

# Preface

## Subject

This book covers recent advances in efficiency evaluation, most notably the Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) methods. It introduces the underlying theories, shows how to make the relevant calculations and discusses some applications. The aim is to make the reader aware of the pros and cons of the different methods and to train him or her on the proper usage of these methods in both standard and non-standard cases.

Several software packages have been developed that can be used to solve some of the most common DEA and SFA models. In this book, however, we rely on R, a free software environment that can be used for optimization, statistical computing, and graphics. This program enables the reader to solve not only standard problems but also many other problem variants. Using R, one can focus on understanding the business case and developing a good model. One is not restricted to predefined models or to the use of a one-size-fits-all approach.

There are several R routines that support the use of DEA and SFA models. While writing this book, we have also developed an R-package named *Benchmarking* that makes applications easy without limiting the variations in the models and calculations that innovative researchers and practitioners seek to use.

## Audience and style

The intended audience includes graduate students, advanced consultants and practitioners with an interest in quantitative performance evaluation.

This book uses mathematical formulations of models, assumptions, etc. Unlike original contributions on this subject, however, this book de-emphasizes formal proofs, partially by placing them in appendices or by referring to the original

sources. Moreover, this book emphasizes the use of theories and interpretations of the mathematical formulations.

A series of small examples and graphical illustrations will be presented. This text also combines formal models with less formal economic and organizational thinking. Moreover, it discusses numerous applications based on projects on which we have worked. This includes some large projects with significant practical effects: e.g., the design of benchmarking-based regulations for energy companies in different European countries or the development of merger decision support systems for competition authorities.

## Acknowledgements

The book covers material that we have used in several courses. We gratefully acknowledge comments by students at Copenhagen University and Copenhagen Business School, Denmark; Universitat Autònoma de Barcelona, Spain; the University of New England, UNE, Australia; the Helsinki School of Economics and Business Administration, Finland; and the Yale School of Management, USA.

In addition, we have benefitted from questions raised by participants in a series of industry courses that we presented in Denmark, Sweden, Germany, the Netherlands and Canada during the last five years. We would also like to acknowledge the influence of a large number of friends, coauthors and colleagues who have helped us to understand the basics of efficiency evaluation. At the risk of leaving out important individuals, we would like to acknowledge the contributions of Professors Per Agrell, Mette Asmild, Rajiv Banker, Robert Chambers, Tim Coelli, William W. Cooper, Philippe Van den Eeckaut, Rolf Färe, Finn Førsund, Shawna Grosskopf, Harold Fried, Emili Grifflé-Tatje, Arne Henningsen, Pekka Korhonen, Jens Leth Hougaard, Knox Lovell, Ole Olsen, Niels Chr. Petersen, Leopold Simar, Jørgen Tind, Henry Tulkens, and Paul Wilson.

Copenhagen,  
September 2010

*Peter Bogetoft*  
*Lars Otto*



<http://www.springer.com/978-1-4419-7960-5>

Benchmarking with DEA, SFA, and R

Bogetoft, P.; Otto, L.

2011, XVI, 352 p., Hardcover

ISBN: 978-1-4419-7960-5