Exercises II with Answers VU Econometrics: Econometrics I Fall 2019

Review of the concepts and mathematical derivations

1. What is meant by the "sampling distribution" of the OLS estimators?

Answer: Consider the regression model $Y_i = \beta_0 + \beta_1 X_i + u_i$. OLS estimators of β_0 and β_1 are a function of the the random variables Y_i and X_i . Hence, the OLS estimators are also random variables and their values change depending on the sample. Sampling distributions of β_0 and β_1 are the probability distributions that describes the values that the true parameter values β_0 and β_1 could take over different possible random samples.

2. Consider the linear regression model

$$Y_i = \beta_0 + \beta_1 X_i + u_i$$
 $i = 1, ..., n$.

Prove that the OLS estimator of β_1 : $\hat{\beta}_1$ is an unbiased estimator.

Answer: We need to prove that $E(\hat{\beta}_1) = \beta_1$. In order to do that we start with the original model:

$$Y_i = \beta_0 + \beta_1 X_i + u_i. \tag{1}$$

First, we can sum this model over i (i = 1, 2, ..., n), which would give:

$$\sum_{i=1}^{n} Y_i = n\beta_0 + \beta_1 \sum_{i=1}^{n} X_i + \sum_{i=1}^{n} u_i$$

Then we divide this model by n and obtain:

$$\overline{Y} = \beta_0 + \beta_1 \overline{X} + \overline{u}$$
 (2)

Subtracting (2) from (1) yields:

$$Y_i - \overline{Y} = \beta_1(X_i - \overline{X}) + u_i - \overline{u}.$$

Answers Exercises Undergraduate Econometrics

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Answers Exercises Undergraduate Econometrics:

<u>Econometrics</u> Badi H. Baltagi,2007-11-21 Here at last is the fourth edition of the textbook that is required reading for economics students as well as those practising applied economics Not only does it teach some of the basic econometric methods and the underlying assumptions behind them but it also includes a simple and concise treatment of more advanced topics from spatial correlation to time series analysis This book s strength lies in its ability to present complex material in a simple yet rigorous manner This superb fourth edition updates identification and estimation methods in the simultaneous equation model It also reviews the problem of weak instrumental variables as well as updating panel data methods

Student Solutions Manual to Accompany 'An Introduction to Econometrics - a Self Contained Approach': Descriptive Statistics; Chapter 2 Essentials of Probability and Estimation; Chapter 3 Interval Estimates and the Central Limit Theorem; Chapter 4 Estimation Procedures, Estimates, and Hypothesis Testing; Chapter 5 Ordinary Least Squares Estimation Procedure-The Mechanics; Chapter 6 Ordinary Least Squares Estimation Procedure-The Properties; Chapter 7 Estimating the Variance of an Estimate's Property Distribution; Chapter 8 Interval Estimates and Hypothesis Testing; Chapter 9 One-Tailed Tests, Two-Tailed Tests, and Logarithms Frank Westhoff, 2013 Solutions to odd numbered prep questions review questions and exercises in an undergraduate econometric textbook designed to teach students regression analysis on one semester

Exercises in Mathematical Economics and Econometrics, with Outlines of Theory John Ervine Spencer, Robert Introductory Econometrics Humberto Barreto, Frank Howland, 2006 This highly accessible and Charles Geary, 1974 innovative text with supporting web site uses Excel R to teach the core concepts of econometrics without advanced mathematics It enables students to use Monte Carlo simulations in order to understand the data generating process and sampling distribution Intelligent repetition of concrete examples effectively conveys the properties of the ordinary least squares OLS estimator and the nature of heteroskedasticity and autocorrelation Coverage includes omitted variables binary response models basic time series and simultaneous equations The authors teach students how to construct their own real world data sets drawn from the internet which they can analyze with Excel R or with other econometric software The accompanying web site with text support can be found at www wabash edu econometrics Bayesian Econometric Methods Joshua Chan, Gary Koop, Dale J. Poirier, Justin L. Tobias, 2019-08-15 Illustrates Bayesian theory and application through a series of exercises in question and answer format **Undergraduate Econometrics** R. Carter Hill, William E. Griffiths, George G. Judge, 1997 This book explores econometrics using an intuitive approach that begins with an economic model It emphasizes motivation understanding and implementation and shows readers how economic data are used with economic and statistical models as a basis for estimating key economic parameters testing economic hypotheses and predicting economic outcomes 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 **Instructor's Resource Guide to** Accompany Undergraduate Econometrics William E. Griffiths, Carter R. Hill, Lawrence C. Marsh, 1997 and Empirical Exercises in Econometrics Nlandu Mamingi, 2005 This is a textbook designed for undergraduate and graduate students and is the result of the author's more than twenty years of involvement with econometrics as both teacher and researcher It contains theory problems and answers many of which have already been tested extensively in classrooms and tutorials and then refined for the book It includes the following topics single equation regressions dummy and limited dependent variable models simultaneous equations models dynamic regression models unit roots cointegration and error correction models aggregation over time issues forecasting and panel data models. The book does not attempt to duplicate the many standard econometrics books Rather it supplements them by focusing exclusively on theoretical and empirical exercises in a systematic way Although much of the material has a Caribbean flavour its rigorous and clear presentation will appeal to students and teachers worldwide Statistics Karim M. Abadir, Risto D. H. Heijmans, Jan R. Magnus, 2018-11-08 Serves as a bridge between elementary and specialized statistics with exercises that are fully solved and systematically built Matrix Algebra Karim M. Abadir, Jan R. Magnus, 2005-08-22 Matrix Algebra is the first volume of the Econometric up Exercises Series It contains exercises relating to course material in matrix algebra that students are expected to know while enrolled in an advanced undergraduate or a postgraduate course in econometrics or statistics The book contains a comprehensive collection of exercises all with full answers But the book is not just a collection of exercises in fact it is a textbook though one that is organized in a completely different manner than the usual textbook The volume can be used either as a self contained course in matrix algebra or as a supplementary text **Introduction to Econometrics** Gary Koop, 2008-03-10 Indem sie Modelle fr die Voraussage wirtschaftlicher Entwicklungen bereitstellt bildet die konometrie heute einen Kernbereich der Wirtschaftswissenschaften und hat sich damit zu einem zentralen Bestandteil wirtschaftswissenschaftlicher Studieng nge entwickelt Die hier vorgelegte Einf hrung er ffnet Einsteigern ebenso wie fortgeschrittenen Studierenden einen Zugang der im Unterschied zur Lehrbuchkonkurrenz von vornherein auf einen starken Praxisbezug setzt Der Verfasser ausgewiesener konometrieexperte behandelt ein breites Spektrum konometrischer Modelle u a das einfache und das multiple Regressionsmodell Im Mittelpunkt seiner Darstellung steht dabei nicht Theoretisches sondern die Anwendung der Modelle auf empirische Daten Zahlreiche Beispiele und bungsaufgaben unter Verwendung der Standardsoftware Strata erm glichen die Ein bung in Methoden und Modelle und schaffen so die Basis frein selbstst ndiges **Exercises in Econometrics** P. C. B. Phillips, Mike Wickens, 1978 **Problems in Linear and** empirisches Arbeiten Non-Linear Programming S. Vajda, 1987 This collection of 235 problems is designed for undergraduates who have

completed a year's course in mathematical programming Each section of linear and non linear problems begins with simple exercises and proceeds to more difficult ones Solutions are based on first principles and can be found using a desk calculator Answers to all problems are provided Time Series Models for Business and Economic Forecasting, Econometrics in Its Place G. M. P. Swann, 2006-01-01 I consider the book as well suited to provide a broader perspective on methods used in applied economic research For the applied researcher the book will provide a nice overview on existing methods and some arguments as to which method might be particularly suitable for specific purposes Peter Winker Jahrb cher f National konomie u Statistik Using Econometrics A. H. Studenmund, Henry J. Cassidy, 1997 A H Studenmund s practical introduction to econometrics combines single equation linear regression analysis with real world examples and exercises Using Econometrics A Practical Guide provides a thorough introduction to econometrics that avoids complex matrix algebra and calculus making it the ideal text for the beginning econometrics student the regression user looking for a refresher or the experienced practitioner seeking a convenient reference BOOK JACKET **EBOOK: Econometrics with** Online Learning Centre CAMERON, 2005-02-16 EBOOK Econometrics with Online Learning Centre Exercises in Probability and Statistics for Mathematics Undergraduates Najeeb Abdur Rahman, 1967 Econometrics for Daily Lives, Volume II Tam Bang Vu,2018-02-25 This volume deals with advanced topics and specific problems in applied econometrics Part III introduces advanced topics in econometric theory and contains three chapters Chapter 7 deals with modeling issues and some phenomena that occur when the dataset you have collected has certain problems that need special attention for your results to be reliable Chapter 8 analyzes the concepts and models that are not linear in their forms Chapter 9 introduces several interesting models in advanced time series techniques when a dataset is not stationary Part IV applies the theoretical concepts learned in the previous chapters into empirical research This part also consists of three chapters Chapter 10 discusses the problem of selection bias and correcting methods Chapter 11 introduces the regression discontinuity design and differences in differences models Chapter 12 presents steps to carry out an empirical research project and provides strategies to avoid pitfalls in applied econometrics

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