

Hayashi *Econometrics*: Answers to Selected Review Questions

Chapter 1

Section 1.1

1. The intercept is increased by $\log(100)$.
2. Since $(\varepsilon_i, \mathbf{x}_i)$ is independent of $(\varepsilon_j, \mathbf{x}_1, \dots, \mathbf{x}_{i-1}, \mathbf{x}_{i+1}, \dots, \mathbf{x}_n)$ for $i \neq j$, we have: $E(\varepsilon_i | \mathbf{x}_i, \varepsilon_j) = E(\varepsilon_i | \mathbf{x}_i)$. So

$$\begin{aligned} E(\varepsilon_i \varepsilon_j | \mathbf{X}) &= E[E(\varepsilon_j \varepsilon_i | \mathbf{X}, \varepsilon_j) | \mathbf{X}] && \text{(by Law of Iterated Expectations)} \\ &= E[\varepsilon_j E(\varepsilon_i | \mathbf{X}, \varepsilon_j) | \mathbf{X}] && \text{(by linearity of conditional expectations)} \\ &= E[\varepsilon_j E(\varepsilon_i | \mathbf{x}_i) | \mathbf{X}] \\ &= E(\varepsilon_i | \mathbf{x}_i) E(\varepsilon_j | \mathbf{x}_j). \end{aligned}$$

The last equality follows from the linearity of conditional expectations because $E(\varepsilon_i | \mathbf{x}_i)$ is a function of $\mathbf{x}_i$.

3.

$$\begin{aligned} E(y_i | \mathbf{X}) &= E(\mathbf{x}_i' \boldsymbol{\beta} + \varepsilon_i | \mathbf{X}) && \text{(by Assumption 1.1)} \\ &= \mathbf{x}_i' \boldsymbol{\beta} + E(\varepsilon_i | \mathbf{X}) && \text{(since } \mathbf{x}_i \text{ is included in } \mathbf{X}) \\ &= \mathbf{x}_i' \boldsymbol{\beta} && \text{(by Assumption 1.2).} \end{aligned}$$

Conversely, suppose $E(y_i | \mathbf{X}) = \mathbf{x}_i' \boldsymbol{\beta}$ ($i = 1, 2, \dots, n$). Define $\varepsilon_i = y_i - E(y_i | \mathbf{X})$. Then by construction Assumption 1.1 is satisfied: $\varepsilon_i = y_i - \mathbf{x}_i' \boldsymbol{\beta}$. Assumption 1.2 is satisfied because

$$\begin{aligned} E(\varepsilon_i | \mathbf{X}) &= E(y_i | \mathbf{X}) - E[E(y_i | \mathbf{X}) | \mathbf{X}] && \text{(by definition of } \varepsilon_i \text{ here)} \\ &= 0 && \text{(since } E[E(y_i | \mathbf{X}) | \mathbf{X}] = E(y_i | \mathbf{X})). \end{aligned}$$

4. Because of the result in the previous review question, what needs to be verified is Assumption 1.4 and that $E(CON_i | YD_1, \dots, YD_n) = \beta_1 + \beta_2 YD_i$. That the latter holds is clear from the i.i.d. assumption and the hint. From the discussion in the text on random samples, Assumption 1.4 is equivalent to the condition that $E(\varepsilon_i^2 | YD_i)$ is a constant, where $\varepsilon_i = CON_i - \beta_1 - \beta_2 YD_i$.

$$\begin{aligned} E(\varepsilon_i^2 | YD_i) &= \text{Var}(\varepsilon_i | YD_i) && \text{(since } E(\varepsilon_i | YD_i) = 0) \\ &= \text{Var}(CON_i | YD_i). \end{aligned}$$

This is a constant since (CON_i, YD_i) is jointly normal.

5. If $x_{i2} = x_{j2}$ for all i, j , then the rank of $\mathbf{X}$ would be one.

Hayashi Econometrics Solution

JG Myers



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The Methodology and Practice of Econometrics Jennifer Castle, Neil Shephard, 2009-04-30 David F Hendry is a seminal figure in modern econometrics He has pioneered the LSE approach to econometrics and his influence is wide ranging This book is a collection of papers dedicated to him and his work Many internationally renowned econometricians who have collaborated with Hendry or have been influenced by his research have contributed to this volume which provides a reflection on the recent advances in econometrics and considers the future progress for the methodology of econometrics Central themes of the book include dynamic modelling and the properties of time series data model selection and model evaluation forecasting policy analysis exogeneity and causality and encompassing The book strikes a balance between econometric theory and empirical work and demonstrates the influence that Hendry's research has had on the direction of modern econometrics Contributors include Karim Abadir Anindya Banerjee Gunnar Brander Andreas Beyer Mike Clements James Davidson Juan Dolado Jurgen Doornik Robert Engle Neil Ericsson Jesus Gonzalo Clive Granger David Hendry Kevin Hoover Soren Johansen Katarina Juselius Steven Kamin Pauline Kennedy Maozu Lu Massimiliano Marcellino Laura Mayoral Grayham Mizon Bent Nielsen Ragnor Nymoen Jim Stock Pravin Trivedi Paolo Paruolo Mark Watson Hal White and David Zimmer

An Introduction to Econometric Theory James Davidson, 2018-07-18 A GUIDE TO ECONOMICS STATISTICS AND FINANCE THAT EXPLORES THE MATHEMATICAL FOUNDATIONS UNDERLYING ECONOMETRIC METHODS An Introduction to Econometric Theory offers a text to help in the mastery of the mathematics that underlie econometric methods and includes a detailed study of matrix algebra and distribution theory Designed to be an accessible resource the text explains in clear language why things are being done and how previous material informs a current argument The style is deliberately informal with numbered theorems and lemmas avoided However very few technical results are quoted without some form of explanation demonstration or proof The author a noted expert in the field covers a wealth of topics including simple regression basic matrix algebra the general linear model distribution theory the normal distribution properties of least squares unbiasedness and efficiency eigenvalues statistical inference in regression t and F tests the partitioned regression specification analysis random regressor theory introduction to asymptotics and maximum likelihood Each of the chapters is supplied with a collection of exercises some of which are straightforward and others more challenging This important text Presents a guide for teaching econometric methods to undergraduate and graduate students of economics statistics or finance Offers proven classroom tested material Contains sets of exercises that accompany each chapter Includes a companion website that hosts additional materials a solution manual and lecture slides Written for undergraduates and graduate students of economics statistics or finance An Introduction to Econometric Theory is an essential beginner's guide to the underpinnings of econometrics

Quantitative Finance with Python Chris Kelliher, 2022-05-19 Quantitative Finance with Python A Practical Guide to Investment Management Trading and Financial Engineering bridges the gap between the

theory of mathematical finance and the practical applications of these concepts for derivative pricing and portfolio management The book provides students with a very hands on rigorous introduction to foundational topics in quant finance such as options pricing portfolio optimization and machine learning Simultaneously the reader benefits from a strong emphasis on the practical applications of these concepts for institutional investors Features Useful as both a teaching resource and as a practical tool for professional investors Ideal textbook for first year graduate students in quantitative finance programs such as those in master s programs in Mathematical Finance Quant Finance or Financial Engineering Includes a perspective on the future of quant finance techniques and in particular covers some introductory concepts of Machine Learning Free to access repository with Python codes available at www.routledge.com/9781032014432 and on https://github.com/lingyixu/Quant_Finance_With_Python_Code

Mathematical Reviews, 2002 Small Sample Size Solutions

Rens van de Schoot, Milica Miočević, 2020-02-13 Researchers often have difficulties collecting enough data to test their hypotheses either because target groups are small or hard to access or because data collection entails prohibitive costs Such obstacles may result in data sets that are too small for the complexity of the statistical model needed to answer the research question This unique book provides guidelines and tools for implementing solutions to issues that arise in small sample research Each chapter illustrates statistical methods that allow researchers to apply the optimal statistical model for their research question when the sample is too small This essential book will enable social and behavioral science researchers to test their hypotheses even when the statistical model required for answering their research question is too complex for the sample sizes they can collect The statistical models in the book range from the estimation of a population mean to models with latent variables and nested observations and solutions include both classical and Bayesian methods All proposed solutions are described in steps researchers can implement with their own data and are accompanied with annotated syntax in R The methods described in this book will be useful for researchers across the social and behavioral sciences ranging from medical sciences and epidemiology to psychology marketing and economics Econometrics Fumio Hayashi, 2000-11-19

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Advanced Lectures in Quantitative Economics Frederick van Der Ploeg, 2014-05-01

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Applied Econometric Techniques Keith Cuthbertson, S. G. Hall, Mark P. Taylor, 1992 Outlines the practical application of a range of recent econometric techniques

Handbook of Financial Time Series Torben Gustav Andersen, Richard A. Davis, Jens-Peter Kreiß, Thomas V. Mikosch, 2009-04-21 The Handbook of Financial Time Series gives an up to date overview of the field and covers all relevant topics both from a statistical and an econometrical point of view There are many fine contributions and a preamble by Nobel Prize winner Robert F Engle

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The Forecasting and Policy System , 1997

Advanced Lectures in Quantitative Economics , 1990

JOURNAL OF ECONOMETRICS: ANNALS 1991-3, THE MEASUREMENT AND ANALYSIS OF WELFARE -- VOLUME 50 (1991) , 1991

Economics Letters , 1979

Notes and Problems in Applied General Equilibrium Economics P.B. Dixon, 1992-03-27 General equilibrium refers to an analytical approach which looks at the economy as a complete system of inter dependent components industries households investors governments importers and exporters Applied means that the primary interest is in systems that can be used to provide quantitative analysis of economic policy problems in particular countries Reflecting the authors belief in the

models as vehicles for practical policy analysis a considerable amount of material on data and solution techniques as well as on theoretical structures has been included The sequence of chapters follows what is seen as the historical development of the subject The book is directed at graduate students and professional economists who may have an interest in constructing or applying general equilibrium models The exercises and readings in the book provide a comprehensive introduction to applied general equilibrium modeling To enable the reader to acquire hands on experience with computer implementations of the models which are described in the book a companion set of diskettes is available **Documentos de trabajo** ,2008

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