Introduction To Bayesian Econometrics

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A First Course in Bayesian Statistical Methods - Peter D. Hoff 2009-06-02
A self-contained introduction to probability, exchangeability and Bayes' rule provides a theoretical understanding of the applied material. Numerous examples with R-code that can be run "as-is" allow the reader to perform the data analyses themselves. The development of Monte Carlo and Markov chain Monte Carlo methods in the context of data analysis examples provides motivation for these computational methods.

Bayesian Essentials with R - Jean-Michel Marin 2013-10-28
This Bayesian modeling book provides a self-contained entry to computational Bayesian statistics. Focusing on the most standard statistical models and backed up by real datasets and an all-inclusive R (CRAN) package called bayess, the book provides an operational methodology for conducting Bayesian inference, rather than focusing on its theoretical and philosophical justifications. Readers are empowered to participate in the real-life data analysis situations depicted here from the beginning. Special attention is paid to the derivation of prior distributions in each case and specific reference solutions are given for each of the models. Similarly, computational details are worked out to lead the reader towards an effective programming of the methods given in the book. In particular, all R codes are discussed with enough detail to make them readily understandable and expandable. Bayesian Essentials with R can be used as a textbook at both undergraduate and graduate levels. It is particularly useful with students in professional degree programs and scientists to analyze data the Bayesian way. The text will also enhance introductory courses on Bayesian statistics. Prerequisites for the book are an undergraduate background in probability and statistics, if not in Bayesian statistics.

Bayesian Data Analysis for the Behavioral and Neural Sciences - Todd E. Hudson 2021-06-24
Bayesian analyses go beyond frequentist techniques of p-values and null hypothesis tests, providing a modern understanding of data analysis.

Bayesian Econometric Methods - Joshua Chan 2019-08-15
Bayesian Econometric Methods examines principles of Bayesian inference by posing a series of theoretical and applied questions and providing detailed solutions to those questions. This second edition adds extensive coverage of models popular in finance and macroeconomics, including state space and unobserved components models, stochastic volatility models, ARCH, GARCH, and vector autoregressive models. The authors have also added many new exercises related to Gibbs sampling and Markov Chain Monte Carlo (MCMC) methods. The text includes regression-based and hierarchical specifications, models based upon latent variable representations, and mixture and time series specifications. MCMC methods are discussed and illustrated in detail - from introductory applications to those at the current research frontier - and MATLAB® computer programs are provided on the website accompanying the text. Suitable for graduate study in economics, the text should also be of interest to students studying statistics, finance, marketing, and agricultural economics.

Introduction to Bayesian Statistics - William M. Bolstad 2013-06-05
Praise for the First Edition "I cannot think of a better book for teachers of introductory statistics who want a readable and pedagogically sound text to introduce Bayesian statistics." —Statistics in Medical Research "[This book] is written in a lucid conversational style, which is so rare in mathematical writings. It does an excellent job of presenting Bayesian statistics as a perfectly reasonable approach to elementary problems in

statistics." —STATS: The Magazine for Students of Statistics, American Statistical Association "Bolstad offers clear explanations of every concept and method making the book accessible and valuable to undergraduate and graduate students alike." —Journal of Applied Statistics The use of Bayesian methods in applied statistical analysis has become increasingly popular, yet most introductory statistics texts continue to only present the subject using frequentist methods. Introduction to Bayesian Statistics, Second Edition focuses on Bayesian methods that can be used for inference, and it also addresses how these methods compare favorably with frequentist alternatives. Teaching statistics from the Bayesian perspective allows for direct probability statements about parameters, and this approach is now more relevant than ever due to computer programs that allow practitioners to work on problems that contain many parameters. This book uniquely covers the topics typically found in an introductory statistics book—but from a Bayesian perspective—giving readers an advantage as they enter fields where statistics is used. This Second Edition provides: Extended coverage of Poisson and Gamma distributions Two new chapters on Bayesian inference for Poisson observations and Bayesian inference for the standard deviation for normal observations A twenty-five percent increase in exercises with selected answers at the end of the book A calculus refresher appendix and a summary on the use of statistical tables New computer exercises that use R functions and Minitab® macros for Bayesian analysis and Monte Carlo simulations Introduction to Bayesian Statistics, Second Edition is an invaluable textbook for advanced undergraduate and graduate-level statistics courses as well as a practical reference for statisticians who require a working knowledge of Bayesian statistics.

Bayesian Risk Management - Matt Sekerke 2015-08-19
A risk measurement and management framework that takes model risk seriously Most financial risk models assume the future will look like the past, but effective risk management depends on identifying fundamental changes in the marketplace as they occur. Bayesian Risk Management details a more flexible approach to risk management, and provides tools to measure financial risk in a dynamic market environment. This book opens discussion about uncertainty in model parameters, model specifications, and model-driven forecasts in a way that standard statistical risk measurement does not. And unlike current machine learning-based methods, the framework presented here allows you to measure risk in a fully-Bayesian setting without losing the structure afforded by parametric risk and asset-pricing models. Recognize the assumptions embodied in classical statistics Quantify model risk along multiple dimensions without backtesting Model time series without assuming stationarity Estimate state-space time series models online with simulation methods Uncover uncertainty in workhorse risk and asset-pricing models Embed Bayesian thinking about risk within a complex organization Ignoring uncertainty in risk modeling creates an illusion of mastery and fosters erroneous decision-making. Firms who ignore the many dimensions of model risk measure too little risk, and end up taking on too much. Bayesian Risk Management provides a roadmap to better risk management through more circumspect measurement, with comprehensive treatment of model uncertainty.

Bayesian and Frequentist Regression Methods - Jon Wakefield 2013-01-04
Bayesian and Frequentist Regression Methods provides a modern account of both Bayesian and frequentist methods of regression analysis. Many texts cover one or the other of the approaches, but this is the most comprehensive combination of Bayesian and frequentist methods that exists in one place. The two philosophical approaches to regression methodology are featured here as complementary techniques, with

theory and data analysis providing supplementary components of the discussion. In particular, methods are illustrated using a variety of data sets. The majority of the data sets are drawn from biostatistics but the techniques are generalizable to a wide range of other disciplines.

Bayesian Multivariate Time Series Methods for Empirical Macroeconomics - Gary Koop 2010
Bayesian Multivariate Time Series Methods for Empirical Macroeconomics provides a survey of the Bayesian methods used in modern empirical macroeconomics.

Introduction to Bayesian Econometrics - Edward Greenberg 2012-11-12
This textbook explains the basic ideas of subjective probability and shows how subjective probabilities must obey the usual rules of probability to ensure coherency. It defines the likelihood function, prior distributions and posterior distributions. It explains how posterior distributions are the basis for inference and explores their basic properties. Various methods of specifying prior distributions are considered, with special emphasis on subject-matter considerations and exchange ability. The regression model is examined to show how analytical methods may fail in the derivation of marginal posterior distributions. The remainder of the book is concerned with applications of the theory to important models that are used in economics, political science, biostatistics and other applied fields. New to the second edition is a chapter on semiparametric regression and new sections on the ordinal probit, item response, factor analysis, ARCH-GARCH and stochastic volatility models. The new edition also emphasizes the R programming language.

An Introduction to Bayesian Inference in Econometrics - Arnold Zellner 1996-08-17
This is a classical reprint edition of the original 1971 edition of An Introduction to Bayesian Inference in Economics. This historical volume is an early introduction to Bayesian inference and methodology which still has lasting value for today's statistician and student. The coverage ranges from the fundamental concepts and operations of Bayesian inference to analysis of applications in specific econometric problems and the testing of hypotheses and models.

Bayesian Methods in Finance - Svetlozar T. Rachev 2008-05-02
Bayesian Methods in Finance provides a detailed overview of the theory of Bayesian methods and explains their real-world applications to financial modeling. While the principles and concepts explained throughout the book can be used in financial modeling and decision making in general, the authors focus on portfolio management and market risk management—since these are the areas in finance where Bayesian methods have had the greatest penetration to date.

Probability and Statistics for Economists - Bruce Hansen 2022-06-28
A comprehensive and up-to-date introduction to the mathematics that all economics students need to know Probability theory is the quantitative language used to handle uncertainty and is the foundation of modern statistics. Probability and Statistics for Economists provides graduate and PhD students with an essential introduction to mathematical probability and statistical theory, which are the basis of the methods used in econometrics. This incisive textbook teaches fundamental concepts, emphasizes modern, real-world applications, and gives students an intuitive understanding of the mathematics that every economist needs to know. Covers probability and statistics with mathematical rigor while emphasizing intuitive explanations that are accessible to economics students of all backgrounds Discusses random variables, parametric and multivariate distributions, sampling, the law of large numbers, central limit theory, maximum likelihood estimation, numerical optimization, hypothesis testing, and more Features hundreds of exercises that enable students to learn by doing Includes an in-depth appendix summarizing important mathematical results as well as a wealth of real-world examples Can serve as a core textbook for a first-semester PhD course in econometrics and as a companion book to Bruce E. Hansen's Econometrics Also an invaluable reference for researchers and practitioners

Introduction to Bayesian Statistics - Karl-Rudolf Koch 2007-10-08
This book presents Bayes' theorem, the estimation of unknown parameters, the determination of confidence regions and the derivation of tests of hypotheses for the unknown parameters. It does so in a simple manner that is easy to comprehend. The book compares traditional and Bayesian methods with the rules of probability presented in a logical way allowing an intuitive understanding of random variables and their probability distributions to be formed.

Intermediate Statistics and Econometrics - Dale J. Poirier 1995
The standard introductory texts to mathematical statistics leave the Bayesian approach to be taught later in advanced topics courses—giving students the impression that Bayesian statistics provide but a few techniques appropriate in only special circumstances. Nothing could be further from the truth, argues Dale Poirier, who has developed a course for teaching comparatively both the classical and the Bayesian approaches to econometrics. Poirier's text provides a thoroughly modern, self-contained, comprehensive, and accessible treatment of the probability and statistical foundations of econometrics with special emphasis on the linear regression model. Written primarily for advanced undergraduate and graduate students who are pursuing research careers in economics, Intermediate Statistics and Econometrics offers a broad perspective, bringing together a great deal of diverse material. Its comparative approach, emphasis on regression and prediction, and numerous exercises and references provide a solid foundation for subsequent courses in econometrics and will prove a valuable resource to many nonspecialists who want to update their quantitative skills. The introduction closes with an example of a real-world data set—the Challenger space shuttle disaster—that motivates much of the text's theoretical discussion. The ten chapters that follow cover basic concepts, special distributions, distributions of functions of random variables, sampling theory, estimation, hypothesis testing, prediction, and the linear regression model. Appendixes contain a review of matrix algebra, computation, and statistical tables.

Introductory Econometrics - P. J. Dhrymes 2012-12-06
This book has taken form over several years as a result of a number of courses taught at the University of Pennsylvania and at Columbia University and a series of lectures I have given at the International Monetary Fund. Indeed, I began writing down my notes systematically during the academic year 1972-1973 while at the University of California, Los Angeles. The diverse character of the audience, as well as my own conception of what an introductory and often terminal acquaintance with formal econometrics ought to encompass, have determined the style and content of this volume. The selection of topics and the level of discourse give sufficient variety so that the book can serve as the basis for several types of courses. As an example, a relatively elementary one-semester course can be based on Chapters one through five, omitting the appendices to these chapters and a few sections in some of the chapters so indicated. This would acquaint the student with the basic theory of the general linear model, some of the prob lems often encountered in empirical research, and some proposed solutions. For such a course, I should also recommend a brief excursion into Chapter seven (logit and pro bit analysis) in view of the increasing availability of data sets for which this type of analysis is more suitable than that based on the general linear model.

Introduction to Modern Bayesian Econometrics - Tony Lancaster 2004-06-28
Almost two hundred and forty years ago, an English clergyman named Thomas Bayes developed a method to calculate the chances of uncertain events. While his method has extensive applications to the work of applied economists, it is only recent advances in computing that have made it possible to exploit the full power of the Bayesian way of doing applied economics.In this new and expanding area, Tony Lancasters text provides a comprehensive introduction to the Bayesian way of doing applied economics. Using clear explanations and practical illustrations and problems, the text presents innovative, computer-intensive ways for applied economists to use the Bayesian method.The Introduction emphasizes computation and the study of probability distributions by computer sampling, showing how these techniques can provide exact inferences about a wide range of econometric problems. Covering all the standard econometric models, including linear and non-linear regression using cross-sectional, time series, and panel data, it also details causal inference and inference about structural econometric models. In addition, each chapter includes numerical and graphical examples and demonstrates their solutions using the S programming language and Bugs software.

Bayesian Econometrics - Mauro Bernardi 2020-12-28
Since the advent of Markov chain Monte Carlo (MCMC) methods in the early 1990s, Bayesian methods have been proposed for a large and growing number of applications. One of the main advantages of Bayesian inference is the ability to deal with many different sources of uncertainty, including data, models, parameters and parameter restriction uncertainties, in a unified and coherent framework. This book contributes to this literature by collecting a set of carefully evaluated contributions that are grouped

amongst two topics in financial economics. The first three papers refer to macro-finance issues for real economy, including the elasticity of factor substitution (ES) in the Cobb–Douglas production function, the effects of government public spending components, and quantitative easing, monetary policy and economics. The last three contributions focus on cryptocurrency and stock market predictability. All arguments are central ingredients in the current economic discussion and their importance has only been further emphasized by the COVID-19 crisis.

Bayesian Non- and Semi-parametric Methods and Applications - Peter Rossi 2014-04-27
This book reviews and develops Bayesian non-parametric and semi-parametric methods for applications in microeconometrics and quantitative marketing. Most econometric models used in microeconomics and marketing applications involve arbitrary distributional assumptions. As more data becomes available, a natural desire to provide methods that relax these assumptions arises. Peter Rossi advocates a Bayesian approach in which specific distributional assumptions are replaced with more flexible distributions based on mixtures of normals. The Bayesian approach can use either a large but fixed number of normal components in the mixture or an infinite number bounded only by the sample size. By using flexible distributional approximations instead of fixed parametric models, the Bayesian approach can reap the advantages of an efficient method that models all of the structure in the data while retaining desirable smoothing properties. Non-Bayesian non-parametric methods often require additional ad hoc rules to avoid "overfitting," in which resulting density approximates are nonsmooth. With proper priors, the Bayesian approach largely avoids overfitting, while retaining flexibility. This book provides methods for assessing informative priors that require only simple data normalizations. The book also applies the mixture of the normals approximation method to a number of important models in microeconometrics and marketing, including the non-parametric and semi-parametric regression models, instrumental variables problems, and models of heterogeneity. In addition, the author has written a free online software package in R, "bayesm," which implements all of the non-parametric models discussed in the book.

Bayesian Theory - José M. Bernardo 2009-09-25
This highly acclaimed text, now available in paperback, provides a thorough account of key concepts and theoretical results, with particular emphasis on viewing statistical inference as a special case of decision theory. Information-theoretic concepts play a central role in the development of the theory, which provides, in particular, a detailed discussion of the problem of specification of so-called prior ignorance . The work is written from the authors s committed Bayesian perspective, but an overview of non-Bayesian theories is also provided, and each chapter contains a wide-ranging critical re-examination of controversial issues. The level of mathematics used is such that most material is accessible to readers with knowledge of advanced calculus. In particular, no knowledge of abstract measure theory is assumed, and the emphasis throughout is on statistical concepts rather than rigorous mathematics. The book will be an ideal source for all students and researchers in statistics, mathematics, decision analysis, economic and business studies, and all branches of science and engineering, who wish to further their understanding of Bayesian statistics

Bayesian Econometrics - Gary Koop 2003
Researchers in many fields are increasingly finding the Bayesian approach to statistics to be an attractive one. This book introduces the reader to the use of Bayesian methods in the field of econometrics at the advanced undergraduate or graduate level. The book is self-contained and does not require that readers have previous training in econometrics. The focus is on models used by applied economists and the computational techniques necessary to implement Bayesian methods when doing empirical work. Topics covered in the book include the regression model (and variants applicable for use with panel data), time series models, models for qualitative or censored data, nonparametric methods and Bayesian model averaging. The book includes numerous empirical examples and the website associated with it contains data sets and computer programs to help the student develop the computational skills of modern Bayesian econometrics.

Bayes' Rule - James V. Stone 2013-06-01
In this richly illustrated book, a range of accessible examples are used to show how Bayes' rule is actually a natural consequence of commonsense reasoning. The tutorial style of writing, combined with a comprehensive glossary, makes this an ideal primer for the novice who wishes to become familiar with the basic principles of Bayesian analysis.

Bayesian Methods in Health Economics - Gianluca Baio 2012-11-12
Health economics is concerned with the study of the cost-effectiveness of health care interventions. This book provides an overview of Bayesian methods for the analysis of health economic data. After an introduction to the basic economic concepts and methods of evaluation, it presents Bayesian statistics using accessible mathematics. The next chapters describe the theory and practice of cost-effectiveness analysis from a statistical viewpoint, and Bayesian computation, notably MCMC. The final chapter presents three detailed case studies covering cost-effectiveness analyses using individual data from clinical trials, evidence synthesis and hierarchical models and Markov models. The text uses WinBUGS and JAGS with datasets and code available online.

Bayesian Methods for Hackers - Cameron Davidson-Pilon 2015-09-30
Master Bayesian Inference through Practical Examples and Computation–Without Advanced Mathematical Analysis Bayesian methods of inference are deeply natural and extremely powerful. However, most discussions of Bayesian inference rely on intensely complex mathematical analyses and artificial examples, making it inaccessible to anyone without a strong mathematical background. Now, though, Cameron Davidson-Pilon introduces Bayesian inference from a computational perspective, bridging theory to practice–freeing you to get results using computing power. Bayesian Methods for Hackers illuminates Bayesian inference through probabilistic programming with the powerful PyMC language and the closely related Python tools NumPy, SciPy, and Matplotlib. Using this approach, you can reach effective solutions in small increments, without extensive mathematical intervention. Davidson-Pilon begins by introducing the concepts underlying Bayesian inference, comparing it with other techniques and guiding you through building and training your first Bayesian model. Next, he introduces PyMC through a series of detailed examples and intuitive explanations that have been refined after extensive user feedback. You'll learn how to use the Markov Chain Monte Carlo algorithm, choose appropriate sample sizes and priors, work with loss functions, and apply Bayesian inference in domains ranging from finance to marketing. Once you've mastered these techniques, you'll constantly turn to this guide for the working PyMC code you need to jumpstart future projects. Coverage includes • Learning the Bayesian "state of mind" and its practical implications • Understanding how computers perform Bayesian inference • Using the PyMC Python library to program Bayesian analyses • Building and debugging models with PyMC • Testing your model's "goodness of fit" • Opening the "black box" of the Markov Chain Monte Carlo algorithm to see how and why it works • Leveraging the power of the "Law of Large Numbers" • Mastering key concepts, such as clustering, convergence, autocorrelation, and thinning • Using loss functions to measure an estimate's weaknesses based on your goals and desired outcomes • Selecting appropriate priors and understanding how their influence changes with dataset size • Overcoming the "exploration versus exploitation" dilemma: deciding when "pretty good" is good enough • Using Bayesian inference to improve A/B testing • Solving data science problems when only small amounts of data are available Cameron Davidson-Pilon has worked in many areas of applied mathematics, from the evolutionary dynamics of genes and diseases to stochastic modeling of financial prices. His contributions to the open source community include lifelines, an implementation of survival analysis in Python. Educated at the University of Waterloo and at the Independent University of Moscow, he currently works with the online commerce leader Shopify.

Bayesian Estimation of DSGE Models - Edward P. Herbst 2015-12-29
Dynamic stochastic general equilibrium (DSGE) models have become one of the workhorses of modern macroeconomics and are extensively used for academic research as well as forecasting and policy analysis at central banks. This book introduces readers to state-of-the-art computational techniques used in the Bayesian analysis of DSGE models. The book covers Markov chain Monte Carlo techniques for linearized DSGE models, novel sequential Monte Carlo methods that can be used for parameter inference, and the estimation of nonlinear DSGE models based on particle filter approximations of the likelihood function. The theoretical foundations of the algorithms are discussed in depth, and detailed empirical applications and numerical illustrations are provided. The book also gives invaluable advice on how to tailor these algorithms to specific applications and assess the accuracy and reliability of the computations. Bayesian Estimation of DSGE Models is essential reading for graduate students, academic researchers, and

practitioners at policy institutions.

The Oxford Handbook of Bayesian Econometrics - John Geweke 2011-09-29
Bayesian econometric methods have enjoyed an increase in popularity in recent years. Econometricians, empirical economists, and policymakers are increasingly making use of Bayesian methods. This handbook is a single source for researchers and policymakers wanting to learn about Bayesian methods in specialized fields, and for graduate students seeking to make the final step from textbook learning to the research frontier. It contains contributions by leading Bayesians on the latest developments in their specific fields of expertise. The volume provides broad coverage of the application of Bayesian econometrics in the major fields of economics and related disciplines, including macroeconomics, microeconomics, finance, and marketing. It reviews the state of the art in Bayesian econometric methodology, with chapters on posterior simulation and Markov chain Monte Carlo methods, Bayesian nonparametric techniques, and the specialized tools used by Bayesian time series econometricians such as state space models and particle filtering. It also includes chapters on Bayesian principles and methodology.

A Student's Guide to Bayesian Statistics - Ben Lambert 2018-04-20
Supported by a wealth of learning features, exercises, and visual elements as well as online video tutorials and interactive simulations, this book is the first student-focused introduction to Bayesian statistics. Without sacrificing technical integrity for the sake of simplicity, the author draws upon accessible, student-friendly language to provide approachable instruction perfectly aimed at statistics and Bayesian newcomers. Through a logical structure that introduces and builds upon key concepts in a gradual way and slowly acclimatizes students to using R and Stan software, the book covers: An introduction to probability and Bayesian inference Understanding Bayes' rule Nuts and bolts of Bayesian analytic methods Computational Bayes and real-world Bayesian analysis Regression analysis and hierarchical methods This unique guide will help students develop the statistical confidence and skills to put the Bayesian formula into practice, from the basic concepts of statistical inference to complex applications of analyses.

A Guide to Econometrics - Peter Kennedy 2008-02-19
This is the perfect (and essential) supplement for all econometrics classes--from a rigorous first undergraduate course, to a first master's, to a PhD course. Explains what is going on in textbooks full of proofs and formulas Offers intuition, skepticism, insights, humor, and practical advice (dos and don'ts) Contains new chapters that cover instrumental variables and computational considerations Includes additional information on GMM, nonparametrics, and an introduction to wavelets

Simulation-based Inference in Econometrics - Roberto Mariano 2000-07-20
An overview of the techniques and practices involved in simulation-based inference.

Introduction to Spatial Econometrics - James LeSage 2009-01-20
Although interest in spatial regression models has surged in recent years, a comprehensive, up-to-date text on these approaches does not exist. Filling this void, Introduction to Spatial Econometrics presents a variety of regression methods used to analyze spatial data samples that violate the traditional assumption of independence between observations. It explores a wide range of alternative topics, including maximum likelihood and Bayesian estimation, various types of spatial regression specifications, and applied modeling situations involving different circumstances. Leaders in this field, the authors clarify the often-mystifying phenomenon of simultaneous spatial dependence. By presenting new methods, they help with the interpretation of spatial regression models, especially ones that include spatial lags of the dependent variable. The authors also examine the relationship between spatiotemporal processes and long-run equilibrium states that are characterized by simultaneous spatial dependence. MATLAB® toolboxes useful for spatial econometric estimation are available on the authors' websites. This work covers spatial econometric modeling as well as numerous applied illustrations of the methods. It encompasses many recent advances in spatial econometric models—including some previously unpublished results.

Financial Econometrics - Nguyen Ngoc Thach 2022
This book overviews latest ideas and developments in financial econometrics, with an emphasis on how to best use prior knowledge (e.g., Bayesian way) and how to best use successful data processing techniques from other application areas (e.g., from quantum physics). The book also covers applications to economy-related phenomena ranging from traditionally analyzed phenomena such as manufacturing, food industry,

and taxes, to newer-to-analyze phenomena such as cryptocurrencies, influencer marketing, COVID-19 pandemic, financial fraud detection, corruption, and shadow economy. This book will inspire practitioners to learn how to apply state-of-the-art Bayesian, quantum, and related techniques to economic and financial problems and inspire researchers to further improve the existing techniques and come up with new techniques for studying economic and financial phenomena. The book will also be of interest to students interested in latest ideas and results.

Introduction to Modern Bayesian Econometrics - Tony Lancaster 2004-06-18
In this new and expanding area, Tony Lancaster's text is the first comprehensive introduction to the Bayesian way of doing applied economics. Uses clear explanations and practical illustrations and problems to present innovative, computer-intensive ways for applied economists to use the Bayesian method; Emphasizes computation and the study of probability distributions by computer sampling; Covers all the standard econometric models, including linear and non-linear regression using cross-sectional, time series, and panel data; Details causal inference and inference about structural econometric models; Includes numerical and graphical examples in each chapter, demonstrating their solutions using the S programming language and Bugs software Supported by online supplements, including Data Sets and Solutions to Problems, at www.blackwellpublishing.com/lancaster

Introduction to Bayesian Estimation and Copula Models of Dependence - Arkady Shemyakin 2017-03-03
Presents an introduction to Bayesian statistics, presents an emphasis on Bayesian methods (prior and posterior), Bayes estimation, prediction, MCMC,Bayesian regression, and Bayesian analysis of statistical modelsof dependence, and features a focus on copulas for risk management Introduction to Bayesian Estimation and Copula Models of Dependence emphasizes the applications of Bayesian analysis to copula modeling and equips readers with the tools needed to implement the procedures of Bayesian estimation in copula models of dependence. This book is structured in two parts: the first four chapters serve as a general introduction to Bayesian statistics with a clear emphasis on parametric estimation and the following four chapters stress statistical models of dependence with a focus of copulas. A review of the main concepts is discussed along with the basics of Bayesian statistics including prior information and experimental data, prior and posterior distributions, with an emphasis on Bayesian parametric estimation. The basic mathematical background of both Markov chains and Monte Carlo integration and simulation is also provided. The authors discuss statistical models of dependence with a focus on copulas and present a brief survey of pre-copula dependence models. The main definitions and notations of copula models are summarized followed by discussions of real-world cases that address particular risk management problems. In addition, this book includes: • Practical examples of copulas in use including within the Basel Accord II documents that regulate the world banking system as well as examples of Bayesian methods within current FDA recommendations • Step-by-step procedures of multivariate data analysis and copula modeling, allowing readers to gain insight for their own applied research and studies • Separate reference lists within each chapter and end-of-the-chapter exercises within Chapters 2 through 8 • A companion website containing appendices: data files and demo files in Microsoft® Office Excel®, basic code in R, and selected exercise solutions Introduction to Bayesian Estimation and Copula Models of Dependence is a reference and resource for statisticians who need to learn formal Bayesian analysis as well as professionals within analytical and risk management departments of banks and insurance companies who are involved in quantitative analysis and forecasting. This book can also be used as a textbook for upper-undergraduate and graduate-level courses in Bayesian statistics and analysis. ARKADY SHEMYAKIN, PhD, is Professor in the Department of Mathematics and Director of the Statistics Program at the University of St. Thomas. A member of the American Statistical Association and the International Society for Bayesian Analysis, Dr. Shemyakin's research interests include informationtheory, Bayesian methods of parametric estimation, and copula models in actuarial mathematics, finance, and engineering. ALEXANDER KNIAZEV, PhD, is Associate Professor and Head of the Department of Mathematics at Astrakhan State University in Russia. Dr. Kniazev's research interests include representation theory of Lie algebras and finite groups, mathematical statistics, econometrics, and financial mathematics.

Contemporary Bayesian Econometrics and Statistics - John Geweke 2005-10-03

Tools to improve decision making in an imperfect world This publication provides readers with a thorough understanding ofBayesian analysis that is grounded in the theory of inference andoptimal decision making. Contemporary Bayesian Econometrics andStatistics provides readers with state-of-the-art simulationmethods and models that are used to solve complex real-worldproblems. Armed with a strong foundation in both theory andpractical problem-solving tools, readers discover how to optimizedecision making when faced with problems that involve limited orimperfect data. The book begins by examining the theoretical and mathematicalfoundations of Bayesian statistics to help readers understand howand why it is used in problem solving. The author then describeshow modern simulation methods make Bayesian approaches practicalusing widely available mathematical applications software. Inaddition, the author details how models can be applied to specificproblems, including: * Linear models and policy choices * Modeling with latent variables and missing data * Time series models and prediction * Comparison and evaluation of models The publication has been developed and fine- tuned through a decadeof classroom experience, and readers will find the author'sapproach very engaging and accessible. There are nearly 200examples and exercises to help readers see how effective use ofBayesian statistics enables them to make optimal decisions. MATLAB?and R computer programs are integrated throughout the book. Anaccompanying Web site provides readers with computer code for manyexamples and datasets. This publication is tailored for research professionals who useeconometrics and similar statistical methods in their work. Withits emphasis on practical problem solving and extensive use ofexamples and exercises, this is also an excellent textbook forgraduate-level students in a broad range of fields, includingeconomics, statistics, the social sciences, business, and publicpolicy.

Bayesian Data Analysis, Third Edition - Andrew Gelman 2013-11-01
Now in its third edition, this classic book is widely considered the leading text on Bayesian methods, lauded for its accessible, practical approach to analyzing data and solving research problems. Bayesian Data Analysis, Third Edition continues to take an applied approach to analysis using up-to-date Bayesian methods. The authors—all leaders in the statistics community—introduce basic concepts from a data-analytic perspective before presenting advanced methods. Throughout the text, numerous worked examples drawn from real applications and research emphasize the use of Bayesian inference in practice. New to the Third Edition Four new chapters on nonparametric modeling Coverage of weakly informative priors and boundary-avoiding priors Updated discussion of cross-validation and predictive information criteria Improved convergence monitoring and effective sample size calculations for iterative simulation Presentations of Hamiltonian Monte Carlo, variational Bayes, and expectation propagation New and revised software code The book can be used in three different ways. For undergraduate students, it introduces Bayesian inference starting from first principles. For graduate students, the text presents effective current approaches to Bayesian modeling and computation in statistics and related fields. For researchers, it provides an assortment of Bayesian methods in applied statistics. Additional materials, including data sets used in the examples, solutions to selected exercises, and software instructions, are available on the book's web page.

Computational Bayesian Statistics - M. Antónia Amaral Turkman 2019-02-28
This integrated introduction to fundamentals, computation, and software is your key to understanding and using advanced Bayesian methods.

Bayesian Inference in Dynamic Econometric Models - Luc Bauwens 2000-01-06
This book contains an up-to-date coverage of the last twenty years advances in Bayesian inference in econometrics, with an emphasis on dynamic models. It shows how to treat Bayesian inference in non linear models, by integrating the useful developments of numerical integration techniques based on simulations (such as Markov Chain Monte Carlo methods), and the long available analytical results of Bayesian

inference for linear regression models. It thus covers a broad range of rather recent models for economic time series, such as non linear models, autoregressive conditional heteroskedastic regressions, and cointegrated vector autoregressive models. It contains also an extensive chapter on unit root inference from the Bayesian viewpoint. Several examples illustrate the methods.

Bayesian Nonparametrics - J.K. Ghosh 2006-05-11
This book is the first systematic treatment of Bayesian nonparametric methods and the theory behind them. It will also appeal to statisticians in general. The book is primarily aimed at graduate students and can be used as the text for a graduate course in Bayesian non-parametrics.

Introduction to Bayesian Econometrics - Edward Greenberg 2013
This textbook explains the basic ideas of subjective probability and shows how subjective probabilities must obey the usual rules of probability to ensure coherency. It defines the likelihood function, prior distributions and posterior distributions. It explains how posterior distributions are the basis for inference and explores their basic properties. Various methods of specifying prior distributions are considered, with special emphasis on subject-matter considerations and exchange ability. The regression model is examined to show how analytical methods may fail in the derivation of marginal posterior distributions. The remainder of the book is concerned with applications of the theory to important models that are used in economics, political science, biostatistics and other applied fields. New to the second edition is a chapter on semiparametric regression and new sections on the ordinal probit, item response, factor analysis, ARCH-GARCH and stochastic volatility models. The new edition also emphasizes the R programming language.

Introduction to Statistics and Econometrics - Takeshi Amemiya 1994
Comic Amy Schumer performs a stand-up set in San Francisco devoted to various aspects of her sex life and her feelings about her own body. ~ Perry Seibert, Rovi

Bayesian Computation with R - Jim Albert 2007
There has been a dramatic growth in the development and application of Bayesian inferential methods. Some of this growth is due to the availability of powerful simulation-based algorithms to summarize posterior distributions. There has been also a growing interest in the use of the system R for statistical analyses. R's open source nature, free availability, and large number of contributor packages have made R the software of choice for many statisticians in education and industry.Bayesian Computation with R introduces Bayesian modeling by the use of computation using the R language. The early chapters present the basic tenets of Bayesian thinking by use of familiar one and two-parameter inferential problems. Bayesian computational methods such as Laplace's method, rejection sampling, and the SIR algorithm are illustrated in the context of a random effects model. The construction and implementation of Markov Chain Monte Carlo (MCMC) methods is introduced. These simulation-based algorithms are implemented for a variety of Bayesian applications such as normal and binary response regression, hierarchical modeling, order-restricted inference, and robust modeling. Algorithms written in R are used to develop Bayesian tests and assess Bayesian models by use of the posterior predictive distribution. The use of R to interface with WinBUGS, a popular MCMC computing language, is described with several illustrative examples.This book is a suitable companion book for an introductory course on Bayesian methods and is valuable to the statistical practitioner who wishes to learn more about the R language and Bayesian methodology. The LearnBayes package, written by the author and available from the CRAN website, contains all of the R functions described in the book.The second edition contains several new topics such as the use of mixtures of conjugate priors and the use of Zellner's g priors to choose between models in linear regression. There are more illustrations of the construction of informative prior distributions, such as the use of conditional means priors and multivariate normal priors in binary regressions. The new edition contains changes in the R code illustrations according to the latest edition of the LearnBayes package.