



FOURTH EDITION

INTRODUCTION TO
ECONOMETRICS

G.S. Maddala & Kajal Lahiri

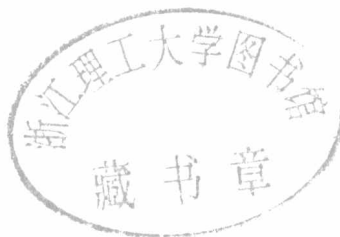


Introduction to Electronics

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Fourth Edition

G. S. Maddala
Kajal Lahiri



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FOREWORD

I would like to thank Professor Kajal Lahiri for his hard work and dedication to the revision of this text. Since my husband's passing, Professor Lahiri has taken the responsibility for preparing this fourth edition and has done an exceptional job of preserving the substance and style of my husband's original work while updating its content to reflect the latest developments and applications in the field.

I would also like to thank Ms Anneli Mockett and Mr Steve Hardman for their guidance and encouragement through the revision process.

This edition is dedicated to Max, Miles, and Maya, G.S.'s three precious grandchildren who would have meant so much to him. His grandchildren are learning about their grandfather through pictures and family stories and someday will learn more through his writing.

Kay Maddala
June 2009

PREFACE TO THE FOURTH EDITION

In revising the third edition of *Introduction to Econometrics*, I have taken utmost care in preserving the brilliant expository style of G. S. Maddala – he could cut through the technical superstructure to reveal only essential details, while retaining the nerve centre of the subject matter he sought to explain. The fourth edition differs from its predecessor in several key respects. Chapters 5 and 6 of Part II, on heteroskedasticity and autocorrelation, now reflect the latest professional practice in dealing with these common violations of the basic regression model. Chapter 10 includes extensive discussion on diagnostic checking in linear models, various nested and nonnested model selection procedures, specification testing, data transformations, and tests for nonnormality. The first three chapters of Part III cover an introduction to time-series analysis, including the Box–Jenkins approach, forecasting and seasonality (Chapter 12), models of expectations and distributed lag models (Chapter 13), and vector autoregressions, unit roots, and cointegration (Chapter 14). Chapters 15 and 16 cover, respectively, the latest developments in panel data analysis and various resampling methods for use in small sample inference. The panel data chapter now deals with simultaneity, correlated individual effects, and GMM and IV methods of estimation, with a number of real-life examples. Chapter 16 of the third edition on large sample theory has been integrated in the third appendix to Chapter 4.

The website related to this book contains several useful data sets. Some of these data sets that are short are printed in the book. Others on the web are not in the book. Here is the listing of all data sets:

- Data sets printed in the book and also on the web:
Tables 3.11, 4.7–4.11, 5.5, 7.2, 8.2, 9.1, and 9.3.
- Data sets available on the web only:
Table 4.12: Auction prices of apartments in Moscow (data provided by Yasushi Toda).
Table 8.7: Data set on bride–groom characteristics and dowries (ICR, SAT-VLS data), south-central rural India (data provided by A. B. Deolalikar).
Tables 13.2–13.8: Assorted time-series data.
Table 15.1: Panel data of annual inflation forecasts for Germany by 31 professional forecasters during 1991–2007. Note that the data set has many missing values – most current econometric software packages (e.g., EViews) will handle missing values appropriately. Based on K. Lahiri and X. Sheng, 2008, “Evolution of Forecast Disagreement in a Bayesian Learning Model,” *Journal of Econometrics*, Vol. 144, No. 2, pp. 325–340.
Table 15.2: Panel data on demand for electricity and natural gas in the USA. Based on G. S. Maddala, H. Li, R. P. Trost, and F. Joutz, 1997, “Estimation of Short-Run and Long-Run Elasticities of Energy Demand from Panel Data Using Shrinkage Estimators,” *Journal of Business and Economic Statistics*, Vol. 15, pp. 90–100.

Table 15.3: Panel data on selected macroeconomic variables for 31 developing countries over 1964–1987. Based on T. Kinal and K. Lahiri, 1993, “On the Estimation of Simultaneous-Equations Error-Components Models with an Application to a Model of Developing Country Foreign Trade,” *Journal of Applied Econometrics*, Vol. 8, No. 1, pp. 81–92.

Owing to the dramatic advances in computing capacity to handle large data sets, and in the development of many econometric software packages in recent years, the situation is very good in terms of the choice of computer programs that will do everything discussed in the book. So we do not follow or recommend any specific computer program. A sampling of the most commonly used packages is as follows: EViews, Gauss, LIMDEP, RATS, SAS, Shazam, Stamp8, Stata, and TSP. Of these, EViews, RATS, and Stamp8 are very user friendly in conducting time-series analysis. LIMDEP is particularly suitable for estimating models with limited dependent and qualitative variables. Stata is very popular amongst analysts doing cross-sectional and panel data. SAS is a general-purpose statistical package and has the maximum appeal outside the economics profession.

We have benefited from comments and suggestions from many students and colleagues who are too numerous to thank individually. However, I owe special gratitude to Wiji Arulampalam, Gavin Cameron, Anthony Davies, Marek Gruszczynski (for Polish translation), Mohamed Lachaab, Xiaomei Li, Dong Li, Laszlo Matyas (for Hungarian translation), Robin Mukherji, Sohini Sahu, Xuguang Sheng, Shariar Yousefi, Yongchen Zhao and many other correspondents and anonymous reviewers who have commented on errors and misprints in earlier editions. We have also made many changes to the list of references, dropping older papers and adding new ones. Most empirical examples reported in earlier editions had to be re-estimated for numerical accuracy. I thank Ningzhong Li for these tedious calculations. Doubtless, omissions remain, and we welcome suggestions for further improvements.

Finally, I thank Steve Hardman and Céline Durand, of John Wiley & Sons, Ltd, and Geoffrey Palmer for the care they have given to the production of this book, and Kay Maddala for her encouragement to complete the fourth edition. As always, I owe the greatest debt to my wife Nandini and to our son Indraneil.

Kajal Lahiri

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¹ Here and below, the * indicates that this is an optional section.

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