

Benefit-Cost Analysis

Financial and Economic Appraisal using Spreadsheets

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Preface

This book is intended for people with a basic understanding of elementary economics who wish to learn how to conduct a social cost-benefit analysis. We use the term *social benefit-cost analysis* to refer to the appraisal of a private or public project from a public interest viewpoint. We follow professional practice in using the terms *benefit-cost analysis* and *cost-benefit analysis* (with or without the *social* prefix) interchangeably.

A social cost-benefit analysis of a publicly funded project may be commissioned by a municipal, state or federal government, or by an international agency such as the World Bank, IMF, UN or OECD. Proponents of private projects which have significant social impacts may also commission an economic analysis of this type in order to support an application for approval to proceed with the project. Sometimes the scope of the required analysis is broader than the evaluation of economic benefits and costs: an impact analysis may also be required to determine the effects of the project on employment and economic growth; an environmental impact statement may be required; and a social impact analysis dealing with factors such as crime and impacts on families may be sought. This book concerns itself mainly with the economic benefits and costs of projects, although it does touch on the question of economic impact. The main questions addressed are: Do the benefits of the project exceed the costs, no matter how widely they are spread? And which group benefits and which bears the costs?

Social cost-benefit analysis relies mainly on microeconomic theory, although some understanding of macroeconomics is also useful. The person whose background should be sufficient to allow them to benefit from this book is someone who did a principles of economics subject as part of a commerce, arts, science or engineering degree; a person with an undergraduate economics training will find the organizational principles set out in the book to be innovative and of considerable practical use.

The book has several unique features: the close integration of spreadsheet analysis with analytical principles is a feature of some financial appraisal texts, but is unusual in social benefit-cost analysis; the particular layout of the spreadsheet is unique in offering an invaluable cross-check on the accuracy of the appraisal; and the book is structured in a way that allows readers to choose the level of analysis which is relevant to their own purposes.

The book emphasizes practical application. It develops a template based on spreadsheet analysis which is recommended for use in conducting a social cost-benefit analysis and which provides a check on the accuracy of the analysis. The template is presented in the form of a case study of a social cost-benefit analysis of a proposed private investment project in a developing economy. The case study, together with reference to the necessary economic principles, is developed stage by stage in Part 1 of the book, consisting of the first six Chapters. At the completion of Part 1 the reader should be capable of undertaking a cost-benefit analysis of an actual project.

Part 2 of the book introduces some complications which were ignored in Part 1: input or output price changes caused by the project under analysis; imperfections in foreign exchange markets; risk; and the cost of public funds. The analysis of many projects does not require consideration of these matters, and because they tend to be a little more complicated they are deferred to this second Part of the book. The treatment of these issues in practical benefit-cost analysis is illustrated by amendments to the case study developed in Part 1.

Part 3 of the book looks at broader issues, including income distribution issues from an atemporal and inter-temporal perspective, valuation of non-marketed goods, and economic impact analysis.

Note to the Instructor

The book is intended as the required text for a sequence of two courses in benefit-cost analysis. It provides a framework for courses involving practical application and leading to the acquisition of a valuable set of skills. It can be supplemented by a range of other readings chosen to reflect the emphasis preferred by the Instructor. It includes exercises and a major benefit-cost analysis problem which can be assigned for credit.

A one-semester undergraduate or postgraduate course can be based on Chapters 1–6 of the book, or Chapters 1–7 if issues of consumer and producer surplus are to be included. We suggest a weighting of 50% credit for examination of the principles put forward in the Chapters, 10% for a selection from the small Exercises that follow each Chapter, and 40% for completing the benefit-cost analysis assignment presented in the Appendix. Chapter 14, dealing with the way in which a benefit-cost analysis should be reported, can also be assigned as reading. The text can be supplemented with other reading, including reference to chapters in other benefit-cost texts which cover some issues in more detail. Some classes might benefit from a set of lectures on the basic microeconomic principles upon which benefit-cost analysis draws, together with reference to a text in microeconomics or public finance.

A more advanced course can be built around Chapters 7–13 and selected parts of Chapters 1–6, together with references to further reading. We teach the higher level course in 6–8 weeks in the second half of the semester, with completion of the basic course as a prerequisite. We use a weighting of 65% credit for examination of principles and 35% for completion of the Exercises. However, a term paper on a particular issue in benefit-cost analysis could be assigned for part of the credit.

For the purposes of the more advanced course the text needs to be supplemented by a significant amount of further reading. In our course we recommend to our students some chapters in some of the benefit-cost analyses texts referred to in our brief suggestions for further reading, but the choice is very much a matter of individual taste.

Our teaching of the basic course is based on two hours of lectures and class discussion per week plus a one-hour computer lab session. To start with we use the lab session to make sure everyone is comfortable with using spreadsheets and is able to access the various financial sub-routines. We then spend some time developing the benefit-cost analysis of the case study project as an example of the practical application of the approach. After 6–7 weeks of lectures and lab work students are ready to undertake the benefit-cost analysis assignment in the Appendix. In the second part of the semester we use the class and lab times for consultations with students who require help with the major assignment. As indicated by the sample case study report, which was prepared by one of our students and is included in Chapter 14, a high standard of work can be expected.

We use a similar teaching pattern for the more advanced course. The lab sessions are used to provide help with the assignments, and consultation sessions can also be provided for this purpose and for assistance with preparing a term paper. The benefit-cost analysis assignment in the Appendix could be expanded, as illustrated in the Appendices to Chapters 7–10, and further development of the report prepared in the basic course could be the subject of a significant assignment.

The text will be supported by a link on Cambridge University Press' website (<http://academic.cambridge.edu.au>) which will provide the Instructor with access to spreadsheets, problem solutions and powerpoint presentations.

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