest; that is,

$$y = y',$$

where  $y'$  is the rate of interest. Since both the traditional theory and Mr. Keynes hold that investment is undertaken up to the point at which the marginal productivity of capital is equal to the rate of interest,  $y'$  may be suppressed, and  $y$  made to stand for the rate of interest which is equal to the marginal productivity of capital.

Then there is the supply equation:

$$x = \phi(y);$$

$x$ , the amount which individuals choose to save, which is equal to the amount of investment, depends on the rate of interest. Thus there are two unknowns, the rate of interest and the volume of saving, and sufficient equations to determine them. It is not necessary for the present purpose to consider controversies concerning the forms of these equations, such as whether a rise in the rate of interest tends to cause people to save more or less.

This treatment of interest and saving is analogous to that of the price of a particular article and the amount of it produced. The treatment depends on the short-cut assumption of *ceteris paribus*. This is often legitimate in the case of particular commodities, although it is recognised that in certain cases it is idle not to bring in certain other variables, for instance the prices of close substitutes. Among the "other things" which are supposed to be "equal" is the level of income in the community under discussion. In many cases it may be true that when we are trying to determine how much of a particular commodity a producer is likely to produce, his decision to produce a little more or a little less will not have a sufficiently large effect on the total income of the community to react on the market for his goods in such a way as to make an appreciable difference to him. This particular short-cut is in that case justified. I suggest that the most important single point in Mr. Keynes' analysis is the view that it is illegitimate to assume that the level of income in the community is independent of the amount of investment decided upon. No results achieved by the short-cut of such an assumption can be of any value.

How does Mr. Keynes' analysis proceed? His first equation is substantially the same as that of the traditional analysis

$$y = f(x).$$

The marginal productivity of capital is a function of the amount of investment undertaken. The marginal productivity of capital appears in Mr. Keynes' book under the title of marginal efficiency. It does not

appear that there is a difference of principle here. It is true that Mr. Keynes makes an exhaustive and interesting analysis of this marginal efficiency and demonstrates that its value depends on entrepreneurial expectations. The stress which he lays on expectations is sound, and constitutes a great improvement in the definition of marginal productivity. This improvement, however, might be incorporated in traditional theory without entailing important modifications in its other parts.

When we come to the second equation the level of income must be introduced as an unknown term, giving

$$x = \phi(y, i),$$

where  $i$  is the level of income. The amount of saving depends not only on the rate of interest, but on the level of income in the community.

It might be thought that to introduce the level of income as an unknown at this point is tantamount to abandoning all attempt to have a departmental theory of the volume of saving, since the level of total income appears in all the equations of the general theory and it is impossible to determine its value without taking all factors into account. This would mean that we should have to leave the ordinary working economist without any departmental theory of saving and interest which he could grasp, and to let him flounder in the maze of  $n \times r \times s$ , etc., equations governing the whole system. Mr. Keynes has, however, come to the rescue and carved out a new short-cut of his own. In his view the value of the unknown level of income can be determined in a legitimate and satisfactory manner by the departmental equations relating to saving and interest only. To the legitimacy of this assumption it will be necessary to return presently.

Meanwhile, since there are three unknowns and but two equations in the savings/interest complex, another equation is needed. Before proceeding to that, it may be well to recur to the second equation,

$$x = \phi(y, i).$$

This may be transposed into the form

$$i = \psi(x, y).$$

The level of income depends on the amount of investment (= that of saving) and the rate of interest. In this form the second equation shows itself as the doctrine of the multiplier. The multiplier is the reciprocal of the fraction expressing the proportion of any given income, which, at a given rate of interest, people consume. If the value of the multiplier is known for any given rate of interest and level of income, the actual level of income can be deduced directly from the volume of investment. Those to whom the doctrine of multiplier seems an alien morsel in the corpus of economic doctrine should remember that it is

merely a disguised form of the ordinary supply schedule of free capital, but with the level of income treated as a variable.

In discussing this doctrine, for the sake of a still shorter cut, Mr. Keynes is inclined to let the rate of interest drop out of sight. Thus the equation becomes

$$i = \psi(x);$$

the level of income depends on the volume of investment. The justification for this procedure\* is that whereas the relation of the level of income to the amount of investment is in the broadest sense known—it may be assumed that people save a larger absolute amount from a larger income—the relation of the amount which people choose to save to the rate of interest is a matter of controversy. Moreover in Mr. Keynes' view the level of income has a more important effect on the amount which people choose to save than the rate of interest. However, there is no need to pick a quarrel here. The rate of interest may be brought back into this part of the picture without affecting the main argument. The propensity to consume may be regarded as depending on the rate of interest, although for the sake of brevity and clarity mention of this need not be insisted on at every point in an exposition of the doctrine of the multiplier.

What of the third equation? We have

$$y = \chi(m),$$

where  $m$  is the quantity of money, a known term, depending on banking policy. This is the liquidity preference schedule. Probably  $i$ , the level of income, ought to be inserted in this equation, thus:

$$y = \chi(m, i),$$

since the amount of money required for active circulation by consumers and traders depends on the level of income. Ought not the price level to come in also? That may be taken to be subsumed under  $i$ , the level of income, in a manner that I shall presently explain. The residue of money, not required for active circulation, is available for ordinary people who are discouraged by their brokers from immediate investment, and, more important, for firms, who may want cash for capital extensions or similar purposes within six months or a year or two, and are unwilling to hold their reserves in the form of securities to which some risk of depreciation within the prescribed period is attached. Since the amount of money available for liquid reserves is strictly limited and cannot be increased by the mere desire on the part of firms to hold more money than that, the prospective yield of less liquid reserves must be sufficient to confine those who insist on a money reserve to the amount of money available for that purpose. The less the amount of money available the higher the rate of interest will have to be, both because the high rate is a *quid pro quo* against the risk of

depreciation of the capital and also because the higher the present rate the less probability is there of depreciation within the prescribed period.

It is not necessary to give a final pronouncement on the significance of the liquidity preference equation. It appears that even if some modification is required in this third equation, which determines the rate of interest, a type of analysis similar in its general structure to that of Mr. Keynes may be maintained.

We now have three equations to determine the value of the three unknowns, level of income, volume of saving (= volume of investment), and rate of interest (= marginal productivity of capital).

For the working economist these results may be set out in still briefer shorthand as follows. The amount of investment (= amount of saving) depends on the marginal productivity of capital and the rate of interest; the level of income is connected with the amount of investment by the multiplier, i.e., by the propensity to consume; and the rate of interest depends on the desire for liquid reserves and the amount of spare cash in the community available to satisfy that desire. The amount of this spare cash depends on the policy of the banks in determining the quantity of their I.O.U.'s that are outstanding and on the level of income (the higher this, the more money will be taken away into active circulation).

Thus if the schedules expressing the marginal productivity of capital, the propensity to consume, and the liquidity preference are known and the total quantity of money in the system is known also, the amount of investment, the level of income and the rate of interest may readily be determined.

The next topic for consideration is the legitimacy of the assumption that the level of income may be regarded as determined by the complex of considerations expressed in the savings/interest equations, rather than by the whole system of equations. In general the level of activity is traditionally conceived as depending on the preference schedules of the various factors expressing their willingness to do various amounts of work in return for income, and on the schedules expressing the relation between the amount of work done and the income accruing from it (Laws of Returns). In considering the former schedules we have to take into account all the factors of production. Now in Mr. Keynes' system the supply of capital has already been dealt with by the savings/interest equations. For the supply of risk-bearing, we may provisionally content ourselves with the elegant device which he provides in his footnote to p. 24. He writes, "by his (the entrepreneur's) expectation of proceeds I mean, therefore, that expectation of proceeds, which, if it were held with certainty, would lead to the same

behaviour as does the bundle of vague and more various possibilities which actually makes up his state of expectation when he reaches his decision." Thus considerations affecting the supply of risk-bearing are subsumed in the equations which determine the volume of investment.

There remain the factors other than those covered by the category of investment. Of these we are only concerned with those the supply of which can be varied. Thus we are left with those which may roughly be designated prime factors. What is the nature of their supply-schedule? What is the form of their preference for income in relation to the work required to obtain it?

In this field Mr. Keynes' argument is vitally dependent on his observation of real conditions. The work/income preference schedule exerts its power upon the economic system through the terms on which the prime factors are willing to sell their services. The contracts or bargains of the entrepreneurs with prime factors are normally fixed in money, with no proviso regarding the general level of prices. In the exceptional cases in which there is such a proviso, it is none the less usually the case that a rise in prices involves *some* fall in real rewards to prime factors and conversely. It is true that in a time of rising prices the factors may press for a rise in rewards, but, even if they achieve this, there is still no proviso to safeguard them against a further rise of prices, and prices may, for all the new bargains lay down, and indeed are very often in fact observed to, run on ahead of rewards. Conversely in a time of falling prices. This gives the supply schedules of the prime factors a very special kind of indeterminacy which undermines their power to determine the general level of activity. Mr. Keynes discusses this matter in Book I and its importance in his logical edifice justifies him in giving it pride of place.

Consider next the second set of schedules determining the general level of activity, namely those expressing the relations between the amount of work done and the income accruing from it (Laws of Returns). Since the bargains with prime factors are expressed in money, the returns due to their employment should be expressed in money also. But the money value of these returns depends on the level of prices. The general price level might be regarded as determined by the Quantity Theory of Money; Mr. Keynes does not so regard it for reasons which will be explained below. On the contrary he regards the general price level as completely malleable and determined by the equations in the general field without reference to the quantity of money.

The consequence of the conclusions yielded by the interest/savings equations, if these are accepted, is, that the level of income and activity is determined. Now suppose the entrepreneurs decide to produce more than the amount so determined. Owing to a deficient propensity to

consume, they will find deficient purchasing power, and either accumulate stocks or sell at a loss. If they do the former the accumulation of stocks will constitute an additional (involuntary) investment on the part of the community, which when added to the intended investment, makes the total investment of the community such as to be consistent, in accordance with the interest/savings equations, with the higher level of activity which entrepreneurs are choosing to indulge in. But such a position is unstable. So long as stocks are accumulating, they will reduce activity and continue to do so, until it reaches the point indicated by the interest/savings equations. If on the other hand they sell at a loss, they will be dis-saving; the propensity to consume will be temporarily raised, so that the higher level of activity which they are choosing to indulge in becomes consistent with that required by the interest/savings equations. But again the position is unstable. The marginal propensity to consume will not be permanently sustained at an abnormally high figure by these means. To avoid losses, entrepreneurs will restrict and continue to do so, until activity and income are reduced to a level which satisfies the interest/savings equations, with the marginal propensity to consume normal for that level of income. Converse arguments would apply in the case of entrepreneurs deciding to produce too little.

Now if the level of activity so determined is indeed the equilibrium level of activity, the price level must be appropriate to it. Let us suppose that the price of each commodity is determined by the marginal money cost of production, in the crude way that a tiro might describe erroneously supposing himself to be explaining the true classical theory of cost of production. If the law of diminishing returns prevailed on balance, as Mr. Keynes supposes that it does anyhow in the short period, the general price level would be expected to rise with increases of output and to fall with decreases. To make the matter still more crude and common, suppose prices to vary not merely in proportion to changes in the number of units of factors required per unit of output, as output varies, but also in proportion to changes in rates of reward to the factors. In this case we should find, as output rose and diminishing returns came into play, that the rise of prices would just sufficiently exceed the rise of wages, etc., if any, to cover the increased real marginal cost of production per unit. Factors might press for a rise of rewards, but though they might gain on balance in *some* trades, they would always be beaten by the price level in the system as a whole.

Now this is precisely what Mr. Keynes supposes actually to happen. It is, however, "subject to the qualification that the equality (between marginal cost and price) may be disturbed, in accordance with certain principles, if competition and markets are imperfect" (p. 5). The ob-

jections to this view which upholders of the Quantity Theory of Money might raise must be considered. But first observe its relation to the determination of the level of activity.

Take a period within which prime factor bargains do not change. The supply of each of these in money terms may then be represented by a horizontal straight line. But if prices vary in proportion to costs (cost variations including allowance for overtime rates, the employment of less efficient labour, etc.), then the money value of the marginal net product of each factor must be represented by a co-incident horizontal straight line. Therefore on these conditions the two sets of schedules leave the level of output entirely indeterminate. If the matter is expressed in real terms both sets of schedules are downward sloping to the right; they are still co-incident. If money rewards to factors are raised or lowered in response to changes in the level of employment *and* prices are adjusted accordingly, the same result ensues. Thus this complex of equations does *not* determine the level of activity; therefore it leaves that level free to be determined by the savings/interest complex. Q.E.D.

Thus the crux of the matter seems to have shifted to the Quantity Theory of Money. The essence of the difference between the traditional theory and Mr. Keynes' theory can be put thus: In the traditional theory the supply and demand schedules of all the factors stand on the same footing; the level of activity is an unknown, but the price level is determined by the monetary equation. This determination of the price level enables the level of activity to be determined by the factors' money supply schedules, and by their marginal productivity schedules. In Mr. Keynes' theory the level of activity is determined by the equations governing the savings/interest complex. In the general field, in which we are now only concerned with the demand and supply of prime factors, the level of activity is conceived as determined *ab extra*. It is a known quantity. But the price level is conceived to be completely malleable. If it were not the system in the general field would be over-determined. Thus the monetary equation is shorn of its former powers. The level of activity being a known quantity the price level is determined by the money cost of production, with suitable modifications for imperfect competition.

What right has Mr. Keynes to gut the monetary equation in this way? Has, then, the banking policy no power to influence the situation? Yes, certainly it has. The fact is that the power residing in the monetary equation has already been used up in Mr. Keynes' system in the liquidity preference equation and it cannot therefore exert any direct influence in the general field. To make it do so would be to use its determining influence twice over. In fact in Mr. Keynes' system all the old pieces reappear, but they appear in different places.

Explanation is necessary. It will be remembered that according to the liquidity preference equation, the rate of interest is determined by the desire of people for liquid reserves and the quantity of money available for that purpose. The quantity of money available for that purpose is equal to the total quantity of money in existence less that required for active trade.<sup>1</sup> Now if the quantity required for active trade were perfectly indeterminate, as it must be by the Quantity Theory—for according to that the price level depends on the quantity of money available for active trade, and therefore it is unknown what quantity of money any given amount of active trade will absorb—the residue would be indeterminate also. But if the  $m$  in

$$y = \chi(m)$$

is indeterminate, there are too many unknowns in the interest/savings set of equations. Thus it is necessary to the validity of Mr. Keynes' solution of the problem of investment and interest that the amount of money available for liquid reserves should be determinate, and that involves that the price level should be determined otherwise than by the monetary equation. And so, in Mr. Keynes' system it is.

The matter may be put thus: The savings/interest equations suffice to determine the level of activity, subject to the proviso that the quantity of money which appears in the liquidity preference equation is a known quantity; and this will be known if the price level and therefore the amount absorbed in active trade is known. The equations in the general field suffice to determine the price level, subject to the proviso that the level of activity is known. Thus there is after all mutual dependency. The level of activity will be such that so much money is absorbed in active trade that the amount left over enables interest to stand at a rate consistent with that level of activity.

The mutual interdependency of the whole system remains, but the short-cuts indispensable to thinking about particular problems, as Mr. Keynes has carved them out, remain also.

The amount of investment depends on the marginal productivity of capital and the rate of interest. The level of income and activity is related to the amount of investment by the multiplier, that is by the marginal propensity to consume, the price level is related to the level of activity by the marginal money cost of production (which depends

<sup>1</sup> In his liquidity preference equation Mr. Keynes includes the demand for money for whatever purpose, and the quantity of money that appears in it is the total quantity of money in the community. It has appeared simpler in this part of the exposition to divide this total into two parts, the amount required for active circulation and the residue, to define the quantity of money which appears in the liquidity preference equation as that residue, and the demand which the equation expresses as the demand for purposes other than those of active circulation. This re-definition of terms is merely an expository device and does not imply any departure from Mr. Keynes' essential doctrines.

on the amount of activity undertaken), the amount of money absorbed in active trade depends on the volume of trade and the price level, the amount of money available for liquid reserves is equal to the total amount of money in the system less that required for active trade, and the rate of interest depends on the amount of money available for liquid reserves and the liquidity preference schedule.

It may be well to do some exercises. Suppose the banks to increase the total amount of money available by open market operations. The increment may eventually be divided between active circulation and liquid reserves. An increase of money available for liquid reserves will tend to reduce the rate of interest; and so to increase investment. This will increase the level of income through the multiplier in accordance with the marginal propensity to consume. If the fall in the rate of interest increases the marginal propensity to consume, the increase of income will be *pro tanto* greater, but it is not certain that it does so. The increase of income involves an increase of turnover, and of prices in accordance with the law of diminishing returns. This involves an increased use of money in active circulation. Thus the fall in the rate of interest will not be so great as it would be if all the new money went into liquid reserves. The money will be divided between the two uses, but there is no reason whatever to suppose that the increments in each use will be in proportion to the amounts of money previously employed there, as is assumed in a Quantity Theory using a compendious index number. The comparative size of the increments will depend on the current elasticity of the liquidity preference schedule and the current elasticity of the marginal productivity of capital schedule (which involves expectations).

Suppose a fall in rewards to prime factors. The price level will drop. Money will be released from active circulation for liquid reserves. This will tend to make the rate of interest fall and to react on the level of investment and activity accordingly. Thus the stimulus to activity is very indirect and its effectiveness depends on the same factors as that provided by an increase in the quantity of money. This is very different from the view that a reduction of rewards will stimulate activity because costs fall while prices are sustained by the quantity of money remaining the same.

It appears to me that the achievement of Mr. Keynes has been to consider certain features of traditional theory which were unsatisfactory, because the problems involved tended to be slurred over, and to reconstruct that theory in a way which resolves the problems. The principal features so considered are (1) the assumption that the level of income could be taken as fixed in the departmental theory of interest and saving, (2) the peculiar nature of the supply schedules of the prime

factors which arises out of their bargains being fixed in money without proviso as to the price level, and (3) the failure of monetary theory to explain how the total stock of money is divided between liquid reserves and active circulation, or, in other words, the unsatisfactory character of the theory of velocity of circulation.

I stated above that the old pieces in the traditional theory reappear, but sometimes in new places. It might at first be thought that the liquidity preference schedule is a new piece, and that therefore either the new system is over-determined or the traditional writers must have been wrong in supposing that their system was determined. But it is not really a new piece. The old theory pre-supposed that income velocity of circulation was somehow determined. But precisely how was something of a mystery. Thus the old theory assumed that there was a piece there but did not state exactly what it was. Mr. Keynes' innovation may thus be regarded as a precise definition of the old piece.

By placing it where he does, he overcomes a difficulty, which has been assuming an alarming prominence in recent economic work. In monetary literature the rate of interest has been treated, and increasingly so, as an influence of vital importance in the monetary situation. But in traditional theory, neither in the general system of equations nor in the departmental theory of interest does it appear that the rate of interest is more intimately connected with the *numeraire* than the price of any other factor of production. This is a striking discrepancy. Mr. Keynes introduces the liquidity preference schedule at a point which makes it a vital link between the general system of equations and monetary theory. His treatment is in harmony with recent literature in that he justifies the special connexion of the price of this particular factor with monetary problems. It is an immense advance on recent literature because it removes the discrepancy between the treatment of interest in the two branches of study.

In my judgement Mr. Keynes has not affected a revolution in fundamental economic theory but a re-adjustment and a shift of emphasis. Yet to affect a re-adjustment in a system, which in its broad outlines, despite differences of terminology, has received the approval of many powerful minds, Marshall, Edgeworth, and Pigou, the Austrian School, the School of Lausanne, Wicksell, Pantaleoni, Taussig, and Clark, to mention but a few, is itself a notable and distinguished achievement. And in the sphere of departmental economics and short-cuts, which are of greatest concern for the ordinary working economist, Mr. Keynes' views constitute a genuine revolution in many fields.

The foregoing account has attempted to expound, not to appraise. The only criticism of Mr. Keynes which I venture to offer is that his system is still static. Note has been taken of the fact that at certain

important points, e.g., in his definition of the marginal efficiency of capital, Mr. Keynes lays great stress on the importance of anticipations in determining the present equilibrium.

But reference to anticipation is not enough to make a theory dynamic. For it is still a static equilibrium which the anticipations along with other circumstances serve to determine; we are still seeking to ascertain what amounts of the various commodities and factors of production will be exchanged or used and what prices will obtain, so long as the conditions, including anticipations, remain the same. But in the dynamic theory, as I envisage it, one of the determinands will be the rate of growth of these amounts. Our question will then be, what rate of growth can continue to obtain, so long as the various surrounding circumstances, including the propensity to save, remain the same?

Saving essentially entails growth, at least in some of the magnitudes under consideration. No theory regarding the equilibrium amount of saving can be valid, which assumes that within the period in which equilibrium is established, other things, such as the level of income, do not grow but remain constant.

I envisage in the future two departments of economic principles. The first, the static theory, will be elaborated on the assumption that there is no growth and no saving. The assumption that people spend the whole of their income will be rigidly maintained. On this basis it will be possible to evaluate the equilibrium set of prices and quantities of the various commodities and factors, excluding saving. In the second department, dynamic theory, growth and saving will be taken into account. Equilibrium theory will be concerned not merely with what size, but also with what rate of growth of certain magnitudes is consistent with the surrounding circumstances. There appears to be no reason why the dynamic principles should not come to be as precisely defined and as rigidly demonstrable as the static principles. The distinguishing feature of the dynamic theory will not be that it takes anticipations into account, for those may affect the static equilibrium also, but that it will embody new terms in its fundamental equations, rate of growth, acceleration, de-celeration, etc. If development proceeds on these lines there will be a close parallel between the statics and dynamics of economics and mechanics.

But to develop this theme further would take me too far from my subject.

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