

## ECONOMICS INTERACTIONS WITH OTHER DISCIPLINES

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**Keywords:** Biological diversity, computable general equilibrium (CGE), consilience, constrained optimization, economic man, evolutionary economics, evolutionary game theory, group selection, health care, hotelling theorem, marginal valuation, maximum sustainable yield (MSY), methodological individualism, neoclassical economics

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### Summary

The field of economics holds a dominant position among the social sciences because of its long intellectual history and its cohesive, mathematical methodology. Yet the approach of standard economics has come under increasing criticism in recent years because of its isolation from other social and natural sciences. This essay and the four topics of this EOLSS theme explore the challenges to contemporary economic theory and policy raised by the burgeoning interdisciplinary work in environmental and health economics. Retooling the discipline of economics in a way that is both scientifically rigorous and socially relevant is one of the great intellectual challenges of the new century.

### 1. Introduction: Economics in the Twenty-First Century

The field of economics occupies a dominant position within the social sciences. It has a cohesive, well-developed reigning paradigm and a rigorous methodology with which to approach a variety of practical and theoretical problems. During the more than 200 years since Adam Smith published the first comprehensive economic treatise, *The Wealth of Nations*, economists have worked to refine Smith's original insight as to how markets allocate goods and services. During the last fifty years the problem of the efficient allocation of resources has dominated economic theory and policy recommendations. Although Smith's metaphor has been recast into an axiomatic mathematical system of optimization under constraints, contemporary economic theory is still at bottom a stylized description of the "invisible hand" of the market. This single-

minded pursuit of a description of market allocation has given economics, in contrast to the other social sciences, a single, widely-accepted model as a starting point for virtually all research in the field. Today, the influence of economics on public policy discourse is unchallenged by any other academic discipline. Economists dominate local, national, and international policy-making bodies. Graduates with degrees in economics are highly employable, well paid, and can expect to hold influential positions in private businesses, consulting firms, or government agencies. In terms of its unified theoretical core and its influence on public policy, economics has earned its designation as the “Queen of the Social Sciences.”

However, in spite of its acknowledged successes the basic assumptions and approaches of the dominant school of economic thought, called neo-classical economics, have come under increasing criticism. As recently as the 1960s it was only a slight exaggeration to claim that the only critics of neo-classical economics were those on the extreme left or extreme right. Today, a growing chorus of critics label mainstream economics as out of touch with reality. The distinguished historian of economic thought, Mark Blaug, has remarked that economics has increasingly become an intellectual game played for its own sake (Blaug, 1998, pp. 11, 34). A survey of graduate students in economics in the 1980s by David Colander and Arjo Klammer (1990) found an astonishing lack of interest in learning about current economic issues or about the literature of economics. Colander and Klammer surmise that, sadly in their view, this may be rational behavior on the part of graduate students in economics. The quickest way to success as an academic economist is to concentrate on mathematics, rather than learning about how actual economies work. Alan Blinder, a former member of President Clinton’s Council of Economic Advisors, has characterized training in economics as “increasingly aloof and self-referential.” While other natural and social sciences have been revolutionized by interdisciplinary interactions, the field of economics has been slow to change. The weaknesses of contemporary economics have been succinctly stated by E. O. Wilson in his book *Consilience*:

[The weaknesses of economics] can be summarized in two labels: Newtonian and hermetic. Newtonian, because economic theorists aspire to find simple, general laws that cover all possible economic arrangements. Universality is a logical and worthy goal, except that the innate traits of human behavior ensure that only a minute set of such arrangements is probable or even possible. Just as the fundamental laws of physics cannot be used alone to build an airplane, the general constructions of equilibrium theory cannot be used alone to visualize an optimal or even stable economic order. The models also fall short because they are hermetic—that is, sealed off from the complexities of human behavior and the constraints imposed by the environment. As a result, economic theorists, despite the undoubted genius of many, have enjoyed few successes in predicting the economic future, and they have suffered many embarrassing failures.

(Wilson, 1998)

The discussion that follows and many of the articles under the four topics of this theme in the *Encyclopedia of Life Support Systems* addresses the two challenges to economics laid down by Wilson. “Newtonian,” in the context of economic theory, refers to the

model of general equilibrium currently dominating economic theory and policy. Although economists are well aware of the complexities of human behavior and have explored in depth alternatives to consumer rationality and perfect competition, these complexities have proved to be exceedingly difficult to incorporate into neo-classical general equilibrium theory. The result is that many, if not most, economic models of the natural world are based on assumptions incompatible with basic understandings from biology, physics, and psychology.

Meeting the challenge facing the economics profession, that is, retooling the discipline in a way that is both scientifically rigorous and relevant to solving the immense social and environmental challenges of the twenty-first century, requires above all an interdisciplinary approach. The past few decades have been unprecedented in terms of the astonishing scientific breakthroughs in all fields of inquiry. New findings in the related disciplines of psychology and biology hold the promise of transforming the field of economics. Psychology has given us new insights as to how humans actually make complex decisions, and this research has called into question the concept of human nature embodied in the notion of “economic man” that underlies much of standard economic theory. The field of biology has been a center of intense intellectual activity during the last quarter century, in terms of both theoretical and empirical breakthroughs. According to many philosophers of science biology is replacing physics as the model for scientific inquiry. Interactions between the field of economics and the fields of psychology and biology are slowly beginning to transform the basic neo-classical world-view. The articles under the theme “Economic Interactions with Other Disciplines” draw heavily on these two fields. Before going into the details of the topics addressed under this theme it will be useful to summarize the basic approach of neo-classical theory. This will help to place in context some of the new directions in economics and help to clarify the world-view underlying the analysis and policy recommendations of mainstream economic theory.

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### **Biographical Sketch**

**John M. Gowdy** is Professor of Economics and Director of the Ph.D. program in Ecological Economics at Rensselaer Polytechnic Institute in Troy, New York, USA. He has been a Fulbright scholar in Vienna, Austria, and a visiting scholar at the Free University in Amsterdam, the Netherlands; the University of Queensland, Australia; Tokushima University and Doshisha University, Japan; and the University of Zurich, Switzerland. He is the author of over 100 academic papers and eight books, including (with Carl McDaniel) *Paradise for Sale: A Parable of Nature* (University of California Press, 2000), *Limited Wants, Unlimited Means: A Reader in Hunter–Gatherer Economics and the Environment* (Island Press, 1998), and (with Sabine O’Hara) *Economic Theory for Environmentalists* (St Lucie Press, 1995). His articles have appeared in *Ecological Economics*, *Environment and Planning*, *Land Economics*, *The Journal of Regional Science*, *Structural Change and Economic Development*, and the *Review of Income and Wealth*. He serves on the editorial boards of several academic journals, including *Ecological Economics*, *Environmental Ethics*, *Structural Change and Economic Dynamics*, and *Environment and Planning*. He is the current President of the US Society for Ecological Economics.

Professor Gowdy’s current research includes the following: economic valuation of biodiversity and environmental theory and policy, economic anthropology, evolutionary models of economic change, and regional sustainable economic development using social accounting matrices. His current work in regional sustainable development is funded by the Hudson River Foundation, the National Science Foundation, and the Center for Economic Growth of the Rockefeller Institute. The Hudson River Project is a pilot program constructing an integrated assessment model of the interactions between economic change, land use change, and ecosystem integrity in a tributary of the Hudson River. Professor Gowdy is also involved in a sustainable development project in the rural village of Umuluwe in south-eastern Nigeria, where he is investigating the inter-related issues of climate change, globalization, and poverty.