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# An Evolutionary Theory Of Economic Change

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*An Evolutionary Theory  
Of Economic Change*

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## JOHNSON MADDEN

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### Foundations of Economic Evolution

Edward Elgar Publishing

This outstanding collection of essays by leading scholars helps explain how evolutionary economics has come of age. They show how evolutionary economics offers a progressive and diverse research agenda built on strong foundations. These are essays of lasting value. J. Stanley Metcalfe, University of Manchester, UK Darwinism is fast becoming an orthodoxy of modern thought, a framework within which a wide range of knowledge communities conduct their discourse. Ever since its formation, Darwinian theory has experienced a close, though not always comfortable, association with economics.

Evolutionary economists now appear to show little concern for the consistency of knowledge in their embrace of Darwinism. Darwinism and Evolutionary Economics brings together contributions from eminent authors who, building on Darwin's own insights and on developments in evolutionary theory, offer challenging views on how economics can use evolutionary ideas effectively. This collection of critical essays provides a thorough examination of the application of Darwinian theory to economic thought, and will appeal to evolutionary economists and all those with an interest in Darwin, innovation and evolutionary science. *Economics as an Evolutionary Science* Edward Elgar Publishing Shows how thinking in evolutionary terms enhances our understanding of the economic and social change taking place

at all levels.

*Applied Evolutionary Economics and the Knowledge-based Economy* Psychology Press

The purpose of this book is to provide a guided tour through the theoretical foundations of spatial locations of firms and industries in an evolutionary economic framework. It addresses the issues of how a location of business in geographical space is selected and where economic activity may (re)locate in the future. The analysis is in the context *The Origin of Wealth* MIT Press A theoretical study dealing chiefly with matters of definition and clarification of terms and concepts involved in using Darwinian notions to model social phenomena. *Darwin's Conjecture* Springer The author examines the interplay

between evolutionary game theory and the equilibrium selection problem in noncooperative games. Evolutionary game theory is one of the most active and rapidly growing areas of research in economics. Unlike traditional game theory models, which assume that all players are fully rational and have complete knowledge of details of the game, evolutionary models assume that people choose their strategies through a trial-and-error learning process in which they gradually discover that some strategies work better than others. In games that are repeated many times, low-payoff strategies tend to be weeded out, and an equilibrium may emerge. Larry Samuelson has been one of the main contributors to the evolutionary game theory literature. In *Evolutionary Games and Equilibrium Selection*, he examines the interplay between evolutionary game theory and the equilibrium selection problem in noncooperative games. After providing an overview of the basic issues of game theory and a presentation of the basic models, the book addresses evolutionary stability, the dynamics of sample paths, the ultimatum game, drift, noise, backward and forward induction, and strict Nash equilibria.

**Nonlinear Dynamics and Evolutionary Economics** Springer Nature

Advances in physics, computers, and mathematics have made it possible to illustrate an astonishing array of potential behavior that can occur when nonlinear interactions are present. As Prigogine explains from a physicist's perspective, the fundamental role of instability and bounded rationality provide more precise understanding for evolution and changes. This volume considers these developments from various fields in the context of economic science. The work starts with a general non-mathematical discussion, introducing the major themes--nonlinearity, dynamical systems, and evolution in economic processes. The work continues with nonlinear analysis of macroeconomic growth and fluctuations. It describes analyses of economic adaptation, learning, and self-organization. The volume also scrutinizes a specific market--equities using nonlinear analysis, controlled experiments, and statistical inference when nonlinearity plays an essential role in data generation. The volume closes with an historical reflection by Richard Goodwin and a roundtable discussion on basic issues and new challenges in nonlinear economic dynamics.

*The Evolutionary Foundations of Economics* Cambridge University Press

Overview and motivation; Organization-theoretic foundations of economic evolutionary theory; Textbook economics revisited; Growth theory; Schumpeterian competition; Economic welfare and policy; Conclusion.

*Darwinism and Evolutionary Economics* Princeton University Press

Evolutionary theory belongs to the rare species of theories that are simultaneously fundamental and over-arching, implicating as it does numerous life contexts as well as an array of scholarly disciplines. Armed with a profound grasp of evolutionary theory and its implications to social research, Professors Zumbansen and Calliess have mobilized an appropriately diverse and truly stellar group of academics to investigate how this theory may provide new insights about law, economics, and their inter-relations. Cast against an especially broad intellectual backdrop set by the editors, this volume is sure to become a standard reference in literature. Amir N. Licht, Radzyner School of Law, Israel Zumbansen and Calliess have done a wonderful job in assembling papers from the leading scholars in the field, who draw on evolutionary approaches for explaining developments in both economics and the law. Anybody interested in issues of institutional change will be inspired by the wealth of ideas and the diversity of perspectives. Stefan Voigt, University of Hamburg, Germany Law and economics has arguably become one of the most influential theories in contemporary legal theory and adjudication. The essays in this volume, authored by both legal scholars and economists, constitute lively and critical engagements between law and economics and new institutional economics from the perspectives of legal and evolutionary theory. The result is a fresh look at core concepts in law and economics such as institutions, institutional change and market failure that offer new perspectives on the relationship between economic and legal governance. The increasingly transnational dimension of regulatory governance presents lawyers, economists and social scientists with an unprecedented number of complex analytical and conceptual questions. The contributions to this volume engage with legal theory, new institutional economics, economic sociology and evolutionary economics in an interdisciplinary assessment of the capacities and limits of the state, markets and institutions. Drawing as well upon legal sociology and the philosophy of law, the authors expand and transform the known terrain of law and economics by applying evolutionary

theory to both law and economics from a domestic and transnational perspective. Legal scholars, evolutionary and regulatory theorists, economists, economic sociologists, economic historians and political scientists will find this cutting-edge volume both challenging and engaging.

*Evolutionary Games and Equilibrium Selection* MIT Press

Are humans at their core seekers of their own pleasure or cooperative members of society? Paradoxically, they are both. Pleasure-seeking can take place only within the context of what works within a defined community, and central to any community are the evolved codes and principles guiding appropriate behavior, or morality. The complex interaction of morality and self-interest is at the heart of Geoffrey M. Hodgson's approach to evolutionary economics, which is designed to bring about a better understanding of human behavior. In *From Pleasure Machines to Moral Communities*, Hodgson casts a critical eye on neoclassical individualism, its foundations and flaws, and turns to recent insights from research on the evolutionary bases of human behavior. He focuses his attention on the evolution of morality, its meaning, why it came about, and how it influences human attitudes and behavior. This more nuanced understanding sets the stage for a fascinating investigation of its implications on a range of pressing issues drawn from diverse environments, including the business world and crucial policy realms like health care and ecology. This book provides a valuable complement to Hodgson's earlier work with Thorbjørn Knudsen on evolutionary economics in *Darwin's Conjecture*, extending the evolutionary outlook to include moral and policy-related issues.

*Population Games and Evolutionary Dynamics* University of Chicago Press

Introduces current evolutionary game theory--where ideas from evolutionary biology and rationalistic economics meet--emphasizing the links between static and dynamic approaches and noncooperative game theory. This text introduces current evolutionary game theory--where ideas from evolutionary biology and rationalistic economics meet--emphasizing the links between static and dynamic approaches and noncooperative game theory. Much of the text is devoted to the key concepts of evolutionary stability and replicator dynamics. The former highlights the role of mutations and the latter the mechanisms of selection. Moreover, set-valued static and dynamic stability concepts, as well as processes of social

evolution, are discussed. Separate background chapters are devoted to noncooperative game theory and the theory of ordinary differential equations. There are examples throughout as well as individual chapter summaries. Because evolutionary game theory is a fast-moving field that is itself branching out and rapidly evolving, Jörgen Weibull has judiciously focused on clarifying and explaining core elements of the theory in an up-to-date, comprehensive, and self-contained treatment. The result is a text for second-year graduate students in economic theory, other social sciences, and evolutionary biology. The book goes beyond filling the gap between texts by Maynard-Smith and Hofbauer and Sigmund that are currently being used in the field. Evolutionary Game Theory will also serve as an introduction for those embarking on research in this area as well as a reference for those already familiar with the field. Weibull provides an overview of the developments that have taken place in this branch of game theory, discusses the mathematical tools needed to understand the area, describes both the motivation and intuition for the concepts involved, and explains why and how it is relevant to economics.

**Human Evolution, Economic Progress and Evolutionary Failure** Taylor & Francis

This book contains the most sustained and serious attack on mainstream, neoclassical economics in more than forty years. Richard R. Nelson and Sidney G. Winter focus their critique on the basic question of how firms and industries change overtime. They marshal significant objections to the fundamental neoclassical assumptions of profit maximization and market equilibrium, which they find ineffective in the analysis of technological innovation and the dynamics of competition among firms. To replace these assumptions, they borrow from biology the concept of natural selection to construct a precise and detailed evolutionary theory of business behavior. They grant that firms are motivated by profit and engage in search for ways of improving profits, but they do not consider them to be profit maximizing. Likewise, they emphasize the tendency for the more profitable firms to drive the less profitable ones out of business, but they do not focus their analysis on hypothetical states of industry equilibrium. The results of their new paradigm and analytical framework are impressive. Not only have they been able to develop more coherent and powerful models of competitive firm dynamics under conditions of growth and technological change, but their approach

is compatible with findings in psychology and other social sciences. Finally, their work has important implications for welfare economics and for government policy toward industry.

**Microfoundations of Evolutionary Economics** Routledge

Generic institutionalism offers a new perspective on institutional economic change within an evolutionary framework. The institutional landscape shapes the social fabric and economic organization in manifold ways. The book elaborates on the ubiquity of such institutional forms with regards to their emergence, durability and exit in social agency-structure relations. Thereby institutions are considered as social learning environments changing the knowledge base of the economy along generic rule-sets in non-nomological ways from within. Specific attention is given to a theoretical structuring of the topic in ontology, heuristics and methodology. Part I introduces a generic naturalistic ontology by comparing prevalent ontological claims in evolutionary economics and preparing them for a broader pluralist and interdisciplinary discourse. Part II reconsiders these ontological claims and confronts it with prevalent heuristics, conceptualizations and projections of institutional change. In this respect the book revisits the institutional economic thought of Thorstein Veblen, Friedrich August von Hayek, Joseph Alois Schumpeter and Pierre Bourdieu. A synthesis is suggested in an application of the generic rule-based approach. Part III discusses the implementation of rule-based bottom-up models of institutional change and provides a basic prototype agent-based computational simulation. The evolution of power relations plays an important role in the programming of real-life communication networks. This notion characterizes the discussed policy realms (Part IV) of ecological and financial sustainability as tremendously complex areas of institutional change in political economy, leading to the concluding topic of democracy in practice. The novelty of this approach is given by its modular theoretical structure. It turns out that institutional change is carried substantially by affective social orders in contrast to rational orders as communicated in orthodox economic realms. The characteristics of affective orders are derived theoretically from intersections between ontology and heuristics, where interdependencies between instinct, cognition, rationality, reason, social practice, habit, routine or disposition are essential for the embodiment of knowledge. This kind of research indicates

new generic directions to study social learning in particular and institutional evolution in general.

**An Evolutionary Theory of Economic Change** Oxford University Press

This book explores the question of whether and how meme theory or "memetics" can be fruitfully utilized in evolutionary economics and proposes an approach known as "economemetics" which is a combination of meme theory and complexity theory that has the potential to combat the fragmentation of evolutionary economics while re-connecting the field with cultural evolutionary theory. By studying the intersection of cultural and economic evolution, complexity economics, computational economics, and network science, the authors establish a connection between memetics and evolutionary economics at different levels of investigation. The book first demonstrates how a memetic approach to economic evolution can help to reveal links and build bridges between different but complementary concepts in evolutionary economics. Secondly, it shows how organizational memetics can help to capture the complexity of organizational culture using meme mapping. Thirdly, it presents an agent-based simulation model of knowledge diffusion and assimilation in innovation networks from a memetic perspective. The authors then use agent-based modeling and social network analysis to evaluate the diffusion pattern of the Ice Bucket Challenge as an example of a "viral meme." Lastly, the book discusses the central issues of agency, creativity, and normativity in the context of economemetics and suggests promising avenues for further research.

**Marshall's Evolutionary Economics** Cambridge University Press

Evolutionary game theory studies the behaviour of large populations of strategically interacting agents & is used by economists to predict in settings where traditional assumptions about the rationality of agents & knowledge may be inapplicable.

**From Pleasure Machines to Moral Communities** Palgrave Macmillan

This book focuses on knowledge-based economies and attempts to analyze dynamic innovation driven processes within those economies. It shows that evolutionary economics, and in particular the strand of applied industry and innovation studies often called Neo-Schumpeterian economics, has left the nursery of new academic approaches and is able to offer important insights for the



understanding of socio-economic processes of change and development having a strong impact on economic reality all over the world. The contributions are summarized under four major sections: knowledge and cognition, studies of knowledge-based industries, the geographical dimension of knowledge-based economies and measuring and modelling for knowledge-based economies and give a broad overview of the prolific research being undertaken in applied evolutionary economics. Students will find this book an invaluable resource for future research, as will researchers seeking an introduction to new methods and perspectives of analysis.

Microeconomics Harvard Business Press  
Cover -- Title -- Copyright -- Dedication -- Contents -- List of tables -- List of boxes -- List of appendices -- Foreword -- Acknowledgements -- Prologue -- 1 Introduction and context -- PART I Human evolution -- 2 Synoptic view of human evolution via natural selection -- 3 Human evolution: beyond the physical -- PART II Economic progress -- 4 Population growth and economic progress: pre-industrial through the 1940s -- 5 Progress since 1950 and the emerging challenges -- PART III Understanding and tackling evolutionary failure -- 6 The idea of evolutionary failure -- 7 Addressing evolutionary failure: the way forward -- Epilogue: hope for humanity -- References and further reading -- Index.

**Economics, Culture and Social Theory** Springer Science & Business Media  
In this novel introduction to modern microeconomic theory, Samuel Bowles returns to the classical economists' interest in the wealth and poverty of nations and people, the workings of the institutions of capitalist economies, and the coevolution of individual preferences and the structures of markets, firms, and other institutions. Using recent advances in evolutionary game theory, contract theory, behavioral experiments, and the modeling of dynamic processes, he develops a theory of how economic institutions shape individual behavior, and how institutions evolve due to individual actions, technological change, and chance events. Topics addressed include institutional innovation, social preferences,

nonmarket social interactions, social capital, equilibrium unemployment, credit constraints, economic power, generalized increasing returns, disequilibrium outcomes, and path dependency. Each chapter is introduced by empirical puzzles or historical episodes illuminated by the modeling that follows, and the book closes with sets of problems to be solved by readers seeking to improve their mathematical modeling skills. Complementing standard mathematical analysis are agent-based computer simulations of complex evolving systems that are available online so that readers can experiment with the models. Bowles concludes with the time-honored challenge of "getting the rules right," providing an evaluation of markets, states, and communities as contrasting and yet sometimes synergistic structures of governance. Must reading for students and scholars not only in economics but across the behavioral sciences, this engagingly written and compelling exposition of the new microeconomics moves the field beyond the conventional models of prices and markets toward a more accurate and policy-relevant portrayal of human social behavior.

**The New Evolutionary Microeconomics** University of Chicago Press  
Economics is traditionally taken to be the social science concerned with the production, consumption, exchange, and distribution of wealth and commodities. Economists carefully track the comings and goings of the human household, whether written small (microeconomics) or large (macroeconomics) and attempt to predict future patterns under different situations. However, in constructing their models of economic behavior, economists often lose sight of the actual characteristics and motivations of their human subjects. In consequence, they have found the goal of an explanatory and predictive science to be elusive. Economics as an Evolutionary Science reorients economics toward a more direct appreciation of human nature, with an emphasis on what we have learned from recent advances in evolutionary science. The authors integrate economics and

evolution to produce a social science that is rigorous, internally coherent, testable, and consistent with the natural sciences. The authors suggest an expanded definition of "fitness," as in Darwin's survival of the fittest, emphasizing not only the importance of reproduction and the quality of offspring, but also the unique ability of humans to provide material wealth to their children. The book offers a coherent explanation for the recent decline in fertility, which is shown to be consistent with the evolutionary goal of maximizing genetic success. In addition, the authors demonstrate the relevance to economics of several core concepts derived from biologists, including the genetics of parent-offspring conflict, inclusive fitness theory, and the phenomena of R-selection and K-selection. The keystone of their presentation is a cogent critique of the traditional concept of "utility." As the authors demonstrate, the concept can be modified to reflect the fundamental evolutionary principle whereby living things-including human beings-have been selected to behave in a manner that maximizes their genetic representation in future generations. Despite the extraordinary interest in applying evolutionary biology to other disciplines, Economics as an Evolutionary Science marks the first major attempt at a synthesis of biology and economics. Scholarly yet accessible, this volume offers unique and original perspectives on an entire discipline.  
*Evolutionary Economics and Creative Destruction* Edward Elgar Publishing  
This text is an ambitious intellectual enterprise to build a naturalistic foundation for economics, with vast knowledge of physical, biological, social sciences and philosophy. Readers will discover that approaches and insights emergent in institutional studies, (social)-neuroscience, network theory, ecological economics, bio-culture dualistic evolution, etc. are persuasively placed in a grand unified frame.  
Evolutionary Economics and Chaos Theory Oxford University Press  
This work acts as a critique of the basis of neoclassical microeconomics, and makes a proposal for the structure of a new evolutionary theory.

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