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ALFRED MARSHALL'S INTELLECTUAL TRAGEDY

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Introduction

Alfred Marshall (1842-1924) was a great economist who had deep intuitions about the processes at work in social systems. His tragedy was that the analytical tools he devised, principally supply and demand functions and curves set within a partial equilibrium framework, were ultimately not powerful enough, or, indeed, suitable, to allow him to analyse the nature and details of the processes he discerned to be at work. Especially were his tools not the appropriate ones with which effectively to analyse the dynamic evolutionary organic systems he rightly discerned were the basic nature of social systems. As he himself acknowledged (especially in the famous Appendix H of his *Principles*), his analytical system could not take account of asymmetrical relations and of path-determinacy which were essential features of an industrial economy.

[1] We would like to thank, but in no way implicate, Neil Hart and Prue Kerr for their incisive and helpful comments.

Marshall adapted the tools of classical physics to economic analysis, with an important place being taken by the concept of equilibrium. Although he acknowledged the importance of evolutionary theory, in his lifetime it had not reached anywhere near the level of development and sophistication that would have allowed him to go on to adapt its approach to economic analysis, and to allow him fully to achieve his aims. His ultimate tragedy therefore was to die before there was a much better chance of this occurring. These are the major themes, together with modern solutions, of Neil Hart's two fine volumes on Marshall before and after, Hart 2012, 2013.

In this paper we set out Marshall's approach, Maynard Keynes's inheritance and adaption of it, and some of the modern contributions which absorb their predecessors' insights and advance our understanding of how to analyse the basic problems Marshall set us. Though Marshall is not explicitly included in the tradition that inspires the *Cambridge Journal of Economics*, yet it could reasonably be argued that, indirectly, Marshall's economics played an honourable part in the development of that tradition, not least as an irritant that led to the creation of many pearls in the *CJE*.

Ceteris Paribus

The basic problem arises from the fact that economic theory has to analyse a dynamic evolutionary organic system made up of overlapping and interrelated

processes of different durations. Marshall's solution was to hold technological knowledge constant once the analysis started. He then analysed short-period stations on their way to the long-period cross, a long-period position, the characteristics of which were implicit in the conditions of the initial starting point of the analysis[2].

Marshall's starting point was partial equilibrium, in which each market (or section of the economy) is considered as a separate entity, so that its interdependence with other markets is not considered. This is often described as *ceteris paribus*; that is, other things do not change. In order to bring some order and understanding to an extremely complex world where everything effects everything else, partial equilibrium concentrates on key relations, holding the rest constant (Hausman 1992). It is not that these are believed to be unchanging, rather that they are locked up in the *ceteris paribus* pound. As Marshall stated in 1922:

> The forces to be dealt with are however so numerous, that it is best to take a few at a time: and to work out a number of partial solutions … Thus we begin by isolating the primary relations of supply, demand and price in regard to a particular commodity. We reduce to inaction all other forces by the phrase "other things being equal": we do not suppose that they are inert, but for the time being we ignore their activity. …. In the second stage more forces are released from the hypothetical slumber that had been imposed on them (pp. xiv-xv).

> The element of time is a chief cause of those difficulties in economic investigations which make it necessary for a man with limited powers to go step by step; breaking up a complex question, studying one bit at a time, and at last combining his partial solutions into a more

[2] This Marshallian approach was the method that Stephen Marglin used in his Marshall lectures and the book on which they were based, Marglin 1984a, 1984b.

> or less complete solution of the whole riddle. In breaking it up, he segregates those disturbing causes, whose wanderings happen to be inconvenient, for the time in a pound called *Cæteris Paribus*. The study of some groups of tendencies is isolated by the assumption other things being equal …. With each step more things can be let out of the pound (p. 366, emphasis in original)

Marshall was fully aware of the interdependence between most markets and prices in the economy. However, he realised that attempting to analyse this would render the economic problem so complex, that the main causal factors could not be isolated. Hence he regarded partial equilibrium analysis, and the use of *ceteris paribus*, as important approximations to allow casual inferences to be made, and real world problems to be studied.

According to Marshall, the question of which factors are left in the *ceteris paribus* pound depends on the time allowed for these factors to respond to changes in the market. In particular, the length of time which is allowed for supply to respond to changed conditions, will exert an important influence on the operation of the market. Accordingly, he distinguished four time periods appropriate for economic analysis, determined on the basis of which factors are held constant in each situation. The very short period, or market period in which it is assumed that goods are already at market and must be sold, so that supply cannot vary, and price is mainly determined by demand. In the short period, quantity supplied is allowed to vary via variations in production through changes in the variable factors, but the quantity and structure of fixed capital goods cannot be varied. As plants are fixed, firms can neither enter or exit the

market, so supernormal profit can be made, even in competitive industries. In the long period, plants can be varied, and firms can enter or exit from the market, so all factors are variable. In this case, no supernormal profit can be sustained in a competitive market. Finally, in what Marshall referred to as the "secular long period" knowledge, population, technology and tastes can all vary.

In his 1932 lecture notes on the distinction between the Monetary Economy and the Real-Wage Economy and on whether this distinction was the same as that between short-period economics and long-period economics, Keynes made perceptive points which bear on these issues. He asked: what do we mean by 'long-period equilibrium' in this context? He cited "three suggestions conveyed by the term, which are differently dominant on different occasions of its use. The first … is that it relates to a position towards which forces spring up to influence the short-period position whenever the latter has diverged from it. The second … is that the long-period position differs from the short-period position in being a stable position capable *cet.par.* of being sustained, whilst short-period positions are *cet.par.* unstable and cannot be sustained. The third … is that the long-period position is … an *optimum* or ideal position from the point of view of production, i.e. a position in which the forces of production are disposed and utilised to their best possible advantage." Keynes, *C.W.*, XXIX, 1979, 54, emphasis in original.

An important aspect of the evolution of the system referred to above is the almost continuous arrival of new ideas relating to productive processes, best-practices, which become embodied in capital stocks through ongoing accumulation. Marshall's solution won't do because the historical time periods involved make untenable holding constant for analytical purposes technical know-how until the long-period position characterised by the initial state of the art has been fully established[3].

Marshall was aware of this when he argued that what was long-period for one situation or issue may be a short-period for others. He always stuck to his maxim that the Mecca of economists is biology not physics. Hart argues that modern advances in evolutionary theory allow Marshall's ultimate aim to be more successfully attained – that is why, for example, Stan Metcalfe remains a Marshall fan while simultaneously making original contributions to evolutionary economics. Unfortunately, the way that, from Piero Sraffa and A.C. Pigou on, Marshall's analysis came down to the profession frustrated the achievement of this by being locked in the static analysis of mechanics that was dominant in physics when Marshall was writing. According to Hart (2012), it is

[3] Neil Hart has reminded us "that this is precisely the issue that led Marshall to lament about the 'unsatisfactory' nature of his long-period equilibrium framework; it may describe a hypothetical long run equilibrium position, but it could not describe the process by which it was reached and no really meaningful interpretations could be placed on movements along long-period supply curves (in response to shifts in demand) unless the unrealistic assumptions that allowed for the formulation of what he called the 'particular expenses curve' were permitted. …. Marshall may have been able to avoid these issues when living (briefly) in the short period in an isolated industry setting, but once we move to the macro economy, things become a lot more complicated when the time dimension is being considered."

Young who highlights the dynamic nature of Marshall's difficulty – an extremely important paper, largely forgotten by the discipline, except by his student, Kaldor (Young 1928).

Keynes too was aware of these limitations but in *A Tract on Monetary Reform* (1923) and *A Treatise on Money* (1930), he was still operating within Marshall's method. In *A Tract*, as we all know, Keynes wrote "*In the long run* we are all dead". He prefaced this by writing: "this *long run* is a misleading guide to current affairs" and followed his death notice with: "Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is long past the ocean is flat again", Keynes 1923, *C.W.*, IV, 1971, 65 emphasis in original.

Much of *A Tract* is devoted to spelling out what happens during short runs, especially disturbed ones, and what may be done about it. As he was still within the quantity theory of money framework, Cambridge version, his principal interest was how to attain stable overall prices, but he was also concerned with what we now call internal and external balance and which should dominate when designing policies. Moreover, having analysed the impacts of inflation and deflation on the operations of the economy, he concluded: "Thus inflation is unjust and deflation is inexpedient. Of the two perhaps deflation is, if we rule out exaggerated inflations such as that of Germany, the worse; because it is

worse, in an impoverished world, to provoke unemployment than to disappoint the rentier", Keynes 1923, *C.W.*, IV, 1971, 36.

In *A Treatise on Money*, while still a Marshallian, he nevertheless tells us that he proposes "a novel means of approach to the fundamental problems of monetary theory: … [by finding] a method which is useful in describing, not merely the characteristics of static equilibrium, but also those of disequilibrium, and to discover the dynamical laws governing the passage from one position of equilibrium to another", Keynes 1930, *C.W.*, V, 1971, xvii.

By the time Keynes wrote *The General Theory*, he was concentrating principally on the short period as an object worthy of analysis in its own right, partly influenced by Richard Kahn's Fellowship Dissertation for Kings, "The economics of the short-period", Kahn 1929; 1989, and Kahn's scepticism about the quantity theory of money, Harcourt (1994; 1995). After the publication of *The General Theory*, Keynes went even further, writing to Hubert Henderson on 28 May 1936: "I should, I think, be prepared to argue that in a world ruled by uncertainty with an uncertain future linked to an actual present, a final position of equilibrium, such as one deals with in static economics, does not properly exist", Keynes, *C.W.*, XXIX, 1977, 222.[4]

[4] In the same letter to Henderson, Keynes makes explicit the distinction between the meaning of period and run that has long been a hobby horse of GCH, see, for example, Harcourt, 2012. He writes: "… the above deals with what happens in the long run, i.e. after a lapse of a considerable period of time rather than in the long period in the technical sense", Keynes, *C.W.*, XXIX, 1979, 221.

Wilfred Salter's procedure (1960) whereby technical knowledge of best-practice techniques is held constant with adjustments to existing capital stocks occurring at their margins until the rates of return on the latest best-practice machines now embodied have become equal to the normal rate of profit (assuming competitive conditions). This procedure is more acceptable because the theoretical and actual time periods involved are brought so much closer to each other. Richard Goodwin (1967), Michał Kalecki (1968) and Joan Robinson's short period by short period cyclical growth models are even more acceptable because they take in both ongoing technical progress and embodiment through accumulation. All three economists denied a separate existence to the long period, best summarised in Kalecki's observation "In fact, the long run trend is but a slowly changing component of a chain of short-run situations; it has no independent entity" (Kalecki 1968 435)

The mainstream solution is incoherent because there is no explicit account of the characteristics of the medium period between the short period and the long period. There is no need to take our word for this – here is a clear statement of it by Bob Solow: "One major weakness in the core of macroeconomics … is the lack of real coupling between the short run picture and the long run structure. Since the long run and the short run merge into one another, one feels they cannot be completely independent", Solow, 1997, 231-32. Anyway, setting out the problem like this falsifies what is actually going on – all decisions are made

in short runs, some are more influenced by long-run considerations, e.g. accumulation, than are others, e.g. employment. For example, how is it possible to have sticky prices and wages short run by short run yet flexible prices in the long run? The link between the two is never properly made and the match between theory and what is to be explained is never satisfactorily brought off. The mainstream is still cursed by the failure of the Marshallian solution.

The Short Period Re-examined

Both Joan Robinson and Tom Asimakopulos were brought up on Marshall but they eventually were to differ on the fundamental point as to whether the short period was a point in time – Joan Robinson's final position – or a period of time, Asimakopulos's criticism of Joan Robinson's final take. For Joan Robinson, the short period was ultimately "not a length of time but a state of affairs" and she argued that the expressions 'short period' and 'long period' should be used " as adjectives, not as substantives", Joan Robinson, 1971, 17-18. Asimakopulos objected because it took away "the setting of Keynes's theory since there was no time available to permit variations in the utilization of productive capacity in response to changing short-term expectations", Asimakopulos, 1988, 196.

Their arguments become acute when analysing the economy as a whole (as opposed to a firm or perhaps even an industry in the setting that was Marshall's usual procedure). Even at a point in time, since aggregates, e.g. total

expenditure on fixed capital goods, consist of expenditures at the beginning, middle and end of gestation periods of different lengths, or, even more exactly, a continuous spectrum of expenditures from go to whoa. Similarly, aggregate outputs are the sum of a continuous spectrum of procedures near their end, in the middle, others just at the beginning of their lives.

Goodwin and Kalecki were well aware of this puzzle and probably would have settled for a compromise between a point and a period. Asimakopulos's argument implicitly assumes a uniformity of lengths of gestation periods and of their beginnings, and of those of outputs produced. This is sometimes akin a Chamberlinian heroic assumption, sometimes it is an acceptable abstraction. The crucial point is to be aware of it. Marshall was but the evolutionary theories of his day did not allow him to effectively combine his method with them.

Keynes, as ever, was especially acute when commenting on these issues. In a letter to Bertil Ohlin on 27 June 1937, discussing the *ex post* and *ex ante* method, he wrote that it was "almost precisely on the lines that he was thinking and lecturing somewhere about 1931 and 1932 and subsequently abandoned. [His] reason for giving it up was owing to [his] failure to establish any definite unit of time … [He therefore] scrapped the lot … When one comes to prove something truly logical and watertight … the *ex post* and *ex ante* device cannot be precisely stated … [He] used to speak of the period between expectation and result as 'funnels of process', but the fact that the funnels are all of different

lengths and overlap one another meant that at any given time there was no aggregate realised result capable of being compared with some aggregate expectation at some earlier date", Keynes, *C.W.*, XIV, 1973, 184-5.

Conclusion

Marshall's problems stemmed from the use of supply and demand analysis as the main tool of economic analysis. The use of period analysis, and of *ceteris paribus* were attempts to render supply and demand analysis more appropriate to analysing actual economic problems. Unfortunately, this approach has always been extremely limited – unlike Marshall's alternative route stressing an evolutionary approach. The relevance of period analysis has become even more limited with modern production techniques, particularly such developments as "just in time" production techniques.

The methods used by Kalecki and Goodwin, which stress path-determinacy and see the long period as not having an independent existence outside the evolution of a series of short periods represent the most promising way forward.

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