

Explaining Process and Change

Approaches to Evolutionary Economics

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Ulrich Witt (ed.). *Explaining Process and Change: Approaches to Evolutionary Economics*.
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The aim of the collection is to explore different meanings of "evolutionary economics" other than the dominant one concerning technological innovations à la Joseph Schumpeter. Besides the introductory chapter, the book consists of eight contributions. While they represent a wide range of topics and perspectives, many of the essays are inspired by the evolutionary economics of Friedrich Hayek.

In an excellent introduction, Witt defines evolutionary economics as the endogenous account of change. Evolutionary economics is not simply about endogeneity. After all, evolutionary game theory provides an endogenous account of institutions--but usually in terms of stable equilibrium strategy. Furthermore, evolutionary economics is not merely about change. Neoclassical theory also explains change--but usually in terms of exogenous variables. While Witt is ready to entertain diverse definitions of evolutionary economics, he does not consider the Schumpeterian tradition evolutionary. It is still wedded to the neoclassical approach. Schumpeterian economists model the source of change, innovations, as exogenous. The big challenge, as posed by Witt, is to construct an endogenous theory of change and the rise of novelty.

Werner Güth and Menahem Yaari offer an evolutionary game theory about the stable emergence of the taste for the reciprocation of harm. They show that mutants with the character to reciprocate harm have greater reproductive success than others. In the game where both players derive pleasure from revenge, the dominant strategy is to play fair. In the game where both players have distaste for revenge, the dominant strategy is to cheat. In the game where only one player has the taste for revenge, the dominant strategy for that player is to cheat the other, but not vice versa. The payoffs in the last two games in terms of reproductive success are less than when both players have the taste for revenge and, hence, the genetic make up shifts towards agents with the taste for revenge. There is one weakness in this argument. The same framework could possibly account for the stability of the distaste for revenge as well. When revenge is costly, agents who are clever enough to exchange hostages to assure cooperation could reap greater payoffs than the agents who have the taste for revenge.

Peter Weise presents a theory of the evolution of the field of socioeconomic forces in the tradition of Kurt Lewin. It is couched in terms which would be unfamiliar to most economists. Instead of the assumption of maximization, he argues that humans are motivated by the minimization of tension. Tension is assumed to be a function of the "time duration" of consumption. So agents shift from one choice to another as time progresses. In a model of multitude of agents, there is the force of conformity with others and the force of deviance from others. The equilibrium of the socioeconomic field is stable when the parameters' intensity for

conformity is within a certain value. Weise's framework explains how individuals act interdependently and generate a socioeconomic field which, in turn, determines the activity of agents. The framework is capable of accounting for mob behavior and fads. But it falls short of accounting for the rise of innovations.

Hans-Paul Schwefel reviews different models of artificial intelligence and artificial learning (genetic algorithms) in order to draw insights on natural intelligence and imitation at the collective level. He draws on literature with which I am not familiar. But Joseph Weissmahr advances the now familiar argument in favor of ecological economics. In an essay which I find to be the weakest in the collection, Weissmahr argues that the forces of nature should not be ignored in the construction of evolutionary economics. While John Locke and the Physiocrats stressed the role of nature, Adam Smith, Karl Marx, and the marginalists omitted that role. For him, what matter for the analysis of production are energy flow, time, and creativity. And he considers, contrary to Marx, the energy flow from the ecosystem as the origin of profit. But, as Marx has pointed out in his critique of the physiocrats, the author confuses the analysis of the physical aspect of production with the value aspect which relates to distribution.

Günter Hesse offers a new and interesting theory of economic growth. He regards human technological innovation as the main factor behind growth. Technological innovation is not a serendipitous activity, but rather the outcome of humans attempting to cope with invariable natural constraints in the face of increasing population density. The author stresses the empirical fact that the proportion of agricultural employment for different countries is inversely correlated with per capita commercial energy consumption. This should be true by definition. But such a mundane observation should not overlook the author's stimulating theory. Hesse maintains that population density and the high seasonal temperature swings of Northwestern Europe explains the industrialization of Europe as opposed to the tropical regions. He argues that innovations are adaptive responses to the general law of agricultural production: as population density increases, output per unit of solar energy rises, but output per unit of labor input declines. Given the Northwestern European seasonal fluctuation and the population pressure, innovations have taken the route of industrial tools rather than multicropping as the case of the tropical regions.

Viktor Vanberg instead contends, on the basis of different historical studies, that liberty, diffused political authority, competition among decentralized centers, and security of property are the reasons behind the European economic growth in the past five hundred years. The European institutional/organizational framework allowed for the Darwinian mechanism of evolutionary change to take place. Namely, the Darwinian mechanism consists of two principles: the diversity of forms of human ingenuity and reliable selection mechanism of trial and error which retains what is found to be an improved technology. Technology consists of routines/rules as well as material tools. Vanberg uses Hayek's theory of evolution to elucidate the Darwinian mechanism. Given that most rules are collectively adopted, Hayek proposed the idea of group selection. The idea invokes a functionalist perspective. But it is still consistent with the Darwinian framework. In place of the idea of group selection, Vanberg resorts to public choice and the intentional experimentation with different rules in order to explain the emergence and demise of collective institutions. The problem with Vanberg's appeal to public choice is that his theory of evolution is no longer within the Darwinian framework. The framework pointedly rejects intentionality and learning.

Manfred Streit and Gerhard Wegner elaborate on Hayek's critique of the neoclassical concept of equilibrium. Equilibrium theory, for them, is similar to planning insofar as it ignores the problem of decentralized information. They regard transaction-cost economics as buttressing

Hayek's critique of neoclassical theory. This is the case because the quality of information cannot be known until an entrepreneur experiences. In the process, this creates new opportunities never foreseen earlier. So information cannot be subjected to marginal analysis. They even consider arbitrage activity as involving the innovative acts of creating new opportunities. Similar to Hayek, the authors are ambiguous about the relation of the objective character of information to its subjective character as seen by the agents.

I find Alexander Gerybadze's article to be the best in the volume. The author sets out to specify the decision process framework concerning the suitability of industrial policy. The necessary condition for industrial policy is the failure of firms to adopt a better technology because of network externality. The state can then induce the adoption via supply-side policies (subsidies), demand-side policies (public procurement), and regulatory/legal reforms which would enhance spontaneous cooperation. The author stresses, however, that network externality is not a sufficient condition for industrial policy. In case of great uncertainty--given the irreversibility of technological choice caused by positive feedbacks and political rigidities--the intervention by the state could lead to a locked-in path of technological development which is inferior to the spontaneous one. The sufficient conditions for industrial policy are, first, the state must be able to process information better than individual firms. Second, the industrial policy must conform with the collective judgment of the concerned firms which would lead to self-enforcement. The author then discusses in detail the advantages and costs of different tools on which the state's industrial policy could enact.

Although the book has a couple of weak articles, it is a must reading for anyone seriously interested in evolutionary economics. Its slender size contains a set of gems of new ideas. But it is not a comprehensive coverage of all the approaches to evolutionary economics. While the editor considers Schumpeterian dynamics as part of the neoclassical non-evolutionary tradition, he is silent about the American (old) institutionalist tradition. It would be a worthwhile enterprise to edit another volume which aims at a comprehensive coverage of the major schools of thought on the challenging topic of explaining process and change.

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