

# **Var Models In Macroeconomics New Developments And Applications Essays In Honor Of Christopher A Sims Advances In Econometrics**

Abstract: This dissertation examines theoretical and empirical topics in macroeconomic dynamics. A central issue in macroeconomic dynamics is understanding the sources of business cycle fluctuations. The idea that expectations about future economic fundamentals can drive business cycles dates back to the early twentieth century. However, the standard real business cycle (RBC) model fails to generate positive comovement in output, consumption, labor-hours and investment in response to news shocks. My dissertation proposes a solution to this puzzling feature of the RBC model by developing a theoretical model that can generate positive aggregate and sectoral comovement in response to news shocks. Another key issue in macroeconomic dynamics is gauging the performance of theoretical models by comparing them to empirical models. Some of the most widely used empirical models in macroeconomics are level vector autoregressive (VAR) models. However, estimated level VAR models may contain explosive roots, which is at odds with the widespread consensus among macroeconomists that roots are at most unity. My dissertation investigates the frequency of explosive roots in estimated level VAR models using Monte Carlo simulations. Additionally, it proposes a way to mitigate explosive roots. Finally, as macroeconomic datasets are relatively short, empirical models such as autoregressive models (i.e. AR or VAR models) may have substantial small-sample bias. My dissertation develops a procedure that

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numerically corrects the bias in the roots of AR models. This dissertation consists of three essays. The first essay develops a model based on learning-by-doing (LBD) that can generate positive comovement in output, consumption, labor-hours and investment in response to news shocks. I show that the one-sector RBC model augmented by LBD can generate aggregate comovement in response to news shock about technology. Furthermore, I show that in the two-sector RBC model, LBD along with an intratemporal adjustment cost can generate sectoral comovement in response to news about three types of shocks: i) neutral technology shocks, ii) consumption technology shocks, and iii) investment technology shocks. I show that these results hold for contemporaneous technology shocks and for different specifications of LBD. The second essay investigates the frequency of explosive roots in estimated level VAR models in the presence of stationary and nonstationary variables. Monte Carlo simulations based on datasets from the macroeconomic literature reveal that the frequency of explosive roots exceeds 40% in the presence of unit roots. Even when all the variables are stationary, the frequency of explosive roots is substantial. Furthermore, explosion increases significantly, to as much as 100% when the estimated level VAR coefficients are corrected for small-sample bias. These results suggest that researchers estimating level VAR models on macroeconomic datasets encounter explosive roots, a phenomenon that is contrary to common macroeconomic belief, with a very high frequency. Monte Carlo simulations reveal that imposing unit roots in the estimation can substantially reduce the frequency of explosion. Hence one way to mitigate explosive roots is to estimate vector error correction models. The third essay proposes a numerical procedure to correct the small-sample bias in autoregressive roots of univariate AR(p) models. I examine the median-bias properties and variability of the

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bias-adjusted parameters relative to the least-squares estimates. I show that the bias correction procedure substantially reduces the median-bias in impulse response functions. Furthermore, correcting the bias in roots significantly improves the median-bias in half-life, quarter-life and up-life estimates. The procedure pays a negligible-to-small price in terms of increased standard deviation for its improved median-bias properties.

The field of financial econometrics has exploded over the last decade This book represents an integration of theory, methods, and examples using the S-PLUS statistical modeling language and the S+FinMetrics module to facilitate the practice of financial econometrics. This is the first book to show the power of S-PLUS for the analysis of time series data. It is written for researchers and practitioners in the finance industry, academic researchers in economics and finance, and advanced MBA and graduate students in economics and finance. Readers are assumed to have a basic knowledge of S-PLUS and a solid grounding in basic statistics and time series concepts. This Second Edition is updated to cover S+FinMetrics 2.0 and includes new chapters on copulas, nonlinear regime switching models, continuous-time financial models, generalized method of moments, semi-nonparametric conditional density models, and the efficient method of moments. Eric Zivot is an associate professor and Gary Waterman Distinguished Scholar in the Economics Department, and adjunct associate professor of finance in the Business School at the University of Washington. He regularly teaches courses on econometric theory, financial econometrics and time series econometrics, and is the recipient of the Henry T. Buechel Award for Outstanding Teaching. He is an associate editor of Studies in Nonlinear Dynamics and Econometrics. He has published papers in the leading econometrics journals, including *Econometrica*, *Econometric Theory*, the *Journal of Business*

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and Economic Statistics, Journal of Econometrics, and the Review of Economics and Statistics. Jiahui Wang is an employee of Ronin Capital LLC. He received a Ph.D. in Economics from the University of Washington in 1997. He has published in leading econometrics journals such as Econometrica and Journal of Business and Economic Statistics, and is the Principal Investigator of National Science Foundation SBIR grants. In 2002 Dr. Wang was selected as one of the "2000 Outstanding Scholars of the 21st Century" by International Biographical Centre.

This volume of Advances in Econometrics contains articles that examine key topics in the modeling and estimation of dynamic stochastic general equilibrium (DSGE) models. Because DSGE models combine micro- and macroeconomic theory with formal econometric modeling and inference, over the past decade they have become an established framework for analysis. Bayesian Multivariate Time Series Methods for Empirical Macroeconomics provides a survey of the Bayesian methods used in modern empirical macroeconomics.

Recent Developments in Cointegration.

This dissertation consists of three chapters dealing with different topics in time series econometrics including generalized method of moments (GMM) estimation and vector autoregressions (VAR). These econometric models have revolutionized empirical research in macroeconomics. Previous work by Hansen and Singleton (1982) showed that the GMM method can be applied to estimate nonlinear rational expectations models in a simple way that the models need not even be solved. The seminal work of Sims (1980) has demonstrated how VAR models can be used for macroeconomic forecasting and policy analysis. The objective of this dissertation is to provide some new econometric tools for applied research in

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macroeconomics using time series data. The first chapter develops an asymptotic theory for the GMM estimator in nonlinear econometric models with integrated regressors and instruments. We establish consistency and derive the limiting distribution of the GMM estimator for asymptotically homogeneous regression functions. The estimator is consistent under fairly general conditions, and the convergence rates are determined by the degree of the asymptotic homogeneity of regression functions. Similar to linear regressions, we find that the limiting distribution is generally biased and non-Gaussian, and that instruments themselves cannot eliminate the bias even when they are strictly exogenous. Therefore, GMM yields inefficient estimates and invalid  $t$ - and chi-square test statistics in general. By implementing the fully modified method developed by Phillips and Hansen (1990), we obtain an efficient GMM estimator which has an unbiased and mixed normal limiting distribution. In the second chapter, we develop a novel shock identification strategy in the context of two-country/block structural vector autoregressive (SVAR) models to identify the transmission of credit shocks. Specifically, we investigate how credit shocks originating in the U.S. or euro area affect domestic economic activity in emerging Asia. Shocks within each block are identified using sign restrictions, whereas shocks across the two blocks are identified using a recursive structure (block Cholesky decomposition). This strategy not only enables us to distinguish the external credit shock from the other structural shocks, but also captures the responses of the domestic country. The main findings include that the transmission of credit shocks across countries through the channel of credit contagion is fast and protracted. The adverse effects of external credit tightening are mitigated by domestic credit policy easing in China, but lead to significant decreases in credit and GDP growth in the other emerging Asian countries. We also find that

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the external credit shocks play a non-negligible role in driving economic fluctuations in emerging Asia, although the role is smaller in China. In the last chapter, we use a global vector autoregressive (GVAR) model to forecast the principal macroeconomic indicators of the original five ASEAN member countries (i.e. Indonesia, Malaysia, Philippines, Singapore, and Thailand). The GVAR model is a compact model of the world economy designed to explicitly model the economic and financial interdependencies at national and international levels. Our GVAR model covers twenty countries which are grouped into nine countries/regions. After applying vector error correction model (VECM) to estimate parameters in the GVAR, we generate twelve one-quarter-ahead forecasts of real GDP growth, inflation, short-term interest rates, real exchange rates, real equity prices, and world commodity prices over the period 2009Q1-2011Q4, with four out-of-sample forecasts during 2009Q1-2009Q4. Forecast evaluation based on the panel Diebold-Mariano (DM) tests shows that the forecasts of our GVAR model tend to outperform those of country-specific VAR models, especially for short-term interest rates and real equity prices. These results suggest that the interdependencies among countries in the global financial market play an important role in macroeconomic forecasting.

This volume of *Advances in Econometrics* contains articles that examine key topics in the modeling and estimation of dynamic stochastic general equilibrium (DSGE) models. Because DSGE models combine micro- and macroeconomic theory with formal econometric modeling and inference, over the past decade they have become an established framework for analyzing a variety of issues in empirical macroeconomics. The research articles make contributions in several key areas in DSGE modeling and estimation. In particular, papers cover the modeling

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and role of expectations, the study of optimal monetary policy in two-country models, and the problem of non-invertibility. Other interesting areas of inquiry include the analysis of parameter identification in new open economy macroeconomic models and the modeling of trend inflation shocks. The second part of the volume is devoted to articles that offer innovations in econometric methodology. These papers advance new techniques for addressing major inferential problems and include discussion and applications of Laplace-type, frequency domain, empirical likelihood and method of moments estimators.

Vector autoregressive (VAR) models are among the most widely used econometric tools in the fields of macroeconomics and financial economics. Much of what we know about the response of the economy to macroeconomic shocks and about how various shocks have contributed to the evolution of macroeconomic and financial aggregates is based on VAR models. VAR models also have been used successfully for economic and business forecasting, for modeling risk and volatility, and for the construction of forecast scenarios. Since the introduction of VAR models by C.A. Sims in 1980, the VAR methodology has continuously evolved. Even today important extensions and reinterpretations of the VAR framework are being developed.

Examples include VAR models for mixed-frequency data, VAR models as approximations to DSGE models, factor-augmented VAR models, new tools for the identification of structural shocks in VAR models, panel VAR approaches, and time-varying parameter VAR models. This volume collects contributions from some of the leading VAR experts in the world on VAR methods and applications. Each paper highlights and synthesizes a new development in this literature in a way that is accessible to practitioners, to graduate students, and to readers in other fields.

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How the creation of the Nobel Prize in Economics changed the economics profession, Sweden, and the world Our confidence in markets comes from economics, and our confidence in economics is underpinned by the Nobel Prize in Economics, which was first awarded in 1969. Was it a coincidence that the prize and the rise of free-market liberalism began at the same time? The Nobel Factor is the first book to describe the origins and power of the most important prize in economics. It tells how the prize, created by the Swedish central bank, emerged from a conflict between central bank orthodoxy and Sweden's social democracy. The aim was to use the halo of the Nobel brand to influence the future of Sweden and the rest of the developed world by enhancing the bank's authority and the prestige of market-friendly economics. And the strategy has worked spectacularly—with sometimes disastrous results for societies striving to cope with the requirements of economic theory and deregulated markets. Drawing on previously untapped archives and providing a unique analysis of the sway of prizewinners, The Nobel Factor offers an unprecedented account of the real-world consequences of economics and its greatest prize.

This text presents modern developments in time series analysis and focuses on their application to economic problems. The book first introduces the fundamental concept of a stationary time series and the basic properties of covariance, investigating the structure and estimation of autoregressive-moving average (ARMA) models and their relations to the covariance structure. The book then moves on to non-stationary time series, highlighting its consequences for modeling and forecasting and presenting standard statistical tests and regressions. Next, the text discusses volatility models and their applications in the analysis of financial market data, focusing on generalized autoregressive conditional heteroskedastic

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(GARCH) models. The second part of the text devoted to multivariate processes, such as vector autoregressive (VAR) models and structural vector autoregressive (SVAR) models, which have become the main tools in empirical macroeconomics. The text concludes with a discussion of co-integrated models and the Kalman Filter, which is being used with increasing frequency. Mathematically rigorous, yet application-oriented, this self-contained text will help students develop a deeper understanding of theory and better command of the models that are vital to the field. Assuming a basic knowledge of statistics and/or econometrics, this text is best suited for advanced undergraduate and beginning graduate students.

Each chapter of Macroeconometrics is written by respected econometricians in order to provide useful information and perspectives for those who wish to apply econometrics in macroeconomics. The chapters are all written with clear methodological perspectives, making the virtues and limitations of particular econometric approaches accessible to a general readership familiar with applied macroeconomics. The real tensions in macroeconometrics are revealed by the critical comments from different econometricians, having an alternative perspective, which follow each chapter.

Structural vector autoregressive (VAR) models are important tools for empirical work in macroeconomics, finance, and related fields. This book not only reviews the many alternative structural VAR approaches discussed in the literature, but also highlights their pros and cons in practice. It provides guidance to empirical researchers as to the most appropriate modeling choices, methods of estimating, and evaluating structural VAR models. The book traces the evolution of the structural VAR methodology and contrasts it with other common methodologies, including dynamic stochastic general equilibrium (DSGE) models. It is intended

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as a bridge between the often quite technical econometric literature on structural VAR modeling and the needs of empirical researchers. The focus is not on providing the most rigorous theoretical arguments, but on enhancing the reader's understanding of the methods in question and their assumptions. Empirical examples are provided for illustration.

The GVAR is a Global Vector Auto-Regression model of the global economy. Its main feature is to take into account the financial and real linkages connecting the major world economies. This book provides an overview of the GVAR and its applications: forecasting, finance issues, and regional studies.

VAR methods suggest that the monetary transmission mechanism may be weak and unreliable in low-income countries (LICs). But are structural VARs identified via short-run restrictions capable of detecting a transmission mechanism when one exists, under research conditions typical of these countries? Using small DSGEs as data-generating processes, we assess the impact on VAR-based inference of short data samples, measurement error, high-frequency supply shocks, and other features of the LIC environment. The impact of these features on finite-sample bias appears to be relatively modest when identification is valid—a strong caveat, especially in LICs. However, many of these features undermine the precision of estimated impulse responses to monetary policy shocks, and cumulatively they suggest that “insignificant” results can be expected even when the underlying transmission mechanism is strong.

This book surveys big data tools used in macroeconomic forecasting and addresses related econometric issues, including how to capture dynamic relationships among variables; how to select parsimonious models; how to deal with model uncertainty,

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instability, non-stationarity, and mixed frequency data; and how to evaluate forecasts, among others. Each chapter is self-contained with references, and provides solid background information, while also reviewing the latest advances in the field.

Accordingly, the book offers a valuable resource for researchers, professional forecasters, and students of quantitative economics.

Panel data econometrics has evolved rapidly over the past three decades. The field is of both theoretical and practical importance, and methods to deal with micro- and macroeconomic panel data are in high demand from practitioners. Applications in finance, development, trade, marketing, health, labor, and consumer economics attest to the usefulness of these methods in applied economics. This book is a comprehensive source on panel data. It contains 20 chapters edited by Professor Badi Baltagi--one of the leading econometricians in the area of panel data econometrics--and authored by renowned experts in the field. The chapters are divided into two sections. Part I examines new developments in theory. It includes panel cointegration, dynamic panel data models, incidental parameters and dynamic panel modeling, and panel data models for discrete choice. The chapters in Part II target applications of panel data, including health, labor, marketing, trade, productivity and macro applications in panels.

This text provides graduate students of macroeconomics, econometrics, and monetary economics with discussion and practical illustrations of the techniques used in applied

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macroeconometrics. Until the 1970s, there was consensus regarding both the theoretical foundations and the empirical specification of applied macroeconomic modelling, commonly known as the Cowles Commission approach. This is no longer the case: the Cowles Commission approach broke down in the 1970s, to be replaced by a number of prominent competing methods—the LSE (London School of Economics) approach, the VAR approach, and the intertemporal optimization/Real Business Cycle approach. 'Applied Macroeconometrics' examines the empirical research strategy of these alternatives by interpreting them as attempts to solve the problems observed in the Cowles Commission approach. The different research strategies are illustrated with specific reference to real-world examples, particularly with respect to the monetary transmission mechanism. A common US dataset is used in these examples, thus allowing the reader easy comparisons. The presentation is based on the view that identification, a central concept in econometrics, provides a natural framework in which to discuss the alternative strategies currently dominating research. The first part of the book introduces time-series models and details the importance of their identification. The second part illustrates, chapter by chapter, the alternative approaches, providing detailed applications of each methodology. Data used in the applications are available in a variety of formats from the author's web site, and will be supplemented by exercises for the reader to perform.

Economic forecasting is a key ingredient of decision making both in the public and in

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the private sector. Because economic outcomes are the result of a vast, complex, dynamic and stochastic system, forecasting is very difficult and forecast errors are unavoidable. Because forecast precision and reliability can be enhanced by the use of proper econometric models and methods, this innovative book provides an overview of both theory and applications. Undergraduate and graduate students learning basic and advanced forecasting techniques will be able to build from strong foundations, and researchers in public and private institutions will have access to the most recent tools and insights. Readers will gain from the frequent examples that enhance understanding of how to apply techniques, first by using stylized settings and then by real data applications--focusing on macroeconomic and financial topics. This is first and foremost a book aimed at applying time series methods to solve real-world forecasting problems. Applied Economic Forecasting using Time Series Methods starts with a brief review of basic regression analysis with a focus on specific regression topics relevant for forecasting, such as model specification errors, dynamic models and their predictive properties as well as forecast evaluation and combination. Several chapters cover univariate time series models, vector autoregressive models, cointegration and error correction models, and Bayesian methods for estimating vector autoregressive models. A collection of special topics chapters study Threshold and Smooth Transition Autoregressive (TAR and STAR) models, Markov switching regime models, state space models and the Kalman filter, mixed frequency data models, nowcasting, forecasting

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using large datasets and, finally, volatility models. There are plenty of practical applications in the book and both EViews and R code are available online.

This paper reviews recent advances in the specification and estimation of Bayesian Vector Autoregressive models (BVARs). After describing the Bayesian principle of estimation, we first present the methodology originally developed by Litterman (1986) and Doan et al. (1984) and review alternative priors. We then discuss extensions of the basic model and address issues in forecasting and structural analysis. An application to the estimation of a system of time-varying reaction functions for four European central banks under the European Monetary System (EMS) illustrates how some of the results previously presented may be applied in practice.

The last twenty years have witnessed tremendous advances in the mathematical, statistical, and computational tools available to applied macroeconomists. This rapidly evolving field has redefined how researchers test models and validate theories. Yet until now there has been no textbook that unites the latest methods and bridges the divide between theoretical and applied work. Fabio Canova brings together dynamic equilibrium theory, data analysis, and advanced econometric and computational methods to provide the first comprehensive set of techniques for use by academic economists as well as professional macroeconomists in banking and finance, industry, and government. This graduate-level textbook is for readers knowledgeable in modern macroeconomic theory, econometrics, and computational programming using RATS,

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MATLAB, or Gauss. Inevitably a modern treatment of such a complex topic requires a quantitative perspective, a solid dynamic theory background, and the development of empirical and numerical methods--which is where Canova's book differs from typical graduate textbooks in macroeconomics and econometrics. Rather than list a series of estimators and their properties, Canova starts from a class of DSGE models, finds an approximate linear representation for the decision rules, and describes methods needed to estimate their parameters, examining their fit to the data. The book is complete with numerous examples and exercises. Today's economic analysts need a strong foundation in both theory and application. *Methods for Applied Macroeconomic Research* offers the essential tools for the next generation of macroeconomists. *Handbook of Macroeconomics* surveys all major advances in macroeconomic scholarship since the publication of Volume 1 (1999), carefully distinguishing between empirical, theoretical, methodological, and policy issues. It courageously examines why existing models failed during the financial crisis, and also addresses well-deserved criticism head on. With contributions from the world's chief macroeconomists, its reevaluation of macroeconomic scholarship and speculation on its future constitute an investment worth making. Serves a double role as a textbook for macroeconomics courses and as a gateway for students to the latest research Acts as a one-of-a-kind resource as no major collections of macroeconomic essays have been published in the last decade

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'Macroeconometric Models for Portfolio Management' begins by outlining a portfolio management framework into which macroeconometric models and backtesting investment strategies are integrated. It is followed by a discussion on the theoretical backgrounds of both small and global large macroeconometric models, including data selection, estimation, and applications. Other practical concerns essential to managing a portfolio with decisions driven by macro models are also covered: model validation, forecast combination, and evaluation. The author then focuses on applying these models and their results on managing the portfolio, including making trading rules and asset allocation across different assets and risk management. The book finishes by showing portfolio examples where different investment strategies are used and illustrate how the framework can be applied from the beginning of collecting data, model estimation, and generating forecasts to how to manage portfolios accordingly. This book aims to bridge the gap between academia and practising professionals. Readers will attain a rigorous understanding of the theory and how to apply these models to their portfolios. Therefore, 'Macroeconometric Models for Portfolio Management' will be of interest to academics and scholars working in macroeconomics and finance; to industry professionals working in financial economics and asset management; to asset managers and investors who prefer systematic investing over discretionary investing; and to investors who have a strong interest in macroeconomic influences on their portfolio.

Applied Macroeconomics for Public Policy applies system and control theory approaches to macroeconomic problems. The book shows how to build simple and efficient macroeconomic models for policy analysis. By using these models, instead of complex multi-criteria models with uncertain parameters, readers will gain new certainty in macroeconomic decision-making.

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As high debt to GDP ratios cause problems in societies, this book provides insights on improving economies during and after economic downturns. Provides a detailed analysis of existing macroeconomic models Addresses the dynamics of debt to GDP ratio and the effects of fiscal and monetary policy on this ratio Shows how to use models to evaluate the dynamics of the debt to GDP ratio in cases of government spending and tax cuts and to decide whether such economic measures are efficient Uses optimal theory to obtain optimal yearly debt levels to reach the established goals (decrease debt or balance budget) Provides many examples and software exercises to promote learning by doing

This volume includes papers delivered at the Fourth World Congress of the Econometric Society. It will interest economic theorists and econometricians working in universities, government, and business and financial institutions.

This book is concerned with recent developments in time series and panel data techniques for the analysis of macroeconomic and financial data. It provides a rigorous, nevertheless user-friendly, account of the time series techniques dealing with univariate and multivariate time series models, as well as panel data models. It is distinct from other time series texts in the sense that it also covers panel data models and attempts at a more coherent integration of time series, multivariate analysis, and panel data models. It builds on the author's extensive research in the areas of time series and panel data analysis and covers a wide variety of topics in one volume. Different parts of the book can be used as teaching material for a variety of courses in econometrics. It can also be used as reference manual. It begins with an overview of basic econometric and statistical techniques, and provides an account of stochastic processes, univariate and multivariate time series, tests for unit roots, cointegration, impulse

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response analysis, autoregressive conditional heteroskedasticity models, simultaneous equation models, vector autoregressions, causality, forecasting, multivariate volatility models, panel data models, aggregation and global vector autoregressive models (GVAR). The techniques are illustrated using Microfit 5 (Pesaran and Pesaran, 2009, OUP) with applications to real output, inflation, interest rates, exchange rates, and stock prices.

Specially selected from The New Palgrave Dictionary of Economics 2nd edition, each article within this compendium covers the fundamental themes within the discipline and is written by a leading practitioner in the field. A handy reference tool.

Economic forecasting involves choosing simple yet robust models to best approximate highly complex and evolving data-generating processes. This poses unique challenges for researchers in a host of practical forecasting situations, from forecasting budget deficits and assessing financial risk to predicting inflation and stock market returns. Economic Forecasting presents a comprehensive, unified approach to assessing the costs and benefits of different methods currently available to forecasters. This text approaches forecasting problems from the perspective of decision theory and estimation, and demonstrates the profound implications of this approach for how we understand variable selection, estimation, and combination methods for forecasting models, and how we evaluate the resulting forecasts. Both Bayesian and non-Bayesian methods are covered in depth, as are a range of cutting-edge techniques for producing point, interval, and density forecasts. The book features detailed presentations and empirical examples of a range of forecasting methods and shows how to generate forecasts in the presence of large-dimensional sets of predictor variables. The authors pay special attention to how estimation error, model uncertainty, and model instability affect forecasting

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performance. Presents a comprehensive and integrated approach to assessing the strengths and weaknesses of different forecasting methods Approaches forecasting from a decision theoretic and estimation perspective Covers Bayesian modeling, including methods for generating density forecasts Discusses model selection methods as well as forecast combinations Covers a large range of nonlinear prediction models, including regime switching models, threshold autoregressions, and models with time-varying volatility Features numerous empirical examples Examines the latest advances in forecast evaluation Essential for practitioners and students alike

As the world is currently in the midst of financial and economic crises, this collection of expert contributions focuses on strategy formation and implementation at various organizational levels to address the challenges ahead. The latest economic turmoil and its ongoing impact on business performance are compelling top managers to develop effective business strategies and redefine the boundaries of their operational and strategic activities. On one hand, tremendous challenges in the competitive business environment have become a source of global threats for many small entrepreneurs. On the other, investors faced with today's volatile economic conditions demand more gains on their capital investments to counter-balance the growing risk of global threats. This book explores the question as to whether it is possible to efficiently and effectively address these threats and obstacles. Are managers capable of planning and implementing strategic actions? What should the major managerial strategy be in order to overcome fluctuations in a market-oriented society? The strategies and practices recommended here are aimed to design continuous development competencies and contribute to the stability, recovery and sustainability of global business operations under volatile

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economic conditions. This refreshingly novel book seeks to establish managerial strategies and practices for effectively responding to challenges in the competitive business environment, as global volatility and fluctuations continue to worsen.

This book presents ground-breaking advances in the domain of causal structure learning. The problem of distinguishing cause from effect (“Does altitude cause a change in atmospheric pressure, or vice versa?”) is here cast as a binary classification problem, to be tackled by machine learning algorithms. Based on the results of the ChaLearn Cause-Effect Pairs Challenge, this book reveals that the joint distribution of two variables can be scrutinized by machine learning algorithms to reveal the possible existence of a “causal mechanism”, in the sense that the values of one variable may have been generated from the values of the other. This book provides both tutorial material on the state-of-the-art on cause-effect pairs and exposes the reader to more advanced material, with a collection of selected papers. Supplemental material includes videos, slides, and code which can be found on the workshop website. Discovering causal relationships from observational data will become increasingly important in data science with the increasing amount of available data, as a means of detecting potential triggers in epidemiology, social sciences, economy, biology, medicine, and other sciences.

The revised edition of the essential resource on macroeconometrics *Structural Macroeconometrics* provides a thorough overview and in-depth exploration of

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methodologies, models, and techniques used to analyze forces shaping national economies. In this thoroughly revised second edition, David DeJong and Chetan Dave emphasize time series econometrics and unite theoretical and empirical research, while taking into account important new advances in the field. The authors detail strategies for solving dynamic structural models and present the full range of methods for characterizing and evaluating empirical implications, including calibration exercises, method-of-moment procedures, and likelihood-based procedures, both classical and Bayesian. The authors look at recent strides that have been made to enhance numerical efficiency, consider the expanded applicability of dynamic factor models, and examine the use of alternative assumptions involving learning and rational inattention on the part of decision makers. The treatment of methodologies for obtaining nonlinear model representations has been expanded, and linear and nonlinear model representations are integrated throughout the text. The book offers a rich array of implementation algorithms, sample empirical applications, and supporting computer code. Structural Macroeconometrics is the ideal textbook for graduate students seeking an introduction to macroeconomics and econometrics, and for advanced students pursuing applied research in macroeconomics. The book's historical perspective, along with its broad presentation of alternative methodologies, makes it an indispensable resource for academics and professionals.

?The Handbook of Financial Econometrics and Statistics provides, in four volumes and

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over 100 chapters, a comprehensive overview of the primary methodologies in econometrics and statistics as applied to financial research. Including overviews of key concepts by the editors and in-depth contributions from leading scholars around the world, the Handbook is the definitive resource for both classic and cutting-edge theories, policies, and analytical techniques in the field. Volume 1 (Parts I and II) covers all of the essential theoretical and empirical approaches. Volumes 2, 3, and 4 feature contributed entries that showcase the application of financial econometrics and statistics to such topics as asset pricing, investment and portfolio research, option pricing, mutual funds, and financial accounting research. Throughout, the Handbook offers illustrative case examples and applications, worked equations, and extensive references, and includes both subject and author indices.?

This valuable text provides a comprehensive introduction to VAR modelling and how it can be applied. In particular, the author focuses on the properties of the Cointegrated VAR model and its implications for macroeconomic inference when data are non-stationary. The text provides a number of insights into the links between statistical econometric modelling and economic theory and gives a thorough treatment of identification of the long-run and short-run structure as well as of the common stochastic trends and the impulse response functions, providing in each case illustrations of applicability. This book presents the main ingredients of the Copenhagen School of Time-Series Econometrics in a transparent and coherent framework. The

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distinguishing feature of this school is that econometric theory and applications have been developed in close cooperation. The guiding principle is that good econometric work should take econometrics, institutions, and economics seriously. The author uses a single data set throughout most of the book to guide the reader through the econometric theory while also revealing the full implications for the underlying economic model. To test ensure full understanding the book concludes with the introduction of two new data sets to combine readers understanding of econometric theory and economic models, with economic reality.

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.

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,

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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.

This book explores the role of national fiscal policies in a selected group of Euro-area countries under the European Economic and Monetary Union (EMU). In particular, the authors characterize the response of output to fiscal consolidations and expansions in the small Euro-area open economies affected by high public and private debt. It is shown that the macroeconomic outcome of fiscal shocks is strongly related to debt levels. The Euro-area countries included in the investigation are Greece, Ireland, Italy, the Netherlands, Spain, and Portugal, over the sample period 1999–2016, i.e., the EMU period. The main econometric tools used in this research are structural vector autoregressive (VAR) models, including panel VAR models. The available literature relating to the subject is also fully reviewed. A further closely investigated topic is the potential spillover effects of German fiscal policies on the selected small Euro-area economies. Moreover, in the perspective of the evolution of the Euro Area towards a full Monetary and Fiscal Union, the authors study the effects of area-wide government spending shocks on aggregate output and other macroeconomic variables during the

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EMU period. The closing chapter of the book considers evidence on the consequences of austerity policies for European labour markets during recent years.

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