BOOK REVIEWS

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Antonio Jorge Jorge Salazar-Carillo Florida International University

Economic Complexity: Chaos, Sunspots, Bubbles, and Nonlinearity.

Edited by William A. Barnett, John Geweke, and Karl Shell. Cambridge: Cambridge University Press, 1989. *Pp. xi*, 469.

Conference volumes have comparative advantages, relative to refereed journals, as sources of information on current research in economics. On one hand, conference volumes usually collect research on related topics in one place. On the other hand, the usual refereeing process and the reward system in academic economics lead to a mean quality of articles that is higher in journals than it is in conference volumes. This same refereeing process, however, also results in a higher variance of quality in conference volumes than in journals, since referees often shy away from what is new or different.

This book contains the proceedings of a conference with the same name that was held at the University of Texas at Austin in May 1987. The focus is on the equilibria of deterministic economic models that appear, in some senses, to be stochastic because of nonlinear dynamics, called chaos, and on the equilibria of otherwise deterministic models that are stochastic because of stochastic processes, called sunspots, that affect the equilibria only through expectations. There are also several articles on bubbles, which like sunspot equilibria, are examples of self-fulfilling expectations, and a number of articles on econometric methodology for dealing with nonlinear models.

A book like this gives researchers a chance to present their most recent research without having to put it into the finished form required by most journals. It is here that the book's principal strength lies—the reader is able to see what is going on at the frontier of research in a number of related areas. Yet this also contains the book's principal weakness—the quality of the papers is very uneven and there is little effort made in relating the different topics covered.

The book is divided into five parts. Part I contains four papers that deal with sunspot equilibria. In the first paper, David Cass and Karl Shell attempt to give the reader an idea of the "big picture" of sunspots. They relate an example of sunspot equilibria in a simple overlapping generations model to other properties of such models, such as the possibility of equilibria with valued fiat money, and to various properties of other models that allow sunspot equilibria. Pierre-Andre Chiappori and Roger Guesnerie derive conditions for the existence of equilibria that depend nontrivially on sunspots that follow a k-state Markov process; most previous analysis has dealt only with the case k=2. Jean-Michel Grandmont explores the relation between bifurcation theory applied to steady states of a deterministic overlapping generations model and the possibility of sunspot equilibria. Finally, James Peck and Karl Shell show that different ways of organizing asset markets, which give rise to the same set of equilibrium allocations if consumers behave competitively, can give rise to different equilibrium allocations if there are sunspots and if consumers realize they have even the smallest amount of market power.

Part II contains three papers by Duncan Foley, by L. Broze, C. Gourieroux, and A. Szafarz, and by Albert Marcet and Thomas Sargent. They deal with such topics as endogenous investment cycles, speculative bubbles in a partial equilibrium model of the market of a storable good, and least-squares learning in a model that allows hyperinflation. These papers contain interesting material, particularly the paper by Marcet and Sargent, which shows that the dynamic stability properties of a stationary equilibrium can change dramatically if agents are assumed to employ a learning mechanism rather than to have rational expectations. The papers are not, however, more than peripherally related to each other or to the other papers in the book.

Part III contains papers by William Barnett and Seungmook Choi and by Jose Scheinkman and Blake LeBaron. The title of this section is "Empirical Tests for Chaos." I did not understand the criterion for separating these papers from those in Part V, which is entitled "Nonlinear Econometric Modeling." This section contains papers by John Geweke, by James Stock, and by Melvin Hinich and Douglas Patterson. Each of the five papers in these two sections presents econometric techniques for dealing with time series data generated by non-linear economic models; in particular, they present various methods for detecting the presence of

nonlinear structure even in the presence of noise. The papers by Geweke and by Hinich and Patterson use stock price data; the paper by Scheinkman and Le Baron uses U.S. GNP data; the paper by Stock uses U.S. and U.K. unemployment data; and the paper by Barnett and Choi uses artificial data generated by a consumer demand model.

Part IV contains four theoretical papers related to chaos: Michele Boldrin shows how chaotic dynamics can arise in a two sector optimal growth model. Richard Day and Jean-Luc Walter analyze various possibilities for nonlinear dynamics in an abstract model of technological change with endogenous population growth. Michael Woodford presents a simple model with infinitely lived consumers who face borrowing constraints; in this model the possibilities for complex dynamics, and even for sunspot equilibria, are analogous to those in the overlapping generations models. Stephen Spear shows that a sort of informational complexity that would be faced by agents in a model with a chaotic perfect-foresight equilibrium would also be present in a model with a perfect-foresight equilibrium that exhibits more conventional exponential growth.

Taken as a whole, this book has many of the typical strengths and weaknesses of a conference volume. There are, however, two aspects of the book that distinguish it: On the positive side, the average quality of the papers in this book seems a little higher than is typical. On the negative side, the topics covered seem less related to each other than I might have hoped. This aspect was particularly evident to me when I searched for connections between the theoretically oriented papers in Parts I, II, and IV and the empirically criented papers in Parts III and V.

To the reader interested in this topic, I also recommend another conference volume. The Stock Market: Eubbles, Volatility, and Chaos edited by Gerald P. Dwyer and R. W. Hafer [Kluwer Academic Publishers, 1990]. Neither book dominates the other: the Barnett-Geweke-Shell volume contains some papers of a higher quality, at least when judged on their own. The Dwyer-Hafer volume langs together better, as it is more tightly organized around the theme of what economic models with complex dynamics can say about events like the October 1987 stock market crash. Neither book provides final answers; complex dynamics in economic models is an area we have only begun to explore.

Timothy J. Kehoe
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Pacific Basin Developing Countries: Prospects for the Future.

By Marcus Noland. Washington, D.C.: Institute for International Economics, 1990. Pp. xvi, 232.

A few years ago governors of Southern states issued a clarion call warning us about the failure of American education to prepare our citizens for competing in the world market. "We know neither the globe nor the cultures of people who habit it. . . We are no longer isolated by the large oceans on either side of our nation. Our economic and political future depends on the ability to communicate with and understand people across national boundaries [3]. Perhaps a partial answer, albeit quite incomplete, to such a warning is a small research volume, The Pacific Basin Developing Countries, written by Marcus Noland, currently a professor at the University of Southern California and a Research Associate of the Institute for International Economics. This thin book is actually one piece of a trilogy of research projects on the countries located in the Pacific rim [1, 2]. Noland sets out to andertake two major tasks: (a) analyzing the impact of prospective changes of the newly industrialized countries (NICs)—Hong Kong, Singapore, Taiwan, and Korea—and of other four countries of the Association of South East Asian Nations (ASEAN)—Indonesia, Malaysia, Philippines, and Thailand—on the world economy; and (b) interpreting the implications of those changes for the global economy in general, and for the United States in particular.

To achieve this end, Noland structures his book in three concise parts. The author begins in Part 1 [ch. 1-3] with a review of the cultural past of the Pacific Basin countries, the historical evolution of their economic public policies and their regime of trade. Part II [ch. 4-5] is more technical: the author presents an econometric projection of trade patterns of these countries in the year 2000. Here, he discusses the future developments in the world economy that might affect the projected trade outcomes of these eight economies. Finally in Part III [ch. 6], he reserves the last chapter of the book for an analysis of the impact and possible implications of present and projected trade developments of the Pacific Basin for the United States from an economic adjustment standpoint and from a international policy perspective.

Although slim in weight, this volume contains much worthy information. The author's analysis of the eight Pacific Basin countries has been cogently presented with neat figures, diagrams, and numerous tables

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