JOAN ROBINSON AND RICHARD KAHN
The origin of short-period analysis

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The most easily identifiable heritage of Marshall, in the 'new' Cambridge School of Economics, is the short period. The short period of Keynes, Kahn and Joan Robinson has a peculiar meaning, whose origin can be traced back to the late 1920s and early 1930s. Those years saw the transition from the Treatise on Money to The General Theory and the transformation of the Marshallian–Pigouvian apparatus that culminated in The Economics of Imperfect Competition.

This paper is concerned with three points in particular. The first is the importance of Kahn's work in providing the link between the short-period determination of price and quantity of a single commodity and the short-period theory of the level of prices and output in aggregate. The second is a comparison between Kahn's fellowship dissertation, The Economics of the Short Period, and Robinson's The Economics of Imperfect Competition, with a view to pointing out their common ground. The third point is the peculiarity of Joan Robinson's position as regards the importance of short period in economic analysis.

THE TRANSITION FROM THE TREATISE TO THE GENERAL THEORY

In his 1924 essay on Marshall, although showing his appreciation of the distinction between long and short periods, Keynes wrote: 'this is a quarter in which, in my opinion, the Marshall analysis is least complete and satisfactory, and where there remains most to do' (Keynes 1972: 206–7).

The task was undertaken by Kahn, who actually chose it as the topic for his dissertation, 'The Economics of the Short Period'. This work, which Kahn started in October 1928 (Marcuzzo 1994a: 26a) and completed in December 1929, earned him a fellowship at King's College, Cambridge, in March 1930. The dissertation turned out to be an important step in the development of Keynesian ideas, although, as Kahn remarked sixty years later at the time of
its publication, 'neither he [Keynes] nor I had the slightest idea that my work on the short period was later on going to influence the development of Keynes's own thought' (Kahn 1989: xi). Kahn began his collaboration with Keynes in the final drafting of the *Treatise*, which was completed in September 1930; the same month saw the beginnings of his intellectual partnership with Joan Robinson. In fact, in the transition to the *General Theory* a major role is assigned by Moggridge to the 'core pair' of Joan Robinson and Richard Kahn (Moggridge 1977: 66).

We know that in the *Treatise* Keynes declared his unwillingness to be led 'too far into the intricate theory of the economics of the short period' (Keynes 1971: 145), but soon after the publication of the book, in a letter to Hawtrey of 28 November 1930, he wrote:

> I repeat that I am not dealing with the complete set of causes which determine volume of output. For this would have led me an endlessly long journey into the theory of short period supply and a long way from monetary theory; though I agree that it will probably be difficult in the future to prevent monetary theory and the theory of short-period supply from running together.

(Keynes 1973b: 145–6)

It was while following this line of research that Keynes came to write his most famous book. The intention of writing the *General Theory* became apparent in the summer of 1932 after a period of long discussions with the participants in the Circus, who urged him to tackle the question of the causes of variation of output in aggregate. This at least is Kahn's opinion, who wrote: 'It is my strong belief - based on our several and joint memories - that the Circus encouraged the development indicated by Keynes to Hawtrey' (Kahn 1985: 48–9).

One crucial element in the transition from the *Treatise* to the *General Theory*, the adoption of the theory of demand and supply, i.e. 'in a given state of technique, resources and costs' (Keynes 1973a: 23), to determine the short-period level of prices - was attributed by Keynes himself to Kahn.

As is well known, Kahn brushed aside any implicit or explicit suggestion that his role in the writing of the *General Theory* was that of a co-author rather than of a remorseless critic and discussant. However, in a letter to Patinkin of 11 October 1978 he wrote: 'I claim that I brought the theory of value into the *General Theory* in the form of a concept of the supply curve as a whole and that this was a major contribution' (Patinkin 1993: 659).

In order to clarify this question we have first to single out the relevant works produced by Kahn in this area. The obvious starting point is the so-called 'multiplier article', to which Keynes refers, but this was written after the dissertation, which, as we have seen, was the first step in the development of short-period analysis. Two further works must be added to the list: the unfinished and unpublished book that has the same title as the dissertation, 'The Economics of the Short Period', where the nature of the short period is further explored, and the lectures on the 'Economics of the Short Period', which Kahn gave from 1931 onwards. These lectures came to us in the form of a summary of their main content, written by Tarshis on the basis of the notes he took when attending Kahn's lectures in the Michaelmas term of 1932.

In the following section we shall take together the multiplier article, published in 1931, with Kahn's lectures, in both of which we find the construction of an aggregate supply curve of consumption goods and output in aggregate. We shall then go on to examine its bearing on the concept of the short period.

**Kahn's Aggregate Supply Function**

In his 'multiplier' article, Kahn maintains that the determination of the level of price and output of consumption goods cannot but be derived from the theory of demand and supply. The aggregate supply curve of consumption goods, just like the supply curve of a single commodity, indicates the price necessary for each level of demand for consumption goods for that quantity to be produced, the demand for consumption goods being a function of total employment. Thus, the aggregate supply curve of the consumption goods sector represents 'all the situations in which the price level is such as to confirm production and employment plans made by the firms in this sector' (Dardi 1990: 8).

Following a change in employment (brought about by the building of roads financed by the government) we can study its effects on the prices and output of consumption goods, in other words the increase in production beyond the increase in investment, by looking at the shape of the supply curve of consumption goods. The latter must be derived according to the point of view of the particular period of time that is under consideration - long, short or otherwise' (Kahn 1972: 6).

As we know, Kahn claims here that:

At normal times, when productive resources are fully employed, the supply of consumption-goods in the short period is highly inelastic ... But at times of intense depression, when nearly all industries have at their disposal a large surplus of unused plant and labour, the supply curve is likely to be very elastic.

(Kahn 1972: 10)

Thus, in the former case, the increase in secondary employment is small and the increase in price high, while in the latter the change in secondary employment is large and the increase in price negligible.

The effects of a change in demand and in employment in the short period are made dependent on the state of demand and the pattern of costs. Thus, in
the short period, we can have an increase in output and employment, or only
an increase in prices. If demand is sustained, the increase in costs (and there
fore in prices) is accounted for by capacity being fully utilized. If
demand is low, plants and machinery are not fully utilized and production can
be increased without any increase in costs. If marginal costs are assumed to
be fairly constant (because there is spare capacity since demand is low) there
need not be a large increase in price to call forth an increase in output (the
aggregate supply curve is elastic); in contrast, if marginal costs are increasing,
because we are closer to full capacity, then prices also will increase or, rather,
only if they increase will it be profitable to increase production.

Kahn's construction of the aggregate supply curve is meant to solve two
problems: (a) what the price must be in order that a given quantity of
consumption goods be produced; (b) how much employment is generated by
the increase in the quantity of consumption goods that it is profitable to
produce. However, the answers to these two questions are kept separate in
his argument. The answer to (a) depends on the assumed pattern of costs, on
the value and pattern of the elasticity of demand, and on the rule of behaviour
assumed to be followed by firms (profit maximization); whereas the answer
to (b) depends on the hypotheses about labour productivity and money
wages.

Once hypotheses are made relatively to (a) and (b), we can calculate the
increase in price and production for any given increase in the primary
employment, which is of course the multiplier.

The multiplier article can be seen then as the first step towards a theory
based on aggregate supply and demand curves, although its application is
limited here to the consumption goods sector. Extension of this analysis to
output as a whole is accomplished in the discussion of the aggregate supply
function as we find it in the lectures given by Kahn in 1932. Unfortunately,
the only published evidence we have here is contained in an article by Tarshis
(1979), where he states that it conveys the substance of the argument put
forward by Kahn in his lectures.8

The starting point for the construction of the aggregate supply curve is the
same as in the multiplier article. The difference is that now on the vertical axis
we have the expected proceeds necessary to induce entrepreneurs to produce
a given output, while on the horizontal axis we can have the level of output
\((ASF-O)^9\) so that the question - what the price must be - is substituted by
what the proceeds must be in order that a given quantity be produced.

To derive the aggregate supply curve, we start from the determination of
the supply curve of each level of output for a single firm. The supply price
answers the question: given marginal and average costs, associated with a
given level of output, \(O_0\), what must the price be in order that the firm that
maximizes its profits be willing to produce precisely that level of output?

The level of output, \(O_0\), will be produced only if profits are at a maximum;
that is to say, only if in \(O_0\) marginal revenue equals marginal cost.10 Thus, for

\[
p_i = \left( \frac{k}{k-1} \right) MC_i,
\]

where \(k = \text{elasticity of demand} \) and \(MC_i = \text{marginal costs at } O_i\).

The supply curve is then given by:

\[
Z(O_i) = p_i O_i = \left( \frac{k}{k-1} \right) MC_i O_i.
\]

It is worth noticing that the above is a general formulation, which does not
require special assumptions about market form or the shape of the marginal
cost curve. Specific assumptions are reflected in the shape of the supply curve
and in the value of its elasticity. According to Tarshis, the different
possibilities were discussed in Kahn's lectures (Tarshis 1979: 369n).

The aggregation problem is 'solved' by assuming that, for any given level
of output, the distribution among firms of their individual share is known. The
aggregate level of output, \(O\), is then:

\[
\sum_{k=1}^{m} O_k^k
\]

\(m = \text{number of firms}; O_k^k = \text{output produced by the } k\text{th firm.}\)

The total output of the economy is measured by a production index; to
avoid double counting, intermediate products are of course subtracted from
the total production, so that a measure in terms of value added is obtained.

The importance of the aggregate supply curve, drawn in the expected
proceeds-aggregate output space, is that the derivation from it of the 'level
of prices' is straightforward: for each level of output, it is given by the ratio
of expected proceeds to output. This means that the level of price can be
determined by the same forces as the level of output and not by the Quantity
of Money. This was an important step in the development of Keynesian ideas,
as Joan Robinson reminded us years later: 'A short period supply curve
relating the level of money prices to the level of activity (at given money-
wages rates) led straight from Marshall to the General Theory' (Robinson
1969b: 582).

The short-period aspect relevant in the construction of the aggregate supply
curve is that profit maximization is the sole stopping rule for changes in
production. For long-run equilibrium, the additional condition is required that
firms earn the normal rate of profit, which is established through changes in
the number of firms within a given industry.

However, profit maximization requires knowledge of the costs and revenue
functions relevant to it, on both an "objective" and a "subjective" point of view. On the "objective" side, short period is defined as the time interval that is required before changes take place in the size of plants and in the number of firms. On the "subjective" side it is defined as the time interval when a change in the condition of demand is not expected to last. There is a "normal" level of demand, relative to which changes in demand are perceived as either temporary or permanent. If a change in demand is not expected to last, capacity will not be altered.

Profit maximization can be given as the general behavioural stopping rule, which defines short-period equilibrium, only if it can be extended to cases when competition is not perfect, this means knowing, in the revenue function, how price is related to quantity, i.e. the value of the elasticity of demand, when the assumption of perfect competition is abandoned.

These two issues - how equilibrium is established when market imperfection is introduced and what sets the limits to the short period - were tackled jointly by Richard Kahn and Joan Robinson in the early 1930s. In the discussion of their work, in the next three sections, we follow the chronological rather than the logical order - first the dissertation, which - as we saw - Kahn wrote between October 1928 and December 1929; then the Economics of Imperfect Competition, which Joan Robinson started writing between the end of 1930 and the beginning of 1931; and finally the unfinished book "The Economics of the Short Period", which Kahn wrote probably between the second half of 1930 and the last months of 1932.

The reason for doing so is to give an account of the beginnings of the collaboration between Kahn and Joan Robinson and to point out their common ground.

THE DISSERTATION

In the dissertation, Kahn starts from Marshall's definition of short period as the situation in which machinery and the organization of production are assumed to be constant. Apparently - he noted - it would seem illogical to yoke together with the same criterion, i.e. how fast they can be altered, two so very different entities. In fact 'fixed plant increases rapidly but decreases slowly' (Kahn 1989: 3), whereas 'organization can be easily and rapidly cut down but can only slowly and with difficulty be enlarged' (Kahn 1989: 3). Thus, the possibility of considering them alike, i.e. as constant from the point of view of the short period, is given by the fact that the decision to alter them is the same and depends on whether or not demand conditions are considered permanent relatively to a level considered to be 'normal'. If changes in demand are assumed to be transitory, the decision to modify the plant or the organization will not be taken.

In the short period, 'firms carry on at a loss in the hope of an improvement, but in the longer period such firms have to close down, either in despair or through necessity' (Kahn 1989: 4). Thus, in a depression: 'It is the hope of the return to prosperity that sustains a firm through a period in which existence is possible only at the expenses of a loss' (Kahn 1989: 3).

The point of the dissertation is to prove that, when the aim is to minimize losses, as in a depression, the relevant average and marginal cost curves have the shape of an inverted L. Because the average unit cost curve is horizontal for the relevant range, only the imperfection of competition can account for an equilibrium level of production below full capacity.

The apparatus used by Kahn to produce this result is built upon very special assumptions. Besides the assumption that the average unit cost curve is linear, it is the assumption that the demand curve is also linear that allows Kahn to determine the equilibrium level of output, by using only the concept of 'maximum monopoly net revenue' introduced by Marshall (1961: 397) to obtain the equilibrium output of a monopolist producer (Marcuzzo 1994a). The generality of the result obtained was therefore limited by the peculiarity of the assumptions made and by the analytical tool adopted.

The assumption that short-period average unit costs are constant up to capacity output was later abandoned by Kahn, who did not propose it again in his multiplier article. The reasons that led him towards a more orthodox line are possibly to be found in the criticism by Pigou of the restrictive nature of the assumption of linearity (Marcuzzo 1995), but more probably - as we shall see - in the construction built upon the concept of marginal revenue, which is presented in its most complete and refined form only in The Economics of Imperfect Competition. It is in fact this construction that eliminates the need for any restriction to the shape of the cost and demand curves.

A generalized application of marginal analysis was also provided by Kahn in his lectures. This allowed for a representation, in the aggregate supply function, of different hypotheses about the shape of marginal cost and demand curves, bypassing the need for restrictive assumptions. Unfortunately, generalization of the results was gained at the expense of the 'realism' of the dissertation, where the actual behavior of cotton firms during the depression was accounted for precisely by L-shaped cost curves.

JOAN ROBINSON AND RICHARD KAHN: THE ECONOMICS OF IMPERFECT COMPETITION

The first letter we have to document the beginnings of the collaboration between Joan Robinson and Kahn is dated 15 March 1930. In this letter Joan Robinson expresses, in her typical style, her pleasure that Kahn got the fellowship: 'I am so glad - tho' not surprised. I congratulate King's on showing sense.'

For more than fifty years the correspondence between them continued almost uninterruptedly, witnessing a lasting emotional and intellectual
partnership. Elsewhere I have dealt with the origin of that encounter in the climate of Cambridge in those years (Marcuzzo 1991). The focus here is rather the importance for short-period analysis of the results achieved in The Economics of Imperfect Competition.

Joan Robinson began writing The Economics of Imperfect Competition between the end of 1930 and the beginning of 1931. The occasion that started everything off was related by Austin Robinson. One day, when Richard Kahn was lunching at 3, Trumpington Street, where Joan and Austin lived in those days, he reported that a pupil of his—C. Gifford—had just invented an interesting concept, which was later christened by Austin Robinson ‘marginal revenue’; according to his reconstruction, the book started as a joint game between Joan and Richard Kahn’ (Leith and Patinkin 1977: 80; A. Robinson 1994: 7–8).

The drafting of the book, which Joan Robinson nicknamed ‘my nightmare’, was tormenting. The exchanges with Kahn were pressing and demanding, because Kahn checked every single passage, as he did with Keynes. Physical distance did not seem to matter, since the revision of proof was done by mail, back and forth between Cambridge (UK) and Cambridge (USA), where Kahn had been visiting since the end of December 1932. Eventually, by early February 1933, he was able to write to her:

I have finished your book and feel that I might be allowed to write to you... It is an amazing piece of work. I find that I usually take it for granted, but whenever I stop to think about it I just can’t believe it is true. Do you by any chance realize what you have done? In the course of two years of your young life? (Letter by RFK to JVR of 7/2/1933; RFK Papers 13/90, King’s College Library, Cambridge)

Early in November 1932, the typescript of the book was taken to Macmillan, who asked Keynes’ opinion. After only two weeks, Keynes recommended publication, but hesitated to stress the originality of the book (Keynes 1973c: 866–7).

Perhaps Keynes was right in warning that the book was ‘predominantly a discussion of the development of ideas which have been started by others, and which are now widely current, not only for learned articles, but in oral discussion at Cambridge and Oxford’. However, this does not invalidate the conclusion that it is only with Joan Robinson’s book that the generalization of the development of a method of analysis based on the equality of marginal cost to marginal revenue was really accomplished.

The starting point\(^*\) of The Economics of Imperfect Competition is Sraffa’s proposal – later dismissed by him – ‘to re-write the theory of value, starting from the conception of the firm as a monopolist’ (Robinson 1969a: 6), but with the aim of extending the marginal technique to market forms other than perfect competition. By doing so it is possible to unify the analysis of monopoly and perfect competition according to a single principle. Joan Robinson considered this an advance on Marshall’s approach, because:

It is clear that the marginal method of analysis will produce exactly the same results as the method, used by Marshall, of finding the price at which the area representing ‘monopoly net revenue’ is at a maximum, since net revenue is at a maximum when marginal revenue and marginal cost are equal. Both methods can be applied to problems of competition and monopoly.

(Robinson 1969a: 54n)

It was rightly argued that Robinson provided for the first time ‘a full and unified treatment of profit-maximizing equilibrium for a firm facing a fixed market environment’ (Whitaker 1989: 187). Without addressing the question of priority as regards the discovery of the main relevant analytical points,\(^*\) it was undoubtedly through that book that perfect competition was shown to be a special case in a general theory of competition.

The Economics of Imperfect Competition is built upon a general relation between average value, marginal value and elasticity of the average value if \( e \) is the elasticity of the average value, \( A \) the average value, \( M \) the marginal value, then:

\[
e = \frac{A}{A - M}; \quad M = A \left(\frac{e - 1}{e}\right); \quad A = M \cdot \frac{e}{e - 1}
\]

The above set of relationships (Robinson 1969a: 36)\(^*\) can be applied both to the average and marginal revenue curve and to the average and marginal cost curve. For the revenue curve, there are two points to note. First, it is only with a downward-sloping demand curve that the marginal revenue becomes a distinct curve.\(^\#\) Second, with a downward-sloping demand curve, any assumption about the shape of the marginal cost curve provides for the determinacy of equilibrium. The generality of the statement that, both in competition and in monopoly, production will be carried up to the point where marginal cost is equal to marginal revenue lies in the fact that it can equally accommodate constant, decreasing and increasing costs.

The Economics of Imperfect Competition is concerned mainly with long-period analysis, and the study of short-period conditions is confined to the discussion of the shape of cost curves. As in Kahn’s dissertation, we find the proposition that in the short period the marginal cost curve is constant for a wide range of output (Robinson 1969a: 49), but, unlike the dissertation, this book makes no mention of expectations relative to the level of demand, which are, as we have seen, an important factor in the definition of short period.

Joan Robinson later became a severe critic of the book that brought her fame and distinction. A few years later it was dismissed as a ‘blind alley’ (Robinson 1979: x), and already in the second edition she listed a number of
blemishes (Robinson 1969a: vi–vii). However, although *The Economics of Imperfect Competition* may appear as a detour, or, to borrow Lossby’s expression, ‘a wrong turning’ (Lossby 1991), if compared with the positions favoured by Joan Robinson later on, the book provided the key to the possibility of extending the theory of supply and demand to the general case (Marcuzzo 1994b). The other key was provided by a book that was not published and that did not get any public recognition, but that was equally important for the issue we are examining here.

**THE ECONOMICS OF THE SHORT PERIOD**

While he was helping Joan Robinson with her *Economics of Imperfect Competition* and assisting Keynes in getting his ideas into focus, Kahn was trying to write his own book, where the main findings of the dissertation could be presented in an improved form. The book, which bears the same title as the dissertation, remained unfinished. The extant copy, which was found among Kahn’s papers in King’s College Archives, contains a few comments pencilled by Joan Robinson, who read it at the beginning of 1933. Of the planned eleven chapters, according to the index, chapters I, III and IV remained unwritten, while chapter VII was left unfinished. Since Joan Robinson’s book is quoted as *The Theory of Monopoly* and we know that its title was changed in January 1933, and since we know that Kahn left for America in December 1932 and the latest reference in the book is an article published in February 1932, it is safe to date the extant version to the last quarter of 1932.

The most striking feature of the book is the attempt to define the short period with the utmost precision; the result is that, compared with the dissertation, the issue of the imperfection of competition is overshadowed. The nature of the short period is described as a matter of fact, rather than a conceptual experiment, where certain variables are kept constant:

> The whole usefulness of the device of the Short Period is based on the fact that the life of fixed capital is considerably greater than the period of production, greater that is to say than the life of working capital. It cannot be too strongly emphasized that this is a fact, which could not be deduced by a priori reasoning. In a different kind of world in which, for example, the plough wore out after a single season’s use (or, better still, in which crops took as long to reach fruition as ploughs to reach decrepitude), quite a different kind of analysis would be appropriate. (Kahn 1932, Chap. II: 2; 1989: xiii)

If there were a complete range of continuous variation in the lives of the different means of production, the notion of short period could not be employed. But, in reality, as far as the range of variation is concerned:

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**THE ORIGIN OF SHORT-PERIOD ANALYSIS**

Between raw materials, on the one hand, and productive plant, on the other hand, there is a desolate and sparsely populated area. As a general rule, the life of physical capital is illustrated either by the mayfly or by the elephant.

(Kahn 1989: xiii)

The reality of the ‘economics of the short period’ is, then, rooted in the nature of the production process, which gives meaning to a time interval where productive capacity is given and only its utilization varies. When we study the effects of a change in demand on the equilibrium of an industry, we have to keep in mind that there are changes that occur rapidly and completely (such as the alteration in the amount of employment) and there are changes that occur only slowly (such as the alteration, quantitative and qualitative, in fixed plant) (Kahn 1932, Chap. II: 6).

The other element entering the definition of the short period is the expectations of the level of demand relative to the level perceived as the normal level. In fact, ‘the situation in which businessmen are expecting a fairly rapid return to more normal conditions . . . provides par excellence the atmosphere that the short period thrives on’ (Kahn 1932, Chap. II: 22).

In a depression, the short period is a longer time interval, because expectations are that demand will return to its normal level, whereas suspending production or reducing the productive capacity to zero would require the belief that demand will continue to remain low. According to Kahn’s taxonomy, in the ‘ideal short period’, when the number of firms is fixed, ‘any change that occurs is not expected to be permanent’ (Kahn 1932, Chap. II: 10). On the contrary, when profits are high and the depression is over, firms react very rapidly by increasing production and capacity, and the short period is consequently ‘shorter’. Moreover, to measure the length of the short period not only are demand expectations relevant, but also market form, since ‘The monopolist is far quicker in adapting himself to new conditions than is a competitive industry’ (Kahn 1932, Chap. X: 7).

As we have seen, the book by Kahn remained unfinished but the way to short-period analysis was paved.

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**JOAN ROBINSON’S SHORT PERIOD**

Joan Robinson, as we saw, became increasingly dissatisfied with her *Economics of Imperfect Competition*, especially as far as the distinction between short and long period was concerned. In the following years she endeavoured to make this distinction more clear, and she returned to this very issue in her last paper (Robinson 1985). Thus, in reviewing Joan Robinson’s later work on this issue, the question arises whether short and long period should be interpreted as two aspects of the same theory or whether this distinction is thought to be feasible only on the basis of two distinct theories.
In her *Accumulation of Capital*, the distinction between short period and long period is derived on the basis of four criteria (Robinson 1969c: 179–82):

1. **Short- and long-period variables.** Changes in production, employment and prices belong to short-period analysis, whereas changes in capital stock, labour force and techniques belong to long-period analysis.

2. **Short- and long-period expectations.** Short-term expectations guide entrepreneurs in their decisions on the level of output, whereas long-term expectations guide entrepreneurs in their decisions on the stock of productive capacity.

3. **Short- and long-period aspects of the same variable.** From the point of view of the short period, investment is a determinant only of the level of aggregate demand, whereas from the point of view of the long period it enters as a determinant of the rate of accumulation and in the choice of techniques.

4. **Short- and long-period market forms.** Competition and monopoly (oligopoly) have both a short-period and a long-period aspect. Competition in its short-period aspect is described as a situation where there are many independent producers and each of them takes the price as given by the market. Each producer tries to keep his costs as low as possible and obtain the maximum profit that is feasible at that price. In oligopoly, price is not given by the market, but each producer must take into account how rivals react to his price policy. This represents the short-period aspect of oligopoly. The long-period aspect of competition is reflected in the relative ease in entering the market and in the pressure to adopt innovations in order to remain in the market. The long-period aspect of oligopoly also reflects how easily potential rivals can enter the market, so that a monopolist can be strong in controlling his market in the short period, but may not be able to prevent others taking control of the market.

In her 1956 book, Joan Robinson thus appears unwilling to give up the idea of having a theory that can deal with both short- and long-run issues. Later on she appears to be wavering between the idea that they can be approached within the same theory (by applying to the long period the same forces that are at work in the short period) and the resigned acceptance that the only option is to have separate theories.

Thus, the question is whether or not the distinction between short and long period can be made independent from the particular theory underlying it. We saw that in order to define a short-period equilibrium a stopping rule is needed for the system, resulting in the absence of any further incentives to change decisions. As far as the theory of effective demand is concerned, the rule that defines short-period equilibrium is given by the equality between saving and investment brought about by changes in income. This proposition, within the framework of analysis employed by Keynes and Kahn, was established through the adoption of aggregate demand and supply curves. However, extension to the long period of the same proposition, established within that particular theory, faces the well-known difficulties related to the need to measure the quantity of capital (Garegnani 1979).

Within the framework of analysis provided by the theory of demand and supply, the short-period equilibrium level of output is determined when we are given the rule of behaviour of profit maximization, which in its most general form can be expressed by the equality of marginal cost to marginal revenue. However, extension to the long period of the theory of demand and supply, needed in order for the rate of profit to be determined, is impeded by the difficulty of giving meaning to the concept of a quantity of capital.

After acknowledging the difficulty of extending to the long period the particular theory adopted for short-period problems, i.e. the theory of output and competition on the basis of supply and demand functions, Joan Robinson drew two conclusions. On the one hand she opted for a long-period theory of value and distribution, which does not encounter the same difficulties as the theory of supply and demand of ‘factors of production’. On the other, she held firmly to the idea that the short period could not be introduced in a framework of analysis where expectations of demand and various degrees of capital utilization do not have any role to play.

**CONCLUSIONS**

In this paper I looked into the meaning of the short period, examining its development at the origin of Keynesian macroeconomics. In the work of Richard Kahn and Joan Robinson the short period emerges as a framework where some decisions are taken and their effects are revealed (level of output) while others are not (plants and productive capacity). Two justifications for short-period analysis are given. The first is rooted in the nature of the productive process itself: the time horizon of decisions about the level of utilization of the labour force is shorter than that of decisions about the degree of utilization of productive capacity. The second is grounded in the nature of decisions in the pricing and production process: expectations about demand are made with respect to a level perceived as 'normal' and only changes that are perceived as permanent involve variations in plants, machinery and the choice of techniques.

This is a meaning of short period as a situation describing decisions taken on the basis of expectations. However, what matters is the divergence between the expected and the 'normal' values of selected variables, not the divergence between fulfilled and unfulfilled expectations. It follows that the short period is not a 'short' time interval, a temporary state when the so-called permanent forces of the system have not yet worked out their effects. The 'Cambridge' idea of short period is, rather, a position that is maintained as
long as the set of decisions depending upon the expected values of those variables does not change (Dardi, Chapter 2 in this volume).

Whereas Richard Kahn always remained faithful to the original formulation of short-period analysis, Joan Robinson's position evolved during the years, branching out in more than one direction. On this issue there was disagreement with Kahn, to whom she once wrote bluntly: 'Cannot we agree on Piero's prices for the long run and on Keynes' prices for the short run and leave it at that?'

Thus, it would appear that her legacy is to solve what she saw as a dilemma between a Keynesian (short-period) and a Stavrian (long-period) approach.

NOTES
1 I wish to thank, without implicating them, Marco Dardi, Andrea Ginzburg, Luigi Pasinetti, Alessandro Roncaglia, Anna Simonazzi, Maurizio Zanezini and especially Annalisa Russell for their comments on earlier versions of this paper. I also wish to express my gratitude to the former Vice-Provost, Ian Fenlon, the Librarian, Peter Jones, and especially the Modern Archivist, Jackie Cox, for the privilege I was granted to consult Kahn's papers before they were catalogued. Finally, I am very grateful to David Papineau for permission to quote from the unpublished writings of R. F. Kahn.
2 'Keynes did not want to divert me from my writing my dissertation, and it was only after December 1929 that he started giving me for comments the proofs of the Treatise' (letter from R. F. Kahn to D. Patinkin of 9/12/1974, published in Patinkin and Leith 1977: 148; see also Kahn 1985: 44). After he had submitted the dissertation on 7 December 1929, Kahn was free to give his time to Keynes to help him in the final revision of the Treatise. In a letter to Keynes on 17/12/1929, he was already raising the issue: 'Do you think that any attention ought to be devoted to the effects of short period influences in the Trade cycle: i.e. the effects of limited capacity and of surplus capacity on prices and profits?' (Keynes 1973b: 121).
3 In the same letter to Patinkin, Kahn added: 'Before I had finished the index (of the Treatise), I went away for a holiday in the Alps and left Joan Robinson to finish it' (Patinkin and Leith 1977: 148). It was during the same holiday in the Austrian Tyrol that Kahn began his multiplier article (Kahn 1984: 91).
4 In fact, according to Kahn: 'The General Theory is... short period theory, whereas... the Treatise is essentially long-period' (Kahn 1984: 68).
5 'It was Mr. Kahn who first attacked the relation of the general level of prices to wages in the same way as that in which that of particular prices has always been handled, namely as a problem of demand and supply in the short period rather than as a result to be derived from monetary factors' (Keynes 1973a, Appendix 400a). Keynes is referring here to the 'multipliers' article.
6 However, whatever Kahn's real contribution to the development of ideas presented in the General Theory may have been, there is not agreement in the literature. At one extreme there is Patinkin (1993), who belittles Kahn's influence in establishing what he sees as the main proposition of the General Theory, i.e. the theory of effective demand. At the other extreme there is Samuelson (in Patinkin and Leith 1977 and Samuelson 1994), who, on the contrary, believes that the theory of effective demand is 'logically equivalent' to the multiplier. Closer to the interpretation given here is the work done by Harcourt and O'Shaughnessy.
7 There is agreement in the literature that this was an original contribution by Kahn. See, for instance, Schacht (1951) and Cain (1979).
8 Tarshis was a student of Keynes and Kahn between 1932 and 1935.
9 Keynes chose to measure the level of economic activity in terms not of aggregate output but of employment, because the latter was believed to be less exposed to aggregation problems. This is the reason why, according to Tarshis, we do not find the ASF in the General Theory.
10 In addition the price must be at least as high as the variable unit cost, otherwise the entrepreneur would earn more (or, in this instance, lose less) by suspending production.
11 Kahn's interest in the short period is witnessed for the first time in a paper, 'Short period equilibrium', that he read at the Political Economy Club on 12 November 1928 and that later earned him the Adam Smith Prize. In the paper we find the following, striking comment: 'While long period economics dealt with things as they should be, and never were, short period economics is concerned with things as they are - and one fears, usually never should be!' (R. F. Kahn Papers [henceforward RKP] 3/81, King's College Library, Cambridge).
12 Defending himself from criticism for his acceptance of the inverse relationship between real wages and employment, Keynes attributed the responsibility to Kahn, who had allowed him to retain the hypothesis of rising marginal costs in the General Theory (Marcuzzo 1993).
13 RKP 13/90. Copyright The Provost and Scholars of King's College, Cambridge, 1994. Permission from King's to publish this quote is gratefully acknowledged.
14 See letter of April 1931, from RKP to Joan Robinson (henceforth JVR): 'I feel I must write this at once and congratulate you on making such a fine beginning and also to thank you. For it is tremendously pleasant to see it all rolling off - or at least beginning to roll off (it is going to be quite a big work) - so beautifully. I am so very pleased it has begun' (RKP 13/90). In October of 1931, the drafting of the book must have gone far enough to worry Shove, who asked for 'some acknowledgment of his part in developing imperfect competition (see letter of 24/10/1931 to JVR; Turner 1989: 27).
15 This part is mainly derived from Marcuzzo (1994a).
16 Comparison with Shove is difficult, because most of his papers were destroyed; comparison with Harrod is easier and supports the interpretation that Harrod had a similar project of providing a general theory of competition. On this point, see Besomi (1983).
17 The algebraic demonstration of the relation between the curves of average and marginal values is given by Harrod (1931).
18 As has been noted, 'nobody had previously wanted the general concept of marginal revenue since they conceived of marginal revenue in the special form of price' (Shackle 1967: 42).
19 As in the case of Keynes, Kahn reacted strongly to the suggestion that he co-authored the ideas presented in The Economics of Imperfect Competition. In a letter of 28/3/1933 he wrote to her: 'you are attributing to me much more than I am responsible for. What I did was to read what you had written. Most of my attempts to do constructive work (e.g. in regard to Discrimination and Exploitation) ended in failure and it was almost invariably you who found the clue... My place in the scheme of things is apparently to correct arithmetic' (RKP 13/90).
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20 See letter of 24/1/1933 from JVR to RFK: 'I have read your book... It is
certainly a very impressive work. I hope you are going to let me help you with
polishing it up' (RFK 1390. Copyright The Provost and Scholars of King's
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gratefully acknowledged).

21 Part of this chapter merged into an article, 'The Marginal Principle', which Kahn
took with him to America and submitted to Tassig for publication in The
Quarterly Journal of Economics. The article was rejected and remained
unpublished.

22 See letter from JVR to RFK of 23/1/1933: 'I enclose the blurb of my book
Austin wrote it for me. The latest idea is to call it 'The Economics of Imperfect
Competition', what do you think? The text does not bear much relation to it, but
I do not think that matters. I would have preferred to stick to the original title,
but Maynard won't let me' (RFK 1390. Copyright The Provost and Scholars of
King's College, Cambridge, 1994. Permission from King's to publish this quote is
gratefully acknowledged).

23 In his Introductions to the Italian (1983) and English (1989) editions of the
dissertation, which include the only reference to the unfinished book, Kahn
wrote: 'In the course of the following three or four years I did rewrite seven
chapters, intending them for publication. On looking at them I am amazed to find
that they are almost entirely confined to conditions of perfect competition;
whereas the importance of my dissertation largely rested on its treatment of
imperfect competition (Kahn 1989: xix).

24 RFK 27.

25 Ibid.

26 Ibid.

27 Ibid.

28 There are many quotations to support this; perhaps the following is worth noting:
'I am working on my book on Marx. Its chief purpose is to show that economics
is no good – either Marxists' or ours – except for short period analysis. This ought
to please Maynard' (letter of JVR to RFK of 22/5/1941; RFK 1390. Copyright
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King's to publish this quote is gratefully acknowledged).

29 It is the most general form because, given the hypothesis of optimizing
behaviour, it allows for different assumptions about the shape of cost functions
and the value of elasticity of demand. Only when these functions exhibit some
kind of discontinuity – as in the case of L-shaped average unit cost curves – is
the condition required weaker (see Marcuzzo 1995).

30 The following quote is fairly representative of her view: 'Sraffa offers long
period analysis in the sense that the stock of means of production for a particular
industry is supposed to be always used at its designed capacity' (Robinson

31 Letter from JVR to RFK of 2/5/1961; RFK 1390. Copyright The Provost and
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this quote is gratefully acknowledged.

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