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## Review of *The Macroeconomics of Self-Fulfilling Prophecies* by Roger E. A. Farmer

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Recent Experience” James H. Stock and Mark W. Watson set the analytical tone for the remaining three papers in this group. The Stock and Watson paper offers a detailed account of the construction and empirical performance of a recession index. The model generates “three indexes of overall economic activity on a monthly basis: an experimental coincident index (the XCI); and experimental leading index (the XLI), which is a forecast of the growth in the XCI over the subsequent six months; and an experimental recession index (the XRI), which estimates the probability that the economy will be in recession six months hence” [p. 96]. In the third paper “Estimating Event Probabilities from Macroeconomic Models Using Stochastic Simulation” Ray C. Fair explains that probability questions can be directly addressed within the context of macroeconomic modeling by using stochastic simulation. Fair uses a model that is dynamic, nonlinear, simultaneous and can be designed to have autoregressive errors of any order. He uses the model to run a number of simulations on several economic events and then compares the models performance with real-time data. Fair estimates event probabilities for two consecutive quarters of negative real GNP growth as well as two quarters of inflation over seven percent. The final paper in this group is Christopher A. Sims’s “A Nine-Variable Probabilistic Macroeconomic Forecasting Model.” This paper is an extension of the Bayesian vector autoregressive six variable model developed by Robert Litterman in the early 1980s. This current model extends the previous work by augmenting the original model with the ability to account for nonnormality of forecast errors and by allowing for time-varying variances as well as time-varying autoregressive coefficients. The new model also adds trade-weighted value of the dollar, Standard and Poors 500 stock index and the commodity price index to the original variable list of T-bill, M1, GNP deflator, Real GNP, business investment and unemployment.

Benjamin M. Friedman and Kenneth N. Kuttner begin the empirical section with a paper entitled “Why Does the Paper-Bill Spread Predict Real Economic Activity?” The paper explores the reasons why the difference between the interest rates on commercial paper and Treasury bills is such a good indicator of real economic activity. Friedman and Kuttner examine default risk, monetary policy effects, differential tax treatments and changing cash requirements of borrowers for possible indications of the variables predicative power. The second paper in this section is “Further Evidence on Business-Cycle Duration Dependence” by Francis X. Diebold, Glenn D. Rudebusch and Daniel E. Sichel. The paper attempts to find out if expansions, contractions or whole cycles are more or less likely to end as they grow older. The authors employ an exponential-quadratic hazard model to examine duration dependence and use data from the U.S., Great Britain, France and Germany. They conclude that all four countries exhibit evidence of positive duration dependence in prewar expansions but not for prewar contractions.

The final two papers focus on the methodological aspects of economic time series and forecasting. In “A Dynamic Index Model for Large Cross Sections” Danny Quah and Thomas J. Sargent present a framework for analyzing commonalities in dynamic models and data structures where the cross-sectional dimension is potentially as large as the time series dimension. The paper develops index structures and shows how standard econometric techniques can be adapted to handle random fields. The final paper is “Modeling Nonlinearity Over the Business Cycle” by Clive W. J. Granger, Timo Teräsvirta and Heather M. Anderson. In this paper the authors compare a wide variety of linear models with those of nonlinear structure. They conclude that nonlinear models are superior in sample but not out of sample. The paper also addresses the dangers of overfitting due to data mining.

This book is not intended for a general audience. It is a selection of highly technical statistical techniques that are directed toward the forecasting professional. To gain the full benefit from this work, one must approach the book with a good understanding of the mechanics of time-series forecasting. However, those already working in the field will find in the book a very convenient cross section of the current state of the art in time-series economic forecasting.

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### **The Macroeconomics of Self-Fulfilling Prophecies.**

By Roger E. A. Farmer. Cambridge, Mass.: The MIT Press, 1993. Pp. xv, 259. \$27.50.

Graduate macroeconomics courses are becoming increasingly technical. Students must learn the tools of dynamic analysis and how to apply these tools to a wide range of macroeconomic models. However, in the contemporary literature only few attempts have been made in this regard. Roger Farmer attempts to fill

this gap by providing a comprehensive overview of various approaches to dynamic analysis. Farmer uses general equilibrium theory to relate the ideas that are taught in graduate macroeconomics courses to the foundations of these ideas in the theory of rational choice.

Since the 1970s, macroeconomists have begun to pay much greater attention to the micro foundation of their subject. This change in the way of macro-thinking can be traced to the episode of high inflation and high unemployment in the early 1970s that was inconsistent with orthodox theory. Farmer starts the book with the premise that since macroeconomics deals with the behavior of the economy as a whole, hence the natural foundation for macroeconomics lies in the microeconomic theory of general equilibrium. The author introduces a number of dynamic general equilibrium models each of which maintains the assumption that agents have rational expectations of future prices. He argues that much of the Keynesian resistance to this approach can be attributed to the fact that much of the debate on rational expectations in macroeconomics have taken place in the context of very simple general equilibrium models in which the competitive mechanism functions smoothly. He believes that the use of over-simplistic environments to convey the central message of the rational expectation research agenda has contributed to a widespread misunderstanding of the implications of rational expectations.

The major argument of this book is that one can think of macroeconomics as the study of equilibrium environments in which the welfare theorems relating to Pareto-optimal allocations of resources may break down. The author argues that only under this circumstance it is possible to discuss the role of stabilization policies in a context in which they may serve some purpose.

The author opens the discussion in Chapter 1 with a simple model of an indeterminate equilibrium. Then he gradually expands on the idea that equilibrium theory is a much richer tool for understanding data than one might otherwise think. He argues against the notion that equilibrium models lead to particular normative conclusions. Chapters 2 and 3 introduce functional equations which are later used to describe linear rational expectations models. The next three chapters take the reader into the realm of nonlinear simultaneous equations. Since macroeconomics is closely connected with problems that involve the passage of time, these equations will typically be systems of differential equations. Using these equations, the author demonstrates that simple dynamic general equilibrium models may behave very differently from the finite Arrow-Debreu paradigm. In the context of the overlapping generations model, the author shows how the welfare theorems may break down and the set of equilibria may be very large.

In Chapter 7, Farmer discusses two alternative ways in which one may reconcile increasing returns with a competitive theory of distribution. The first approach assumes that there are significant externalities in the production process and the second introduces important noncompetitive elements to explain how a profit-maximizing firm may attain an interior optimum in the presence of a nonconvex technology. In Chapter 8, he extends the finite general equilibrium model, introduced earlier, to handle uncertainty. This extension is important for both macroeconomics as well as finance, where it forms the basis for thinking about security prices.

In the last three chapters, the author tries to cover a relatively large amount of material in a relatively short space. For example, the basic theme in Chapter 9 is that general equilibrium economies may display sunspot fluctuations even when all possible insurance markets are open. The connection of this idea to indeterminacy is that models with indeterminate steady states are good candidates for belief-driven equilibria since they allow one to construct stationary sunspot equilibria that can be supported by fully rational forecast rules. The last two chapters in the book are undoubtedly its weakest chapters. Farmer tries to incorporate money into a simple general equilibrium model of the macroeconomy. He analyzes some quantitative theoretical work in monetary theory. These works draw inferences about the magnitudes of some of the key parameters of a monetary economy based on studies of the U.S. money demand in the last few decades.

A reader of this book may or may not be sympathetic to the idea that equilibria may be driven by sunspots, or the idea of explaining sticky prices with market-clearing models, but I believe the author will succeed in persuading the reader to be open to the idea that general equilibrium theory can provide us with a common language. I strongly recommend this instructive and stimulating book to all those economists who are interested in advanced methods of dynamic analysis. It is appropriate as a recommended textbook for graduate level macroeconomics courses.

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