

A note on Marshall and Schumpeter

Brian J. Loasby

Yuichi Shionoya and Tamotsu Nishizawa (eds) *Marshall and Schumpeter on Evolution: Economic Sociology and Capitalist Development*. Cheltenham UK and Northampton MA, USA: Edward Elgar 2008, pp. x, 285.

As the editors observe at the beginning of their introduction, it has become routine to consider Marshall and Schumpeter as quite different in their views on the scope and method of economics – so different that there seemed to be no point in making any detailed comparison. (They also differed in their personalities, in ways which clearly influenced the presentation of their ideas, and probably the content; but that is a theme not pursued either in this volume or these comments.) A notable symptom of this pervasive attitude is that only three of the 148 contributors to the Elgar Companions to Marshall and Neo-Schumpeterian Economics appear in both: not much companionship there. The modest but significant difference in the orientation of the two Companions, which is reflected in their titles (although both sets of editors clearly believed in the major potential for development of their focal economist's ideas and methods, the Schumpeterian volume gives this far more attention, and is correspondingly much larger) is a partial explanation of this extreme disjunction, but I believe it is only a minor factor. The fifteen authors of this set of essays include seven 'Marshallians', two 'Schumpeterians' and one (Metcalf) who is both; they do not directly attempt to explain the general failure to make substantive connections between Marshall's and Schumpeter's conceptions of what economists should do and how they should do it, but in exploring these connections they demonstrate how substantively this failure has impeded the development of economics, or – to be more precise – the development and application of a vision of economics which is substantially different from much that is currently practised.

The importance of a pre-analytic vision is, of course, a classic Schumpeterian idea, which he applied both to the history of economics and to the nature of entrepreneurship. It is not readily associated with the cautious presentation of Marshall's *Principles* (especially after the series of defensive revisions which Whitaker has emphasised); yet it is possible to extract from Marshall's qualifications and elaborations a compendium of strikingly bold assertions about both the content and method of economics which is coherent and attractive (See pp. xvii-xxiv of the editors' introduction to the Marshall Companion). Thanks, above all, to the persistent scholarship of Tiziano Raffaelli and the encouragement and practical ambition of Giacomo Becattini, we can now appreciate the emergence of Marshall's own profound pre-analytic vision and its implications for interpreting his work. Furthermore, after reading this collection it is clear how much Marshall's and Schumpeter's visions have in common, and how interesting are the differences.

Since many of the authors explicitly or implicitly invoke the principle that what you perceive is influenced, sometimes decisively, by what you already know (or more broadly by the context in which it is placed – a principle which is crucial to Marshall's theory of the mind), and since differences of perception between individuals are central to both Marshall's and Schumpeter's accounts of the working of economic systems, it seems reasonable to organize my comments according to my own perceptions, which I believe are similar, though not identical, to those which seem to have influenced much of the content of this volume. (I shall include indicative references, but much of what

follows draws on multiple sources within and beyond it.) The three pervasive themes of these essays, in logical succession, are the conception of an economy as an evolving system, the desirable characteristics of economics as a field of study intended to develop an understanding of such systems, and the most effective way of organizing the social sciences: should we aim at unification, separation, or overlapping fields? The underlying unity of these themes is the problem of organizing the growth and application of knowledge, which entails an understanding of the nature of knowledge. This is very clearly not perceived as a significant economic problem by most economists; for example the concept of ‘information’ in the standard sense which ignores all the difficulties in order to permit the application of rational choice analysis is, at best, highly dubious.

As the editors insist (p. 3), economic development is a unique process in historical time. We therefore need to be careful in assembling samples of economic development if we wish to test any general theory of growth – especially of supposedly endogenous growth. Progress is not just quantitative expansion (Caldari and Masini, p. 175), but entails changes in both the elements and their interrelationships (p. 180); the ‘givens’ of standard theory – goods, preferences, technological possibilities – are subject to amendment or transformation. Underlying such changes, and the basic motivation for Marshall’s interest in economics, are human character and ethics, closely linked to the plasticity of the human mind (Introduction, pp. 5-6), which both shape and are shaped by human activities. Resource allocation is still important, but its content is very different from the standard conception. For developing the economics of progress, what both Marshall and Schumpeter advocated was a combination of inductive evidence and deductive theory: since this was the prescription of Gustav Schmoller (Hodgson, p. 95) they both had considerable sympathy with the German historical school.

If economic development changes the game, it is natural to look for game-changing agents. Schumpeter and Marshall both invoke individual initiative to create new possibilities, not by deduction but by imagination, although both expect their agents to apply reason to the new premises which they have created. Individuals matter, and they matter because they differ. A ‘representative agent’ is therefore not an appropriate tool of analysis, although a ‘representative firm’ may be a useful summary of the (provisional) outcomes of a continuing evolutionary process; as Metcalfe (p. 124) points out, it fits neatly into a model of replicator dynamics in which the dynamics continuously redefines what is representative. However, whereas Schumpeter relies on big players, either as individual entrepreneurs or as giant firms responding to confident direction, Marshall relies on ‘the tendency to variation’ within each sector of the economy. Not only is this closer to biological evolution, from which Schumpeter preferred to keep his distance; it is closely aligned with Marshall’s appreciation of both the powers and the limitations of the human mind, and therefore of the influence of even modest differences in context in encouraging novel conjectures.

Such modest differences are important because Marshall was much more realistic about the likelihood of failure, recognising that uncertainty is a necessary condition of imagination. The life-cycle of the firm was not only an empirical phenomenon but also a significant feature of continued progress; as one of the most knowledgeable and perceptive writers on management observed, ‘(w)e want privately owned businesses precisely because we want institutions that can go bankrupt and can disappear’ (Drucker 1969, p. 293). Schumpeter, by contrast, is interested only in entrepreneurs who get things right; that their success destroys many established businesses is simply an unavoidable consequence. Both Marshall and Schumpeter require imagination to be coupled with energy and will, although Schumpeter (as usual) is much more emphatic; rationality is not enough (Shionoya, p. 23). I would just like to draw attention to their Italian precursor,

Carlo Cattaneo (2001 [1861]), who argued that economic development was the product of intelligence and will, not physical accumulation – a principle which is closer to Adam Smith’s ‘system of social science’ (Skinner 1996) than he recognised.

Even with these human propensities and capabilities, how is development possible? We know that most new ideas do not work; how is it that some of them do? The answer depends on the characteristics of human beings, natural systems, and the artificial systems in which the two are combined. Let us begin with human beings. That knowledge grows by focus is Adam Smith’s great principle, which he saw was equally applicable to human understanding and productive activities. Moreover, since the creation of knowledge is an act of imagination – in Smith’s terms a new connecting principle, in Schumpeter’s a new combination – even within a particular focus people may be expected to differ in the links which they envisage. Marshall notes as an important implication of his model of ‘Ye machine’ that machines of identical design may develop different connections if placed in different contexts; this supports his invocation of the proposition (Marshall 1920, p. 355) that ‘the tendency to variation is a chief cause of progress’ as a natural corollary of Smith’s fundamental principle of development. Together these provide the basis for a theory of economic evolution ‘that strictly mimics the way that Darwinian evolution works’ (Raffaelli, p. 37) – but which also allows intentionality without requiring rational expectations.

As Raffaelli points out, the appropriate theoretical context for this, as for all evolutionary theories, is partial, not general, equilibrium. It may therefore be instructive to recall Samuelson’s (1998, pp. 458-9) summary assessment of Marshall as a theorist.

‘Alfred Marshall ... backed the wrong horse of analysis – the gratuitously fuzzy paradigms of *partial* equilibrium analysis: a distinct (and unnecessary) step down from the *general* equilibrium analysis that had been implicit in Cantillon, Smith, and J. S. Mill and which Walras later formally explicated.’

Samuelson is certainly correct about the course of economics, and the rapid decline of Marshall’s reputation; but implicit in his judgement is that economics is properly to be defined by its analytical method, which in turn defines its scope – as for example in its specification as the analysis of incentives (Myerson 1999, p. 1068), which is typically based on simplistic assumptions about motivation. I would respond to Samuelson by asserting that the practical usefulness of an analytical system which postulates a general equilibrium of rational optimisers is as a foil to the development of useful theory; it is rather easy to see what general equilibrium theory cannot do.

In order to ensure that what is computed is a true general equilibrium of rational optimisers, it has been necessary to extend Walras’s model by defining every commodity by its location, date, and state of the world. In addition to unresolved issues about the degree of precision required in each dimension to ensure perfect homogeneity within each class of goods, this imposes important restrictions. In declining to follow the path to general equilibrium Marshall recognised and rejected them: ‘a theoretically perfect long period ... will be found to involve the supposition of a stationary state of industry, in which the requirements of a future age can be anticipated an indefinite time beforehand’ (Marshall 1920, p. 379 n.1). Nothing can ever happen that cannot be fully incorporated into present decisions, and must be incorporated in them if we are to produce a general equilibrium of rational optimisers.

Moreover, an Arrow-Debreu economy in which goods and services are actually being produced and exchanged is not a market economy: as Walras had discovered, in order to avoid ‘false trading’ which frustrates the attainment of the computed equilibrium, the complete set of contracts must be established before the economy starts functioning, and when this is done all markets close forever (Hahn 1984). If there were

an equilibrium of rational optimisers, it would already have been established and there would be no decisions to make. The world would therefore be populated by automata without intelligence (Knight 1921). This is just as well, because within a general equilibrium framework any change in the data requires a recomputation of the whole system, and presumably a suspension of all activity until this has been done.

Marshall was consistent in his methodology. To understand a complex system it is necessary to break up the problem into manageable parts, and subsequently to try to fit the pieces together again (Arena, p. 67). Such a procedure is especially necessary when one human brain is attempting to make sense of a system containing many thousands, or millions, of human brains. This economising principle is curiously neglected in most economic theory, although it was recognised in Knight's conception of intelligence and emphasised in Hayek's *Sensory Order* (Hayek 1952, p. 185), and seems to be appreciated by many natural scientists. To function effectively, economic systems – which rely on human capabilities – must operate on the same principle. But since any such isolation of features for study obviously leaves so much out, we should not be surprised that particular attempts usually fail; indeed the obvious question is why they should ever work.

Herbert Simon (1969) argued that the possibility of success exists because the natural world that we perceive is itself predominantly organized as a quasi-decomposable system ; and this in turn is because decomposability is strongly favoured by the uncertainties and shocks of evolutionary processes, which long predate the emergence of life-forms. Raffaelli (p. 37) observes that the great zoologist and palaeontologist Georges Cuvier (1769-1832) used his principle that 'each part of an organism is always in a necessary relation to all other parts' to deny the possibility of evolution, because nothing could be changed unless everything changed; this neatly counterpoints Simon's argument. We may note, incidentally, that Cuvier is also famous for insisting that the fossil record demonstrated that many species had become extinct; but in attributing these extinctions to shocks, to which adaptation was according to his principle impossible, he leaves us wondering why neither the shock nor the secondary effects of selective extinction (for example through predator-prey relationships or complementarities such as pollination) spread further: completely undecomposable species in a completely decomposable environment is a highly improbable combination. Raffaelli goes on to note that Cuvier's principle is also an essential property – and claimed virtue – of general equilibrium. Here too the rejection of decomposability entails the impossibility of producing a credible explanation of change: thus the opportunity cost of providing an internally consistent model of an efficiently co-ordinated system is the impossibility of specifying a co-ordinating process.

Schumpeter's fundamental separation between co-ordination and growth as analytical foci allowed him to acclaim Walras at the supreme champion in the first field while excluding him from contention in the second; and by observing that the 'prompt and rational' behaviour observable in equilibrium was actually produced by interlocking routines (Schumpeter 1934, p. 80) he also implicitly excluded equilibration as a topic for economic analysis. (One could simply claim, as has been done, that the equilibrium derived from the initial conditions is the only resting point of this unanalysable process.) Unemployment is therefore the natural consequence of frictions which inevitably result when embedded routines are disrupted by entrepreneurship (as explained by Boianovsky and Trautwein); and government intervention is likely to be unhelpful because it prevents the necessary restructuring of the economy, although short-run price stability may be useful in preventing disorder (Boianovsky and Trautwein, p. 259). Though the causation is different, Schumpeter's reasoning parallels Hayek's (1931) argument against delaying

the reconstruction of production systems that have been designed to suit unsustainably low rates of interest; both authors recognize that closely-complementary capital structures which are no longer appropriate cannot be transformed quickly, but that transformation cannot be avoided. Such explanations may also be compared to Marshall's (1920, pp. 710-11) recognition of the possibility of 'commercial disorganization' because of the failure of co-ordinating processes, though it is the loss of confidence rather than structural problems which is blamed for the most serious disorders.

However, Marshall wanted to explain the tendencies towards equilibrium in a way which was consistent with his explanation of the tendencies to change; and this was much easier if both tendencies relied primarily on the distributed actions of many agents. Co-ordination and growth both depended on trial and error processes, both of which can be traced back to his early mental model, which is a model of both human problem-solving and the development of capabilities. This kind of analysis was also particularly appropriate for his lifelong interest – which was not shared by Schumpeter – in improving not merely the condition of the people but their character and preferences; people are not only agents of change but are themselves changed by what they do.

Partial equilibrium is therefore the only sensible option; and Schumpeter was quite wrong in asserting that Marshall was moving towards general equilibrium, a movement perhaps delayed by the time and thought spent in developing a deep understanding of the capitalist process (Backhouse, pp. 55-6), though Backhouse (p. 59) suggests that Schumpeter's claim might have been influenced by the possibility of using Marshall to support his argument against Keynes and the Cambridge Keynesians for reasoning in terms of aggregates. As Simon argued, it is only decomposability that offers the possibility of human understanding of the universe or of any human society. However, as Simon also recognises, decomposability is not complete, and the limits may not be recognised, because they may be dependent on contingencies and connections which have not been experienced, or which take time to have effect. This has been powerfully demonstrated in the recent banking crisis, and it is the most difficult aspect of the study of climate change and the policies which may be appropriate to deal with it. Partial equilibrium analysis is not, as Samuelson claimed, *gratuitously* fuzzy, it is *necessarily* fuzzy, like the classification systems of Knightian intelligence, Marshall's 'machine' and Hayek's neural networks. That is why imagination is possible, and why unintended consequences, both welcome and unwelcome, are common – and why there is rather more to producing major innovations, especially in large organizations, than Schumpeter seems to have appreciated.

As Marshall explicitly recognised, the growth of knowledge depends on the ways in which knowledge-generating systems are organized. Such organization requires a combination of differentiation and selective integration; and as Marshall also insisted, effective knowledge production requires multiple forms of organization in order to provide the range of contexts which is necessary to generate a variety of knowledge and to combine it in appropriate ways. Marshall's recognition that every firm needs an external as well as an internal organization, and his interest in both industrial districts and what would now be called national systems of innovation (Marshall 1919) is a response to the phenomenon of quasi-decomposability. George Richardson (1972) explained and illustrated the extraordinary variety, and sometimes complexity, of industrial organization. It is a pity that Schumpeter's recognition of the depth of Marshall's understanding of the workings of industry was not accompanied by a recognition of how closely this was related to Marshall's conception of the role of theory in economics. The recent award of the Schumpeter Prize to the latest results of Bart Nooteboom's exploration of such contexts (Nooteboom 2010) is highly appropriate; if there were a

Marshall Prize it would merit that as well.

Probably the clearest example of the similarities and differences between Marshall and Schumpeter is provided by their invocation of the relationship between innovation and routine as essential to their theories. Schumpeter identifies the innovative entrepreneur as an exceptional individual, who nevertheless relies on the rule-following majority to provide a reliable basis for calculation, so that the eventual destruction of these routines by innovation necessarily destroys the basis for calculation by subsequent entrepreneurs, and therefore produces a strictly non-Keynesian business cycle. For Marshall, however, the key relationship between innovation and routine is found within the individual. As Raffaelli has shown, the need to convert experimental success into routine in order to free resources for experimentation, which if successful generates further routines and so releases resources again, was a key relationship for explaining the process by which a 'machine' could build up knowledge. This continuing process is carried over into Marshall's conception of partial equilibrium as 'an adjustment that *would* be attained if the very endeavour to reach it did not reveal fresh possibilities, give fresh command of resources, and prepare the way for inevitable, natural, organic further change' (Shackle 1965, p. 36). Metcalfe (p. 139) makes a similar argument.

What is still not fully appreciated is the relevance to this process of another crucial conception of Simon's: the scarce resource of attention, and the consequent problem of who notices what, how it is interpreted and how they decide to respond. (These are key issues in both military intelligence and in deception schemes, about which enough has been revealed to provide valuable clues to individual and organizational behaviour – notably that people are particularly susceptible to apparent confirmation of their present beliefs.) In Marshall's account of development, individuals and firms must go step by step (like economists), modifying arrangements for co-ordination as they go. Penrose's (1959) explanation of the growth of firms, which began with a Schumpeterian-style distinction between co-ordination and growth as distinct theoretical realms in order to create a protected space for her own analysis, turns out to be thoroughly Marshallian in this respect, as she was subsequently happy to recognise. She had been given the conventional view that Book V was the essence of Marshall, which had been superseded. This is an important reason why economics – like economists – needs history.

It is worth pointing out that 'partial equilibrium' in Marshall's and Simon's sense is partial in two respects. Not only does it apply to a subsystem, where it assumes substantial decomposability for a limited time (note that Marshall never considered a long-run equilibrium for the firm – nor did Penrose) and therefore, in Shackle's phrase, sets provisional bounds to uncertainty; it also applies to the internal arrangements of this subsystem, and not least to the functioning of the human mind. As Hayek put it in 1937, the key question is which elements stand in an equilibrium relationship to each other (Hayek 1937, p. 36). This in turn has a double meaning: first what can be taken for granted in the process of deciding what to do, and second how are the elements in a plan of action related to each other? Because we are considering economic entities which not only respond to change but also generate change, we should also consider the stability of any equilibrium, and for that I still believe that Hahn's formulation is potentially very useful: a system 'is in equilibrium when it generates messages which do not cause agents to change the theories which they hold or the policies which they pursue' (Hahn 1984, p. 59). We can then enquire into the potential sources of such messages, who (if anyone) may notice any particular message (remember the scarce resource of attention), how might it be interpreted, how might it impact on existing theory, and if it does cause a modification of theory, how might this affect policy. In this enquiry we should distinguish between programmed responses, which in principle are predictable, and

responses which lead to novel connections within the brain of an individual or between individuals. (There are major unexplored connections here to the work of Cyert, March and Simon.) Such an analytical structure, combining routines and innovation, both Marshallian and Schumpeterian, seems appropriate to economic (though not biological) evolution.

The third theme of this collection deserves more consideration than can be given here. That decomposability is substantial but incomplete and uncertain poses continuing and formidable problems for the organization of both economic systems and systematic enquiry into these systems. Even on a narrow definition of its subject matter, the search for a uniquely defined economic science seems doomed to failure: the development of game theory has revealed the need to borrow some concepts from psychology and sociology in order to escape the limitations of pure rationality. (The notion of pure self-interest is itself, of course, also borrowed.) Nishizawa and Hagemann note that Marshall and Schumpeter insisted that the study of economic phenomena must take proper account of the wider social system – one cannot aggregate individuals, and Nishizawa (p. 158) draws attention to Marshall's insistence until 1871 that his home was in mental science. However, on what basis could we unify social science in a way that would be both comprehensive and comprehensible? Both Marshall (Nishizawa, p. 155) and Schumpeter (Hagemann, p. 227) thought this impossible. Knight was right to argue that intelligent behaviour requires the development of classification systems that are appropriate to particular ranges of phenomena, and which therefore may be mutually incompatible. This applies both to the organization of economic and social systems and to sciences both natural and social – for rather obvious reasons. There is no uniquely correct way of either unifying or partitioning the social sciences. Methodology matters, but (like other questions) it should be discussed in appropriate contexts.

Final thought

The entrepreneurs who organized the workshop from which these papers emerged are to be congratulated on producing a new combination. But though there is a great deal of specific interest in this volume, I would like to conclude by recording what I believe is its most important message. It has been said that we know more than our predecessors, because they are what we know. However, many present day economists (and perhaps especially recent graduates) know very little about their predecessors; and as a consequence they may know less – perhaps much less – than them. These essays provide striking examples of what has been lost from the knowledge of two predecessors; if one wishes to be optimistic, one could claim that a great deal of useful knowledge is readily accessible to those who are willing to look.

Bibliography

Cattaneo, Carlo ([1861] 2001) *Del Pensiero Come Principio d'Economia Publica*. Milano: Libri Scheiwiller.

Drucker, Peter F. (1969) *The Age of Discontinuity*. London: Heinemann.

Hahn, Frank H. (1984) *Equilibrium and Macroeconomics*. Oxford: Basil Blackwell.

Hayek, Friedrich A. (1931) *Prices and Production*. London: Routledge.

- Hayek, Friedrich A. (1937) Economics and knowledge. *Economica* 4: 33-54.
- Hayek, Friedrich A. (1952) *The Sensory Order*. Chicago: University of Chicago Press.
- Knight, Frank H. (1921) *Risk, Uncertainty and Profit*. Boston: Houghton Mifflin.
- Marshall, Alfred (1919) *Industry and Trade*. London: Macmillan.
- Marshall, Alfred (1920) *Principles of Economics* 8th edn. London: Macmillan.
- Myerson, Roger B. (1999) Nash equilibrium and the history of economic theory. *Journal of Economic Literature* 37, 3: 1067-82.
- Nooteboom, Bart (2010) *A Cognitive Theory of the Firm: Learning, Governance and Dynamic Capabilities*. Cheltenham UK and Northampton MA, USA: Edward Elgar.
- Penrose, Edith T. (1959) *The Theory of the Growth of the Firm*. Oxford: Basil Blackwell. 3rd edn. Oxford: Oxford University Press. 1995.
- Richardson, George B. (1972) The organization of industry, *Economic Journal* 82: 883-96.
- Samuelson, Paul A. (1998) Report card on Sraffa at 100. *European Journal of the History of Economic Thought* 5,3: 458-67.
- Schumpeter, Joseph A. (1934) *The Theory of Economic Development*. Cambridge MA: Harvard University Press.
- Shackle, George L. S. (1965) *A Scheme of Economic Theory*. Cambridge: Cambridge University Press.
- Simon, Herbert A. (1969) The architecture of complexity. In *The Sciences of the Artificial*. Cambridge and London: MIT Press, pp. 84-118.
- Skinner, Andrew S. (1996) *A System of Social Science: Papers Relating to Adam Smith*. Oxford: Clarendon Press.