Preface

This book provides readers with a set of both theoretical and applied tools in order to illustrate the correct implementation of modern micro-econometric techniques for program evaluation in the social sciences. As such, the reader is offered a comprehensive toolbox for designing rigorous and effective ex post program evaluation using the statistical software package Stata. The theoretical statistical models relating to each individual evaluation technique are discussed and followed by at least one empirical estimation of the treatment effects using both built-in and user-written Stata commands.

During the course of the discussion, readers will gradually become familiar with the most common evaluation techniques discussed in the literature, such as the Regression-adjustment, Matching, Difference-in-differences, Instrumental-variables, and Regression-discontinuity-design, and will be offered a series of practical guidelines for the selection and application of the most suitable approach to implement under differing policy contexts.

The book is organized in four chapters.

The first chapter provides an introduction to the econometrics of program evaluation, paving the way for the arguments developed in subsequent chapters, laying out the statistical setup, standard notation, and basic assumptions used in the estimation of a program's treatment effects in the socioeconomic context. The concept of selection bias, both due to observable and unobservable factors, is discussed and an overview of the econometric methods available to correct for such biases is illustrated. The chapter concludes with a brief discussion of the principle Stata commands for the estimation of the treatment effects, along with the various econometric methods for binary treatment proposed in the literature.

The second chapter focuses on the estimation of average treatment effects under the assumption of "selection on observables" (or "overt bias") and provides a systematic account of the meaning and scope of such an assumption in program evaluation analysis. A number of econometric methods (such as: Regression-adjustment, Matching, Reweighting, and the Doubly-robust estimator) are discussed, in order to ensure correct inference for casual parameters in this setting.

The chapter ends with a series of empirical applications of these methods in a comparative perspective.

The third chapter focuses on econometric methods for estimating average treatment effects under "selection on unobservables" (or "hidden bias"). This occurs when non-observable factors significantly drive the nonrandom assignment to treatment. In such a situation, the methods discussed in Chap. 2 are no longer appropriate for estimating program effects. In Chap. 3, therefore, we present three techniques for correct estimation in the presence of selection on unobservables: Instrumental-variables, Selection-models, and Difference-in-differences, the implementation of which requires either additional information or further assumptions.

The fourth chapter addresses two related subjects: the Local average treatment effect (LATE) and the Regression-discontinuity-design (RDD), both considered as nearly quasi-experimental methods. It offers a discussion of the theory underlying the LATE approach, illustrating the setting of a randomized experiment with imperfect compliance, and goes on to discuss the sample estimation of LATE. The second part of the chapter focuses on the RDD, used when a specific variable (the so-called *forcing* variable) defines a "threshold" separating—either sharply or fuzzily—treated and untreated units. After presenting the econometric background for the RDD model, the discussion focuses on both sharp RDD and fuzzy RDD methodologies. A simulation model both for sharp RDD and fuzzy RDD is also presented in order to illustrate the role played by each of the underlying assumptions of these differing approaches.

The chapters of this book can be considered as fairly self-contained units. The more interested reader will however find it useful to have a thorough understanding of the subjects singularly treated in each chapter. Finally, it should be noted that I assume the reader to be familiar with basic econometric theory and to have some prior knowledge of the use of Stata for econometric purposes.

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