Econometric Modeling A Likelihood Approach

Econometric Modeling provides a new and stimulating introduction to econometrics, focusing on modeling. The key issue confronting empirical economics is to establish sustainable relationships that are both supported by data and interpretable from economic theory. The unified likelihood-based approach of this book gives students the required statistical foundations of estimation and inference, and leads to a thorough understanding of econometric techniques. David Hendry and Bent Nielsen introduce modeling for a range of situations, including binary data sets, multiple regression, and cointegrated systems. In each setting, a statistical model is constructed to explain the observed variation in the data, with estimation and inference based on the likelihood function. Substantive issues are always addressed, showing how both statistical and economic assumptions can be tested and empirical results interpreted. Important empirical problems such as structural breaks, forecasting, and model selection are covered, and Monte Carlo simulation is explained and applied. Econometric Modeling is a self-contained introduction for advanced undergraduate or graduate students. Throughout, data illustrate and motivate the approach, and are available for computer-based teaching. Technical issues from probability theory and statistical theory are introduced only as needed. Nevertheless, the approach is rigorous, emphasizing the coherent formulation, estimation, and evaluation of econometric models relevant for empirical research.

In the 16th Edition of Advances in Econometrics we present twelve papers discussing the current interface between Marketing and Econometrics. The authors are leading scholars in the fields and introduce the latest models for analysing marketing data. The papers are representative of the types of problems and methods that are used within the field of marketing. Marketing focuses on the interaction between the firm and the consumer. Economics encompasses this interaction as well as many others. Economics, along with psychology and sociology, provides a theoretical foundation for marketing. Given the applied nature of marketing research, measurement and quantitative issues arise frequently. Quantitative marketing tends to rely heavily upon statistics and econometrics. However, quantitative marketing can place a different emphasis upon the problem than econometrics, even when using the same techniques. A basic difference between quantitative marketing research and econometrics tends to be the pragmatism that is found in many marketing studies. Another important motivating factor in marketing research is the type of data that is available. Applied econometrics tends to rely heavily on data collected by governmental organizations. In contrast marketing often uses data collected by private firms or marketing research firms. Observational and survey data are quite similar to those used in econometrics. However, the remaining types of data, panel and transactional, can look quite different from what may be familiar to econometricians. The automation and computerization of much of the sales transaction process leaves an audit trail that results in huge quanitities of data. A popular area of study is the use of scanner data collected at the checkout stand using bar code readers. Methods that work for small data sets may not work well in these larger data sets. In addition, new sources of data, such as clickstream data from a web site, will offer new challenges. This volume addresses these and related issues.

In addition to econometric essentials, this book covers important new extensions as well as how to get standard errors right. The authors explain why fancier econometric techniques are typically unnecessary and even dangerous.

Spatial Econometrics provides a modern, powerful and flexible skillset to early career researchers interested in entering this rapidly expanding discipline. It articulates the principles and current practice of modern spatial econometrics and spatial statistics, combining

rigorous depth of presentation with unusual depth of coverage. Introducing and formalizing the principles of, and 'need' for, models which define spatial interactions, the book provides a comprehensive framework for almost every major facet of modern science. Subjects covered at length include spatial regression models, weighting matrices, estimation procedures and the complications associated with their use. The work particularly focuses on models of uncertainty and estimation under various complications relating to model specifications, data problems, tests of hypotheses, along with systems and panel data extensions which are covered in exhaustive detail. Extensions discussing pre-test procedures and Bayesian methodologies are provided at length. Throughout, direct applications of spatial models are described in detail, with copious illustrative empirical examples demonstrating how readers might implement spatial analysis in research projects. Designed as a textbook and reference companion, every chapter concludes with a set of questions for formal or self--study. Finally, the book includes extensive supplementing information in a large sample theory in the R programming language that supports early career econometricians interested in the implementation of statistical procedures covered. Combines advanced theoretical foundations with cutting-edge computational developments in R Builds from solid foundations, to more sophisticated extensions that are intended to jumpstart research careers in spatial econometrics Written by two of the most accomplished and extensively published econometricians working in the discipline Describes fundamental principles intuitively, but without sacrificing rigor Provides empirical illustrations for many spatial methods across diverse field Emphasizes a modern treatment of the field using the generalized method of moments (GMM) approach Explores sophisticated modern research methodologies, including pre-test procedures and Bayesian data analysis

Financial econometrics is a great success story in economics. Econometrics uses data and statistical inference methods, together with structural and descriptive modeling, to address rigorous economic problems. Its development within the world of finance is quite recent and has been paralleled by a fast expansion of financial markets and an increasing variety and complexity of financial products. This has fueled the demand for people with advanced econometrics skills. For professionals and advanced graduate students pursuing greater expertise in econometric modeling, this is a superb guide to the field's frontier. With the goal of providing information that is absolutely up-to-date--essential in today's rapidly evolving financial environment--Gourieroux and Jasiak focus on methods related to foregoing research and those modeling techniques that seem relevant to future advances. They present a balanced synthesis of financial theory and statistical methodology. Recognizing that any model is necessarily a simplified image of reality and that econometric methods must be adapted and applied on a case-by-case basis, the authors employ a wide variety of data sampled at frequencies ranging from intraday to monthly. These data comprise time series representing both the European and North American markets for stocks, bonds, and foreign currencies. Practitioners are encouraged to keep a critical eye and are armed with graphical diagnostics to eradicate misspecification errors. This authoritative, state-of-the-art reference text is ideal for upper-level graduate students, researchers, and professionals seeking to update their skills and gain greater facility in using econometric models. All will benefit from the emphasis on practical aspects of financial modeling and statistical inference. Doctoral candidates will appreciate the inclusion of detailed mathematical derivations of the deeper results as well as the more advanced problems concerning high-frequency data and risk control. By establishing a link between practical questions and the answers provided by financial and statistical theory, the book also addresses the needs of applied researchers employed by financial institutions.

Presents the main statistical tools of econometrics, focusing specifically on modern econometric methodology. The authors unify the approach by using a small number of estimation techniques, mainly generalized method of moments (GMM) estimation and kernel

smoothing. The choice of GMM is explained by its relevance in structural econometrics and its preeminent position in econometrics overall. Split into four parts, Part I explains general methods. Part II studies statistical models that are best suited for microeconomic data. Part III deals with dynamic models that are designed for macroeconomic and financial applications. In Part IV the authors synthesize a set of problems that are specific to statistical methods in structural econometrics, namely identification and over-identification, simultaneity, and unobservability. Many theoretical examples illustrate the discussion and can be treated as application exercises. Nobel Laureate James A. Heckman offers a foreword to the work.

A synthesis of the authors' groundbreaking econometric research on automatic model selection, which uses powerful computational algorithms and theory evaluation. Economic models of empirical phenomena are developed for a variety of reasons, the most obvious of which is the numerical characterization of available evidence, in a suitably parsimonious form. Another is to test a theory, or evaluate it against the evidence; still another is to forecast future outcomes. Building such models involves a multitude of decisions, and the large number of features that need to be taken into account can overwhelm the researcher. Automatic model selection, which draws on recent advances in computation and search algorithms, can create, and then empirically investigate, a vastly wider range of possibilities than even the greatest expert. In this book, leading econometricians David Hendry and Jurgen Doornik report on their several decades of innovative research on automatic model selection. After introducing the principles of empirical model discovery and the role of model selection, Hendry and Doornik outline the stages of developing a viable model of a complicated evolving process. They discuss the discovery stages in detail, considering both the theory of model selection and the performance of several algorithms. They describe extensions to tackling outliers and multiple breaks, leading to the general case of more candidate variables than observations. Finally, they briefly consider selecting models specifically for forecasting.

This book presents some of the more recent developments in nonlinear time series, including Bayesian analysis and cointegration tests. Nowadays applied work in business and economics requires a solid understanding of econometric methods to support decision-making. Combining a solid exposition of econometric methods with an application-oriented approach, this rigorous textbook provides students with a working understanding and hands-on experience of current econometrics. Taking a 'learning by doing' approach, it covers basic econometric methods (statistics, simple and multiple regression, nonlinear regression, maximum likelihood, and generalized method of moments), and addresses the creative process of model building with due attention to diagnostic testing and model improvement. Its last part is devoted to two major application areas: the econometrics of choice data (logit and probit, multinomial and ordered choice, truncated and censored data, and duration data) and the econometrics of time series data (univariate time series, trends, volatility, vector autoregressions, and a brief discussion of SUR models, panel data, and simultaneous equations). • Real-world text examples and practical exercise questions stimulate active learning and show how econometrics can solve practical questions in modern business and economic management. • Focuses on the core of econometrics, regression, and covers two major advanced topics, choice data with applications in marketing and micro-economics, and time series data

with applications in finance and macro-economics. • Learning-support features include concise, manageable sections of text, frequent cross-references to related and background material, summaries, computational schemes, keyword lists, suggested further reading, exercise sets, and online data sets and solutions. • Derivations and theory exercises are clearly marked for students in advanced courses. This textbook is perfect for advanced undergraduate students, new graduate students, and applied researchers in econometrics, business, and economics, and for researchers in other fields that draw on modern applied econometrics.

Illustrates a wide variety of complex econometric techniques for applied econometrics researchers in economics, finance, health economics, and energy and labor economics.

This book is intended to provide the reader with a firm conceptual and empirical understanding of basic information-theoretic econometric models and methods. Because most data are observational, practitioners work with indirect noisy observations and ill-posed econometric models in the form of stochastic inverse problems. Consequently, traditional econometric methods in many cases are not applicable for answering many of the quantitative questions that analysts wish to ask. After initial chapters deal with parametric and semiparametric linear probability models, the focus turns to solving nonparametric stochastic inverse problems. In succeeding chapters, a family of power divergence measure likelihood functions are introduced for a range of traditional and nontraditional econometric-model problems. Finally, within either an empirical maximum likelihood or loss context, Ron C. Mittelhammer and George G. Judge suggest a basis for choosing a member of the divergence family.

This book provides a rigorous introduction to the principles of econometrics and gives students and practitioners the tools they need to effectively and accurately analyze real data. Thoroughly updated to address the developments in the field that have occurred since the original publication of this classic text, the second edition has been expanded to include two chapters on time series analysis and one on nonparametric methods. Discussions on covariance (including GMM), partial identification, and empirical likelihood have also been added. 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. This book is intended for upper undergraduate and first year graduate courses in economics and statistics and also has applications in mathematics and some social sciences where a reasonable knowledge of matrix algebra and probability theory is common. It is also ideally suited for practicing professionals who want to deepen their understanding of the methods they employ. Also available for the new edition is a solutions manual, containing answers to the end-of-chapter exercises.

"Econometrics: Alchemy or Science?" analyses the effectiveness and validity of applying econometric methods to economic time series. The methodological dispute is long-standing, and no claim can be made for a single valid method,

but recent results on the theory and practice of model selection bid fair to resolve many of the contentious issues.The book presents criticisms and evaluations of competing approaches, based on theoretical economic and econometric analyses, empirical applications, and Monte Carlo simulations, which interact to determine best practice. It explains the evolution of an approach to econometric modelling founded in careful statistical analyses of the available data, using economic theory to guide the general model specification. From a strong foundation in the theory of reduction, via a range of applied andsimulation studies, it demonstrates that general-to-specific procedures have excellent properties.The book is divided into four Parts: Routes and Route Maps; Empirical Modelling Strategies; Formalization; and Retrospect and Prospect. A short preamble to each chapter sketches the salient themes, links to earlier and later developments, and the lessons learnt or missed at the time. A sequence of detailed empirical studies of consumers' expenditure and money demand illustrate most facets of the approach. Material new to this revised edition describes recent major advances in computer-automatedmodel selection, embodied in the powerful new software program PcGets, which establish the operational success of the modelling strategy.

For Masters and PhD students in EconomicsIn this textbook, the duality between the equilibrium concept used in dynamic economic theory and the stationarity of economic variables is explained and used in the presentation of single equations models and system of equations such as VARs, recursive models and simultaneous equations models.The book also contains chapters on: exogeneity, in the context of estimation, policy analysis and forecasting; automatic (computer based) variable selection, and how it can aid in the specification of an empirical macroeconomic model; and finally, on a common framework for model-based economic forecasting.Supplementary materials and notes are available on the publisher's website.

Copula Modeling explores the copula approach for econometrics modeling of joint parametric distributions. Copula Modeling demonstrates that practical implementation and estimation is relatively straightforward despite the complexity of its theoretical foundations. An attractive feature of parametrically specific copulas is that estimation and inference are based on standard maximum likelihood procedures. Thus, copulas can be estimated using desktop econometric software. This offers a substantial advantage of copulas over recently proposed simulation-based approaches to joint modeling. Copulas are useful in a variety of modeling situations including financial markets, actuarial science, and microeconometrics modeling. Copula Modeling provides practitioners and scholars with a useful guide to copula modeling with a focus on estimation and misspecification. The authors cover important theoretical foundations. Throughout, the authors use Monte Carlo experiments and simulations to demonstrate copula properties

The three chapters in this dissertation study and apply econometric models to answer questions in transportation

economics. Chapter 1 and 2 analyze the Berry, Levinsohn and Pakes (BLP) discrete choice model for combined micro- and macro-level data. Chapter 1 considers the concerns of choice set aggregation and estimating consistent standard errors within the BLP Model. These concerns are studied within the context of a vehicle choice application with interest in estimating household valuation of fuel efficiency. Chapter 2 studies the numerical properties of the maximum likelihood approach to estimating this BLP model. Chapter 3 applies a Poisson-Log Normal panel data model to study the effect of red light cameras on collision counts in Los Angeles. The camera program suffered from weaknesses in enforcement that dampened the effectiveness of the program over time. The model considered here controls for this dampening effect. Chapter 1 finds that choice set aggregation affects the point estimates obtained from the BLP model and causes standard errors to be too small. The use of inconsistent sequential standard errors also underestimates the magnitude of standard errors. These findings may partly explain the disparity across existing estimates from choice models on the value households place on vehicle fuel efficiency. Chapter 2 finds that the maximum likelihood estimation approach is able to find the global minimum regardless of choice of starting values, optimization routine used and tightness of convergence criteria. These findings highlight the benefits of estimating the BLP model on combined micro- and macro-level datasets using the maximum likelihood approach compared to using the nested fixed point approach and only macro level data where numerical stability is difficult to obtain. Chapter 3 finds that controlling for the dampening effect from poor enforcement, the Los Angeles Automated Red Light Camera program decreased red light running related collisions but increased right-angle and injury collisions, as well as collisions overall.

This book is intended to provide the reader with a firm conceptual and empirical understanding of basic information-theoretic econometric models and methods. Because most data are observational, practitioners work with indirect noisy observations and ill-posed econometric models in the form of stochastic inverse problems. Consequently, traditional econometric methods in many cases are not applicable for answering many of the quantitative questions that analysts wish to ask. After initial chapters deal with parametric and semiparametric linear probability models, the focus turns to solving nonparametric stochastic inverse problems. In succeeding chapters, a family of power divergence measure-likelihood functions are introduced for a range of traditional and nontraditional econometric-model problems. Finally, within either an empirical maximum likelihood or loss context, Ron C. Mittelhammer and George G. Judge suggest a basis for choosing a member of the divergence family.

Evaluation of Econometric Models presents approaches to assessing and enhancing the progress of applied economic research. This book discusses the problems and issues in evaluating econometric models, use of exploratory methods in economic analysis, and model construction and evaluation when theoretical knowledge is scarce. The data analysis by partial least squares, prediction analysis of economic models, and aggregation and disaggregation of nonlinear equations are also elaborated. This text likewise covers the comparison of econometric models by optimal control techniques, role of time series analysis in econometric model evaluation, and hypothesis testing in spectral regression. Other topics include the relevance of laboratory experiments to testing resource allocation theory and token economy

and animal models for the experimental analysis of economic behavior. This publication is intended for students and researchers interested in evaluating econometric models.

Following theseminal Palgrave Handbook of Econometrics: Volume I , this second volume brings together the finestacademicsworking in econometrics today andexploresapplied econometrics, containing contributions onsubjects includinggrowth/development econometrics and applied econometrics and computing.

Economic Models for Industrial Organization focuses on the specification and estimation of econometric models for research in industrial organization. In recent decades, empirical work in industrial organization has moved towards dynamic and equilibrium models, involving econometric methods which have features distinct from those used in other areas of applied economics. These lecture notes, aimed for a first or second-year PhD course, motivate and explain these econometric methods, starting from simple models and building to models with the complexity observed in typical research papers. The covered topics include discrete-choice demand analysis, models of dynamic behavior and dynamic games, multiple equilibria in entry games and partial identification, and auction models.

Confronts the practical problems of modelling aggregate time series data, in a systematic and integrated framework. The primary aim of this book is to develop an operational econometric approach which allows constructive modelling

A thorough foundation in probability theory and statistical inference provides an introduction to the underlying theory of econometrics that motivates the student at a intuitive as well as a formal level.

In this book the authors present a reassessment of some recently proposed econometric methods for the analysis of continuous-time specifications of economic models. Given the vastness of this stream of the literature, that does not allow for a full exposition of the topic, the authors concentrate on the estimation and simulation analysis of a continuous-time econometric model based on a theoretical framework -- the SETI model -- developed in Padoan (1996). The application is almost completely instrumental to a more thorough analysis of methodological issues entailed with continuous-time econometrics. Nevertheless, it presents some interesting theoretical aspects such as the process of diffusion of ICT and the role of services in international diffusion of technology. The standard methods are not suitable for theoretical models in which disequilibrium analysis is necessary and, in general, presents a clear limitation when the structural multi-equation form of the model should be preserved. Thus the authors show how, by means of continuous-time econometric, it is possible to estimate the parameters of the model using the Full Information Maximum Likelihood techniques in a time series set-up. Then, the authors extend the econometric analysis in order to evaluate the out-of-equilibrium dynamic properties of a system via simulation techniques. The declared aim of the present work is to define the conditions to the equilibrium and to discuss its stability properties. Furthermore, the application provides the guidelines for the formulation and empirical validation of a model considering growth-driven-by-technology phenomena, interactions between countries through trade effects, and the diffusion of technology. Finally, spatial aspects of the problem are explicitly taken into account.

Time series econometrics is a rapidly evolving field. Particularly, the cointegration revolution has had a substantial impact on applied analysis. Hence, no textbook has managed to cover the full range of methods in current use and explain how to proceed in applied domains. This gap in the literature motivates the present volume. The methods are sketched out, reminding the reader of the ideas underlying them and giving sufficient background for empirical work. The treatment can also be used as a textbook for a course on applied time series econometrics. Topics include: unit root and cointegration analysis, structural vector autoregressions, conditional heteroskedasticity and nonlinear and

nonparametric time series models. Crucial to empirical work is the software that is available for analysis. New methodology is typically only gradually incorporated into existing software packages. Therefore a flexible Java interface has been created, allowing readers to replicate the applications and conduct their own analyses.

This book had its conception in 1975in a friendly tavern near the School of Businessand PublicAdministration at the UniversityofMissouri-Columbia. Two of the authors (Fomby and Hill) were graduate students of the third (Johnson), and were (and are) concerned about teaching econometrics effectively at the graduate level. We decided then to write a book to serve as a comprehensive text for graduate econometrics. Generally, the material included in the bookand itsorganization have been governed by the question, " Howcould the subject be best presented in a graduate class?" For content, this has meant that we have tried to cover " all the bases " and yet have not attempted to be encyclopedic. The intended purpose has also affected the levelofmathematical rigor. We have tended to prove only those results that are basic and/or relatively straightforward. Proofs that would demand inordinant amounts of class time have simply been referenced. The book is intended for a two-semester course and paced to admit more extensive treatment of areas of specific interest to the instructor and students. We have great confidence in the ability, industry, and persistence of graduate students in ferreting out and understanding the omitted proofs and results. In the end, this is how one gains maturity and a fuller appreciation for the subject in any case. It is assumed that the readers of the book will have had an econometric methods course, using texts like J. Johnston's Econometric Methods, 2nd ed.

Stationary disturbances and asymptotic theory; Specfiml (spectral full information maximum likelihood) estimation; The specfilm estimation with inadequate sample size; The estimation of the multiple regression model with stationary erros and lagged endogenous variables; The specfilm method as applied to models with lagged endogenous variables; The asymptotic variance matrix of the structural estimators when the erros follow an AR process.

Maximum Likelihood Estimation with Stata, Fourth Edition is written for researchers in all disciplines who need to compute maximum likelihood estimators that are not available as prepackaged routines. Readers are presumed to be familiar with Stata, but no special programming skills are assumed except in the last few chapters, which detail how to add a new estimation command to Stata. The book begins with an introduction to the theory of maximum likelihood estimation with particular attention on the practical implications for applied work. Individual chapters then describe in detail each of the four types of likelihood evaluator programs and provide numerous examples, such as logit and probit regression, Weibull regression, random-effects linear regression, and the Cox proportional hazards model. Later chapters and appendixes provide additional details about the ml command, provide checklists to follow when writing evaluators, and show how to write your own estimation commands.

This book brings together presentations of some of the fundamental new research that has begun to appear in the areas of dynamic structural modeling, nonlinear structural modeling, time series modeling, nonparametric inference, and chaotic attractor inference. The contents of this volume comprise the proceedings of the third of a conference series entitled International Symposia in Economic Theory and Econometrics. This conference was held at the IC;s2 (Innovation, Creativity and Capital) Institute at the University of Texas at Austin on May 22-23, l986.

This is the first volume in a major two-volume set of advanced texts in econometrics.

This book proposes a new methodology for the selection of one (model) from among a set of alternative econometric models. Let us recall that a model is an abstract representation of reality which brings out what is relevant to a particular economic issue. An econometric model is

also an analytical characterization of the joint probability distribution of some random variables of interest, which yields some information on how the actual economy works. This information will be useful only if it is accurate and precise; that is, the information must be far from ambiguous and close to what we observe in the real world Thus, model selection should be performed on the basis of statistics which summarize the degree of accuracy and precision of each model. A model is accurate if it predicts right; it is precise if it produces tight confidence intervals. A first general approach to model selection includes those procedures based on both characteristics, precision and accuracy. A particularly interesting example of this approach is that of Hildebrand, Laing and Rosenthal (1980). See also Hendry and Richard (1982). A second general approach includes those procedures that use only one of the two dimensions to discriminate among models. In general, most of the tests we are going to examine correspond to this category.

Building upon, and celebrating the work of David Hendry, this volume consists of a number of specially commissioned pieces from some of the leading econometricians in the world. It reflects on the recent advances in econometrics and considers the future progress for the methodology of econometrics.

Panel Data Econometrics: Theory introduces econometric modelling. Written by experts from diverse disciplines, the volume uses longitudinal datasets to illuminate applications for a variety of fields, such as banking, financial markets, tourism and transportation, auctions, and experimental economics. Contributors emphasize techniques and applications, and they accompany their explanations with case studies, empirical exercises and supplementary code in R. They also address panel data analysis in the context of productivity and efficiency analysis, where some of the most interesting applications and advancements have recently been made. Provides a vast array of empirical applications useful to practitioners from different application environments Accompanied by extensive case studies and empirical exercises Includes empirical chapters accompanied by supplementary code in R, helping researchers replicate findings Represents an accessible resource for diverse industries, including health, transportation, tourism, economic growth, and banking, where researchers are not always econometrics experts

This volume contains the papers presented in honor of the lifelong achievements of Thomas J. Rothenberg on the occasion of his retirement. The authors of the chapters include many of the leading econometricians of our day, and the chapters address topics of current research significance in econometric theory. The chapters cover four themes: identification and efficient estimation in econometrics, asymptotic approximations to the distributions of econometric estimators and tests, inference involving potentially nonstationary time series, such as processes that might have a unit autoregressive root, and nonparametric and semiparametric inference. Several of the chapters provide overviews and treatments of basic conceptual issues, while others advance our understanding of the properties of existing econometric procedures and/or propose new ones. Specific topics include identification in nonlinear models, inference with weak instruments, tests for nonstationary in time series and panel data, generalized empirical likelihood estimation, and the bootstrap.

"Maximum likelihood estimation is a general method for estimating the parameters of econometric models from observed data. The principle of maximum likelihood plays a central role in the exposition of this book, since a number of estimators used in econometrics can be derived within this framework. Examples include ordinary least squares, generalized least squares and full-information maximum likelihood. In deriving the maximum likelihood estimator, a key concept is the joint probability density function (pdf) of the observed random variables, yt. Maximum likelihood estimation requires that the following conditions are satisfied. (1) The form of the joint pdf of yt is known. (2) The specification of the moments of the joint pdf are known. (3) The joint pdf can be evaluated for all values of the parameters, 9. Parts ONE and

TWO of this book deal with models in which all these conditions are satisfied. Part THREE investigates models in which these conditions are not satisfied and considers four important cases. First, if the distribution of yt is misspecified, resulting in both conditions 1 and 2 being violated, estimation is by quasi-maximum likelihood (Chapter 9). Second, if condition 1 is not satisfied, a generalized method of moments estimator (Chapter 10) is required. Third, if condition 2 is not satisfied, estimation relies on nonparametric methods (Chapter 11). Fourth, if condition 3 is violated, simulation-based estimation methods are used (Chapter 12). 1.2 Motivating Examples To highlight the role of probability distributions in maximum likelihood estimation, this section emphasizes the link between observed sample data and 4 The Maximum Likelihood Principle the probability distribution from which they are drawn"-- publisher.

Spatial econometrics deals with spatial dependence and spatial heterogeneity, critical aspects of the data used by regional scientists. These characteristics may cause standard econometric techniques to become inappropriate. In this book, I combine several recent research results to construct a comprehensive approach to the incorporation of spatial effects in econometrics. My primary focus is to demonstrate how these spatial effects can be considered as special cases of general frameworks in standard econometrics, and to outline how they necessitate a separate set of methods and techniques, encompassed within the field of spatial econometrics. My viewpoint differs from that taken in the discussion of spatial autocorrelation in spatial statistics - e.g., most recently by Cliff and Ord (1981) and Upton and Fingleton (1985) - in that I am mostly concerned with the relevance of spatial effects on model specification, estimation and other inference, in what I call a model-driven approach, as opposed to a data-driven approach in spatial statistics. I attempt to combine a rigorous econometric perspective with a comprehensive treatment of methodological issues in spatial analysis.

This book introduces a new generation of statistical econometrics. After linear models leading to analytical expressions for estimators, and non-linear models using numerical optimization algorithms, the availability of high- speed computing has enabled econometricians to consider econometric models without simple analytical expressions. The previous difficulties presented by the presence of integrals of large dimensions in the probability density functions or in the moments can be circumvented by a simulation-based approach. After a brief survey of classical parametric and semi-parametric non-linear estimation methods and a description of problems in which criterion functions contain integrals, the authors present a general form of the model where it is possible to simulate the observations. They then move to calibration problems and the simulated analogue of the method of moments, before considering simulated versions of maximum likelihood, pseudo-maximum likelihood, or non-linear least squares. The general principle of indirect inference is presented and is then applied to limited dependent variable models and to financial series.

The advent of electronic computing permits the empirical analysis of economic models of far greater subtlety and rigour than before, when many interesting ideas were not followed up because the calculations involved made this impracticable. The estimation and testing of these more intricate models is usually based on the method of Maximum Likelihood, which is a well-established branch of mathematical statistics. Its use in econometrics has led to the development of a number of special techniques; the specific conditions of econometric research moreover demand certain changes in the interpretation of the basic argument. This book is a self-contained introduction to this field. It consists of three parts. The first deals with general features of Maximum Likelihood methods; the second with linear and nonlinear regression; and the third with discrete choice and related micro-economic models. Readers should already be familiar with elementary statistical theory, with applied econometric research papers, or with the literature on the mathematical basis of Maximum Likelihood theory. They can also try their hand at some advanced econometric research of their own.

This volume focuses on recent developments in the use of structural econometric models in empirical economics. The first part looks at recent developments in the estimation of dynamic discrete choice models. The second part looks at recent advances in the area empirical matching models.

Copyright: 9de150a0ca3add52c19d657e9840e351