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The microfoundations of the 'generalisation of *The General Theory*' and 'bastard Keynesianism': Keynes's theory of employment in the long and the short period

J. A. Kregel*

1. Introduction

The initial challenge to the marginalist theory of capital arose from Joan Robinson's 'generalisation of *The General Theory*' to long-period conditions. The question she raised was subsequently settled within the context of Sraffa's rehabilitation of the classical conception of prices of production. The clear success of Sraffa's theory in this regard has led to the suggestion that the long-period method of the classical or 'surplus' approach 'may provide better support than was provided by Keynes himself for establishing the principle of effective demand in long-period analysis' (Garegnani, 1979, p. 181). Such a proposal implies abandoning the extension of Keynes's theory to long-period conditions first begun by Joan Robinson in 1935[1], as well as rejecting certain aspects of Keynes's work which give a 'central role to uncertainty and expectations' (*ibid.*, p. 185) for, it is suggested, such factors involve theoretical 'weaknesses' which facilitated 'the subsequent rehabilitation of the orthodox long-run relation between savings and investment' (*ibid.*, p. 181) in the 'neoclassical synthesis' and the 'neo-neoclassical' theory of long-run growth.

The purpose of this paper is to assess these implicit criticisms of the post-Keynesian position developed on the basis of Joan Robinson's work by first reviewing in Section 2

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[1]The kernel of such an extension first appears in Joan Robinson's comments on proofs of p. 219, last full paragraph of the final version of *The General Theory*:

> You mean that the community with less capital will be able to continue investing after the other has stopped. But if so it will soon become like the other community. In what sense is there "long-period equilibrium" if investment is still going on? You have stopped [sic] rather suddenly in this section out of the short period with fixed equipment to which the rest of the book belongs. I think all you really want is to say that the greater the capital equipment in existence at any moment the greater will be the propensity to save, the lower the m.e. of capital corresponding to each rate of investment, the lower must be the rate of interest which will give full employment. (Assuming no inventions—you ought to make that clear.) As a community accumulates capital it approaches the dangerous situation in which 2 per cent or even 0 per cent won't give full employment. I think this is all you really need. I have been working out this long-period stuff and I find that to make a proper job of it one needs to bring in several considerations that are not really relevant to your main theme, e.g. I find elasticity of substitution is an important factor.'

The comment is dated 19 June 1935 (JMK, XIII, 647–648).

The article was originally published in *Zeitschrift für Nationalökonomie*, Vol. VII, Heft 1, 1936. The title page indicates that the journal went to the printers on 2 March 1936, so it seems reasonable to conclude that the paper was in fact completed before publication of *The General Theory*. I am indebted to Ingo Barens of Universität Paderborn for the particulars of this note.

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her unique initial attempt to construct a long-period theory of employment on the basis of the demand curve for labour in an industry that she had already developed in *The Economics of Imperfect Competition*. Her use of the elasticity of substitution to determine the distribution of income on the aggregate level was the most original, and most criticised, aspect of this initial attempt at long-period Keynesian theory. Her subsequent attempts to develop an acceptable theory of distribution led not only to a rejection of her initial definition of the 'long period', but to her questioning of the orthodox theory of capital. The successes and failures of this initial formulation were thus to dominate investigation in growth and capital theory for nearly fifty years and lead to the development of the post-Keynesian approach. None of the important developments of her work of extension are, however, related to expectations or liquidity preference. Rather she has been criticised for neglect of these factors. Weaknesses in Keynes's theory, if they exist, must be sought elsewhere.

Joan Robinson has put forward her own explanation of the success of traditional theory in 'recuperating' Keynes' theory. Hicks was the first to use the elasticity of substitution on the aggregate level. Section 3 sets out the way in which Hicks interpreted *The General Theory* as a special case of the long-period analysis in his *Theory of Wages*. This formulation of Keynes, which Joan Robinson christened 'bastard Keynesianism', produced the long-period analysis of *The General Theory* which formed the basis of the neoclassical synthesis by 'generalising' Hicks's special case to reproduce the analysis of the *Theory of Wages*. That both Joan Robinson's and Hicks's approach used the elasticity of substitution to produce diametrically opposed long-period Keynesian theories suggests that Hicks's results are not due to any inherent weakness in Keynes's theory, but rather to a weakness in Hicks's formulation: bastard Keynesianism is the source of the weaknesses.[1]

It is, however, possible to accept this explanation of the 'degeneration' of Keynesian theory and still maintain that the results of the capital theory debates 'provide better support' for a long-period theory of effective demand. But Joan Robinson's most recent writings reject this view. The concluding section seeks to explain why, after her early attempt to formulate a long-period theory, Joan Robinson rejected both classical and traditional long-period analysis in favour of a more dynamic or 'historical' analysis such as that expressed in her ultimate assessment of the 'unimportance of reswitching' (Robinson, 1975). It is concluded that this assessment does not represent a radical change in her position, but rather is a logical development of the question that she posed of Keynes's theory in her original article of 1936. This conclusion suggests divergent conceptions of a long-period theory of effective demand in the post-Keynesian approach on the one hand and the 'surplus' approach on the other.

2. A long-period theory of employment

Although Marshall noted that 'there is no hard and sharp line of division between "long" and "short" periods' (Marshall, 1920, p. 378) he was 'chiefly concerned . . . with the normal relations of wages, profits, prices, etc., for rather long periods' (*ibid.*, p. 380). From this point of view Keynes's *General Theory* was restricted to an area of lesser theoretical generality: the short period; Keynes's conclusions would have to be shown to apply to the 'long period', the domain of the 'classical' theorists that Keynes had singled out for criticism, if they were to gain widespread acceptance.

[1]Roncaglia and Tonveronachi (1983) suggest a similar relationship by demonstrating the strict equivalence between Pigou's theory and that of the 'neoclassical synthesis' variety of Keynesian theory.

From a Marshallian standpoint such an extension would *not* have implied direct analysis of the accumulation of capital, which Marshall had considered under the heading of 'dynamic' analysis, the 'very gradual or Secular movements of normal price, caused by the gradual growth of knowledge, of population and of capital' (*ibid.*, p. 379),[1] but rather by 'statistical' analysis:

> By that method we fix our minds on some central point: we suppose it for the time to be reduced to a stationary state; and we then study in relation to it the forces that affect the things by which it is surrounded, and any tendency there may be to equilibrium of these forces (*ibid.*, p. 369).

Joan Robinson was quick to attempt such an extension in her essay 'The long-period theory of employment', published soon after *The General Theory* appeared and reprinted in her *Essays in the Theory of Employment* in 1937. As Harrod noted in his review of the reprinted version, such a Marshallian extension had very particular characteristics:

> Something should be said about the general method employed by Mrs. Robinson in this essay. Aware that the traditional static analysis is only valid when saving is equal to zero, she takes the bull by the horns and considers the effects of certain disturbances when these are so fully worked out that the rate of saving has fallen to zero (Harrod, 1937, p. 330).

In *The General Theory* Keynes made passing reference to the long-period effects of investment on the capital stock and noted 'that a rate of investment, higher (or lower) than prevailed formerly, begins to react unfavourably (or favourably) on the marginal efficiency of capital if it is continued for a period which, measured in years, is not very large' (Keynes, 1936, p. 251). For Joan Robinson this leads to a theory of long-period employment for

> as long as capital goods continue to accumulate, their profitability at the margin declines and the incentive to further investment is continuously weakened. Investment is always tending to bring itself to an end... In conditions of equilibrium the stock of capital is adjusted to the given rate of interest, and no further accumulation takes place... The familiar phrase 'long-period' equilibrium may be adopted to describe this situation (Robinson, 1937, pp. 106–107).

In long-period analysis investment will affect the stock of capital as well as income. The effect of investment on employment must then take into account the increased employment on the expanded stock of equipment. If we hypothesise a rise in the level of investment due to a reduction in the rate of interest, given saving propensities, the state of expectations and the state of technology, both income and the capital stock would expand. The expansion of income comes to a halt when savings equals investment. When would the expansion of the capital stock come to a halt?

Clearly, as long as net investment remains positive additions to the capital stock will continue. But, with each addition 'profitability at the margin declines' until it reaches equality with the rate of interest. At this point net investment will come to a halt for it is no longer profitable and the capital stock will have expanded to the point where the initial per period absolute increment to investment is required to keep the addition to the initial capital stock intact: the initial increment to net investment has been absorbed into gross investment. With net investment zero, net savings are zero and the capital stock

[1]Marshall devotes just one chapter (Book VI, Chapter XII) of the *Principles* to the subject of dynamic analysis (cf. Marshall, 1920, p. 380).

remains constant in 'long-period' equilibrium. The level of output associated with this position depends on the size of the multiplier (and thus on the propensity to save) operating during the accumulation process, while the level of employment will depend on the technical coefficients relating labour to the additional capital stock and output.

A generalised Keynesian theory would then imply that a higher propensity to save, given the rate of interest, should lead not only to a lower level of output and employment in the *short* period, but to a lower level of output, employment, *and* capital stock in the *long* period when 'the influence of the current rate of investment upon effective demand disappears from the picture' (Robinson, 1937, p. 112) and net savings and investment are zero.

This is represented in Fig. 1 which shows the long-period relation (L) between net savings (S) and income (Y). Technology, the rate of interest and the saving propensities will determine the equilibrium level of long-period income at which net saving equals zero, i.e. the capital stock has become sufficiently large to require for replacement all investment that is profitable at the ruling rate of interest.[1] 'With zero investment, output, consumption and income, for the community as a whole are synonymous' (Robinson, 1937, p. 109). At income level Y_1 any attempt to raise the level of investment would cause net saving to become positive in a greater proportion than net investment as output expands *via* the multiplier to the right of Y_1. This causes the rate of return on investment to fall below the prevailing rate of interest. Net investment will thus be cut back to zero and gross investment to the level which produces income level Y_1[2]. On the other hand, an increase in the propensity to save would cause L_1 to shift upwards to L_2, reducing the equilibrium

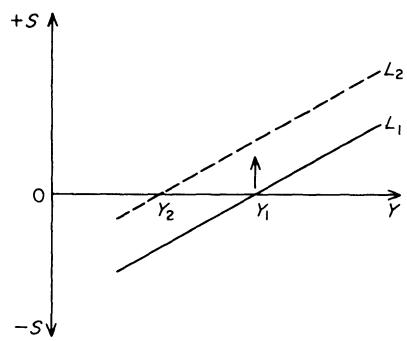

Fig. 1.

[1]Since this need not be full employment income and 'the unemployed must somehow be provided for, and their consumption is likely to be made to some extent at the expense of the savings of the rest of the community... the amount of unemployment, in equilibrium, must be whatever is sufficient to reduce net saving to zero for the community as a whole' (Robinson, 1937, p. 110). Or one could conceive of the government paying unemployment benefits equal to the amount of private net saving.

[2]'In short, the existence of a unique position of long-period equilibrium corresponding to a given rate of interest requires that, if a chance increase in the stock of capital were to occur when equilibrium has been reached, then, at the level of income corresponding to the larger stock of capital, there would be positive saving. If this condition is fulfilled a chance increase in the stock of capital will reduce its earnings below the level dictated by the (constant) rate of interest, a period of disinvestment will restore the stock to its former size. The paradoxical appearance of thinking of an increase in saving as leading to disinvestment is merely a reflection of the fundamental paradox that an increase in thriftiness tends to reduce the stock of capital' ('The Concept of Zero Saving', Robinson, 1937, pp. 141–142). Fig. 1 is suggested but not drawn in (Robinson, 1937); it does appear in a slightly altered form in 'The Model of an Expanding Economy' (Robinson, 1964, p. 81, note 3).

level of income to Y_2. Given the rate of interest the stock of capital must also decline, for the lower level of output will require a lower level of employment. An unchanged capital stock with lower employment would have a marginal productivity lower than the prevailing rate of interest. The long-period equilibrium analysis characterised by zero net saving thus reproduces Keynes's negative short-period effect of saving on output and extends it to its negative effect on the stock of capital: a higher level of saving out of net income implies a lower long-run equilibrium stock of capital.

Since the equality between the rate of interest and the marginal efficiency of capital determines Y, and changes in the long-period levels of output, employment and capital depend on the effect of the ratio of saving to income, i.e. on the multiplier, 'it is with the long-period effects of a fall in the rate of interest upon consumption that we are alone concerned' (*ibid.*, p. 112) in order to determine the long-period level of employment.

There are two possible effects of the rate of interest on saving. The first concerns saving out of a given level of income. Joan Robinson assumes that 'a curve connecting the rate of interest with the rate of saving from a given individual income may be either rising or backward rising' (*ibid.*, p. 113, note 1), i.e. the relation may be positive or negative.

In addition,

> a change in the distribution of income between workers and capitalists will have an important effect upon the thriftiness of the community as a whole. It may be postulated that in our community the capitalists are ... richer than the workers, and are consequently more addicted to saving' (*ibid.*, pp. 114–115).

These two effects are of course independent of the effect of the level of unemployment (and thus of population growth) on savings as a whole noted above.

Joan Robinson noted a certain contradiction in the analysis of distribution in the short-period and long-period theory of employment. A reduction in the rate of interest which raised the level of investment and increased output and employment per unit of a given stock of capital in the short period would lower the marginal product of labour and thus reduce the real wage; the returns to labour and capital move *together*, rather than inversely as in the traditional long-period analysis: 'It is one function of the long-period Theory of Employment to reconcile this apparent contradiction, and to fit the propositions of the traditional Theory of Distribution into their place in the analysis of employment' (*ibid.*, pp. 112–113).

The analysis of the effect of the rate of interest on distribution, given the state of economic theory in the mid 1930s, implied the analysis of changes in the production coefficients of capital and labour that would be associated with changes in the interest rate. This integration of the theory of distribution may be considered the major innovation of the extension of the theory of employment to the long period. Joan Robinson's analysis of the problem was framed in terms of her innovative work in the other 'revolution' of the 1930s: imperfect competition. Hicks had already opened the question of the effect of factor prices on distribution in his *Theory of Wages* (1932, Chapter 6) and Joan Robinson had criticised and further extended this analysis in her *The Economics of Imperfect Competition* (1933, pp. 261–264).

The basic difference between the use of this concept by Hicks and Joan Robinson was that the former used it to determine the distribution of the 'National Dividend' while the latter's analysis applied to the demand for productive factors by a single industry. Joan Robinson's analysis of the demand for labour in an industry included an additional factor,

the effect of the elasticity of demand for the product: 'Now the increase in output will be greater the greater the elasticity of demand for the commodity, and the increase in the amount of labour employed per unit of output will be greater the greater the elasticity of substitution' (Robinson, 1933, p. 258) when wages are reduced.

The analysis could also be used to determine the demand for the other factor:

> If the elasticity of substitution is greater than the elasticity of demand for the commodity the amount of capital employed will be reduced when the amount of labour is increased (as a result of a fall in wages), and if the elasticity of substitution is less than the elasticity of demand the amount of capital will be increased as the amount of labour increases (*ibid.*; see also Hicks, 1963, p. 291, note 1 for his own recognition of the importance of the introduction of the elasticity of demand, and Hicks, 1970).

The concept of the elasticity of substitution created a great deal of discussion in the mid 1930s and the first number of the *Review of Economic Studies* in October 1933 contained a symposium on the subject with contributions by Sweezy, Lerner, Hicks and Kahn. Of particular importance was Kahn's observation that Joan Robinson's industry and Hicks's aggregate definitions were mutually consistent. Hicks (1970) suggests that it is more correct to credit Joan Robinson with the elasticity of substitution since his own concept was the reciprocal (he suggests calling it the elasticity of complementarity).[1]

Joan Robinson had early argued (cf. 1951, p. 55) that Keynes's theory could be viewed as an application of Marshall's analysis of a single industry to the analysis of output as a whole. The use of concepts from her micro 'toolbox' to analyse the determination of relative shares which was required in her long-period extension of Keynes's short-period theory must have seemed straightforward: indeed, her 'essay' might be interpreted as the extension of her analysis of the demand for labour in an industry to the demand for labour in the aggregate for, as Kahn (1933, p. 73) notes, the similarity between the Hicks and Robinson concepts can be applied 'just as well to the share of a factor in the value of the output of a single industry as to the share of a factor in the total product of a closed community'. Thus the elasticity of substitution could be used to represent the combined effect of a change in the rate of interest on the distribution of income. If the elasticity were less than one the reduction of labour per unit of output due to a lower rate of interest would be more than offset by the higher wage so the share of labour would be higher. A higher labour share meant a lower savings ratio, a higher value for the multiplier and a higher level of long-period income. Joan Robinson thus concludes 'that the equilibrium i.e. long period level of total output will tend to be raised or lowered by a fall in the rate of interest, according as the direct effect of the fall in interest upon the desire of individuals to save is negative or positive, and according as the elasticity of substitution between labour and capital is less or greater than unity' (Robinson, 1937, p. 116).

Following her earlier analysis for an industry, Joan Robinson goes on 'to provide a formula to represent the contrary pulls of increased total output and increased output per head upon the amount of employment' in terms of the elasticity of demand for output as

[1]Both writers had used the concept of the elasticity of substitution to represent the effect of a proportionate change in the relative prices of labour and capital on the proportionate change in their relative quantities. Cf. Hicks, 1932, p. 117: 'An increase in the supply of any factor will increase its relative share (i.e., its proportion of the National Dividend) if its "elasticity of substitution" is greater than unity... The "elasticity of substitution" is a measure of the ease with which the varying factor can be substituted for others', and Robinson, 1933, p. 256: 'The degree to which substitution of factors is possible can best be measured by considering the change in the ratio of the factors which occurs when their relative prices alter', the elasticity of substitution is 'the proportionate change in the ratio of the amounts of the factors employed divided by the proportionate change in the ratio of their prices', and is 'determined by the technical conditions of production'.

a whole and the elasticity of substitution of labour for capital (*ibid*, p. 117; compare the quotation given above, p. 342, and Robinson, 1933, p. 261: 'We have seen that a fall in wages will increase or diminish the amount of capital employed according as the elasticity of substitution is less or greater than the elasticity of demand for the commodity. By the same proof it can be seen that a rise in the price of capital will diminish or increase the amount of labour employed according as which of the two elasticities is greater.').

Richard Kahn had already pointed out, in the article cited above, the problems with this approach when applied to the aggregate level:

> When we have to deal with the output of a closed community we measure the price of the product in terms of itself: the price is always unity and the elasticity is infinite. The elasticity of demand must therefore always exceed the elasticity of substitution (Kahn, 1933, p. 76).

This would imply, among other things, that the demand for labour is always greater when the rate of interest is lower.

For the analysis of the demand for a factor used in the output of an industry the elasticity of demand for the industry's output may be considered as exogenous; for Joan Robinson's Keynesian long-period equilibrium (assuming the effect of interest on the propensity to save to be neutral) the elasticity of demand for output as a whole depends on the effect of the distribution of income on the multiplier. In aggregate analysis it is the value of the elasticity of substitution that determines the elasticity of demand. Joan Robinson thus proceeds directly to the definition of the elasticity of demand for aggregate output as 'a curve ... connecting the rate of interest with the equilibrium level of output' (Robinson, 1937, p. 117).[1]

This dependence of the elasticity of demand on the elasticity of substitution is most easily seen when the elasticity of substitution is equal to unity and a lower rate of interest leaves relative shares unchanged. There will then be no change in the demand for net output (which with a zero net saving equilibrium is composed entirely of consumption goods). The elasticity of demand must then be zero. Since the elasticity of substitution exceeds the elasticity of demand, the demand for labour must be less when the rate of interest is lower.

On the other hand, when the elasticity of substitution is less than one, the elasticity of demand will be greater than zero. At some point given by the production technology and the behaviour of the savings propensities of workers and capitalists, the elasticity of demand will exceed the elasticity of substitution and the demand for labour will be greater as output and the stock of capital are greater when the rate of interest is lower. Only in this latter case would a short-period increase in demand for output increase employment in long-period equilibrium. In general then, the long-period levels of output, employment *and* the capital stock (cf. *ibid.*, p. 117) could be higher *or lower* when the rate of interest is lower.

While it is common to argue, on the basis of short-period analysis, that a reduction in the rate of interest will have a beneficial effect on investment, output and employment, Joan Robinson's analysis identifies three possible obstacles to consistency between the short and long-period effects on employment, of a lower rate of interest:

> First, a fall in the rate of interest may increase the desire to save, and so tend to reduce total income. Second, the change in distribution may be unfavourable to labour, and so tend to reduce total income. Third, even if total income increases, employment may be reduced, because of the increase in output per head (*ibid.*, p. 123).

[1] 'This elasticity ... involves a complexity of factors and must be regarded as a useful shorthand term rather than as a concept which is of interest in itself' (Robinson, 1937, p. 117).

Having successfully adapted the analysis of the demand curve for labour in an industry to the economy as a whole, Joan Robinson proceeds to employ her framework to analyse the claim of traditional theory that long-period forces will be at work to adjust the rate of interest to the level which ensures equilibrium at full employment. Fig. 2 shows the impact of the elasticity of substitution on the long-period level of output. Above the solid line i_0 the elasticity of substitution, n, is less than unity and below i_0 it is greater than unity. At i_0 the elasticity of demand, e, is equal to zero. The shape and height of the curve are determined by the production technology, savings behaviour and the level of capital accumulation.

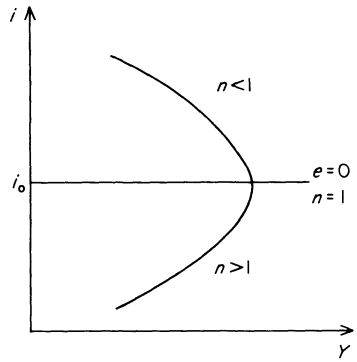

Fig. 2.

The relation between the values of n and e can be employed to produce a curve showing the relation between the long-period demand for labour and the rate of interest. At i_0, $n > e$ implies that the demand for labour is lower when the rate of interest is lower, as shown in Fig. 3. The curve DD′D″ which traces out the long-period relation between the rate of interest and the demand for labour can be used to illustrate the effect of long-period relative adjustment and analyse the proposition that these forces constrain the rate of interest to that which produces full employment equilibrium. Consider an interest rate above i_1. If there were unemployment at this rate there would be downward pressure on wages. Given the quantity of money, a fall in money wages produces a fall in the rate of interest and a rise in labour demand along DD′. As long as there is no impediment to the fall in money wages the rate of interest will fall towards i_1, producing full employment, as long as the available long-period labour supply is not greater than N_1.

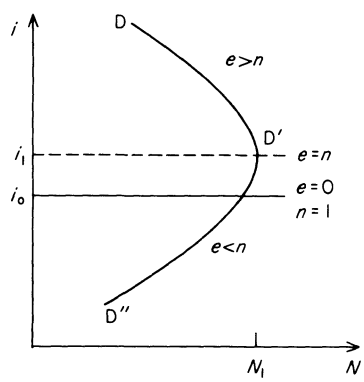

Fig. 3.

In *The General Theory* Keynes had argued that liquidity preference might stop the fall in the rate of interest or that trade unions might resist falling money wages more vigorously than rising prices at given wages. In the long-period analysis there is a rather different obstacle to full employment: 'we have found that in some cases a fall in the rate of interest merely increases the long-period level of unemployment' (Robinson, 1937, p. 121) since there is nothing to guarantee that the portion D′D″ of the labour demand curve, which lies below i_1, is not applicable to the economy. Further, since technology, savings behaviour and the level of capital accumulation determine the shape and position of DD′D″, i_1 may occur at any absolute rate of interest, high or low. 'In a community with perfectly plastic money wages the level of prices may be always moving towards zero without setting up any tendency permanently to reverse the situation which is causing prices to fall. It is thus impossible to argue that there is any self-righting mechanism in the economic system which makes the existence of unemployment impossible, even in the longest of runs' (*ibid.*, p. 121), once the possibility that D′D″ applies to the economy is admitted.

It is also possible that the available supply of labour exceeds N_1, as is the case in Fig. 4 which shows the long-period relationship between real wages and the supply and demand for labour. The level of i_1 is transported from Fig. 3 so that the DD′D″ curve is thus inverted on i_1. Above i_1 a fall in the rate of interest corresponds to a rise in the real wage. Thus the labour supply curve may be upward sloping in its initial range, but eventually bend back upon itself at some sufficiently high real wage (Robinson, 1937, p. 173). In this case no reduction in the rate of interest could lead to full employment because the supply curve lies at all points to the right of the demand curve: 'The most effective remedy for a community which finds itself in such a situation is to make a direct attack upon the maldistribution of income which is the cause of excessive thriftiness' (*ibid.*, p. 125). This would imply a shift to the right of the DD′D″ curve in Fig. 4 until the demand and supply curves intersect or become tangent at i_1.[1] This point simply reflects Keynes's concern that 'the richer the community, the wider will tend to be the gap between its actual and its potential production; and therefore the more obvious and outrageous the defects of the economic system' (Keynes, 1936, p. 31).

[1]There may, of course, be single or double intersections with stable and unstable equilibria. Kaldor's (1961, pp. 198–201) Keynesian demand curve is directly related to Joan Robinson's DD′D″ curves, but the underlying mechanism is rather different as Kaldor relies on variations in demand (induced investment). In this respect it is interesting to note that from the beginning Kaldor restricted his growth analysis to the 'longer run' to distinguish it from a true long-run analysis which works under the assumption that the 'net investment activity has already come to an end' (1938, p. 646, n. 1) although he retained Joan Robinson's emphasis on the importance of technical production conditions (in his 'complementarity' and 'specificity' concepts, pp. 643–644) and on the importance of the distribution of income to the regulation of savings and investment at full employment ('The key to ... regulation is to be found in the fact that savings, for any given total income, largely depend on the distribution of income' p. 650).

Joan Robinson also notes that a possible counter-argument to her analysis would be to argue that at sufficiently high levels of capital accumulation the value of n would fall below unity and that at sufficiently low levels of the rate of interest, saving may be discouraged so that a 'sufficiently low' rate of interest will bring about full employment. In a remarkable footnote (Robinson, 1937, pp. 126–127) she notes that the level of the rate of interest will have a direct effect on the size of capitalist's incomes so that 'as the interest rate falls towards zero a point must be reached at which the typical earned income becomes greater than the typical capitalist income. When this point has been passed ... a fall in the rate of interest tends to increase thriftiness when the elasticity of substitution is *less* than unity'. Thus, 'a fall in the rate of interest, by enriching the earners, who now enjoy higher incomes than the capitalists, will increase thriftiness and so reduce the equilibrium level of income. Thus there is likely to be a certain range of low values of the rate of interest within which a fall will increase equilibrium income, but in the lowest range of all a fall in the rate of interest will reduce equilibrium income'. See Fig. 5 where the *low* and *lowest* ranges of the rate of interest are identified. Thus, even beyond the point of the 'euthanasia of the rentiers' (or what has emerged in recent times as the 'Pasinetti point') excess thriftiness produces long-period unemployment in equilibrium and the impossibility of automatic self-adjustment.

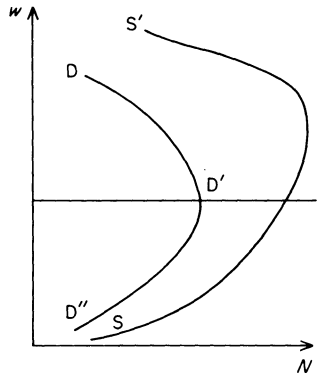

Fig. 4.

Joan Robinson thus produces a long-period theory of effective demand based on the traditional theory of distribution which captures both the effect of saving on the capital stock and the impotence of relative factor prices in acting as a self-adjusting equilibrium force. The key to her approach is the shape and position of the DD′D″ curve which is determined by the combined effects of the distribution of income and the propensities to save. These in turn result from the technology and thriftiness conditions and there seems to be no reason to exclude from the analysis positions below i_1, which are compatible with production functions possessing an elasticity of substitution greater or equal to unity.

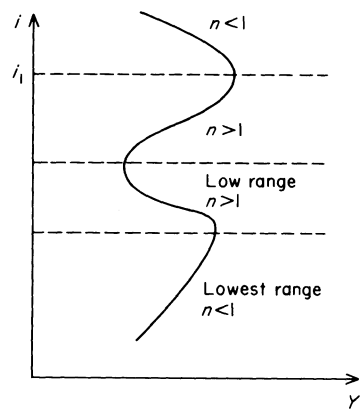

Fig. 5.

The analysis also emphasises that short-period policies to increase investment *via* reductions in the rate of interest (or reductions in wages producing lower rates of interest) need not produce identical short and long-period effects on the level of output and employment (a point made by Domar some years later). Nor is there any reason to believe that there is any self-adjusting mechanism which will cause the rate of interest to bring about an expansion in saving and the capital stock capable of providing employment for the available supply of labour. As a by-product, Joan Robinson's and Kahn's (1933) analyses suggest that even the traditional theory of distribution can be made compatible with Keynes's theory of employment and that there is no reason for there to be either a positive relation between saving and the stock of capital, or a negative relation between the rate of interest and the stock of capital.

It is interesting to note that Joan Robinson's conclusions are 'long-period' in Marshall's sense of the stationary conditions and thus do not in any way depend on either expectations or liquidity preference considerations, and that they have been reached within the Marshallian theory of distribution as amended by imperfect competition. The analysis places emphasis on the relation between the state of technical knowledge, the distribution of income and the degree of thriftiness. The results make it difficult to argue that the subsequent rehabilitation of the long-period relation between saving and investment should be found in the ease with which traditional theory was reintroduced into Keynes's analysis because of its emphasis on expectations, liquidity preference and its own preservation of certain remnants of marginalist distribution theory such as the demand curve for labour and the marginal efficiency of capital schedule. Nor could it be argued that the neoclassical resurgence was due to a failure to treat the problems of the long period, or that the classical theory of value is a prerequisite to the preservation of Keynes's results in the long period. It would seem that the answer must be sought elsewhere, in what Joan Robinson identifies as 'bastard Keynesian' analysis.

3. Bastard Keynesianism

It was Hicks who originally proposed the elasticity of substitution as an explanation of the aggregate distribution of income in his *Theory of Wages*. As Hicks reminds us (Hicks, 1963, p. 306) that book was written under the influence of the works of economists such as Cassel, Walras, Pareto, etc., 'with all of whom I was much more at home at that stage than I was with Marshall and Pigou. (We were such "good Europeans" in London that it was Cambridge that seemed "foreign")'.

While working on a more dynamic version (Hicks, 1935) of the model set out in his book Hicks was, however, influenced by what was occurring in Cambridge:

> though the *General Theory* was not available to me when I wrote it, I must certainly have heard that Keynes was determining the rate of interest by the supply of money, I was curious to test out this doctrine on the model with which I was working ... on the dynamic side. The idea of a model of very short-run equilibrium had come to me from Sweden, ... (Hicks, 1982, p. 10).

The result of this 'test' was 'Wages and Interest: the Dynamic Problem' (Hicks, 1935) which was 'to ask about the effect of a change in real wages, on employment, on real capital formation, and the real rate of interest' (*ibid.*, p. 64). This analysis, which posed virtually the same questions for the short run as Joan Robinson had set out for her long-period analysis, formed the basis for Hicks' IS-LM representation of Keynes's theory and provided, even before *The General Theory* was published, the source of what Joan Robinson baptised 'bastard Keynesianism'. Since this model was constructed as a short-period, dynamic version of the long-period analysis of the *Theory of Wages*, it maintained intact the long-period self-adjusting mechanisms of the traditional theory which were again made the centre of analysis when economists again took up analysis of the long period.

Joan Robinson's long-period theory of employment (summarised in Section 2 above) showed how even the traditional theory of distribution could be adapted to formulate a long-period theory of effective demand consistent with Keynes's short-period results.[1] This suggests that the rehabilitation of the pre-Keynesian results of traditional theory are due

[1]This lends support to Samuelson's (1975, p. 43, note 6) contention that he should have been able to produce this result 'from neoclassical considerations alone'.

to the exclusion from traditional analysis of certain factors present in Joan Robinson's analysis.

Hicks used 'periods' to convert continuous flows of non-stationary analysis into stocks which could be analysed within a general equilibrium framework aggregated so as to produce three-way trade in the three markets of an economy producing a homogeneous commodity, 'bread', with labour and equipment financed *via* the market for loans. With bread as numeraire, the prices of labour and loans were to be determined by the three market-equilibrium relations: 'of these three equations (as in the system of Walras) one follows from the other two. But it is completely indifferent which of the three equations we strike out...' Thus, 'in order to determine the rate of interest, we need not examine that elusive thing the "capital market"...' (Hicks, 1935, p. 77) but need only consider equilibrium in the bread and labour markets.

In this system an increase in bread wages produces an excess demand for bread since the bread supply is inelastic within the 'period'. Since the rate of interest is the only remaining 'price' it must rise to produce equilibrium in the bread market (unless producers instantly accede to the rise in real wages translating them into lower future profits which leads them to reduce their current consumption by an equivalent amount). Because the rise in real wages represents an increase in the marginal cost of output at all future dates, Hicks argued that output in future periods would be adjusted downwards (despite excess demand and rising prices!) and that producers would be induced to substitute 'past' labour for current labour.

A rise in bread wages thus produces a rise in the bread rate of interest and a reduction in employment. This parallel movement of the real wage and the interest rate caused Hicks some consternation (cf. Hicks, 1963, pp. 354 ff. and 1982, pp. 64–67) but he subsequently came to consider it as an 'orthodox Keynesian' position: 'If there is not enough money to support full employment at the enhanced level of money wages, the rate of interest will rise, employment will therefore fall and (probably) real wages will rise, since a smaller volume of labour is being applied to an unchanged capital stock. This is not so very far away from the classical analysis of the same problem; after all, it is a rather "classical" problem, with which classical theory ought to be better able to cope. Both Keynes and the Classics are agreed that the rise in money wages will now lead to a rise in real wages and a fall in employment' (Hicks, 1963, pp. 360–361).

It is not difficult to recognise the reasoning Joan Robinson subsequently classed as 'bastard Keynesian' which employs

> arguments which are purely Keynesian (though formalistic and silly), showing how the effect upon prices of changes in money-wage rates reacts upon liquidity preference and the propensity to consume.... But the bastard-Keynesian model is not only silly. It is seriously defective in logic. Any arbitrarily fixed quantity of money... is compatible with full employment, in conditions of short-period equilibrium, at some level of money-wage rates, the level being lower the smaller the postulated quantity of money, and the larger the labour force to be employed. This is supposed, in the bastard-Keynesian argument, to justify the contention that falling wages and prices are good for trade (Robinson, 1965, pp. 100–101).

In 1937 Hicks revised his 'test' of Keynes's proposition into a formal representation of *The General Theory* which he had by then been able to read.[1] Keynes had identified three crucial variables: the propensity to consume, the efficiency of capital and liquidity prefer-

[1]This process of development of Hicks' ideas in a Keynesian framework is analysed in more detail in Kregel, 1982.

ence, which together with the quantity of money constituted the exogenous variables which would determine the level of output and employment. Hicks had his 'three market' analysis at hand to be applied to Keynes's three crucial variables in terms of the goods, loans and money markets. In the 'bread' model the rate of interest was determined by the supply and demand for bread, the loans market was redundant. It Keynes's theory savings and investment were always equal, which looked like much the same thing. Taking money as the numeraire left the rate of interest and goods' prices to be determined by two market relations (the labour market and the wage rate seem to have disappeared). Since in a general equilibrium framework it is a matter of convenience which market-equilibrium relation determines which price, Hicks chose to eliminate the goods market, leaving the loan market and money market equations to determine the rate of interest and the price of aggregate output.[1]

In 1935 Hicks was able to avoid 'that elusive thing "the capital market" '; in 1937 he avoids Keynes's theory of effective demand by eliminating the goods market and referring to the loans and money markets. The loans market equilibrium is determined by the 'investment rate of interest' which equates savings and investment for each level of income.

Hicks assumes that saving is always a positive function of the rate of interest, that there is no effect of distribution on saving, and that $\partial S/\partial Y > \partial I/\partial Y$ so that the *IS* curve reflecting the relation between the investment rate of interest and the level of income is always downward sloping. With a given stock of capital the elasticity of substitution will be less than unity and declining while the elasticity of demand will be near unity and rising, indeed, the stability conditions that Hicks gives for the 'elusive' loans market (1937, p. 114, note 1) assure the relation between e and n required to assure that a reduction in the rate of interest increases output and employment. Thus, a higher wage rate, given the quantity of money, shifts the LM curve to the left, reduces output and employment as it increases the rate of interest. Wages and interest move together just as in the (1935) 'bread' model. It now becomes a simple matter to make the 'bastard Keynesian' argument that reductions in wages lead to an expansion in output and employment *via* the effect of liquidity preference and the propensity to consume. Just as in the bread model there is no way for the direct effect of the change in bread income to be represented except as a change in the rate of interest, and an opposite change in income and employment. In contrast to Keynes' analysis of the effect of changes in wages on effective demand, which has been eliminated along with the market equilibrium relation for the goods market as a matter of 'indifference' in general equilibrium modelling, there can be no direct effect of a change in wages on *IS*, so it must appear indirectly *via* the influence on the rate of interest and of the latter, *via* saving-investment equilibrium, on income.

All this concerns what Hicks has called the 'impact' (or short-period) effect of a change in wages (Hicks, 1982, p. 65). The rise in unemployment and the reduction in investment would eventually reduce marginal efficiency leading to a downward shift in the *IS* curve and a fall in the rate of interest. At this point, as Joan Robinson recognised, the same argument used concerning the ability of a given quantity of money to produce full employment—if only wages were set at the proper level—could also be applied to the quantity of capital in the long period: 'It was taken for granted ... that any given quantity of "capital" could employ any number of workers, because unemployment would cause real wages to fall, so making it profitable to employ more labour per unit of "capital" until

[1]There are, as Hicks now admits (1982, pp. 318 ff.) some fundamental difficulties involved in transferring his 1935 analysis to Keynes' theory. Keynes in particular did not accept that it was a matter of indifference which markets were eliminated (cf. Kregel, 1982, note 53).

all available workers are absorbed' (Robinson, 1965, p. 100). Thus Hicks's concern that after the 'impact' effect, wages and interest should move in opposite directions allowing the process of substitution of the *Theory of Wages.*

So, in the long-period analysis, after the 'impact' effect, the elasticity of substitution with be higher. But the effects on substitution and the flexibility of wages will cause the long-run *IS* curve to become nearly horizontal (cf. Hicks, 1950, pp. 136–139, and 1967, p. 143 ff.) and thus cause the elasticity of demand to approach infinity which assures the required relation between n and e.[1]

Hicks's 1935 and 1937 papers thus provided a short-period or 'dynamic' extension of his already worked out 'stationary' or long-period analysis of 1932. It was this 'bastard Keynesian' position which Hicks clearly recognised some thirty years later to be 'rather classical'. Just as in Joan Robinson's attempt to formulate a long-period theory of employment Hicks notes the contradiction between the short-period parallel movement of real wages and the rate of interest and the long-period inverse movement. Joan Robinson resolved this contradiction and preserved Keynes's paradox of thrift, while Hicks resolved it by returning to his prior analysis of the *Theory of Wages* where savings determine investment, 'showing its consistency with the theory of growth equilibrium, or steady equilibrium, which was so fashionable in the sixties' (Hicks, 1982, p. 65).

Hicks was able to do this because there is no link in his 'orthodox Keynesian' theory between factor incomes and demand in the short period or between the distribution of income and the level of demand in the long period (i.e. between the elasticity of substitution and demand). Instead, a reduction in price always increases the demand for a factor, e is always greater than n, and the 'bastard Keynesian' mechanism prevents the 'reversal' of the demand curves for labour, output and capital upon which Joan Robinson was able to construct a long-period equivalent of Keynes's short-period paradox of thrift.

4. Beyond the long-period theory of employment

Joan Robinson's extension of Keynes's short-period theory to the long period where changes in the stock of capital were taken into account was centred on the behaviour of two key concepts, the elasticity of substitution and the elasticity of demand, in conditions of stationary equilibrium. The elasticity of substitution expressed both the effect of the distribution of income on saving and thus the multiplier, and the impact of changes in prices and outputs on the relative demands for labour and capital; the elasticity of demand expressed the relation of relative factor prices on the multiplier and thus on the demand for aggregate output. Both of these concepts were transferred from the economic tool-box of imperfect competition and applied to the analysis of economic aggregates.

In this respect Richard Kahn concluded his 1933 contribution with this warning: 'it may be well to mention a fundamental objection, which has been pointed out by Mr. Keynes, against the use of marginal productivity in dealing with output as a whole'. Since the com-

[1]It is interesting to note that Hicks, in his *Trade Cycle* (1950), sets out his *SI* curve as showing that 'given a marginal efficiency of capital schedule, and... given [a] consumption function, there is a determinate money income corresponding to each rate of interest', and notes that 'If a fall in the rate of interest affects the volume of saving forthcoming out of a given income, the multiplier itself becomes a function of the rate of interest' but this can only make the *IS* curve 'become less elastic' and 'this effect will never be large enough to disturb the general rule that the *SI*-curve slopes downwards' (pp. 138–139). But this is precisely what Joan Robinson, with the aid of the effect the distribution of income on saving, did argue. Tobin (1980, pp. 15–18) has recently produced an income curve that reverses on itself in price-output space on the basis of a 'reverse' Pigou effect maintaining the downward slope of *SI*.

position of output will change as output varies 'the total increment of product will be composed of a composite commodity quite different in character from the composite commodity of which output as a whole is composed... It is therefore very difficult to see in what sense a factor may be said to receive its marginal physical productivity' (Kahn, 1933, p. 78).

In her well-known essay on 'Euler's Theorem and the Problem of Distribution' Joan Robinson had also noted difficulties in identifying 'aggregate' factors:

> strictly speaking, it is impossible to reduce a group of non-homogeneous productive units to a common term so that they can be treated as a single factor. Any statement about the marginal productivity of a 'factor' which is not perfectly homogeneous cannot be perfectly accurate (Robinson, 1951, p. 5, note 3).

The position of the concept of the elasticity of substitution within traditional theory had also been sharply criticised by Leontief in his attack on 'implicit theorizing'. Although Leontief's criticism was directed at Hicks, and in particular his (1936) effort to reinterpret the concept, the argument applied with equal force to Joan Robinson's use of the concept (Leontief, 1966, pp. 68–69).

Harrod, in a review of the 1937 version of Joan Robinson's 'Essay' had objected that the

> Elasticity of substitution is introduced at a point where its property is not apparent and the conditions at the margin to which it is supposed to relate are not sufficiently clearly explained... Unfortunately, this definition is ambiguous, without the provision of a precise measure of the volume of capital... How is the amount of the new capital to be measured to ensure that it is the same as the old?... Reference to money value will not avoid the ambiguity, since we may suppose stable prices, prices falling as productivity rises, etc. An alternative procedure, and one which fits very well with Mrs Robinson's line of approach, is to divide inventions into those which *at a given rate of interest*... (Harrod, 1937, pp. 328–329).

Keynes also echoed this criticism, writing to Harrod in reference to the passage just quoted: 'I have just been reading your review of Joan. I quite agree what you say about her treatment of the effect of invention. Your line of approach seems to be the right one. I am not quite sure what assumptions the elasticity of substitution method requires, but I think that they would be found to be inappropriate' (Keynes, 1973, pp. 173–174).

The point of greatest weakness in Joan Robinson's long-period analysis thus appeared to be the application of the elasticity of substitution, and the meaning of marginal analysis upon which it was based, in macroeconomic analysis. Its replacement involved a theory to determine aggregate relative shares and specification of the reaction of factor proportions to changes in the rate of interest.[1]

[1]It is in this respect that Garegnani is correct to argue that Sraffa's framework provides a much firmer foundation for demonstrating the possibility of the 'reversal' of the long-period labour demand curve, for it requires neither the elasticity of substitution, nor that such conditions be considered as 'curiosa'. It does not follow that the same approach also provides that solution to the problem of distribution sought by Joan Robinson, especially when distribution in the surplus approach depends on an exogenously given real-wage rate. In any case this path was not open to Joan Robinson (particularly in the late 1930s!) for when she rejected the marginal productivity basis of the elasticity of substitution she also rejected the static (or stationary) conception of equilibrium which lay behind her zero-net saving long period condition. Since the capital theory debates of the 1960s, which fully developed the 'firmer' foundation of which Garegnani speaks, rely on such static or stationary conditions she clearly could not consider them appropriate to any but 'conditions of accumulation in a given state of technical knowledge' and thus without application. Whether the surplus approach may have applicability outside these assumptions and might thus be applied to the problem as conceived by Joan Robinson is a question still under discussion (cf. Robinson, 1979, and Garegnani, 1979).

As Joan Robinson's subsequent work in the area testifies, she chose to follow Harrod's suggestions in attempting to surmount these difficulties. First, she substituted for her zero net saving static equilibrium a 'steady rate of growth' derived from Harrod's 'warranted rate' which allowed her to preserve 'the proportion of income saved' as the 'key ratio' to determine equilibrium (Robinson, 1952, p. 160). The key ratio would still be determined by the distribution of income between workers and capitalists. Since marginal productivity and the elasticity of substitution had proved unsuitable for this task she set out to provide a new theory of distribution, taking particular interest in the work of Kalečki. It was this quest that produced her concern over the determination of the rate of profit in the analysis of long-period growth.[1]

But, Joan Robinson notes, 'my debt to Harrod goes back much earlier, for it was under his influence that I first formulated the concept of neutral technical progress [in 'The Classification of Inventions', *Review of Economic Studies*, Feb. 1938] that we have both made the centre of our analysis' (Robinson, 1956, p. vi). As Harrod pointed out in his original suggestion above, his approach had the advantage of side-stepping the influence of changes in relative prices (in Joan Robinson's case, the rate of interest) on factor proportions. Indeed, Harrod had expressly avoided discussion of such issues in his own dynamic analysis (cf. Kregel, 1980, pp. 116–117). Adopting Harrod's suggestion thus did not solve the problem of how the relation between relative factor prices and relative factor quantities should be analysed, and although it was no longer of importance in determining the distribution of income it was necessary to determine the long-period level of employment. It thus did not resolve, in Joan Robinson's words, the problem of 'the theory of accumulation in a given state of technical knowledge' (Robinson, 1956, p. viii) which she came to consider one of the main objectives of analysis.[2]

Indeed, Joan Robinson's work continued to analyse the link between changes in techniques of production, relative prices and distribution. The discussion of the defects of traditional theory which had arisen in discussion of her 'Essay' produced criticism of the application of marginal producitivity theory *via* the use of the concept of aggregate

[1]The 'Essay' was also criticised, in particular by Hicks (see his exchange of letters with Keynes 1973, pp. 72 ff.), for its failure to discuss the effect of inventions. The reprinted version contains a section which does just that, identifying inventions in terms of their effect on the distribution of income (and thus on saving and the multiplier) using Hicks's own marginal productivity-based concepts. It is to these that Harrod objected in his famous suggestion in his review. It is also interesting to note that Joan Robinson thanks Kalečki for assistance in developing the analysis of the relation of invention to distribution. (The effect of inventions has not been introduced in the exposition of Section 2 above for they complicate, but do not change, the logic of the argument.)

Kalečki himself eventually also analysed 'what would be the consequences of technical progress for economic development if only pure changes in the technique of production—i.e. the increase in productivity of labour and change in the relation of productive capacity to capital—were to take place' (1941, p. 180). A note points out 'It is this problem which has been considered by Mrs Robinson for long-period equilibrium'. Kalečki instead proposes a 'reference system'. Vol. XII of Keynes's *Collected Writings* (1983, pp. 829 ff.) reproduces the editorial correspondence between Joan Robinson and Keynes concerning Kalecki's article. She notes 'The real advantage of the theorem is to clear out of the way any unnecessary difficulty so that some progress can be made with long-run (but not full equilibrium) analysis. Without this theorem one is held up by thinking one has to allow for the effect of changes in technique on thriftiness etc., as I thought when I did my Long-Period Theory' (*ibid.*, pp. 834–835). The article was eventually sent to Kaldor, who thought no more of it than Keynes, and Joan Robinson complains that neither of them could 'get the point about relative shares' (*ibid.*, p. 836). It would seem that it was at this stage that Kaldor was brought into discussion of the problem which was already occupying Harrod, Kalečki and Robinson and which would eventually produce 'post-Keynesian' theory.

[2]Joan Robinson subsequently made the lack of any analysis of distribution, factor proportions or the determination of the rate of profit the centre of her criticism of Harrod's approach. As early as her review (Robinson, 1951, p. 61) in the December 1936 *Economic Journal* of Harrod's *Trade Cycle* she objected that the 'the essential part which is played by the accumulation of capital in curtailing the inducement to invest is not given its due prominence in Mr. Harrod's analysis'.

capital in a production function even *before* such a proposal was made by orthodox economists in their attempt to remedy the seeming absence of any relation between factor prices and factor proportions in Harrod's growth analysis (which they interpreted as assuming fixed production coefficients over time). It also led her to propose her own original replacements for the traditional analysis in terms of what has come to be called the 'pseudo-production function' or the proverbial 'book of blueprints'.

The post-Keynesian approach to the capital theory debates is thus a direct result of the attempt to find a coherent replacement for the role played by the elasticity of substitution in the earlier 'Long-Period theory of Employment' in order to provide the required link between the rate of interest, the distribution of income, the savings ratio and thus the demand for labour and capital in the long period. From this point of view the 'Ruth Cohen Curiosum' (Robinson, 1956, p. 109) simply reproduced the result that Joan Robinson had already suggested in 1936 that a lower rate of interest might be associated with a lower rather than higher equilibrium capital stock. Nor is it surprising that Joan Robinson initially placed more importance on Sraffa's reinterpretation of Ricardo in his famous 'Introduction' to Ricardo's *Collected Works* (Sraffa, 1951) than on his more famous subsequent book, for the former provided clues to the resolution of the determination of the problem of distribution, while the latter left the problem 'open' (cf. Robinson, 1956, p. vi). Sraffa's (1960) book seemed only to provide additional curiosa, which were subsequently used to good effect in demonstrating logical errors in traditional capital theory, but which offered little help in resolving the positive problem of accumulation in a given state of technical knowledge.

When Joan Robinson had given up her analysis of long-period theory with zero net saving in favour of the analysis of accumulation she had shifted from statics to dynamics in Mill's sense,[1] to the study of 'actual economic events' where the existing technology is bound up with investment and accumulation. In this context the stationary conditions of the capital theory debates as well as the analysis of accumulation in a given state of technical knowledge became an anachronism:

> there is no such phenomenon in real life as accumulation taking place in a given state of technical knowledge. The idea was introduced into economic theory only to give meaning to the concept of the marginal productivity of capital, just as the pseudo-production function was constructed in order to show that it has no meaning (Robinson, 1975, p. 39).

Once it is recognised that 'the long-period aspect of investment is the change that it is bringing about in the stock of means of production often accommodating technical innovations' (Robinson, 1979, p. 179), the assumptions of stationarity that must be assumed to derive the results of the capital theory debates come into direct contradiction with the economic problems that they are supposed to explain. Or, as Kalečki (1941, p. 178) put it,

> If we start from a position of long-run equilibrium and assume some changes in the technique of production we may establish what will be the 'new' long-run equilibrium. But the results achieved in this way do not help us much in answering the question: what are the actual effects of technical

[1] Mill states the 'We have to consider ... adding a theory of motion to our theory of equilibrium—The Dynamics of political economy to the Statics.' He identifies 'the progress of wealth, ... the advancement in what is called material prosperity' which 'is actually in progress' as the 'natural' starting point for dynamics (Mill, 1886, pp. 421).

progress upon economic development? For the adjustment which is necessary to reach the new equilibrium will require a certain time and in the meantime technical progress goes on and therefore the new long-run equilibrium is actually never reached.

In this respect the results of the reswitching debates can be considered as unimportant to the analysis of the problem Joan Robinson set in 1936, the effect on the long-run growth in employment opportunities of an increase in the short-period rate of investment produced by a lower rate of interest. For post-Keynesian theory the response to this question is still open, while for the bastard Keynesian theory it was easily resolved by reference to the pre-Keynesian self-adjusting mechanism that had remained in what Hicks called 'orthodox' Keynesian theory. Joan Robinson's position would seem to reflect a realistic scepticism concerning application of stationary neoclassical theory or the natural positions of the surplus approach to the analysis of the problems of accumulation and employment.

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