

## **Roy Harrod and traditional theory\***

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I believe the confusion to be due to your failure to think yourself back in the system of thought you have abandoned.

(Harrod to Keynes)

My own firm conviction is that your mind is still half in the classical world, and that you ought to be accusing me, not of bad manners, but of faulty theory.

(Keynes to Harrod)

### **1. Years of high criticism**

The 1930s, besides being years of high theory, also opened a new era in the criticism of neoclassical economics.<sup>1</sup> Before the 1920s, only a few heretics challenged the established doctrine, but their assaults were quite ineffective. As Keynes noted, either they claimed that observed facts do not support the theory, but forgot that facts are theory-dependent, or they rejected the conclusions of classical economics while maintaining its premises, thus facing the charge of inconsistency (see Carabelli 1991: 105–9).

In 1925 an entirely new line of criticism was launched by Piero Sraffa, who attacked the Marshallian approach on its favourite ground, by questioning the logical consistency of its theoretical core, namely the theory of supply. On the one hand, Sraffa showed that Marshall's law of supply unified forces which, according to the classical economists, pertained to different domains: increasing productivity related to the analysis of production (division of labour), while decreasing productivity related to the analysis of distribution (decreasing productivity of land). This, however, raised logical difficulties for the classification of an 'industry': a broader definition would have included the firms employing a larger share of a given factor, for which

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decreasing returns prevailed. Conversely, a narrower definition would only include the production of a particular commodity, for which increasing returns were more likely. On the other hand, Sraffa showed that in most productive conditions small increases in production entail variations in both the costs of the product considered and of the other commodities, and therefore in the demand for both. He therefore concluded that the requirement of *independence* between supply and demand curves was not satisfied (Sraffa 1926: 539–40; see also Sraffa 1925). Sraffa's ultimate conclusion was that 'Marshall's theory . . . should be discarded' (Sraffa 1930: 93), although in his 1926 article he suggested allowing increasing returns back on the scene by abandoning the assumption of perfect competition and considering monopoly instead. In this case output would be restricted not by increased costs, but by increased difficulty in marketing, and descending demand curves would have to be considered for the products of individual firms rather than for the total production of a given commodity (Sraffa 1926: 543).

In 1936, Keynes provided a new challenge to traditional economics on logical and methodological grounds. He maintained that the superstructure of orthodox theory rested on some implicit premises that either restricted its generality or were inconsistent with the explicit premises. In particular, he pointed out that most of these assumptions implied the independence of variables that were not, in general, independent (see, for a discussion of Keynes's methodology of criticism, Carabelli 1991). Of special interest for the present paper is Keynes's criticism of the neo-classical theory that the rate of interest is determined by the curves of supply and demand for capital: this presupposes the assumption that income is constant, which 'is *inconsistent* with the assumption that these two curves can shift *independently* of one another'; Keynes thus concluded that the theory 'involves formal error' (Keynes CW VII: 179, my italics).

To clarify his thoughts and 'to persuade economists to re-examine critically certain of their basic assumptions' (Keynes CW VII: xxi), in the *General Theory* Keynes continually stressed the differences of traditional theory to his own, making his book a highly controversial one. Keynes knew that his task was an arduous one, 'the difficulty [lying], not in the new ideas, but in escaping from the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds'. Time justified Keynes's worries. Certainly, economists could not remain indifferent to Sraffa's and Keynes's attacks on traditional doctrine; but instead of renouncing the orthodox approach, they have incorporated into the traditional frame the positive suggestions implied in Keynes's and Sraffa's works. On the one hand, the theory of imperfect competition developed Sraffa's suggestion that the growth of firms is limited not by the structure of costs, but by the

structure of demand. On the other hand, the IS-LM approach limited the relevance of the under-employment described in the *General Theory* to a particular case due to some sort of friction.

Roy Harrod was one of those most impressed by Sraffa's and Keynes's criticisms, both of which stimulated his research in new directions, leading in the end to new pieces of *high theory*. On the one hand, Harrod provided significant contributions to the theory of imperfect competition, which in turn became an important ingredient of his 1936 book on *The Trade Cycle*. On the other hand, his dynamic theory was deeply influenced by the discussion with Keynes on the *General Theory*'s criticism of the traditional theory of investment, saving and interest.<sup>2</sup>

To understand Harrod's ideas correctly, especially those connected with dynamics, it thus seems necessary to examine them carefully in the light of his attitude towards the implications of Sraffa's and Keynes's assaults on the citadel of nineteenth-century orthodoxy. Harrod accepted their point that it was necessary to clarify somewhat the foundations of the partial equilibrium approach. But an attack on logical grounds inflicts wounds that cannot be healed; Sraffa and Keynes therefore explicitly abandoned the orthodox approach to develop one of their own. Harrod did not follow this line, but thought that traditional analysis could still be of use if applied to the appropriate domain, and that the principles on which it was based could be taken as the foundations on which to develop one's treatment of the complementary domain. But in order to avoid discarding the whole theory, Sraffa's and Keynes's destructive attacks had to be interpreted as applying to the *relevance* of traditional theory rather than to its *logical* consistency. This reinterpretation (tacit in the case of Sraffa, explicit in the case of Keynes) was the methodological counterpart of Harrod's positive analytical construction.

Thus, the primary objective of this paper is to show that the *methodological* implications of Harrod's notion of marginal returns and of his distinction between statics and dynamics countered Sraffa and Keynes attacks on traditional economics. The secondary aim is to examine how Harrod's general project reflected on the *method* of his dynamics in its relationship to statics, in particular by pointing out how Harrod placed statics (traditional theory in a generalised form) at the foundation of dynamics. This paper is concerned with the developmental stage of Harrod's dynamics: most of the references are therefore to his works published in the 1930s.

It is not, however, the purpose of this article to provide a detailed examination of either Sraffa's and Keynes's criticisms or Harrod's positive treatment of imperfect competition and dynamics. On the one hand, these themes have been the subject of other studies, to which I shall therefore refer when necessary. On the other hand, since I aim to understand how

Harrod built up his dynamics, only his own interpretation of Sraffa's and Keynes's positions matters, regardless of the actual strength of their criticism and even the correctness of Harrod's exegesis.

In Section 2, I examine how Harrod tackled Sraffa's problem by proposing the theory of imperfect competition as a generalization of the partial equilibrium approach. In Section 3, I show how Harrod endeavoured to discuss change in economic magnitudes without contradicting the 'general theory of value'. In Sections 4 and 5, I discuss Harrod's reaction to Keynes's criticism of the traditional theory of interest, showing how it sparked the notion of dynamics as an analysis capable of overcoming the limitations of the orthodox approach. Section 6 is dedicated to Harrod's comments on Keynes's *General Theory*, which reveal his attitude towards both the 'Keynesian revolution' and traditional analysis. In the final section I briefly summarize the upshot of the preceding discussion and offer some concluding remarks. In particular, I argue that Harrod's notions of statics and dynamics originate from his attempt to reduce traditional theory and Keynes's and Sraffa's analysis to special cases covered by a more general theory, concerned with the determination of the level and variations of output.

## 2. Perfect competition as a special case of a general theory of value

Sraffa's criticism was generally understood as concerning the appropriateness of the assumption of perfect competition, rather than the logical consistency of the partial equilibrium approach. Accordingly, very soon a few young and brilliant economists relaxed this premise and considered sloping demand curves, without, however, abandoning the full spirit of the Marshallian tradition. One of the most important bricks in the new building was provided by Harrod in July 1928 (Harrod 1928 [unpublished]).

The notion of *marginal revenue* enabled him to couch in analytical terms Sraffa's suggestion that the true obstacle to an expansion of production lies in the difficulty of marketing it rather than in the decreasing returns (Harrod 1931: 566). Harrod's hunch was that if demand for the individual source of production is downward sloping rather than horizontal then it is not the *average* but the *marginal* revenue that matters in determining the equilibrium production maximizing the profits of a firm.

Harrod was fully aware that the new notion was consistent with Marshall's partial analysis, and also with Cournot's treatment of monopoly. Indeed, it provides a generalization of both schemes, since it enables one to treat the cases of monopoly, perfect competition and all the intermediary conditions by the same *method*:

Marshall laid down that the entrepreneur 'endeavours to employ each agent up to that margin at which its net product would no longer exceed the price he would have to pay for it.' This is true alike of the monopolist and of the competitive entrepreneur, if the net product is valued in the right way. Where the firms are very many, value of the net product can be given its face meaning, viz. the value of the product which is the difference between the whole product of  $n$  units of agent and the whole product of  $(n - 1)$  units of agent. But this, the most natural, interpretation of value of net product makes Marshall's proposition untrue for the case where the firms are not many. Where the firms are not many it is necessary, in order to make Marshall's proposition true, to interpret value of the net product as meaning the difference between the value of the whole product of  $n$  units of the agent and the value of the whole product of  $(n - 1)$  units. Where the firms are many either interpretation gives the same result. *Thus the second interpretation makes the proposition true universally.*<sup>3</sup>

(Harrod 1928 [unpublished]; italics mine)

In Harrod's eyes, far from being logically inconsistent with its premises – as Sraffa's critical contention suggested – Marshall's approach in terms of demand and supply curves was perfectly suited to deal with decreasing as well as increasing returns. In fact if the demand curve is inclined, the marginal revenue curve may well intersect the marginal cost curve in correspondence with the decreasing tract of the average cost curve, therefore permitting equilibrium to occur at a point below the technical optimal capacity of plants.

According to Harrod then, the inadequacy of the Marshallian approach did not lie in its analytical method, but in assuming a restrictive condition in the structure of the market. Harrod's solution allowed the removal of this unnecessary hypothesis and the application of the same analytical instrument to the entire domain from monopoly to perfect competition. There was therefore, in Harrod's view, continuity in a double sense between these two extremes: a theoretical continuity, and continuity in the reality of the market, since the elasticity of the demand curve can accommodate all values between the maximum defined by perfect competition and the minimum corresponding to perfect monopoly<sup>4</sup> (for a more detailed discussion see Besomi 1993).

As the discontinuity vanished, Sraffa's criticism was also neutralized: far from invalidating the traditional approach, in Harrod's view imperfect competition and monopoly rather provided a new and broader domain to which the partial equilibrium toolbox could be successfully applied.<sup>5</sup> But two observations are necessary here. In the first place, Harrod could resolve the situation in favour of the partial equilibrium approach only by changing the methodological status of Sraffa's argument. Harrod recognized the existence of a hidden assumption implicit in Marshall's own treatment, but in his view this only restricted its validity to the particular instance where there is no need to distinguish between marginal and average revenue (for

the two curves coincide), and by no means implied logical fallacy. In other words, Harrod's solution to Sraffa's criticism was to generalize the traditional theory of value: Marshall's treatment of perfect competition and Cournot's approach to monopoly were interpreted as particular and extreme cases for economic analysis, just as monopoly and perfect competition are the extremes to be observed in the reality of the market. Harrod's notions of equilibrium, profit and optimal employment of plants were meant to amend rather than substantially alter the orthodox ones.

In the second place – and as a consequence of Harrod's reinterpretation of Sraffa's attack – it must be noted that the difficulty originally highlighted by Sraffa was left unsolved. For, if on the one hand it is true that Harrod's notion of marginal returns allowed a generalization of the application of demand curves in the partial equilibrium approach (and thus also enabled one to consider the possibility of increasing returns), on the other hand, for the validity of this very approach, it was still necessary to assume the independence of the two curves. But this hypothesis is far from being universally satisfied. In fact, in the particular condition of perfect competition, this assumption is usually still subject to the logical difficulties pointed out by Sraffa. In the general case of imperfect competition, the problem is by no means simpler. For Harrod maintained that if firms were subject to decreasing costs, the resulting equilibrium level of output would be unstable;<sup>6</sup> this implies that a small change in output may entail consequences of far greater magnitude. In such conditions, the cost and demand curves could not be assumed to be given, nor to be independent of each other. Therefore the logical conditions for the extension of the partial equilibrium approach were not automatically satisfied by the more general interpretation of demand curves, but needed further discussion, of which there is no trace in Harrod's work.

### **3. The instability of equilibrium**

Harrod's 'generalized theory of value' was still concerned with determining the equilibrium quantity of production which maximizes the entrepreneur's profits at the point where marginal costs equal marginal revenue. But while in the case of perfect competition the equilibrium so determined is stable (assuming the usual conditions), in the sense that any deviation from it sets in motion forces tending to re-establish the old position, Harrod soon realized that if imperfect competition prevailed the stability of equilibrium would be undermined (Harrod 1934: 466–7). The implications of this conclusion deserve careful examination, since they will prove very important for the further development of Harrod's thought. On the one hand, here lies the origin of his instability principle, which later gave rise

to so many debates; on the other hand, and most importantly, it provided the epistemic link between traditional theory and Harrod's dynamics.

The idea of disassociating the notions of equilibrium and stability emancipated the concept of equilibrium from the idea of *rest*, and made it possible to view some kind of movement as not necessarily being incompatible with the maximizing behaviour of entrepreneurs. This implied the possibility of explaining a change in the relevant variables (e.g., fluctuations or growth) without renouncing the framework of partial equilibrium analysis. If equilibrium is stable, then to explain, say, a cycle, one has to suppose either that some persistent exogenous force is in action to keep the system in a state different from rest, or that the 'fundamental conditions' (costs and demand) fluctuate themselves. In either case, this approach does not provide a satisfactory explanation of the cycle: either the phenomenon to be explained is attributed to a cause not accounted for, or the burden of explanation is shifted onto the causes of fluctuations of the fundamental conditions. On the contrary, if equilibrium is not stable (unstable or neutral) the dynamic system itself accounts for the *possibility* of motion, therefore providing 'the very kind of explanation which a rational account of the trade cycle requires'.<sup>7</sup>

The conclusion is straightforward, and Harrod drew it a couple of years later in a paper entitled 'Imperfect Competition and the Trade Cycle' (Harrod 1936a). The purpose of this article was to show that some prominent features of the trade cycle, far from constituting aberrations from the neoclassical theory of value, were fully compatible with its general form (for a discussion see Besomi 1993). But proving that the general theory of value was compatible with the phenomena of the cycle only allowed one to consider the *possibility* of fluctuations within that scheme, not their *necessity* nor their specific features. Indeed, the presence of some destabilizing force enabled one to take account of a multitude of equilibria in each instant, but not to determine which equilibrium level of output would actually prevail, nor why it might change in the next instant. This is the task Harrod faced in his 1936 book on *The Trade Cycle*.

But before engaging in that work, Harrod came across another criticism of neoclassical theory. In fact in June 1935 Keynes sent him the galley proofs of the *General Theory*, which gave rise to a discussion centred on Keynes's criticism of the traditional theory of interest. Harrod's line of defence eventually led him to provide a new definition of statics and dynamics that also helped provide an explanation of the inevitability of the cycle which did not contradict the orthodox theory of value. To understand Harrod's solution it is therefore necessary to discuss first Keynes's attack and the debate that followed; an examination of the theme of the necessity of fluctuations is thus to be postponed until Section 5.

#### 4. Harrod and Keynes on saving, investment and the rate of interest

Keynes's criticism of the orthodox approach to the rate of interest is the aspect of the *General Theory* that left Harrod most unsatisfied. While Harrod appreciated the 'positive doctrine' of books III and IV, he did not agree with the violence and the content of Keynes's attack on traditional theory:

the view that I object to lies in the argument that because saving must always and necessarily equal net investment (which I accept) there is 'no sense' in the view that interest is a price which equates the demand for saving in the shape of investment to the supply which results from the community's propensity to save.

(Harrod to Keynes, in Keynes CW, XIII: 530)

Harrod contended that the classical theory of interest was not *nonsense* – that is, in Harrod's words, 'inconsistent or confused on its own premises' (Keynes CW, XIII: 546) – but rather simply erroneous, being founded on a false premise: 'the classical theory is invalid but not nonsense' (Keynes CW, XIII: 540 and *passim.*). In fact Harrod agreed with Keynes that the orthodox theory implicitly assumed that income was constant. Harrod interpreted this hypothesis as one of the *ceteris paribus* clauses that were necessary for determining the equilibrium price level (in this case, interest) from demand and supply curves (namely, investment and saving). He thus concluded as follows:

Now you are perfectly justified in saying that the amount of saving is so clearly related to the level of income that to cover the level of income by the *cet. par.* clause is to refuse to examine the problem. . . . When you do examine the functional relation all sort of funny things (including the very important one that variations in the propensity to save may be offset by variations in the level of income in such wise that they have no effect on the rate of interest) appear. But you are *not* justified in denying to classical theory a logical and water-tight view, albeit one which neglected the most important features in the situation.

(Keynes CW, XIII: 532, Harrod's emphasis)

Harrod's comments gave Keynes the opportunity to specify that

there is no sense in the view that interest is a price which equates saving and investment; or at any rate that if one could invent a sense for it, it would be quite remote from anything intended by the classical theorists. Perhaps the clue is to be found where you allege that I am doing great violence to the accepted and familiar when I maintain that 'two independent demand and supply functions won't jointly determine price and quantities', for my whole point is that the functions in question are *not independent*.

(Keynes CW, XIII: 538, Keynes's italics)

Keynes disagreed with Harrod's opinion that the traditional theory maintained its cogency if one supposed that the level of income was *given*: 'one can invent a meaning for the classical ideas, if one assumes that income and employment *cannot change*' (Keynes CW, XII: 541, Keynes's emphasis). In fact

if either the propensity to save or the marginal efficiency curve changes, the level of income changes; so that the assumption of a given level of income involves us in assuming that neither of the classical theory's own chosen variables is capable of change, – unless there are changes in certain factors which happen by a miracle to be such as to leave income unchanged (and in this case it is the nature of the miracle which determines the rate of interest).

(Keynes CW, XIII: 558)

Harrod protested that Keynes's remark correctly represented Keynes's thought, but not what the traditional theorist had in mind. For Keynes, the level of income depended upon the marginal efficiency of capital schedule and on the propensity to save and therefore could not remain constant if one of these variables changed (unless exactly balanced by a miraculous change in something else). Harrod observed that for the orthodox theorist income depended instead on marginal disutility and marginal productivity of labour, hence 'tho' income can't be taken as constant' its changes were not of the magnitude required by Keynes's theory (Keynes CW, XIII: 560). The only *faux pas* that Harrod could discern in classical theory was the illicit extension of the *ceteris paribus* clause, while the confusion was due to Keynes's 'failure to think [himself] back into the system of thought [he had] abandoned' (Harrod to Keynes, in Keynes CW, XIII: 561).

Keynes and Harrod's concluding remarks bear witness to the incompatibility of their viewpoints. Keynes sarcastically replied: 'I am content! If the classical theory could not be made, even by you, to make more coherent sense than that, it does not deserve very many compliments' (Keynes CW, XIII: 561); Harrod, somewhat depressed, reaffirmed: 'I deplore all the more attacks from ill-chosen ground' (Keynes CW, XIII: 562).

Given that Harrod agreed with Keynes as regards the existence of a hidden assumption in the neoclassical interest theory, what was the nature of the quarrel with his friend? The strife centred upon the position of this premise in the orthodox analysis. For Keynes, its presence was essential for the classical analysis, yet it was in contradiction with other assumptions. Keynes maintained that saving and investment functions were not *in pari materia*, i.e., they belonged to different planes in space and thus did not intersect. Only 'if one assumes that income and employment *cannot change*' (Keynes CW, XIII: 541) can the two functions be flattened on the same plane; but

the assumption that income is constant is inconsistent with the assumption that these two curves can shift independently of one another. If either of them shift, then, in general, income will change; with the result that the whole schematism based on the assumption of a given income breaks down.

(Keynes CW, VII: 179)

While Keynes's criticism concerned the *logic* of the orthodox theory, Harrod

accepted the details of Keynes's argument but interpreted them as relating to the *relevance* of the traditional analysis:<sup>8</sup>

What you seem to me to have shown is that there are changes in other things which are so relevant and of such overpowering importance, that the old s[upply] and d[emand] analysis had better be put away. . . . The amount of saving is so clearly related to the level of income that to cover the level of income by the *cet. par* clause is to refuse to examine the problem.

(Harrod to Keynes, in Keynes CW, XIII: 551–2)

For Harrod therefore the problem with the classical theory was only its lack of generality,<sup>9</sup> and not its consistency. He stressed this point many times in the course of the correspondence:

If there was some mechanism for securing constancy of income, which the *old* classical doctrine assumes (i.e. it implicitly assumes constancy of income and does not envisage the rate of interest as the mechanism for keeping incomes constant) then the classical doctrine that it is the rate of interest which equates the propensity to invest to the propensity to save would not only make sense but also be true.

(Keynes CW, XIII: 540; see also 553 and 554)

Here we can see an exact analogy with Harrod's position with respect to the problem raised by Sraffa. In both cases Harrod recognised the existence of implicit assumptions in the orthodox analytical apparatus, but refused to admit their inconsistency with the other hypotheses; he only admitted that the presence of such assumptions restricted the validity of the theory to a special case. The final parallel to be drawn concerns Harrod's original contribution. In the case of the theory of prices, he began laying the foundations for a *general* theory of value which enabled him to interpret traditional analysis as a special case corresponding to the assumption that competition is perfect. As regards the theory of investment, saving, interest and income, the development of Harrod's thought led to a new notion of *economic dynamics*. To this I now turn.

## 5. Statics and dynamics

Keynes seems to have perceived his disagreement with Harrod as stemming from the different status they attributed to the tacit premise, and he also guessed the possible upshot of Harrod's line of thought:

You emphasise in numerous . . . places . . . that my discovery consists in showing that the classical theory forgets the part played by changes in the level of income, but that this omission can be repaired.

(Keynes to Harrod, in Keynes CW, XIII: 549)

In his subsequent writings, in fact, Harrod examined whether there existed a set of conditions that, if satisfied, would ensure constancy of income. He

found the answer in the General Theory itself, for he accepted the doctrine of the multiplier which he interpreted as asserting that new net investment was the main determinant of increases in income. From this, he concluded that if there was no investment, income would not change. Since investment is equal to saving, the requisite for income to remain constant was simply an absence of net savings and investment. If this condition were satisfied, according to Harrod there would be no objection to the application of the traditional analysis. In this case, of course, there did not remain much scope for trying to determine the rate of interest from saving and investment curves, and in fact Harrod maintained that it had to be determined otherwise. What is important to note here is that Harrod had identified a realm where Keynes's attack on the logical consistency of the orthodox toolbox did not apply, and named it statics: 'The static system provides an analysis of what happens where there is no increase which entails . . . that saving = 0' (Harrod to Keynes, April 1937, in Keynes CW, XIV: 164. See also Harrod 1936: 150, and 1937a: 497).

Accordingly, statics was concerned with the determination of the equilibrium *level* of income. Harrod's analysis then proceeded to specify the factors that would stimulate or inhibit production given certain circumstances, and then to consider 'the way in which these forces hold that level of activity in equilibrium' (Harrod 1936: 5 and *passim*).

On the other hand, saving 'entails a growth of productive power', and therefore 'necessarily involves growth' (Harrod 1936: 167). Thus, alongside static theory, according to Harrod a second branch of economics had to be developed, whose subject matter should be the equilibrium rate of economic growth:

In the second department, dynamic theory, growth and saving will be taken into account. Equilibrium theory will be concerned not merely with what size, but also with what rate of growth of certain magnitudes is consistent with the surrounding circumstances.

(Harrod 1937: 86)

Harrod's early definition of dynamics therefore originated in reflections stimulated by Keynes's criticism of the orthodox theory of the rate of interest, as Harrod himself implicitly acknowledged in the Preface to his book.<sup>10</sup>

With the new definition of statics, Harrod restricted the traditional theory's pertinence to an economy where income could not increase, and thus excluded its relevance to discussing the causes and phenomena of the trade cycle. How is Harrod's solution to the difficulty introduced by Keynes's criticism reconcilable with the epistemic requirement that reference to mechanisms alien to the laws of value has to be avoided? Harrod recognized the relevance of this problem to his theory, and in his book on

*The Trade Cycle* he devoted many pages to its solution (Harrod 1936: 1–52, 75–89, 125–45, 170–3).

There are two aspects to be considered. In the first place, it must be appreciated that Harrod did not think of dynamics as an improvement or a generalization of statics, nor as an antagonist to it, but rather as a complement to it.<sup>11</sup> Statics and dynamics were intended as different branches of economic science, each devoted to the resolution of specific problems, namely, the determination of the volume of economic magnitudes and of their rate of change respectively.

Here comes the second point to be heeded, since ‘of course in the dynamic system the static conditions have to be fulfilled’ (Harrod to Keynes, in Keynes CW, XIV: 169). To understand how Harrod managed to meet this requirement, it is necessary to consider briefly the main strands of his argument. Harrod’s statics recast some of the inducements (or deterrents) to produce already considered by traditional analysis as forces acting on the level of output. These ‘static determinants’ were

- 1 ‘the rate of pay at which prime factors of production can be secured’;
- 2 ‘the efficiency of the prime factors’;
- 3 ‘the elasticity of demand for commodities’; and
- 4 the general level of prices.

The magnitude and direction of these forces were dependent upon the amount actually produced. Equilibrium output is the level at which the opposing tendencies as determined by all the forces balance each other, so that there results no stimulus to change in either direction.

As regards dynamics, Harrod reasoned in analogous terms. Income’s increases were triggered by expenditure on investment goods, *via* the multiplier; the forces involved were therefore those determining the amplitude of the multiplying effect, that is, the propensity to save and the distribution of income. Investment depended on the prospective increase in consumption, *via* the acceleration principle (that Harrod called the Relation). The corresponding force, determining the amplitude of accelerating effect, was the amount of capital used in the production of a unit of consumption goods. As with static forces, all these dynamic determinants were functions of the level of income and thus were subject to change in the course of the cycle.

In a dynamic world, static forces do not disappear. What ensured that the income levels at any given point in time were compatible with the variations of income decreed by the dynamic determinants? Harrod’s 1936 solution was based on the epistemic premises made explicit in 1934 (here described in Section 3 above). For changes in the level of income to be possible, it was necessary that the point of equilibrium was not stable, that is to say that in

the neighbourhood of equilibrium the resultant of the static forces did not tend to bring the system back to the equilibrium position. This result could be achieved, according to Harrod, via the destabilising power of the fourth static determinant, i.e., the general level of prices – whose changes were triggered by the growth of the economy – which at any given time offset the stabilizing power of the other determinants:

We do *not* suppose the cycle to be governed by cyclical variation in the fundamental conditions (utility functions, cost functions etc.). There may be some variation there, but we reject them. Therefore the system must be in neutral equilibrium over the range within which it swings. Therefore any one force must be equal and opposite to the resultant of all the others. The price-movement is a de-stabiliser. ∴ the resultant of the others is a stabiliser. If the price drop required to induce a unit change in output is large, the stabilisers must be acting strongly. If I have to exert great strength to make the billiard ball move an inch over the cloth, the forces opposed to that action must be great.

(Harrod to Keynes, in Keynes CW, XIV: 169)

For the purpose of this paper it is not necessary to discuss the complicated mechanism that Harrod set up to explain his conclusion (see, however, Besomi 1997), but only to appreciate its significance for the connection between Harrod's dynamics and traditional theory. Harrod himself stressed this point in a letter to Keynes, who could not understand why Harrod called 'those forces stabilisers which . . . are those which cause prices to fluctuate' (Keynes CW, XIV: 173):

The reason why I call the forces which make prices to fluctuate stabilisers, is that I want to bring level-of-output theory into relation with the system of cost and utility functions on which the orthodox general theory has – in a way rightly – reposed. The level of output ought *prima facie* to depend on the desire for goods, for leisure etc. In the Crusoe economy it would so rest. Now that in a growing and capitalist society the level of output surely depends on the interaction of the relation and the multiplier, what has happened to those fundamental forces? They are still there, I say. But they are overcome by price fluctuations. The factors having agreed to bargain in money, their natural inclination to relate their work to certain fundamental desires is counteracted by the fluctuation of prices. The amount by which prices have to fluctuate to secure given changes of output measures the force of the stabilising forces. The static system of equations, including the money equation, provides a field of neutral equilibrium within which output may fluctuate in accordance with the laws of growth.

(Harrod to Keynes, in Keynes CW, XIV: 176)

It is now obvious that in Harrod's eyes, the epistemic requirement to avoid recourse to *ad hoc* causes for the explanation of the business fluctuations, far from invalidating the traditional doctrine because of its incapacity to independently provide an endogenous theory of the cycle, made it necessary to strengthen the tie between orthodox analysis and the new dynamic theory. With statics accounting for the *possibility* of fluctuations and

dynamics calling for their *necessity*, the two branches of economics were to be regarded as complementary not only in subject matter, but also in their epistemic status.

More precisely, statics was called upon to provide the *background* and the *foundation* of dynamic analysis. In truth, the argument was only hinted at in *The Trade Cycle*.<sup>12</sup> However, Harrod pondered upon the methodological implications of his epistemic premise on many occasions in private correspondence. Harrod discussed the matter with Hubert Henderson, whom he had sent the first draft of his book. Henderson was 'fundamentally unsympathetic' to the assumption that 'each entrepreneur is endeavouring to maximise his "monopoly net income"' since 'as an instrument of trade cycle analysis, it is too unreal to be legitimate' (Henderson to Harrod, 21 February 1936). Harrod explained that 'the parts about elasticity of demand merely attempt to *provide the static background in terms of most up-to-date theory*' (Harrod to Henderson, 21 February 1936, emphasis mine). Harrod also argued out the matter with Robertson. Harrod's letter of 25 December 1936 is particularly important in this respect, for he discussed the relative positions of statics and dynamics with explicit reference to Keynes's *General Theory*. Having reiterated the point that 'the doctrine of what governs the volume of saving and the rate of interest must be thrown out bag and baggage' from static theory, Harrod maintained however that '*the static system retains its place as a foundation*' (italics mine). He then stressed that despite the limits of statics, 'among other things I have wanted in my book to throw out a salvage line in the situation. It is for this reason that I attached a certain importance to my chapter one, which Joan R[obinson]. finds so fanciful.'<sup>13</sup>

## 6. The *General Theory* and traditional theory

Harrod indirectly returned to the relationship between statics and dynamics in discussing Keynes's *General Theory* (Harrod 1937). Harrod's aim was to establish which elements of traditional theory were maintained, which were expelled and which were modified in Keynes's treatment; his paper therefore provides precious information on Harrod's attitude to the comparative value of traditional and Keynesian theory for contemporary economic analysis.

Two of Harrod's judgements on the originality of Keynes's theory are particularly enlightening. Firstly, Harrod alleged that 'Keynes has not affected a revolution in fundamental economic theory but a re-adjustment and a shift of emphasis' (Harrod 1937: 85). In fact Harrod held that Keynes had rearranged some of the components of traditional theory giving them a new

logical ordering, without introducing new pieces: in the *General Theory* 'the old pieces in the traditional theory reappear, but sometimes in a new place' (1937: 85); Keynes's contribution 'has been to consider certain features in the traditional theory which were unsatisfactory, because the problems involved tended to be slurred over, and to reconstruct that theory in a way which resolves the problems' (1937: 84). According to Harrod, the marginal efficiency of capital was nothing other than a new name for the old marginal productivity of capital (Harrod 1937: 76–7). The multiplier 'is merely a disguised form of the ordinary supply schedule of free capital, but with the level of income treated as a variable' (1937: 77–8), while the liquidity preference theory had to be considered as the determination of the velocity of circulation (1937: 85).<sup>14</sup>

Harrod's second judgement on the *General Theory* was that Keynes's 'system is still static':

Note has been taken of the fact that at certain important points, *e.g.* in his definition of the marginal efficiency of capital, Keynes lays great stress on the importance of anticipations in determining the present equilibrium.

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

(Harrod 1937: 85–6)

It seems to me that Harrod's reflections on Keynes's *General Theory* provide a framework for interpreting his previous reflections on the conditions in which the traditional analysis would be valid with respect to the development of his own theoretical contribution. But in order to gather the elements necessary to have a complete picture of Harrod's attitude towards traditional theory, I shall first summarize the upshot of the preceding discussion.

## 7. Traditional theory revisited

The 1926 English version of Piero Sraffa's 1925 destructive criticism of the logical tightness of the Marshallian approach was accompanied by the suggestion that the assumption of perfect competition be abandoned in favour of monopoly, thereby admitting the possible occurrence of equilibrium with increasing returns. Harrod was one of the young economists who took up this suggestion and introduced the doctrine of imperfect competition, which was developed in the spirit of, and using the analytical instruments of, the Marshallian tradition. Harrod himself stressed that his invention, the marginal revenue curve, enables one to consider monopoly and perfect

competition as the extremes of a continuum to be subjected to the same analytical tool. In Harrod's approach, Sraffa's criticism was interpreted as being concerned with the relevance rather than the consistency of Marshall's thought, and his attack was neutralized by defining a domain within which the classical scheme maintains its cogency. Harrod's 'general theory of value' (Harrod 1936: 75, and 1936a: 87 and 88) thus countered the particular case discussed by Marshall.

Harrod reacted in a similar way to the criticism of orthodoxy developed a few years later by Keynes. Keynes also attacked the core of traditional theory by pointing out the concealed assumptions necessary to support its conclusions and by showing either that they are extremely restrictive – thus reducing the validity of classical theory to special cases where nothing relevant happens – or are in contradiction with other premises of the theory – therefore undermining its logical consistency. Harrod discussed in particular the assumption that income is constant. This hypothesis was implicit in the traditional treatment of the rate of interest as price equating demand and supply of capital; and according to Keynes, it was in contradiction to the assumption of independence of demand and supply curves. Again, Harrod ignored the logical aspect of Keynes's criticism to concentrate on the relevance of the traditional approach. Harrod in fact maintained that the orthodox analysis was consistent with its premises provided that one assumed the conditions that ensure constancy of income. Harrod thus defined a domain where these conditions held, called it *statics*, and then defined a complementary domain, to be named *dynamics*, where changes of income were considered.

Economic dynamics was thus developed so as to fill a second gap in the field of problems and phenomena that could be dealt with by traditional theory, while the 'general theory of value' was required to provide the *foundation* on which dynamics could be constructed. In Harrod's view, in fact, the (static) problem of the determination of the level of output logically preceded that of the determination of its *variations* (for a discussion see Besomi 1997: §1). The approaches of statics and dynamics each have some specificity: statics lends itself to the study of changes occurring once and for all, dynamics is appropriate when considering *continuous* variations (see Harrod 1939: 15, and Harrod to Keynes, in CW, XIV: 163–4). In Harrod's view, however, their *general method* was the same:

Ce qui est nécessaire, c'est que les vagues mécontentements et les idées mi-formulées qu'exprime l'usage courant de la dynamique, soient mises en relation avec la structure méthodologique de la doctrine existante par une *extension* de celle-ci appropriée à l'usage en question. L'objet de la présente étude est de suggérer une méthode d'extension de cette espèce.

(Harrod 1939a: 161, my italics)

Si l'on pouvait établir les éléments d'un système de conception dynamique vraiment analogue à la théorie statique, on réaliserait un grand progrès.

(Harrod 1939a: 167)<sup>15</sup>

Thus in Harrod's view both spheres of inquiry required the preliminary definition of some fundamental conditions, the determination of the equilibrium state appropriate to them, a study of the stability of the equilibrium position, and finally, consideration of the course of events following the occurrence of changes in the fundamental conditions.

The foundation of dynamics did not lie only in the method of traditional theory, but also in some of its component parts (though in a somewhat modified form) which were given a dynamic status or were required to provide a link between static and dynamic forces. These were the same components that, according to Harrod, Keynes maintained in his system (although rearranging the logical connections between them), thus *completing* the classical system. It is important to note, in this connection, that once again Harrod preferred to interpret Keynes's work as a more or less radical revision and integration of the classical system, rather than a rejection.

Curiously, Harrod overturned the methodological ground of Keynes's criticism, which was meant to show how the tacit assumptions of orthodox theory restricted its conclusions to situations where nothing relevant happened, and which therefore aimed to reject its generality in favour of a truly *General Theory* free of assumptions of independence among variables. Harrod's criticism also pointed out that the conclusions of the traditional theory related to specific cases. But instead of rejecting the method of analysis responsible for this lack of generality, Harrod attempted to produce an even more *general theory*, preserving and extending the pertinence of the old method.<sup>16</sup> The gist of Sraffa's and Keynes's attack was that the trouble lay in the conceptual tools of partial equilibrium analysis, for they demanded assumptions of independence that rendered the traditional method unacceptable. Harrod, on the contrary, was convinced that the inadequacy of traditional theory did not lie in its method but in the assumptions themselves, which he thought could, and had to, be removed for generality. To Harrod the problem was not the logical and methodological issues involved in the assumption of independence, but was one of relevance: in his view, the hypotheses of perfect competition and constancy of income, instead of clashing with the other assumptions of the theory, simply reduced the range of application of the theory, and were not irremovable.

The aspect of Sraffa's and Keynes's criticism that Harrod refused to consider was their remark about the independence of the demand and supply curves. As regards the theory of value, I have already mentioned that Harrod only raised doubts about the validity of the independence

assumption on one occasion and only in connection with imperfections in the market (see Section 3 above); Harrod thus concluded that in the appropriate domain of traditional analysis the difficulty did not apply. In correspondence about the *General Theory*, when Keynes explicitly stated that saving and investment were not independent curves (Keynes CW, XIII: 538), Harrod simply did not respond: there was not a single word on independence in any of his letters. It is not difficult to understand the reason for this attitude: both Harrod's general theory of value (i.e., the doctrine of imperfect competition) and his approach to economic dynamics required the same assumption.

On the one hand, even if demand was downward sloping, the possibility of determining equilibrium prices and quantities still presupposes that cost and revenue curves are independent. On the other hand, the level and rate of growth of output as discussed in *The Trade Cycle* were seen as resulting from the combined action of different forces (the four static and three dynamic determinants, respectively): equilibrium states corresponded to the exact balancing of forces acting in opposite directions, while, out of equilibrium, the prevailing tendency is determined by the resultant of the relevant forces (Besomi 1997: §3). But again, it is only possible to add together the separate effects of distinct causes provided that independence among the causes is assumed. Although in his 1939 'Essay in Dynamic Theory' Harrod abandoned the approach in terms of static and dynamic determinants, the assumption of independence was still implicit. In fact, Harrod treated the propensity to save  $s$  and the acceleration coefficient  $C$  as given and independent from the changes in income triggered by them. Keynes, in the exchange of letters with Harrod on the first draft of this article, promptly remarked that it was not possible to 'assume absolute rigidity of  $s$  and  $C$  and a departure from warranted growth. You have to make some assumptions as to the changes in  $s$  and  $C$  in unwarranted conditions' (Keynes CW, XIV: 334, Keynes's italics). Harrod, however, eliminated the problem by confining the applicability of his growth equation to a single instant.<sup>17</sup> Instead of focusing on traditional theory, this time Keynes's attack pointed out the existence of an independence assumption in Harrod's dynamics; his criticism remained nonetheless of the same methodological nature. Harrod's reply similarly repeated his preceding defence of orthodoxy by looking for a sphere in which the criticism did not apply.

The upshot of this methodological twist was a general theory which included as special cases the traditional theory, Harrod's own dynamic theory, but also Keynes's theoretical system and the analytical developments following Sraffa's suggestion, which Harrod redefined in such a way as to make them fit within the more comprehensive scheme. Harrod thus felt that this general project was to be the most important achievement for

economic theory and would constitute the true mental revolution needed in economic thought. Here originates his judgement of Keynes's work as not truly revolutionary: Harrod only saw it as a first step towards the recognition of the limits of statics, but he did not think that these had yet been resolved.

Harrod's solution to the limits of traditional theory, evidenced by Sraffa's and Keynes's criticisms, was thus worked out within the principles of orthodoxy itself, which Harrod's work therefore rehabilitated and strengthened.

On the other hand, two aspects of Harrod's work must be appreciated. Firstly, his considerations have introduced into orthodox analysis some concepts that were truly unthinkable before his book and article. Although the traditional approach could not neglect the existence of cycles, its explanation of, for instance, business fluctuations had to resort to causes exogenous to the proper working of the economic system. On the contrary, devoting a branch of economics to the study of endogenous changes of income entailed recognizing that equilibrium and stability are unlikely states of affairs and that the economy is far from being in a condition of permanent optimum.

Harrod's attempt consisted in the reconciliation of cycles and imperfection with a system of thought excluding such phenomena from its own premises. To achieve this result, he had to modify the premises and complement the traditional approach with a new theoretical construction based on the new extended set of assumptions. But he could not renounce certain fundamental assumptions of the old approach. For instance, both his static and dynamic equilibrium states were defined in terms of the satisfaction of the individuals operating within the economy: statics considered

whether individuals, having the tastes and needs that they have in those circumstances, can improve their position by altering their line of conduct.

(Harrod 1936: viii)

and dynamics inquired into

what sort of action we must suppose individuals to take in certain circumstances, so that, having regard to the circumstances and the factor of growth which their action entails, they will not be able to improve their position otherwise than by continuing to act as they do.

(Harrod 1936: ix)

Harrod therefore insisted upon the question of how fluctuations in output are consistent with the ordinary behaviour of people (i.e., the compatibility of static and dynamic forces), and used the term 'justification' for characterising the states of static and dynamic equilibria. Equilibrium thus still implied profit maximisation, and hence some sort of optimality under the prevailing conditions.

As a second example of a premise that could not be radically modified we have Harrod's treatment of expectations. I have already quoted a passage where he maintained that traditional theory could conveniently deal with the state of confidence; to this it may be added that in *The Trade Cycle* expectations played a very restricted role, while in the subsequent 1939 article they were even not mentioned.<sup>18</sup> It is not surprising then that Harrod could not understand Keynes's notion of investment as an autonomous process rather than as dependent on some sort of calculus, and that he concluded that the *General Theory's* 'treatment of the trade cycle was merely fragmentary for lack of a theory as to what governs the volume of investment' (Harrod to Keynes, in Keynes CW, XIV: 175). In fact, Harrod's approach was elaborated in analogy with the forces of classical mechanics, just as traditional theory was; this required expression of all the magnitudes involved as functions of some other variable,<sup>19</sup> meaning that Harrod could find no workable determinant of investment in Keynes's work.

The second aspect of Harrod's work to be noted is the skill with which he originally developed the *pars construens* of Sraffa's and Keynes's contribution, injecting into economics fresh ideas full of consequences. Unfortunately Harrod's theories, together with other economists' contributions in the same direction, have often been interpreted as the sole and necessary outlet of Keynes's and Sraffa's analysis. Harrod's *Trade Cycle* is thus seen as one of the dynamic versions of the *General Theory*, in that it supplements it with an explanation of the genesis of investment, while Keynes's and Sraffa's attacks are simply ignored. But Keynes himself, in a letter to Harrod, warned that 'acceptance of my constructive parts can only be partial if you do not accept my critical sections'. Keynes's conclusion applies both to Harrod and his above-mentioned exegetes:

I am frightfully afraid of the tendency, of which I see some signs in you, to appear to accept my constructive part and to find some accommodation between this and deeply cherished views which would in fact only be possible if my constructive part has been partially misunderstood.

(Keynes to Harrod, in Keynes CW, XIII: 548)

## Notes

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unpublished papers and correspondence. I have also cited a passage from a letter from Hubert Henderson to Harrod; I am grateful to Nicholas Henderson for permission to do so.

- 1 Throughout this paper, by the expressions 'orthodox' and 'traditional' theory I mean, in broad terms, the Marshallian theory of value as it was commonly taught in Cambridge in the mid-1920s. This choice of words was dictated by the fact that Harrod himself consistently used them with this generic meaning. Of course Harrod had access to Marshall's own text, but when referring to 'traditional' or 'orthodox' analysis he almost exclusively alluded to the textbook version of the partial equilibrium approach, or directly to Pigou's or – more frequently – Robertson's ideas. Direct reference to Marshall were indeed rare, with the notable exception of the passages mentioned in Section 3 below.
- 2 It is not certain whether Sraffa's article directly influenced Harrod's very first writings on imperfect competition; Harrod cited instead Pigou's 1928 *Economic Journal* article on supply (Harrod 1928 and 1930; on the place of Pigou's article in the history of the theory of the firm, see Moss 1984). In his next essay, however, Harrod explicitly referred to Sraffa's argument on returns (Harrod 1931). As to Keynes's criticism, Harrod discussed it at length in correspondence in 1935 (see Section 4 below).
- 3 See also Harrod (1930: 239): there Harrod concluded less emphatically that 'the second interpretation has general application'.
- 4 Harrod was very precise in stressing this point. In his review of Chamberlin's *Theory of Monopolistic Competition*, he devoted considerable space to the criticism of the view that 'there is no gradual transition from monopoly to competition, but a sudden break at the point at which the individual ceases to think that his own change will have any effect at all on the action of others' (Harrod 1933: 663).
- 5 It may be interesting to note that Joan Robinson undertook a similar project to provide a general theory of competition: see Marcuzzo (1993).
- 6 The instability of equilibrium and its importance for the development of Harrod's dynamics will be discussed below, Section 3.
- 7 Harrod to Haberler, 19 October 1934. Harrod focused on the epistemic premises to trade cycle theorizing in this letter to Haberler, when he discussed the Keynesian approach in the *Treatise on Money*, and again in a critical appraisal of Pigou's psychological theory of the cycle (Harrod 1934: 466–70). For a more detailed exposition of Harrod's argument see Besomi (1997: §1).
- 8 Harrod felt that the difference between himself and Keynes was not to be found in the substance but in the exposition of the argument: 'You may wonder why I lay such stress on a point that merely concerns formal proof rather than the conclusion reached' (Keynes CW, XIII: 533).
- 9 Accordingly, Harrod and Keynes attributed a different methodological status to the tacit premise of constant income. Harrod treated it as a *ceteris paribus* clause, that is, a condition that might or might not be satisfied; Keynes never referred to that notion in this connection, either in the correspondence with Harrod or in the chapters of the *General Theory* dedicated to the classical theory of interest. On the contrary, Keynes qualified the assumption, specifying that 'income and employment *cannot change*' (Keynes CW, XIII: 541, Keynes's italics).
- 10 Describing the method of static analysis, Harrod restated what he believed to be the valuable part of Keynes's criticism:

The weak point in the static theory is that, in order not to be too remote from the facts, it is often assumed that one line of action, which individuals take, is to save so

and so much. An attempt is made to demonstrate what determines the equilibrium price for this saving, viz. the rate of interest. Yet really the supposition of saving is inconsistent with the pre-requisites of a static analysis, for, if any net saving is occurring, the quantity of capital and the income-earning capacity of the community must be growing, and the factor of growth does not appear among the static assumptions.

(Harrod 1936: viii. See also Harrod 1938: 403–4)

11 In his famous 1939 article on dynamics, for instance, he wrote:

Once the mind is accustomed to thinking in terms of trends of increase, the old static formulation of problems seems stale, flat and unprofitable. This is not to deny to static theory its own appropriate sphere. It will become apparent which kind of problems belongs to each branch of study.

(Harrod 1939: 15. See also 1939a: 163)

12 With reference to his ‘study of the Crusoe state’, Harrod specified that the analysis of ‘the stabilizing elements in a modern society’ was not irrelevant nor ‘a device to hold the reader’s attention, by directing his suspicions to a wrong quarter’, but ‘is indispensable to the general theory’ (Harrod 1936a: 170).

13 In her review of *The Trade Cycle*, Joan Robinson failed to understand the role of the preliminary, static analysis reformulated in terms of forces, which she considered an ‘odd masquerade’ (Robinson 1936: 693).

14 It is interesting to note that Harrod’s *The Trade Cycle* was based on the same elements, save that the accelerator was substituted for the marginal efficiency of capital. I have examined this similitude in more detail in Besomi 1993–94, where I argue that Harrod 1937 was more of an attempt to qualify *The Trade Cycle* in the light of the *General Theory* and to orthodox analysis rather than an exposition of Keynes’s thought.

15 ‘It is necessary that the vague dissatisfaction and the roughly outlined ideas represented by the current use of the term dynamics are put in relation to the methodological structure of the current doctrine, which ought to be *extended* to fit the appropriate requirements. The purpose of the present essay is to suggest such a method of extension. . . . Establishing the elements of a dynamic conception truly analogous to static theory would amount to an immense progress’ (my translation).

16 In the preface of his book, Harrod declared that his dynamics resulted from the attempt ‘to adopt a procedure in relation to the factor of growth similar to that of static analysis’ (Harrod 1936: viii–ix).

17 For a discussion of Harrod’s debate with Keynes and of the methodological peculiarities of his instantaneous analysis, see Besomi (1995).

18 For a discussion of the vanishing of expectations from the ‘Essay’, see Besomi (1995).

19 Discussing the *General Theory* with Keynes, Harrod claimed the right to express savings and investment as functions of different determinants:

The demand schedule for saving is a different thing from the propensity to save. (Now don’t accuse me of saying that interest is determined by them. I merely re-iterate that thinking saving the same as investment doesn’t itself make nonsense of the view that the amount of it is determined by different things: a demand schedule and a supply schedule).

(Harrod to Keynes, in Keynes CW, XIII: 554)

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- \* The Trade Cycle & the Theory of Distribution. Autograph, 17 pages, und., but 1925, file V-105.
- \* Notes on Monopoly and Quasi-Competition. Autograph, July 1928, file II-17-b.
- \* Letter to Gottfried Haberler, 19 October 1934, file IV-395-422.
- \*\* Letter to Hubert Henderson, 21 February 1936, file 22A/6.
- \*\* Letter to Hubert Henderson, 23 February 1936, file 22A/6.
- \* Letter to Dennis Robertson, 25 December 1936, file IV-990-1069d-45.

Henderson, H.

- \* Letter to Harrod, 21 February 1936, in HP IV-480-484.

### Abstract

In 1926 and 1936 Sraffa and Keynes attacked the methodological core of traditional economic theory by showing that the premises of partial equilibrium analysis were mutually inconsistent.

This paper aims to show that Harrod neglected Sraffa and Keynes's *logical* arguments, and only admitted that the tacit assumptions under discussion *restricted the domain of validity* of the theory to special cases: perfect competition and statics. He then proceeded to generalize the theory to imperfect competition and dynamics by applying the principles (but not the instruments) of traditional analysis. The definition of these domains thus aimed at rescuing as much as possible from the orthodox approach.

### Keywords

Harrod, statistics, dynamics, trade cycle, instability principle