

PREFACE

My purpose in writing this textbook is to provide graduate students with an introduction to classical econometric theory. Econometric theory is the collection of mathematical ideas and principles that motivates much of the empirical analysis by economists. The term *classical* refers to analyzing data as the outcome of repeatable experiments. To introduce this material to graduate students, I have followed a particular pedagogical approach.

I have striven to develop the material in a natural order for the *introduction* of ideas and their foundations. After we have mastered a theory, our internalization of that theory often follows its logic. Certain lemmas come before a principal proposition because the lemmas hold intermediate results. When I began teaching econometrics as a professor at Berkeley, I used such an ordering in my lectures. My experience has taught me to introduce and motivate the principal proposition first. The chapters of this book use this same approach. Hence, intuition and motivation appear at the outset. Empirical illustrations often open a chapter, whereas technical arguments and proofs tend to appear in closing sections.

To provide reference points for students, I have organized this textbook around a few unifying principles. *Mathematical projection* is the primary theoretical principle. The familiar geometry of the ordinary least-squares fit introduces this principle. It reappears in partitioned regression, restricted regression, the conditional expectation, the population projection, generalized least squares, instrumental variables, and the relative efficiency of estimators. The *latent variable model* is the primary econometric modeling principle. One moves from such statistical concepts as the conditional expectation to such economic concepts as the demand function through the conceptual framework of latent variables.

This textbook focuses on econometrics, treating introductory linear algebra, calculus, probability, and statistics as prerequisites. Nevertheless, several appendices contain summaries of this foundational material. These appendices are handy references but introductory texts are my recommended source for learning.

To explore this book superficially I invite the reader to leaf through the text, reading the prefaces and overviews of each of the four parts and the chapter overviews. The overviews appear at the end of each part or chapter and provide numbered lists of the important points.

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Berkeley, California

To obtain data sets, computer programs, copies of figures, errata, and answers to frequent questions visit the internet site at <http://elsa.berkeley.edu/users/ruud/cet/>. Professors will also be able to retrieve suggested answers to the exercises.