Introduction
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A NEW BRANCH: EVOLUTIONARY ECONOMIC GOVERNANCE

The last two decades have seen an explosion of research in evolutionary economics and related fields. There has been an upsurge in the publications addressing evolutionary themes in economics, paralleled by the foundation of new journals, new academic societies and, last but not least, a reorientation of the publication programmes of major publishing houses.

The potential of this knowledge stock with respect to its application to issues of economic governance – in the line of an evolutionary economic governance – has as yet received little attention in the literature. Evolutionary economic governance can be defined as the study of the possibilities and consequences of any external intervention into structure and processes of an evolving economic system. Specifically, evolutionary economic policy is the application of evolutionary governance to the economy as a whole.

The notion of ‘evolutionary’ acknowledges, on the one hand, that continual change in economic systems is an empirical fact, and it calls, on the other hand, for a theoretical account of this dynamic on the basis of an evolutionary rather than mechanistic explanatory schema. Thus, both explanandum and explanans are evolutionary.

The notion of ‘governance’, in turn, means that the analysis is not confined to an economic system in isolation from external instances of mutual or unidirectional influences. Evolving systems can be, and often are, embedded in a hierarchy of decision-making strata. Evolutionary economic policy is a special case of governance that applies to the highest level of aggregation and decision-making authority in an economic system. In its interdisciplinary and long-run perspective evolutionary policy governance resembles much classical political economy.

The 14 contributions to this volume address the issue of evolutionary economic governance at various levels of aggregation and of decision making. Inspired by evolutionary thinking a range of models emerges that highlight the variety and the complexity of evolutionary governance of economic systems.
The contributions were selected from a set of papers presented at two annual conferences of the ‘Expert Group for the Study of Evolutionary Economics’ (Ausschuss für Evolutorisiche Ökonomik) devoted to the topics ‘Evolutionary Economics: Methodological, Econometric and Mathematical Foundations’ and ‘Evolutionary Economic Policy’. The complete set of papers of the two conferences was published in the German language as volumes VII and VIII of the series ‘Studien zur Evolutonischen Ökonomik’ (Dopfer, K.(ed.) (2003, 2004), Berlin: Duncker and Humblot).

INSTITUTIONAL SETTING

Before giving a summary introduction of the various contributions to the volume, a few remarks on the institutional setting in which they came about will be made. The research group mentioned is an institution within the so-called Verein für Socialpolitik which is the professional association of German-speaking economists – the German Economic Association – with members coming from all over the world, but mostly from Germany, Austria and Switzerland.

The Verein was founded in the year 1873. The activities of the new association focused on opposing laissez-faire in social policy and the revolutionary social ideas of emerging socialism. The founders of the association wanted ‘to raise, educate and reconcile the lower classes on the basis of the existing order’ as Gustav Schmoller, the chairman of the Verein for many years (1890–1917), put it. In Schmoller’s time, the Verein für Socialpolitik started to develop into a politically neutral, interdisciplinary society. (www.socialpolitik.org)

The Verein voluntarily disbanded in 1936 to avoid having to bow to the ruling political party. It was refounded in 1948.

While its over 3000 members discuss their scientific findings at the society’s meeting annually (with 700 papers at the 2004 meeting in Dresden), the most concentrated research efforts are probably made in the regular meetings of the expert groups. The Expert Group for the Study of Evolutionary Economics has emerged from an unofficial working group organised by Ulrich Witt in 1989 and became an official Ausschuss of the Verein in 1991. It is the youngest and presently largest and fastest developing of the 23 expert groups of the Verein.

The various expert groups reflect the variety of the scientific activities of its members and mirror its history, but the dominant doctrine of the Verein (if there is any) revolves around neoclassical economics. The likelihood that a majority of its members may contradict such a statement may signify the particular kind of neoclassical economics that is being followed.
The contributions to this volume are grouped around three major topics:

- Economic evolution as open process
- Self-organisation and networks
- The political economy of complexity

**ECONOMIC EVOLUTION AS OPEN PROCESS**

**Directedness in Economic Evolution**

In their chapter on ‘Heterogeneity and evolutionary change – concepts and measurement’, Uwe Cantner and Horst Hanusch deal with an empirical approach to heterogeneity as both the force and the result of evolutionary change, that is the result of as well as the source for local technological change. Heterogeneity here is understood as differences in the technological performance of productive units. Those differences are due to the local application and local innovation of specific production techniques resulting in structures of asymmetric productive efficiency and/or in structures of variety in the production technologies in use. Investigating those structures and their development empirically requires a specific measure for technologically heterogeneous performances and a specific methodology which allows the detection of this heterogeneity. With respect to the former the authors propose total factor productivity (TFP) and changes of TFP as measures for technological heterogeneity and its dynamics. From a methodological point of view a non-parametric empirical approach appears appropriate to identify heterogeneous structures and to track them over time. Structures of asymmetric performances as well as of variety can be identified by non-parametric best-practice production or efficiency frontiers. Computing the Malmquist-productivity index allows one to track those structures over time and to identify local changes. Discussing these concepts and procedures the chapter concludes by raising a number of unresolved issues.

C. Christian von Weizsäcker in his chapter is concerned with the question: Is the notion of progress compatible with an evolutionary *view of the economy*? The measuring rod for the performance of an economy is the fulfilment of the needs of its members as evaluated by themselves according to their preferences. Neoclassical economics has developed policy advice making the assumption of exogenously given preferences. This assumption is incompatible with an evolutionary approach to economics. In evolutionary economics it is assumed that preferences ‘evolve’, hence are endogenously determined. Is then policy advice still possible, if the measuring rod changes with the object to be measured? Von Weizsäcker
develops a theory of adaptive preferences which fulfils two requirements at the same time: (1) adaptive preferences can be seen as the ‘laws of evolution’ of preferences, thereby being compatible with an evolutionary approach in economics; (2) a theorem can be derived which ensures that welfare economics is possible with adaptive preferences, hence endogenously determined preferences. The central idea is to show that normative comparability of different allocations A and B can be obtained consistently by means of ‘improvement paths’ going from A to B (or vice versa, but not both) even if preferences induced by A would make A preferred to B and preferences induced by B would make B preferred to A, hence would make A and B normatively incomparable.

Gerhard Wegner’s contribution to this volume aims at reconciling evolutionary economics with liberalism. Although evolutionary economics highlights the innovation process as the driving force of economic welfare, its political implications are far from being unambiguous and have not resulted in a new conceptualisation of economic policy. It is an open question whether evolutionary economics should stick to the logical structure of deductive normative economics, that is to deduce welfare-promoting policies from a revised ‘non-stationary’ welfare concept. This chapter casts doubts on such deductivism and advocates a liberal interpretation of evolutionary economics. Namely, economic policy should not be conceptualised to promote welfare directly but to ensure the institutional preconditions for a rise in welfare. It is argued that evolutionary economics supports the view that economic welfare results from experiments which are ultimately based on economic ‘world views’ or beliefs and lack objectivity; for that reason, their ongoing assessment by a competitive environment is required. Generally, economic policy is well advised to foster economic freedom as well as competition in order to make sure that rival economic ideas cannot outperform each other except through competition. From an epistemological point of view, evolutionary economics denies that a comprehensive description of economic opportunities can be made from the perspective of a theoretical observer. For that reason alone economic policy should desist from ‘constructing’ superior allocative states in concrete terms.

In ‘Historical economics and evolutionary economic policy – Coasean perspectives’, Matthias Klaes focuses on evolutionary aspects in Coase’s thinking. The recent literature evaluating Coase’s work in the light of evolutionary economics has come to distinguish between two Coasean traditions, one appropriated by the economic mainstream, the other identifying a significant heterodox potential. It is the aim of Klaes’ paper to take the latter reception of Coase’s legacy as the starting point for exploring his contribution in the light of recent debates on an evolutionary approach to
economic policy. The author defends the view that contrary to attempts to label Coase as an arch neoliberal, one can identify a commitment to the primacy of institutional direction rather than decentralised allocation of resources across markets as the core building block of his outlook on economic policy. This leads to an interpretation of Coase’s approach in terms of a historico-empirical method of comparative institutional analysis, which calls both for a hermeneutical approach to economic policy evaluation, and constitutes a form of historical economics that offers an ambitious research agenda for attempts to move the conceptualisation of history in evolutionary economics beyond affirmations of the relevance of path-dependent processes. What Coase ultimately offers to evolutionary economics is the prospect of a morphological analysis that exhibits interesting parallels to recent developments in evolutionary ‘Evo-Devo’ biology that have re-established the relevance of ontogenetic approaches to developmental processes.

Self-organisation and Networks

Andreas Pyka and P. Paolo Saviotti in their chapter examine ‘The concept of network organisation – biotechnology-based industries as exemplar’. Technological progress in the biological sciences is now advancing across such a wide range and at such a pace that no firm can hope to keep up in all the different areas. Participating in innovation networks offers an alternative to extremely expensive go-it-alone strategies. This imbalance between the rate of growth of the biotechnology knowledge base and the capability of individual firms to access it can explain the persistence of cooperative R&D in the biotechnology-based sectors at the end of the 1990s. Such imbalance is not due any more only to the lack of absorptive capacity of large pharmaceutical firms, because they have meanwhile developed considerable competencies in that field. The authors are proposing that a new role, that of explorers scanning parts of the knowledge space that LDFs (large diversified firms) are capable of exploring but unwilling to commit themselves to in an irreversible way, can be played by DBFs (dedicated biotechnology firms) in innovation networks. The authors’ simulation approach attempts to represent the emergence of these two roles as endogenous changes in the motivation for participating in innovation networks, allowing them to become an important and long-lasting organisational device for industrial R&D.

The contribution by Wolfgang Weidlich deals with ‘Sociodynamics – an integrated approach to modelling in the social sciences’. Sociodynamics – an important branch of the emergent field of econophysics – aims at providing a general strategy for designing mathematical models for the quantitative
description of a broad class of dynamic collective phenomena within human society. These design principles have been applied in the past to models of non-equilibrium economics as well as to those of group dynamics, political opinion formation, migration and urban evolution. Weidlich’s contribution highlights the essential formalism of the so-called master-equation, and discusses specifically aspects of the choice of variables, transition rates and the evolution of socioconfigurations. The socioeconomic method is applied to the case of interregional migration of socioculturally different populations and to that of the evolution of a city with hinterland connections. Solutions of the model equations for a range of meaningful trend parameters are offered for both applied models.

Carsten Herrmann-Pillath discusses in his paper ‘The concept of space in trade – some evolutionary basics’. Recent research in the theory of international trade shows the serious limitations of its theoretical foundations. The chapter proposes alternative foundations based on the concept of transaction and the proposition that the capabilities of economic agents to realise transactions cannot be priced within a market system. It is thus impossible to include the trading competences of international traders in the general concept of factor, and to apply neoclassical approaches, such as the factor-proportions theory, on the basic endowments of countries and of agents that would enable them to transact successfully across the border. The chapter proposes a totally new concept of factor, based on the properties of storability, non-rivalness of use in time, non-producibility and non-tradability. These factors determine country-specific competences to trade, which are classified in a threefold way as organisational capital, collective human capital, and social capital.

The aim of Lambert T. Koch’s ‘Economic Policy – A Process of Communication’ is to understand and analyse policy and economic policy in particular as an evolutionary process. Agents in this process are by no means only those who are in the public eye as responsible parties for policy and decision making. Every policy has its roots beyond the official political structures, in areas where there is ‘private’ dissatisfaction, where there is a need seen for action, where this kind of perception is shared with others, where potential policy content is defined and, finally, where critical masses are created which can generate pressure for policy action. The view of the policy-making process to be taken in this chapter goes beyond traditional approaches by emphasising the relevance of cognition and communication. It moves away from the implicit idea currently prevailing, even in well-informed circles, that there are ‘born’ state tasks, ‘right’ packages of measures to implement ‘objective’ aims and scientific methods to find out what ‘good’ policies are. The basic credo of an evolutionary theory of economic policy according to the author is to see policy as being the product of
communicated, related perceptions. These perceptions — which influence evaluations of policy conditions, formulation of objectives and packages of measures — are themselves transformed by the results of running political processes. This doubly recursive structure in itself leads to innovations, giving the phenomenon its evolutionary character.

The chapter by Malcolm H. Dunn, ‘Why endogeneity is not enough to explain technological change — a critique of Paul Romer’, analyses the inner logic of one of the most prominent models of endogenous growth: Paul Romer’s contribution ‘Endogenous Technological Change’. Although Romer’s model captures important features of technological advance, such as the relevance of externalities and imperfect competition, it also neglects many aspects that are equally important. The paper argues that Romer’s growth theory is based on a production function which gives an inadequate account of the dynamics between the existing stock of capital and knowledge on the one hand and the factors leading to the emergence of new products on the other hand. The chapter then attempts to show that technological change can be better interpreted as an open process which is driven by entrepreneurs acting under true uncertainty. Drawing on the rich pool of insights provided by the tradition of evolutionary economics a more complex story behind the emergence of innovation behaviour is suggested. As for the methodology the chapter suggests that more emphasis should be placed on forces which escape an easy formalisation, for instance the achievement motivation and competence of market participants and the system of property rights.

**Political Economy of Complexity**

In their contribution on ‘Innovation and the learning policy maker – an evolutionary approach based on historical experience’, Joachim Schwerin and Claudia Werker discuss how to design, implement and perform a learning economic policy approach in line with the principles of evolutionary theory. Socio-economic systems evolve in ways that cannot be fully anticipated. These dynamics pose a challenge to policy makers, who have to devise a framework that needs to co-evolve with the socio-economic system. The knowledge stock on which politicians base their decisions to modify the set of policy rules plays a pivotal role in this process. Here, learning is key to success: Based on past experience, politicians need to constantly improve their knowledge by turning learning into a routine systematically linked with modifications of policy rules. The chapter starts with a methodological analysis that identifies types of rules on which policy should be based to institutionalise learning. On this basis the authors present a practically feasible concept of learning policy built upon the identification of historical
invariant patterns. They apply this concept to the analysis of innovation and growth, where they demonstrate that the openness of the set of identified patterns towards a changing environment is a prerequisite for learning. Their results, which lead to some policy guidelines, serve as a reference system for innovation policy that meets evolutionary standards.

‘The national German innovation system – its development in different governmental and territorial structures’ by Harolf Grupp, Icíar Domínguez Lacasa and Monika Friedrich-Nishio provides several long time series of R&D indicators bridging more than 100 years of German economic history. The ups and downs are put into perspective and compared to important events in the global innovation system. The pertinence found for the national German innovation system seems to rest in educational, cultural and language traditions rather than in governance and territorial coverage, which changed many times. This is possibly due to path dependence of technological paradigms. The suggested range of indicators on a national or sectorial level gives a detailed impression of both the extent and the contents of innovation activities. The empirical base which evolutionary researchers, interested in innovation and economic history-related questions, can rely on, has been broadened to a large extent, so that there is no longer a serious empirical gap.

Reiner Peter Hellbrück’s ‘Emergence and diffusion of disastrous innovations – a case study’ examines diabetes care in Germany. There is a consensus among all specialists that diabetes care needs to be improved. Hence, there has been steady development, improvement, and implementation of programmes for diabetes care in Germany. In virtually all German lands there is at least one (legal) health insurance fund which is offering a diabetes programme. For this purpose special contracts between at least one health insurance fund and some health care providers have to be signed. These contracts contain an extra budgeting payment to the health care providers. Those contracts have the charm for the health care providers of earning, supplementary to their regular budgets, extra money. Health insurance funds have in turn been hurt by concluding such contracts when evaluated on a regulation ruling from 1993 up to 2000. The chapter tries to answer the following questions: What reasons led to the conclusion of such contracts? Why are these contracts under today’s laws, rules, and regulations a hazard to health insurance funds and their business? Why did those disastrous contracts diffuse at all? Which strategies are chosen to reduce the hazard to insurance business? Why are these business-harming innovations not simply stopped?

In his chapter ‘Applying evolutionary economics to public policy – the example of competitive federalism in the EU,’ Wolfgang Kerber states that due to the Hayekian knowledge problem it seems often to be very difficult
to derive positive policy proposals from evolutionary reasoning; he argues in favour of a pragmatic approach, as to how evolutionary argumentation should be used in policy discussions as important complements to other (mainly neoclassical) arguments. Starting with the hotly discussed policy question of centralisation vs decentralisation of public policies in the EU, it is shown that the traditional economic theory of federalism is mainly based upon neoclassical theories, which do not take into account the creation and diffusion of new policies in a satisfactory way. Therefore the theory of federalism should be supplemented by important evolutionary reasoning about the innovation and imitation of public policies. The main evolutionary argument is that decentralised experimentation can lead to more policy innovations and a greater degree of mutual learning from the experiences with public policies (laboratory federalism). Therefore the application of evolutionary (and innovation) economics leads to the conclusion that a more decentralised EU (with a system of competitive federalism) can be expected to lead to more innovation in regard to public goods, legal rules and regulation.

‘Can evolutionary economics make a billion $ difference for 60 per cent of the world’s poor in Asia?’, Hans-Peter Brunner asks in his contribution to this volume. The use of evolutionary and institutional economics in the analysis of increasing returns, transaction costs, and agglomeration and network effects is important because of their determining impacts on the processes of trade, growth and development. Institutional analysis facilitates definition of the role of governments, and of international agencies, in the design of projects and provision of services in sectors such as transport, communications, and financial services. The application of institutional methods and evolutionary models that relate positive externality and linkage effects to actual representations of institutional and physical infrastructures results in a powerful tool for the economic development of financial sectors and trade corridors. The question posed is whether wide application of institutional and evolutionary methods would yield higher payoffs for growth, equity, and poverty reduction. The cases of Nepal's financial sector reform, and of the design of West Bengal’s trade and transport corridor, show the huge difference evolutionary economics can make. It is worth the effort. Why then is evolutionary analysis not employed more often? The answer appears to lie in unfamiliarity with the methods and results. The chapter ends with practical suggestions as to how evolutionary and institutional economics could become a household tool for multilateral development institutions.