



Dynamic General Equilibrium Modeling: Computational Methods and Applications

By Burkhard Heer, Alfred Maussner

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Modern business cycle theory and growth theory uses stochastic dynamic general equilibrium models. In order to solve these models, economists need to use many mathematical tools. This book presents various methods in order to compute the dynamics of general equilibrium models. In part I, the representative-agent stochastic growth model is solved with the help of value function iteration, linear and linear quadratic approximation methods, parameterised expectations and projection methods. In order to apply these methods, fundamentals from numerical analysis are reviewed in detail. In particular, the book discusses issues that are often neglected in existing work on computational methods, e.g. how to find a good initial value.

In part II, the authors discuss methods in order to solve heterogeneous-agent economies. In such economies, the distribution of the individual state variables is endogenous. This part of the book also serves as an introduction to the modern theory of distribution economics. Applications include the dynamics of the income distribution over the business cycle or the overlapping-generations model.

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Dynamic General Equilibrium Modeling: Computational Methods and Applications By Burkhard Heer, Alfred Maussner Bibliography

- Sales Rank: #664694 in Books
- Published on: 2008-10-10
- Original language: English
- Number of items: 1
- Dimensions: 9.25" h x 1.66" w x 6.10" l, 2.25 pounds
- Binding: Paperback
- 702 pages

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Editorial Review

Review

From the reviews of the second edition:

"The book is devoted to the presentation of such methods applied to solving a variety of discrete stochastic and deterministic DGE models in infinite time horizon. The way the book is written enables to use it as a lecture book for courses on computational methods in macroeconomics or modern dynamic equilibrium modeling for graduate students. There are given many useful practical hints on using the methods in practice - this makes the book very valuable for practical users of DGE models." (Piotr Mackowiak, *Zentralblatt MATH*, Vol. 1200, 2011)

Review

"This is perhaps the perfect book to learn how to solve quantitative macroeconomics models. Its balance between theory, choice of models, computational insights and use of examples make it an excellent teaching tool. One of the very few books a professional macroeconomist should have: I always learn something important when I consult it."

José-Víctor Ríos Rull, University of Minnesota

"This is an excellent book for economists who do quantitative research. It will be an invaluable teaching tool for graduate macroeconomic courses. In addition to having a great set of examples, the programs that accompany them are also made available. It will help the new generation of graduate students to progress much faster with solving what used to be complicated model economies."

Ayse Imrohoroglu, Marshall Business School, University of Southern California

"Heer and Maussner's book provides the reader with exactly the necessary computational tools to solve the dynamic general equilibrium models

macroeconomists care about. It is therefore the perfect complement to Stokey, Lucas and Prescott's and Sargent and Ljungqvist's theoretical treatment of modern macroeconomics. Both students and producers of quantitative macroeconomic research will find this book essential."

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"The use of computational tools in macroeconomic analysis has increased enormously over the past decade. This book not only does an excellent job in explaining the existing tools, but it also teaches the reader on how to write her/his own programs and it provides the reader with the tools to help advance the state of the art of dynamic macroeconomics. This book will be useful to those who are new to this field and would like a systematic approach as will be useful to those who are more advanced and who are looking for a comprehensive overview of existing techniques."

Wouter J. Den Haan, University of Amsterdam

From the Back Cover

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In an accompanying home page to this book, computer codes to all applications can be downloaded.

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