

Evolutionary concepts in economics and biology

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The role of Darwinian concepts has been a matter of controversy in evolutionary economics from its very beginnings. The seminal approaches to this question taken by Veblen (1898), on the one hand, and Schumpeter (1912), on the other, reflect the opposing views, attributing and denying relevance to Darwinian concepts, respectively. In December 2004, the Max Planck Institute of Economics in Jena organized a workshop on “Evolutionary Concepts in Economics and Biology” that brought together people with different disciplinary background to reappraise the question in an interdisciplinary dialogue. More specifically, the problems discussed were: What precisely may be the relevant insights from evolutionary biology for evolution in the cultural sphere, particularly in the domain of economics? What role do cultural forms of adaptations play? What general, unifying insights and principles, if any, can be gained from the interdisciplinary dialogue?

The papers in this special issue try to provide answers to these questions from different points of view, resulting in different, and somewhat controversial, assessments. The majority of the papers emerged from the workshop. Two papers shedding additional light on the topic (Cordes and Joosten) have been added to round out the special issue. Four of the papers—those by Nelson, Hodgson and Knudsen, Cordes, and Buenstorf—focus on the role that “Universal Darwinism” (Dawkins 1983) can play as an overarching frame in the various disciplines that deal with evolution in their domain, like, e.g., biology and economics. As its label indicates, Universal Darwinism claims general validity for the abstract principles to which, it is submitted, the Darwinian theory can be reduced. These abstract principles are variation, selection, and retention or replication (Campbell 1965).

After Geoff Hodgson’s recent plea for Universal Darwinism in this Journal (Hodgson 2002), the paper by him and Thorbjorn Knudsen elaborates in more detail on what it means to invoke the abstract triadic scheme within a socioeconomic context. The particular principle the two authors are interested in is selection. They

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discuss how one of the core problems in working with the principle in a socioeconomic context—to identify a proper unit of selection—can be accounted for. Selection also figures prominently in Richard Nelson's contribution, in which he makes clear that his interpretation (and the interpretation underlying the classical reference Nelson and Winter 1982) of the role of selection in the economic domain is much different from that of Universal Darwinism. Emphasizing the complexity of cultural evolution, he argues in contrast to Hodgson and Knudsen that too far-reaching abstractions tend to render evolutionary theory rather infertile. Similar concerns motivate the paper by Guido Buenstorf. To put the usefulness of the general principles of Universal Darwinism to the test, he reflects at a pragmatic level on whether they are helpful in organizing research in industrial dynamics. With reference to recent findings in the life cycle literature, he argues that concepts such as inheritance may—far below the level of abstraction of Universal Darwinism—be used to summarize important aspects of industrial reality, albeit in terms of metaphor or analogy, not in terms of a generalization of biological principles.

A critical stance towards Universal Darwinism is also taken in Christian Cordes' contribution. He inquires into alternative uses of Darwinian thought in economics and their ontological implications. The spectrum reaches from metaphorical uses and analogy constructions that are usually silent on the question of a common ontological basis for biology and economics (or the question of scientific monism) to approaches *assuming* such a common basis. In this light, the status of Universal Darwinism is ambiguous. On the one hand, the principles of variation, selection, and retention are abstract reductions of conditions that are domain specific for evolution in nature. The extension of these principles to evolution in the economic domain can therefore be understood as an abstract analogy construction that does not necessitate any ontological commitment. On the other hand, Hodgson (2002) explicitly claims that Universal Darwinism assumes a common ontology for evolutionary sciences. Before the background of alternative interpretations (as e.g. in Witt 2004), Cordes develops a more complex, historical approach to the role of the Darwinian theory for man-made evolution in general and economic evolution in particular.

Discussing Universal Darwinism is not the major concern of Jack Vromen's contribution. However, he helps to clarify further the role of Darwinian concepts for economics by focusing on analogy constructions, particularly the analogy between genes and (organizational) routines that is not the least a core element of Nelson and Winter's (1982) approach to evolutionary economics. Vromen argues that this analogy is misleading in several respects. His main argument is that both genes and organizational routines do not determine behavior uniquely, so that knowledge of genes or routines is not sufficient to predict behavior. (The same holds, Vromen submits, for the notion of program based behavior advocated by Mayr 1991 and Vanberg 2004.) Then, the claim that a firm's routines decide its performance and profitability is, of course, a problematic one, as is, by the same token, the assumption that (market) selection operates on the firms' routines. The upshot of this argument is that adaptations occurring under the competitive (selection) pressure of the markets may hinge at least as much on the competencies and learning mechanisms of the individual decision makers as on the organizational routines to which they more or less adhere.

Reinoud Joosten's paper deals with a different issue, though one of great importance for the way in which evolutionary concepts are put to use in biology and economics: the question of formal modeling. Much formalization of evolutionary concepts was developed in early population genetics in the 1930s, particularly in the works of F.A. Fisher. They have been criticized for their attempt to make evolutionary biology more like physics, an attempt by which Darwin's theory of an open, unfolding system is converted back into the closed-system dynamics of Newtonian physics that it was supposed to overcome (cf. Mayr 1991, Chap. 10). This is indeed a problem also in evolutionary economics. As Joosten shows, the well known replicator-dynamics representation of selection processes is formally equivalent to the excess-demand based dynamics of the market-equilibrating, Walrasian auctioneer's rule—usually considered the prototype of a Newtonian interpretation of economic processes (Mirowski 1989). In evolutionary biology, reductionism has been overcome by acknowledging in the so-called synthetic interpretation of Darwinism the complexity and plurality both of processes and phenomena produced by evolution and of scientific approaches to deal with them (Mayr 1991, Chap. 10). One of the lessons for evolutionary economics to be drawn from an interdisciplinary dialogue with evolutionary biology may, therefore, be this: quasi-physical analytical reasoning should be prevented from becoming a dogma, as it has elsewhere in economic theorizing. To maintain a plurality of methods of describing and analyzing allows us, where necessary, to take advantage of qualitative reasoning that is, after all, still the best way to account for the open system character of evolution and its enormous complexity.

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