



THE EVOLVING ECONOMY



Essays on the Evolutionary Approach to Economics

Ulrich Witt

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Research into Economic Systems, Jena, Germany*

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Preface

The papers collected in this volume reflect the gradual shaping of my understanding of evolution in the economy. The ubiquitous, multi-faceted economic transformations may tempt us to believe that there is nothing invariable in the economy except its constant change. Technological change and the corresponding restructuring of industry are obvious examples. But these are by no means the only ones. Consumption has been transformed just as dramatically, as has the entire institutional set-up of the economy. Is there anything in, or behind, these transformations that is common to all of them? If there are common characteristics they would provide a clue which may enable us to identify the more general principles governing evolution in the economic domain. Searching for such general principles is indeed necessary if we are not willing to regard all the tremendous changes we observe simply as an entirely erratic product of history. As a first step, proper concepts and tools for describing and analyzing economic change – economic evolution – need to be developed, and a great number of possible causal and functional conjectures need to be considered. This is a cumbersome, and sometimes delicate, heuristic task. The present volume documents my grappling with both the multitude of conceptual questions which arise in attempting to make sense of evolution in the economy, and the answers that have been suggested.

Thinking about evolution in general and the driving forces in, and the regularities of, economic evolution in particular is not possible without a good deal of interdisciplinary openness. Indeed, as this book shows, over the years I have borrowed heavily from biology, psychology, physics and philosophy in establishing the core premise – what is called in the introductory chapter ‘the hypothesis of the continuity of evolution’. However, the intention behind this borrowing always was to profit in terms of improved understanding at the disciplinary level. How can economic theory be given more substance? What empirical hypotheses can be formulated concerning the driving forces and the regularities of economic change, be it at the level of individual adaptation or that of collective outcomes? At a time when exactly the opposite trend is popular, namely emphasizing formalism in economic theorizing, insisting on material conjectures is not always appreciated – not even in the evolutionary camp.

The problems with the interdisciplinary dialogue and its disciplinary acceptance are well known, and they were known to me, too. What I discovered only later was an unexpected problem with the disciplinary ‘marketing’ of the results in a research niche like that of evolutionary economics. The complexity of the evolutionary process of change, and its resurfacing in many different domains of economics, induced me to go into quite diverse sub-disciplines of economics. The intention was to find commonalities in the way in which change materializes in these different domains. Given the rather strong specialization of sub-communities and publication outlets in economics, this strategy meant writing for rather unconnected groups of

scholars within economics and the social sciences. As a consequence, I found that hardly any of the sub-communities took notice of my parallel work in other fields. Moreover, as I was eager not to confine the conception of evolution to the kind of change in one particular context, I found myself in a somewhat peripheral position in each of the various fields.

It is therefore a great satisfaction to be able to unite in this volume a selection of the different strands of sub-disciplinary ideas on the theme of evolution on which I have worked in the past years, and I am grateful to Edward Elgar for giving me this opportunity. There is no scientific author who is not indebted in some way to inputs from others; this is very much true also for the papers in this volume. Over the years, when they emerged, there have been many people, friends and colleagues, to whom I am indebted for their scholarly help, their encouragement, and their criticism – so many, indeed, that it would not be possible to mention them all, and mentioning only a few would not be fair. I should therefore like to confine myself to expressing my gratitude to those two who were directly involved in producing this volume, namely Inken Poszner for her superb management of copyright permission and the final compilation process, and Dr Juli Irving-Lessmann for her profound help over all the years in putting my ideas straight in plain English.

Jena, Autumn 2002

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PART I

INTRODUCTION

Evolutionary economics and the extension of evolution to the economy

If we have difficulties in economics with making sense of the evolutionary character of our economy, the reason is not the historical record. The statistics and even our own casual experience do not fail to show us that economic life is changing tremendously. What hampers the understanding is the lack in economic theory of proper heuristic frames, of concepts and material conjectures by which the hundreds and thousands of years of incessant economic transformations can be put in perspective. The work in this book is therefore not empirical and descriptive. Rather it is concerned with conceptual and methodological problems that need to be solved on the way to a theory of evolution in the economy. In the form of a general orientation, this introductory chapter tries to tie together the broad range of issues that are dealt with in detail in the chapters to come.

The discussion about the role of evolution in economics is not new. Where it took place – usually only at the margins of economic theorizing – it was often inspired by Darwinian notions of evolution and the enormous success these have had in the sciences. However, such a source of motivation and inspiration is not without problems. It is not clear in what sense Darwinian theory can be relevant for economics. As I will argue, this question requires a fairly complex answer. There is no doubt that the human species is a result of evolution. Yet, the human economy is, at least in its modern forms, hardly explicable in terms of the theory of natural selection. Somewhere in the history of the humankind there is, thus, a point where the power of Darwinian evolutionary theory for explaining (economic) behavior ends. But evolutionary change continues beyond that point – only with different means and in other forms. I call this the assumption of an ‘ontological continuity of evolution’ which sets the frame for the approach to evolutionary economics in this book. Why and how evolution continues can only be assessed, I claim, on the basis of a general, domain-unspecific conception of evolution. What the conception means more precisely, how it differs from other views, and what follows from it, is the topic of the remainder of both this introductory chapter and, of course, the other chapters of this book.

Different paradigms – diverging concerns

Historically, change is what has governed the human economy in historical perspective – and it continues to do so. Just read the business section of the newspaper. At least some traces of the sweeping economic changes taking place can easily be found in the daily reports. True, the financial columns show many repetitive patterns. But these do not have the stationary repetitiveness of the weather

report. The weather forecast in a newspaper in June 1882, say, may have by and large been the same as in June 1942 or June 2002. A comparison of the commercial sections of the newspapers in June 1882, 1942, and 2002, in contrast, is witness to the striking transformations in the economy. Firms and industries, their commerce and technologies, institutions and, in fact, the whole way of living differ significantly at the different dates. Over a time span of roughly four human generations, working and producing has changed to such an extent that it is difficult for us to imagine what the past conditions were like (Goldin 1986, Mokyr 1990, 2000, Maddison 2001). A whole universe of new products and services have become available, and rising real income has made them affordable for mass consumption (Lebergott 1993). Institutions have changed dramatically, allowing people to interact on an increasingly reliable basis. Inter alia, this has resulted in ever-larger stocks of capital, both private and public, being accumulated (North 1990). This, in turn, has altered dramatically the role of the non-market transactions and the state. The structure of employment mutated as never seen before (cf. Kuznets 1966). The number of humans able to live on this globe has been growing exponentially and an increasing share of them enjoy at least part of the amenities of modern life (Simon 1977). Concomitantly, of course, ever fewer domains of nature remain untouched by man, and nature has been degraded or irreversibly been changed by much of human usage (World Bank 1992).

Have we become so much used to these historically unprecedented changes that we barely notice them anymore? Has the impressive performance of the modern humankind in solving problems that have afflicted our ancestors from time immemorial become merely a matter of course? Looking at what economic theorizing is engaged with can well give such an impression. There is a vast empirical, descriptive literature on technological, institutional, and commercial change. But the hard core of economic theory is deeply committed to the equilibrium-cum-optimality paradigm created by the neoclassical writers over the past 120 years. As a consequence, economic theorizing is mostly concerned with equilibrating forces in, and (sub-) optimal states of, the economy. The omnipresent process of change is basically ignored – a true puzzle of modern scientific practice.

It cannot be denied that for certain purposes such a reduced perspective may have its merits, for example, in assessing some (hypothetical) states in the market(s) or in the economy as a whole. Concerned with an allocative (in-) efficiency, economists may then want to logically analyze such a situation more closely, usually under idealized conditions. However, to limit economic theorizing paradigmatically to such a perspective would be disastrous for economics. The interest in coming to terms with the massive economic changes not accessible on the basis of an equilibrium-cum-optimization heuristic is therefore the major motive for the reflections in this book. The process of transforming the economy is not generically driven by exogenous shocks (although such shocks do occur). Nor is it pushed forward by peoples' optimal adjustments to exogenous shocks as the equilibrium-cum-optimization heuristic suggests. Rather this process is induced by causes internal to the economy, internal to at least some of its agents. Should optimal arrangements and market equilibria indeed be reached, they can be, and regularly are, destroyed again by these causes. Therefore other ways of conceptualizing

economic change are required, conceptions which are more than just better ways of doing the comparative statics of the equilibrium-cum-optimization approach and the corresponding allocation assessments.

The alternative conception on which this volume focuses is that of 'evolution'. This will be explained in more detail in a moment. First, however, it is worth mentioning that this conception is not unknown in economics. Even though it has not been rigorously developed in the past, it is clearly present in the history of economic thought. Consider, for instance, the economists of the classical period, Adam Smith (1776) and other writers related to Scottish moral philosophy among them. They were enthralled by their discovery of the self-regulating nature of the spontaneous market exchanges and growth processes which they witnessed in the awakening capitalist development. The discovery is powerfully conveyed in Smith's metaphor of the 'invisible hand'.¹ However, as will be explained in detail in Chapters 4 and 10 of this volume, self-regulation is but one mode of what are, in more modern terms, self-organizing processes taking place over time in living systems. The other mode is a (temporary) self-augmentation. In the economic context, self-augmenting developments are triggered by the innovative activities within the economy. This means that, in free markets, there can be simultaneously two diverging tendencies (cf. Loasby 1991, Chap. 1, Lesourne 1993): a coordinating one which is driven by competition and arbitrage towards equilibria and a de-coordinating one which is propelled by innovativeness to diverge from equilibria. While the former can be represented within an equilibrium-cum-optimization heuristic, the latter cannot. As shown in Chapter 2 below, innovative activity is neither a matter of market equilibria nor of optimizing behavior.

The classical writers deviating from the views of the Scottish moral philosophy, most prominently David Ricardo (1817) and Karl Marx (1867), obviously accepted self-regulating market forces for the short run in the form of market clearing. Yet, the thrust of their own theorizing was on the long-run development, the fate of capitalist accumulation, for which they rejected the idea of self-regulation. Marx saw the economy evolving through several societal revolutions, a development which he believed would come to an end after the stage of communism had been reached. From the point of view of a modern evolutionary epistemology as discussed in Chapter 3 in this volume, this is a misunderstanding of the nature of evolution.² As is well known, the impact of this school of thought on the intellectual debate in the times that followed was enormous. It was only in the academic economic circles that, with the marginalist (or subjectivist) revolution in the late nineteenth century, economic theorizing gradually turned to a discussion of the role of optimization and equilibria.

The shift in interest seems to have been inspired, at least as far as Stanley Jevons (1879) and Leon Walras (1874) are concerned, by the attempt to emulate the scientific ideal of Newtonian mechanics.³ The Newtonian world view was conceived for, and reasonably well adapted to, systems of gravitating bodies or particles. In retrospect, its enthusiastic extension by those writers to the economy, the sphere of actions and artefacts created by living, intentional beings, is therefore not easy to understand. As a consequence of the new – though already somewhat outdated⁴ – scientific ideal in economics, the theories of consumption, production, investment,

exchange were reshaped to formally meet the conditions of a system of gravitating bodies. The development eventually led to rigorous statements of what could be called a Newtonian economics by authors like Samuelson (1947) and Debreu (1959). But even before that the new theories' inability to come to grips with the evolutionary nature of the ongoing processes of economic change was already recognized. Two academic economists, in particular, launched a strong criticism, Thorstein Veblen and Joseph Schumpeter. Both articulated the need for a different research interest. Both pleaded for accounting for the observable change in the economy with a proper, 'evolutionary', theory. But they framed and outlined their research programs in quite different ways. The different visions they developed are related to different strands in the heterodox approach to evolutionary economics which can be traced to the present day.

Historical pathways to evolutionary economics

More than a century ago Thorstein Veblen published a programmatic article with the provocative title 'Why is Economics not an Evolutionary Science?' (Veblen 1898). The notion of an evolutionary science he had in mind clearly reflected the impact of contemporary Darwinian thought on the scientific ideals as opposed to Newtonian ones (cf. Hodgson 1998). The article is often considered a scientific manifesto of American Institutionalism. Notably enough, it introduced the term 'evolutionary economics' to the discipline. However, what Veblen actually did was more a critique of the economic theory of his time than a constructive outline of an evolutionary research program for economics. He castigated the economists' taxonomic habits of arguing about 'tendencies', controlling principles', 'disturbing factors', 'natural laws' etc. But what he failed to convey to the reader was a clear outline of the principles of his evolutionary economics. Veblen emphasized the role of habit, including habits of thought, and their adaptation as the following quote shows:

elements of the existing frame of mind of the agent ... are the outcome of his antecedents and his life up to the point at which he stands. They are the products of hereditary traits and his past experience, cumulatively wrought out under a given body of traditions, conventionalities, and material circumstances; and they afford the point of departure for the next step in the process. The economic life history of the individual is a cumulative process of adaptation of means to ends that cumulatively change as the process goes on.... All economic change is a change in the economic community – a change in the community's methods of turning material things to account. The change is always in the last resort a change in habits of thought. (Veblen 1898)

Veblen's creed raises several interesting questions. How precisely do hereditary traits affect the agents' responses to the institutional circumstances under which they try to adapt? How is past experience processed? How do habits of thought emerge and change with experience? What kind of learning takes place, and what kinds of regularities does it produce at the level of the individual and that of the community? How do these two influences feed back, in a collective outcome, to the transformation of traditions, material circumstances, and habits of thought? These are important questions in an evolutionary approach to economics. In my understanding, an attempt to answer them requires a thorough inquiry into the behavior of the individual who carries hereditary traits, who learns and gains experience, who forms

habits of thought, and who acts. For such an inquiry a theory of human behavior, of its inherited foundations, of cognitive and non-cognitive learning, and of the influences of social interactions on subjective perceptions and intentions is needed. Such a theory is suggested in the present book. Its implications figure prominently in many of the hypotheses on economic evolution suggested below. Yet such an individualistic perspective – backed with insights from sociobiology and psychology – does not seem to be what Veblen and the institutionalists embrace.⁵

In his later work, Veblen presented many observations and conjectures on particular attitudes and habits of thought which he considered significant for the ‘cumulative causation’ of the modern state of institutions.⁶ However, for reasons that are unclear (cf. Rutherford 1998, Peukert 2001), he nowhere systematically developed a theory. The theoretical deficit has never been compensated in American Institutionalism, a school that has continued to use the label ‘evolutionary economics’ to the present day. The lack of an explicit theoretical foundation may be a major reason for the school’s declining influence in the twentieth century (Hodgson 1999, Chap. 5).

The intellectual inspiration for Veblen’s approach to evolutionary economics came from contemporary Darwinism. In contrast, the other prominent author who made a seminal contribution, Joseph A. Schumpeter, explicitly denied Darwinism any relevance for understanding economic evolution. In fact, he rarely even used the term ‘evolution’. His programmatic position seems to have been stimulated more by another major intellectual controversy of the time, namely the debate on the Marxist teachings of a crisis-prone capitalist development of the economy. But the growth process in the period of ‘promoterism’ in Europe in the late nineteenth and early twentieth centuries had also created previously unknown forms of economic reality in production, consumption, exchange, and even in the institutional set up of the economy. An attempt to theorize about capitalist development could therefore hardly bypass the role of innovations and of entrepreneurship, in short, of sources of change emerging from within the economy. Schumpeter had to notice, of course, that this was not much of an issue among the leading economists of the time. He explicitly attributed the reason for this neglect to the heuristic analogy to gravitating systems underlying the ‘pure’ theory that was in vogue.⁷ He concluded that pure economic theory (which he equated with ‘static’ theory) cannot account for development from within and set out to provide a ‘developmental method’.

It is true that instances of evolution other than that in nature are little understood. Moreover, there is no well-established general notion of evolution other than that derived by abstraction from natural evolution. Therefore, most writers interested in economic evolution try to arrive at proper economic evolutionary theorizing by way of more or less abstract analogies to, or a metaphorical use of, Darwinian notions – not so Schumpeter (1934). If we leave the question of labels aside, he ingeniously identified a generic feature of evolutionary change without recourse to Darwinian thought, namely the crucial role of the endogenous generation and the dissemination of novelty. However, Schumpeter fell short of realizing the potential of this ingenious insight for an evolutionary economics because of some unfortunate, self-imposed constraints in elaborating his theory.

First, he stopped half way in his investigation of endogenously generated

economic change. With a somewhat artificial distinction between invention and innovation in mind, he submitted that it is not conceiving new ideas, but 'doing the thing', carrying out innovative ventures, that drives development. Accordingly he focused exclusively on innovations which, he argued, only entrepreneurs (in contrast to 'plain businessmen') are capable of carrying out.⁸ The prerequisite of entrepreneurial innovation – ideas about new possibilities or, more generally, novelty – are assumed to already exist. An explanation of how new knowledge is created, of what the feed-back between search, discovery, experimentation, and adoption of new possibilities is like (and the respective motivations) is thus avoided. Second, in discussing the implications of his approach, throughout his writings Schumpeter favored the jargon of pure theory and tried to somehow align his results with the conventional, static economic argumentation. Apparently, Schumpeter somehow considered his developmental method to be a supplement to contemporary pure theory (see Schumpeter 1912, Chap. 7). Third, Schumpeter chose to cast his developmental method in terms of a theory of unsteady capitalist development, that is of business cycle theory. When he discusses how entrepreneurs accomplish innovations and, by doing so, induce development 'from within the economy', the upshot of his discussion is that these innovative activities occur in a regular cyclical pattern. The latter, in turn, cause an unsteady economic growth process which passes through 'prosperity and depression'.

In view of these heuristic constraints it is perhaps not surprising that Schumpeter (1934) failed to set the stage for what could have been a Schumpeterian evolutionary school. In fact, Schumpeter himself modified his theory when he later turned from a business cycle perspective to a longer-run view of the transformation of modern capitalism (Schumpeter 1942 – references point to Marx's philosophy of history as a major source of inspiration for this turn). He asserted (*ibid.*, pp. 132–3) that the promoter-entrepreneur has become increasingly obsolete, and he abandoned the corresponding psychological underpinnings of his theory (which were irreconcilable with the plain equilibrium-cum-optimization paradigm). In the bureaucratic organization of the large corporations and trusts, he claimed, the carrying out of innovations had been taken over by teams of trained specialists. How these teams operate in their innovative activities, how the search for, and the pursuit of, novel strategies is achieved and affects performance, all this is left open. Schumpeter remained reluctant to address the problem of how novelty emerges in the economy. Instead, he focused on the alleged implications of an incessant, routine-like, industrial innovativeness.

These implications embrace monopolistic practices as a necessary concomitant of the innovative process of 'creative destruction' (*ibid.*, Chap. 8) and the process of economic growth which it brings about. Such an interpretation contradicts the static model of perfect competition and has therefore attracted a great deal of attention. As an isolated conjecture, the hypothesized relationship between market structure and innovativeness has been discussed under the label 'Schumpeterian competition' in innumerable empirical and theoretical investigations (*cf.*, e.g., Baldwin and Scott 1987 for a survey). However, from the point of view of evolutionary economics the debate on Schumpeterian competition went astray. It is dominated today by notions of optimal innovation race strategies and equilibrium investments into innovative