Piergiuseppe Morone and Richard Taylor (2011)

Knowledge Diffusion and Innovation: Modelling Complex Entrepreneurial Behaviours by Piergiuseppe Morone and Richard Taylor: A Response to the Review

🌐 Abstract

In this brief note we reply to César García-Díaz and Diemo Urbig who reviewed our book on *Knowledge Diffusion and Innovation* (Edward Elgar Publishing: Cheltenham, 2010). We take this opportunity to reaffirm our personal view on several relevant issues, such as the need for a holistic view in economics, the adoption of a pragmatic heuristic approach when dealing with complex socio-economic systems, the relevance of a 'prototype model' to setting a rigorous conceptual framework and the proposition of a novel way of looking at knowledge and innovation.

Keywords: Knowledge Diffusion, Innovation, Agent-Based Model, Validation

🌐 Introduction

1.1 Recently a review of our book on *Knowledge diffusion and innovation* appeared in *JASSS*. Although we found the comments and suggestions proposed by César García-Díaz and Diemo Urbig interesting and stimulating, we felt the need to point out some aspects of our book which we believe have been misinterpreted or overlooked by the reviewers in their essay. The following is a brief note in reply to the book reviewers.

🌐 On the literature review

2.1 Indeed, there is much to add to what we have surveyed in our short book and we are grateful to the reviewers for pointing this out. However, along with the papers suggested by César García-Díaz and Diemo Urbig, there are several other articles (less novel, but well rooted in the literature) that we could have mentioned. For instance, the seminal contribution by Edit Penrose (1959) on the growth of the firm is relevant to understand how learning occurs through the management-intensive process of exploiting a productive opportunity; or the more recent contribution of Brian Loasby (1999), where the author reasons on multifarious novelty as a problem which reformulates a "co-ordination problem as one of efficient allocation" (Loasby 1999: 32). If we were to be really ambitious, we could have reconciled our work with Adam Smith himself. In fact, the concept of meta-knowledge used in our model stems directly from Smith's seminal contribution on the wealth of nations where he stated that knowledge about knowledge is acquired by those "whose trade it is not to do anything, but to observe everything; and who upon that account are often capable of combining together the powers of the most distant and dissimilar objects" (Smith 1776 [1976]: 21).[1], [2]

2.2 Having said that, we need to make it clear that, when writing chapters 2 and 3, we decided to go for a functional and short review (as opposed to a comprehensive one and broad in scope), concentrating our attention on a handful of articles which we found useful in guiding the reader to the key argument of the book - i.e. knowledge should be understood as a structure, this affecting the way in which innovation is conceived and modelled. This approach is also taking into account that the book does not, by any means, aim to be a handbook on knowledge diffusion. Yet, this is our personal view and we do not expect everybody to share it.

2.3   A further minor point worth mentioning on this issue is that publishing a book is a rather long process, and a book printed out in February typically has been submitted to the publisher in its final form more than a year before. Hence, it is hard to expect that the survey chapters could include papers published in 2009 or 2010.

On the neoclassical/evolutionary debate

3.1   As for the neoclassical/evolutionary debate, the point we make in the book is not simply about recognising heterogeneity or perfect information (which, of course, is now well acknowledged); nor it is about opposing to all sorts of simplifying hypotheses and assumptions (like perfect foresight, instantaneous market clearing, perfect rationality, etc.).

3.2   In this sense, we feel the reviewers have put their finger on a key point in the argument. We are referring to the evolutionary methodological approach of historical contingency of economic phenomena (i.e. at any particular point in time, the state of nature or the economy is historically unique)[3] and advocate a holistic approach to investigate complex socio-economic systems. What we oppose are the philosophical roots (Cartesianism and positivism) of mainstream economics,[4] as we see the need for a pragmatic heuristic approach when dealing with complex phenomena, even if researchers aim to abstract from a specific case study and elaborate a conceptual model.[5]

On the model robustness

4.1   Although we agree with the reviewers on the relevance of conducting a sensitivity analysis to strengthen and generalise results, we do not think this criticism is pertinent to this book. A correlation analysis was carried out in Chapter 4, as well as investigation of variance/dispersion within each set of 100 simulation runs in both Chapters 4 and 7. Variance proved to be high and confidence intervals large (as is often found to be the case in ABM) and we therefore took an alternative approach to investigate the extremes of this interval (pp 64-80 and 143-149). Nevertheless, through a lack of statistical testing, this may not be seen as "comprehensive" by some readers.

4.2   When writing Chapter 4, we deliberately decided to concentrate all our efforts on presenting a rigorous complex model, with the aim of creating a "prototype" of a novel approach to knowledge and innovation modelling.

4.3   As stated by an anonymous referee, "[T]he essential merit of this [model] is that it treats both knowledge and industrial organization as structures, i.e. as systems consisting of elements that are connected in particular ways, and focuses on the relationships between inter-organizational connections and the potential for novel integrations of knowledge possessed by different organizations which may be easier to achieve than transfers of knowledge between them".

4.4   In this sense, adding an articulated robustness check fell out of the scope of the book. We believe that building a prototype model was a more appropriate aim, as it sets the way for further research and leaves the ground open to many possible extensions (on possible extensions see Morone and Taylor 2010).

Final remark

5.1   We believe the book succeeds in its aim of making a point on the need to conceive knowledge and innovation in a novel way. Missing this point is somewhat like missing the forest for the trees.

Notes

[1]On this point please refer to our recent *J Evol Econ* paper (Morone and Taylor 2010).

[2]To the best of our knowledge, there is another set of literature that we deliberately excluded from our survey and which the reviewers did not mention in their comprehensive list of "missing papers". We refer to the literature on optimal control problems and differential games which introduces, for instance, advertising strategies and price strategies as policies to stimulate diffusion of new products (see, for instance: Jorgensen and Zaccour 2004; De Cesare, Di Liddo and Ragni 2004; Jørgensen, Kort and Zaccour 2009; Viscolani and Zaccour 2009). Probably there is more to add to the shopping list but, as it seems, both the reviewers and us fell short of mentioning it.

[3]On this point see Witt (2008).

[4]As stated by Yefimov (2003: 1) "[u]sually mainstream economics is criticised for its economic concepts and assumptions. Much less attention of criticisers is drawn to the philosophical roots (Cartesianism and positivism) of the failure of this economics to capture economic realities and of its autistic character".

[5]Colander et al (2004: 485) observe that "economics is currently undergoing a fundamental shift in its method, away from neoclassical economics and into something new. Although that something new has not been fully developed, it is beginning to take form and is centered on dynamics, recursive methods and complexity theory".

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