Dynamic Optimization In Environmental Economics Dynamic Modeling And Econometrics In Economics And Finance

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Mathematical Modeling in Economics, Ecology and the Environment - N.V. Hritonenko 2013-04-17

The problems of interrelation between human economics and natural environment include scientific, technical, economic, demographic, social, political and other aspects that are studied by scientists of many specialities. One of the important aspects in scientific study of environmental and ecological problems is the development of mathematical and computer tools for rational management of economics and environment. This book introduces a wide range of mathematical models in economics, ecology and environmental sciences to a general mathematical audience with no in-depth experience in this specific area. Areas covered are: controlled economic growth and technological development, world dynamics, environmental impact, resource extraction, air and water pollution propagation, ecological population dynamics and exploitation. A variety of known models are considered, from classical ones (Cobb Douglass production function, Leontief input-output analysis, Solow models of economic dynamics, Verhulst-Pearl and Lotka-Volterra models of population dynamics, and others) to the models of world dynamics and the models of water contamination propagation used after Chemobyl nuclear catastrophe. Special attention is given to modelling of hierarchical regional economic-ecological interaction and technological change in the context of environmental impact. Xlll XIV Construction of Mathematical Models ...

A Selected Annotated Bibliography on the Analysis of Water Resource Systems - Water Resources Scientific Information Center 1975

Lecture Notes on Resource and Environmental Economics - Anthony C. Fisher 2020-06-26

This book, based on lectures on natural and environmental resource economics, offers a

nontechnical exposition of the modern theory of sustainability in the presence of resource scarcity. It applies an alternative take on environmental economics, focusing on the economics of the natural environment, including development, computation, and potential empirical importance of the concept of option value, as opposed to the standard treatment of the economics of pollution control. The approach throughout is primarily conceptual and theoretical, though empirical estimation and results are sometimes noted. Mathematics, ranging from elementary calculus to more formal dynamic optimization, is used, especially in the early chapters on the optimal management of exhaustible and renewable resources, but results are always given an economic interpretation. Diagrams and numerical examples are also used extensively. The first chapter introduces the classical economists as the first resource economists, in their discussion of the implications of a limited natural resource base (agricultural land) for the evolution of the wider economy. A later chapter returns to the same concerns, along with others stimulated by the energy and environmental "crises" of the 1970s and beyond. One section considers alternative measures of resource scarcity and empirical findings on their behavior over time. Another introduces the modern concept of sustainability with an intuitive development of the analytics. A chapter on the dynamics of environmental management motivates the concept of option value, shows how to compute it, then demonstrates its importance in an illustrative empirical example. The closing chapter, on climate change, first projects future changes and potential catastrophic impacts, then discusses the policy relevance of both option value and discounting for the very long run. This book is intended for resource and environmental economists and can be read by interested graduate and advanced undergraduate students in the field as well.

Dynamic Modeling in Behavioral Ecology - Professor Department of Environmental Studies Marc Mangel 1988

This book describes a powerful and flexible technique for the modeling of behavior, based on evolutionary principles. The technique employs stochastic dynamic programming and permits the analysis of behavioral adaptations wherein organisms respond to changes in their environment and in their own current physiological state. Models can be constructed to reflect sequential decisions concerned simultaneously with foraging, reproduction, predator avoidance, and other activities. The authors show how to construct and use dynamic behavioral models. Part I covers the mathematical background and computer programming, and then uses a paradigm of foraging under risk of predation to exemplify the general modeling technique. Part II consists of five "applied" chapters illustrating the scope of the dynamic modeling approach. They treat hunting behavior in lions, reproduction in insects, migrations of aquatic organisms, clutch size and parental care in birds, and movement of spiders and raptors. Advanced topics, including the study of dynamic evolutionarily stable strategies, are discussed in Part III.

LQ Dynamic Optimization and Differential Games - Jacob Engwerda 2005-11-01

Game theory is the theory of social situations, and the majority of research into the topic focuses on how groups of people interact by developing formulas and algorithms to identify optimal strategies and to predict the outcome of interactions. Only fifty years old, it has already revolutionized economics and finance, and is spreading rapidly to a wide variety of fields. LQ Dynamic Optimization and Differential Games is an assessment of the state of the art in its field and the first modern book on linear-quadratic game theory, one of the most commonly used tools for modelling and analysing strategic decision making problems in economics and

management. Linear quadratic dynamic models have a long tradition in economics, operations research and control engineering; and the author begins by describing the one-decision maker LQ dynamic optimization problem before introducing LQ differential games. Covers cooperative and non-cooperative scenarios, and treats the standard information structures (open-loop and feedback). Includes real-life economic examples to illustrate theoretical concepts and results. Presents problem formulations and sound mathematical problem analysis. Includes exercises and solutions, enabling use for self-study or as a course text. Supported by a website featuring solutions to exercises, further examples and computer code for numerical examples. LQ Dynamic Optimization and Differential Games offers a comprehensive introduction to the theory and practice of this extensively used class of economic models, and will appeal to applied mathematicians and econometricians as well as researchers and senior undergraduate/graduate students in economics, mathematics, engineering and management science.

Dynamic Modelling - Alisson Brito 2010-01-01

When talking about modelling it is natural to talk about simulation. Simulation is the imitation of the operation of a real-world process or systems over time. The objective is to generate a history of the model and the observation of that history helps us understand how the real-world system works, not necessarily involving the real-world into this process. A system (or process) model takes the form of a set of assumptions concerning its operation. In a model mathematical and logical assumptions are considered, and entities and their relationship are delimited. The objective of a model – and its respective simulation – is to answer a vast number of “what-if” questions. Some questions answered in this book are: What if the power distribution system does not work as expected? What if the produced ships were not able to

transport all the demanded containers through the Yangtze River in China? And, what if an installed wind farm does not produce the expected amount of energyt? Answering these questions without a dynamic simulation model could be extremely expensive or even impossible in some cases and this book aims to present possible solutions to these problems.

EPA-600/9 - 1976-07

Resource Economics - Jon M. Conrad 2010-06-14

A text for students with a background in calculus and intermediate microeconomics and a familiarity with the spreadsheet software Excel.

Control Systems and Mathematical Methods in Economics - Gustav Feichtinger 2018-06-08

Since the days of Lev Pontryagin and his associates, the discipline of Optimal Control has enjoyed a tremendous upswing – not only in terms of its mathematical foundations, but also with regard to numerous fields of application, which have given rise to highly active research areas. Few scholars, however, have been able to make contributions to both the mathematical developments and the (socio-)economic applications; Vladimir Veliov is one of them. In the course of his scientific career, he has contributed highly influential research on mathematical aspects of Optimal Control Theory, as well as applications in Economics and Operations Research. One of the hallmarks of his research is its impressive breadth. This volume, published on the occasion of his 65th birthday, accurately reflects that diversity. The mathematical aspects covered include stability theory for difference inclusions, metric regularity, generalized duality theory, the Bolza problem from a functional analytic perspective, and fractional calculus. In turn, the book explores various applications of control theory, such as population dynamics, population economics, epidemiology, optimal growth theory, resource and energy economics,

environmental management, and climate change. Further topics include optimal liquidity, dynamics of the firm, and wealth inequality.

Theory And Programming Of Computable General Equilibrium (Cge) Models: A Textbook For Beginners - Gene H Chang 2022-02-18

This book adopts a typical textbook approach and format for CGE beginners to learn and master the subject. It explains the economics theory behind the CGE models. The learning proceeds step by step from basic economic theories to advanced topics, from simple to more comprehensive CGE structures along with the corresponding computer programs. Each chapter reviews relevant economic theories; illustrates new material with examples, diagrams and exercises; and provides the mathematical models along with the GAMS computer programing codes. At the end of a chapter, exercises are assigned for practice and enhancing understanding.

Dynamic Optimization and Differential Games - Terry L. Friesz 2010-08-20

This book has been written to address the increasing number of Operations Research and Management Science problems (that is, applications) that involve the explicit consideration of time and of gaming among multiple agents. It is a book that will be used both as a textbook and as a reference and guide by those whose work involves the theoretical aspects of dynamic optimization and differential games.

Nonlinearities in Economics - Giuseppe Orlando 2021-08-31

This interdisciplinary book argues that the economy has an underlying non-linear structure and that business cycles are endogenous, which allows a greater explanatory power with respect to the traditional assumption that dynamics are stochastic and shocks are exogenous. The first part of this work is formal-methodological and provides the mathematical background needed for the remainder, while the second part

presents the view that signal processing involves construction and deconstruction of information and that the efficacy of this process can be measured. The third part focuses on economics and provides the related background and literature on economic dynamics and the fourth part is devoted to new perspectives in understanding nonlinearities in economic dynamics: growth and cycles. By pursuing this approach, the book seeks to (1) determine whether, and if so where, common features exist, (2) discover some hidden features of economic dynamics, and (3) highlight specific indicators of structural changes in time series. Accordingly, it is a must read for everyone interested in a better understanding of economic dynamics, business cycles, econometrics and complex systems, as well as non-linear dynamics and chaos theory.

Optimization and Applications - Milojica Jaćimović 2020-01-08

This book constitutes the refereed proceedings of the 10th International Conference on Optimization and Applications, OPTIMA 2019, held in Petrovac, Montenegro, in September-October 2019. The 35 revised full papers presented were carefully reviewed and selected from 117 submissions. The papers cover such topics as optimization, operations research, optimal control, game theory, and their numerous applications in practical problems of operations research, data analysis, and software development.

Dynamic Economic Analysis - Gerhard Sorger 2015-02-12

Focusing on deterministic models in discrete time, this concise yet rigorous textbook provides a clear and systematic introduction to the theory and application of dynamic economic models. It guides students through the most popular model structures and solution concepts, from the simplest dynamic economic models through to complex problems of optimal policy design in dynamic general equilibrium frameworks.

Chapters feature theorems and practical hints, and seventy-five worked examples highlight the various methods and results that can be applied in dynamic economic models. Notation and formulation is uniform throughout, so students can easily discern the similarities and differences between various model classes. Chapters include more than sixty exercises for students to self-test their analytical skills, and password-protected solutions are available for instructors on the companion website. Assuming no prior knowledge of dynamic economic analysis or dynamic optimization, this textbook is ideal for advanced students in economics.

Socioeconomic Environmental Studies Series - 1973

Introduction to Modern Economic Growth - Daron Acemoglu 2008-12-15

Introduction to Modern Economic Growth is a groundbreaking text from one of today's leading economists. Daron Acemoglu gives graduate students not only the tools to analyze growth and related macroeconomic problems, but also the broad perspective needed to apply those tools to the big-picture questions of growth and divergence. And he introduces the economic and mathematical foundations of modern growth theory and macroeconomics in a rigorous but easy to follow manner. After covering the necessary background on dynamic general equilibrium and dynamic optimization, the book presents the basic workhorse models of growth and takes students to the frontier areas of growth theory, including models of human capital, endogenous technological change, technology transfer, international trade, economic development, and political economy. The book integrates these theories with data and shows how theoretical approaches can lead to better perspectives on the fundamental causes of economic growth and the wealth of nations. Innovative and authoritative, this book is likely to shape how economic growth is taught and

learned for years to come. Introduces all the foundations for understanding economic growth and dynamic macroeconomic analysis Focuses on the big-picture questions of economic growth Provides mathematical foundations Presents dynamic general equilibrium Covers models such as basic Solow, neoclassical growth, and overlapping generations, as well as models of endogenous technology and international linkages Addresses frontier research areas such as international linkages, international trade, political economy, and economic development and structural change An accompanying Student Solutions Manual containing the answers to selected exercises is available (978-0-691-14163-3/$24.95). See: http://press.princeton.edu/titles/8970.html. For Professors only: To access a complete solutions manual online, email us at: acemoglusolutions@press.princeton.edu

Handbook of Environmental Economics - Karl-Goran Maler 2005-12-09

Many of the frontiers of environmental economics research are at the interface of large-scale and long-term environmental change with national and global economic systems. This is also where some of the most of challenging environmental policy issues occur. Volume 3 of the Handbook of Environmental Economics provides a synthesis of the latest theory on economywide and international environmental issues and a critical review of models for analyzing those issues. It begins with chapters on the fundamental relationships that connect environmental resources to economic growth and long-run social welfare. The following chapters consider how environmental policy differs in a general-equiIibrium setting from a partial-equilibrium setting and in a distorted economy from a perfect economy. The volume closes with chapters on environmental issues that cross or transcend national borders, such as trade and the environment, biodiversity conservation, acid rain, ozone depletion, and

global climate change. The volume provides a useful reference for not only natural resource and environmental economists but also international economists, development economists, and macroeconomists.

Research Tools in Natural Resource and Environmental Economics - Amitrajeet A. Batabyal 2011

A collection of scholarly accounts and articles written by recognized experts in environmental economics, this book is the first of its kind and as a valuable reference and textual source for graduate students and active researchers. It draws together the pedagogical discussion of the key tools used to conduct theoretical and empirical research in natural resource and environmental economics. With contributions by prominent international researchers like Robert Ayres, Charles Perrings and Anastasios Xepapadeas, the book will be useful for researchers who wish to learn new techniques or change their area of research emphasis within natural resource and environmental economics or those who wish to familiarize themselves with these tools.

The Effect Evaluation of Haze Governance Policies in Hebei Province–Based on I-O Model - Guofeng Zhang 2020-03-04

This book provides a dynamic simulation model based on input-output table. The model includes an objective function, i.e. maximizing economic and social development and three sub-models, including economic growth model, pollutant emission model and energy balance model. The data of 2012 is selected as the base period data. The haze control policy of Hebei Province is written into the model as an exogenous variable. Reducing the total PM2.5 emissions is an environmental constraint, which is used to eliminate the impact of natural factors on environmental quality. Lingo software is used to simulate this model. By comparing the socio-economic impacts in different scenarios, this book found the most effective policy combination

of haze governance. Comprehensive haze governance policy recommendations provide experience for other regions of China and other developing countries. In this book, the dynamic simulation model of haze governance also provides a reference to other environmental policy simulations. This book is divided into five parts. The first part is an introduction. This paper mainly introduces the research background, research status at home and abroad, the purpose and significance of the study, the content and methods of the study, the key scientific problems to be solved and the expected results. In the second part, the current situation and existing problems of economic, social, energy and environment development in the study area are analyzed in detail. In the third part, a comprehensive evaluation model of dynamic optimization of haze control policy is constructed. The fourth part carries on the simulation experiment, and carries on the analysis to the experimental result. The fifth part puts forward the policy suggestions to realize the economic, social, energy and environmental development of Hebei Province. In this book, we have some understandings about haze governance. From the perspective of policy effect, the policy effects of subsidy for soil and water conservation, subsidy for development and utilization of clean energy, subsidy for new energy vehicles, motor vehicle restriction and subsidy for introduction of PM2.5 treatment technology are decreasing. Comprehensive policy can better achieve the goal of sustainable development of economy, energy and environment than single policy, and the effect of "source governance" policy is better than that of "end governance" policy.

Modeling, Computation and Optimization - S. K. Neogy 2009

This volume provides recent developments and a state-of-the-art review in various areas of mathematical modeling, computation and optimization. It contains theory, computation as

well as the applications of several mathematical models to problems in statistics, games, optimization and economics for decision making. It focuses on exciting areas like models for wireless networks, models of Nash networks, dynamic models of advertising, application of reliability models in economics, support vector machines, optimization, complementarity modeling and games.

Theoretical and Empirical Analysis in Environmental Economics - Keiko Nakayama 2019-05-17

This monograph presents potential remedies for some of the current environmental issues in developed countries in a theoretical or empirical manner with the interdisciplinary approaches of economics, statistics, and engineering. The book illustrates effective economic and environmental policies for environmental challenges and factors where corrective policies to date may have failed. The importance of this essential book has is related to the transition in the major concerns of the people or governments in developed countries shifting from economic growth to the stability of life and environmental preservation as their economies have matured. The environmental issues dealt with here include forest environment tax introduced as part of local taxes, air pollution reduction policies for mobile emission sources, introduction of renewable energies and power fuel cell technology, the mechanism of city agglomeration and dispersion, and measurement of environmental sustainability. In analytical methods, some research employs theoretical approaches such as the mathematical economic model or nonlinear dynamic model. Other analyses are implemented with empirical or statistical tools such as the long-run general equilibrium model, the input–output model, and the dynamic optimization model, among others.

Dynamic Optimization in Environmental Economics - Elke Moser 2016-09-03

The book presents new developments in the

dynamic modeling and optimization methods in environmental economics and provides a huge range of applications dealing with the economics of natural resources, the impacts of climate change and of environmental pollution, and respective policy measures. The interrelationship between economic activities and environmental quality, the development of cleaner technologies, the switch from fossil to renewable resources and the proper use of policy instruments play an important role along the path towards a sustainable future. Biological, physical and economic processes are naturally involved in the subject, and postulate the main modelling, simulation and decision-making tools: the methods of dynamic optimization and dynamic games.

FUNDAMENTAL ECONOMICS – Volume II - Mukul Majumdar 2010-12-12

Fundamental Economics in two volumes is a component of Encyclopedia of Social Sciences and Humanities in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme discusses on Fundamental Economics, Walrasian and Non-Walrasian Microeconomics, Strategic Behavior, The Economics of Bargaining, Economic Exernalities, Public Goods, Macroeconomics, Decision Making Under Uncertainty, Development Economics and many other related topics. These two volumes are aimed at the following five major target audiences: University and College Students Educators, Professional Practitioners, Research Personnel and Policy Analysts, Managers, and Decision Makers, NGOs and GOs.

Dynamic Optimization, Second Edition - Morton I. Kamien 2013-04-17

Since its initial publication, this text has defined courses in dynamic optimization taught to economics and management science students. The two-part treatment covers the calculus of variations and optimal control. 1998 edition.

The Oxford Handbook of Computational Economics and Finance - Shu-Heng Chen 2018-01-12

The Oxford Handbook of Computational Economics and Finance provides a survey of both the foundations of and recent advances in the frontiers of analysis and action. It is both historically and interdisciplinarily rich and also tightly connected to the rise of digital society. It begins with the conventional view of computational economics, including recent algorithmic development in computing rational expectations, volatility, and general equilibrium. It then moves from traditional computing in economics and finance to recent developments in natural computing, including applications of nature-inspired intelligence, genetic programming, swarm intelligence, and fuzzy logic. Also examined are recent developments of network and agent-based computing in economics. How these approaches are applied is examined in chapters on such subjects as trading robots and automated markets. The last part deals with the epistemology of simulation in its trinity form with the integration of simulation, computation, and dynamics. Distinctive is the focus on natural computationalism and the examination of the implications of intelligent machines for the future of computational economics and finance. Not merely individual robots, but whole integrated systems are extending their "immigration" to the world of Homo sapiens, or symbiogenesis.

Optimal Control of Age-structured Populations in Economy, Demography, and the Environment - Raouf Boucekkine 2013-05-13

This book covers a wide range of topics within mathematical modelling and the optimization of economic, demographic, technological and environmental phenomena. Each chapter is written by experts in their field and represents new advances in modelling theory and practice.

These essays are exemplary of the fruitful interaction between theory and practice when exploring global and local changes. The unifying theme of the book is the use of mathematical models and optimization methods to describe age-structured populations in economy, demography, technological change, and the environment. Emphasis is placed on deterministic dynamic models that take age or size structures, delay effects, and non-standard decision variables into account. In addition, the contributions deal with the age structure of assets, resources, and populations under study. Interdisciplinary modelling has enormous potential for discovering new insights in global and regional development. Optimal Control of Age-structured Populations in Economy, Demography, and the Environment is a rich and excellent source of information on state-of-the-art modelling expertise and references. The book provides the necessary mathematical background for readers from different areas, such as applied sciences, management sciences and operations research, which helps guide the development of practical models. As well as this the book also surveys the current practice in applied modelling and looks at new research areas for a general mathematical audience. This book will be of interest primarily to researchers, postgraduate students, as well as a wider scientific community, including those focussing on the subjects of applied mathematics, environmental sciences, economics, demography, management, and operations research.

Modeling Dynamic Economic Systems - Matthias Ruth 1997

"The CD-ROM contains the run time version of the STELLA II software which is fully compatible with later versions of the software. All these versions of the software are collectively referred to in the text as STELLA" --back of title page.

Dynamic Modeling in Behavioral Ecology - Marc Mangel 2019-12-31

This book describes a powerful and flexible technique for the modeling of behavior, based on evolutionary principles. The technique employs stochastic dynamic programming and permits the analysis of behavioral adaptations wherein organisms respond to changes in their environment and in their own current physiological state. Models can be constructed to reflect sequential decisions concerned simultaneously with foraging, reproduction, predator avoidance, and other activities. The authors show how to construct and use dynamic behavioral models. Part I covers the mathematical background and computer programming, and then uses a paradigm of foraging under risk of predation to exemplify the general modeling technique. Part II consists of five "applied" chapters illustrating the scope of the dynamic modeling approach. They treat hunting behavior in lions, reproduction in insects, migrations of aquatic organisms, clutch size and parental care in birds, and movement of spiders and raptors. Advanced topics, including the study of dynamic evolutionarily stable strategies, are discussed in Part III.

Optimization in Economics and Finance - Bruce D. Craven 2005

Extends the optimization techniques, in a form that may be adopted for modeling social choice problems. The models in this book provide possible models for a society's social choice for an allocation that maximizes welfare and utilization of resources. A computer program SCOM is presented here for computing social choice models by optimal control.

Elements of Dynamic Optimization - Alpha C. Chiang 1999-12-22

In this text, Dr. Chiang introduces students to the most important methods of dynamic optimization used in economics. The classical calculus of variations, optimal control theory, and dynamic programming in its discrete form are explained in the usual Chiang fashion, with patience and thoroughness. The economic

examples, selected from both classical and recent literature, serve not only to illustrate applications of the mathematical methods, but also to provide a useful glimpse of the development of thinking in several areas of economics.

Resource Economics - Jon M. Conrad 2010-06-14

Resource Economics is a text for students with a background in calculus and intermediate microeconomics and a familiarity with the spreadsheet software Excel. The book covers basic concepts (Chapter 1), shows how to set up spreadsheets to solve simple dynamic allocation problems (Chapter 2), and presents economic models for fisheries, forestry, nonrenewable resources, and stock pollutants (Chapters 3–6). Chapter 7 examines the maximin utility criterion when the utility of a generation depends on consumption of a manufactured good, harvest from a renewable resource, and extraction from a nonrenewable resource. Within the text, numerical examples are posed and solved using Excel's Solver. Exercises are included at the end of each chapter. These problems help make concepts operational, develop economic intuition, and serve as a bridge to the study of real-world problems in resource management.

Ecological Economics - Stanislav E. Shmelev 2011-10-12

In a concise and crisp manner, this book presents the state of the art in ecological economics, an interdisciplinary field focused on the analysis of sustainability of global, national and regional economic systems. An elegant guide, the book offers a range of cutting edge methods used in sustainability research including multicriteria decision aid (MCDA), input-output analysis, and life cycle analysis. This book is packed with references for students with some background in economics, environmental science or mathematics who aim to develop the analytical skills required for redirecting our development path towards sustainability in government, international

organisations, academia, non-profit sector and business. As such, the book is primarily aimed at MSc and first year PhD students reading for degrees in Environmental Change and Management, Ecological Economics, Environmental Management, Philosophy, Politics and Economics, and those taking part in similar programmes. The book strives to develop the idea that a significant adjustment of the current economic theories is required, an idea supported by the emerged world economic crisis, the climatic and biodiversity crisis the world is currently facing and the enormously slow progress that has been made in the field of reorientation of the global economy towards sustainability. The practical case studies provided focus on the most pressing topics of today, and the book adopts a positive approach for problem solving and strategic development, which is aimed at educating the future decision makers and business leaders.

Applications of Simulation Methods in Environmental and Resource Economics - Riccardo Scarpa 2006-01-27

Simulation methods are revolutionizing the practice of applied economic analysis. In this book, leading researchers from around the world discuss interpretation issues, similarities and differences across alternative models, and propose practical solutions for the choice of the model and programming. Case studies show the practical use and the results brought forth by the different methods.

Elements of Numerical Mathematical Economics with Excel - Giovanni Romeo 2019-11-28

Elements of Numerical Mathematical Economics with Excel: Static and Dynamic Optimization shows readers how to apply static and dynamic optimization theory in an easy and practical manner, without requiring the mastery of specific programming languages that are often difficult and expensive to learn. Featuring user-friendly numerical discrete calculations developed within the Excel worksheets, the book

includes key examples and economic applications solved step-by-step and then replicated in Excel. After introducing the fundamental tools of mathematical economics, the book explores the classical static optimization theory of linear and nonlinear programming, applying the core concepts of microeconomics and some portfolio theory. This provides a background for the more challenging worksheet applications of the dynamic optimization theory. The book also covers special complementary topics such as inventory modelling, data analysis for business and economics, and the essential elements of Monte Carlo analysis. Practical and accessible, Elements of Numerical Mathematical Economics with Excel: Static and Dynamic Optimization increases the computing power of economists worldwide. This book is accompanied by a companion website that includes Excel examples presented in the book, exercises, and other supplementary materials that will further assist in understanding this useful framework. Explains how Excel provides a practical numerical approach to optimization theory and analytics Increases access to the economic applications of this universally-available, relatively simple software program Encourages readers to go to the core of theoretical continuous calculations and learn more about optimization processes

Salinity and Drainage in San Joaquin Valley, California - Andrew C. Chang 2013-11-19

This book documents the history of irrigated agriculture and drainage in the San Joaquin Valley, and describes the hydrology and biogeochemical processes of salts and selenium, remediation technologies for salts and trace elements and policy and management options. The contents are comprised of fourteen chapter-length independent treatises, each depicting with fresh perspective a distinctive salinity drainage topic. The opening chapters detail the evolution of irrigated agriculture, and depict the

geochemical and hydrological processes that define the San Joaquin Valley, including the physics, chemistry, and biology attributes that impact water management policies and strategies. Next, the contributors address the biogeochemistry of selenium, the role of plants in absorbing it from soils, and the processes involved in retaining and concentrating dissolved salts in drainage water. Further chapters describe on-farm and plot-level irrigation provisions to reduce agricultural drainage outputs and examine their effects on plant performance. This volume offers realistic policy analysis of water management options for irrigated agriculture in the Valley and assesses their respective outcomes, if implemented. Also included is an international perspective on the sustainability of irrigated agriculture there.

Issues in Ecological Research and Application: 2011 Edition - 2012-01-09

Issues in Ecological Research and Application: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Ecological Research and Application. The editors have built Issues in Ecological Research and Application: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Ecological Research and Application in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Ecological Research and Application: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Dynamic Economics - Gregory C. Chow 1997
This work presents the optimization framework for dynamic economics and treats a number of topics in economics, including growth, macroeconomics, microeconomics, finance and dynamic games. The book also teaches by examples, using concepts to solve simple problems, moving on to general propositions.
Dynamic Optimization in Environmental Economics - Elke Moser 2014-07-08
The book presents new developments in the dynamic modeling and optimization methods in environmental economics and provides a huge range of applications dealing with the economics of natural resources, the impacts of climate change and of environmental pollution, and respective policy measures. The interrelationship between economic activities and environmental quality, the development of cleaner technologies, the switch from fossil to renewable resources and the proper use of policy instruments play an important role along the path towards a sustainable future. Biological, physical and economic processes are naturally involved in the subject, and postulate the main modelling, simulation and decision-making tools: the methods of dynamic optimization and dynamic games.
Economic Analysis of Environmental Problems - Gregory C. Chow 2014-11
This book introduces the basic tools of dynamic optimization in economics to study environmental problems, applies econometric methods to estimate and test the models derived by dynamic optimization, and discusses environmental problems in a broad perspective, including the design and implementation of environmental policies. Although the coverage is selective, it represents what the author has to offer from his perspective and experience gained in research in dynamic optimization, econometrics and policy analysis, especially for China. The volume is self-contained for readers with mathematical background of first-year

graduate students in the analytical fields of science and engineering but only limited training in economics, while an economics text presumes more knowledge of economics. Once the tools are mastered, the reader can pursue his own research on the topic if he is interested, or simply become a more mature citizen in the global economy.

Computational Economics - David A. Kendrick 2011-10-23

The ability to conceptualize an economic problem verbally, to formulate it as a mathematical model, and then represent the mathematics in software so that the model can be solved on a computer is a crucial skill for economists. Computational Economics contains well-known models--and some brand-new ones--designed to help students move from verbal to mathematical to computational representations in economic modeling. The authors' focus, however, is not just on solving the models, but also on developing the ability to modify them to reflect one's interest and point of view. The result is a book that enables students to be creative in developing models that are relevant to the economic problems of their times. Unlike other computational economics textbooks, this book is organized around economic topics, among them macroeconomics, microeconomics, and finance. The authors employ various software systems--including MATLAB, Mathematica, GAMS, the nonlinear programming solver in Excel, and the database systems in Access--to enable students to use the most advantageous system. The book progresses from relatively simple models to more complex ones, and includes appendices on the ins and outs of running each program. The book is intended for use by advanced undergraduates and professional economists and even, as a first exposure to computational economics, by graduate students. Organized by economic topics Progresses from simple to more complex models Includes instructions on numerous

software systems Encourages customization and creativity