

Economics 490 - Project Evaluation and Cost-Benefit Analysis

Spring 2000

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Course Description

This course is intended as graduate level introduction to the study of cost-benefit analysis (CBA) and project evaluation. As you know from previous courses, under the right conditions, the market gives efficient outcomes. However, these conditions are frequently not met in the real world. This can lead to market failure and a case for government intervention. The first-best solution is usually to try to fix the markets so goods are allocated efficiently, but this is often difficult or impossible. An alternative is to have the government directly intervene in the allocative process. This may be done through economic planning or voting, for example. However, these solutions usually do not lead to efficiency, and are often impractical to implement in a real world situation. Project evaluation and CBA is a third alternative. I develop the basic methodology, and then describe the major pitfalls and difficulties of using this method. The message of the course is that CBA is strictly a second-best approach, however, it may be the only choice. CBA is more of an art than an exact science, and we must strive to conduct the analysis as carefully and completely as is practically possible. Perfection is not feasible.

This course will be split into three parts. For the first six weeks, we will focus on market equilibrium and public finance. We will define and explore the first-best solutions that we would like to obtain, and discover the reasons why the market fails to give them to us. We will discuss possible market based solutions to these problems. Public goods and externalities will be our primary focus. I will assign two problem sets and a midterm for this section of the course.

The second six weeks will deal explicitly with theoretical and applied project evaluation and CBA. I approach these topics as a structure to organize thinking about difficult public policy questions rather than as mechanism to give us exact solutions. The fundamental idea behind this structure is extremely simple. Getting the right information, on the other hand, is very difficult. The more effort you

put into getting data to evaluate a project, the better your decision is likely to be. However, this is costly and time consuming process. My priority is this course is to make you aware of which questions to ask, and how to ask them. A good analyst does the best job he can with the research resources he has available. I hope to give you an ability to distinguish as well as possible between first and second order concerns in order guide you in allocating your efforts. I will also assign two problem sets and a midterm for this section of the course.

The last two or three weeks will be devoted to writing a project evaluation. You will be provided with data and it will be your job to decide how to use the tools we have developed in the course to analyze the problem and effectively present your conclusions. We will give you only part of the information you need and you must figure out what is missing and ask for additional data as you think it is required. During this period, Diego will play the role of a “research assistant” whose job it is to track down the information you ask for. He will also answer questions of fact related to the data and project. Diego will hold a brief meeting with the class as a group each week to coordinate you all and provide general information. He will also meet with you once per week individually to check your progress. During this period, I will hold office hours and will be available by appointment to address theoretical questions relating to the project. There will be no final exam besides the paper, which will be due at the beginning of finals week.

Grading will be based on the following system: each problem set is worth 5%, each midterm 25%, and the paper 30% of the final grade. I strongly encourage you to set up study groups and to discuss the homework and project together. However, after your discussions, you must write your understanding of the correct answers in your own words! The TA will not give credit for copied answers. My office is in Commerce. West 406, and my phone number is 333-4590. Office hours will be held immediately after class or by appointment. If you feel you are getting lost, *please* come in and talk to me. It is a good idea to mention to me that you plan to see me just to make sure I stay in my office. I look forward to working with you all.

Readings and Topics

There are three main textbooks for this course.

Hyman, David (1999): *Public Finance: A Contemporary Application of Theory to Policy*. Dryden Press.

We will use this book mainly in the first part of the course.

Gramlich, Edward (1990): *A Guide to Benefit-Cost Analysis*. Prentice Hall.

Dasgupta, Partha, Amartya Sen, and Stephen Marglin (1992): *Guidelines for Project Evaluation*. UNIDO, Vienna.

These last two books are will be used in the second part of the course. In addition, several articles will be assigned. Some of the topics I will lecture on have no associated readings. This is because the papers are often fairly complicated and give much more detail than you need in an applied course. However, If a topic catches your interest, or for any other reason you would like to explore a subject more deeply, do not hesitate to ask me for references. In any event, the papers bellow constitute a partial list. I will add more as the semester progresses. These will be on reserve at the commerce library.

1. Market Equilibrium

- a. Assumptions for a competitive economy
- b. Partial equilibrium welfare analysis
- c. General equilibrium analysis and welfare theorems
 - **Hyman** ch. 1, and 2
 - **Gramlich** ch. 1

2. Market failure

- a. Monopolies and market power
- b. Incomplete information

3. Externalities

- a. Welfare analysis of positive and negative externalities
- b. Pigouvian tax solutions
- c. Coasian analysis
- d. Tragedy of the commons

- e. Fundamental nonconvexities and nonconvexities in general
 - **Hyman** ch. 3
 - **Gramlich** ch. 2
 - **Coase, R.** (1960): “The Problem of Social Cost,” *Journal of Law and Economics*, October, 1-44.
 - **Starrett, D.** (1972): “Fundamental Non-Convexities in the Theory of Externalities,” *Journal of Economic Theory*, Vol. 4, 180-199.
 - **Boyd, J. and J. Conley** (1997): “Fundamental Nonconvexities in Arrowian Markets and a Coasian Solution to the Problem of Externalities,” *Journal of Economic Theory*, Vol. 72, 388-407.
 - **Baumol, W.** (1974): “On Taxation and the Control of Externalities,” *American Economic Review*, June, 307-322.
4. Public goods
- a. Lindahl equilibrium
 - b. Free riding
 - c. The revelation problem
 - d. Local public goods and club goods
 - **Hyman** ch. 4 and 5
 - **Gramlich** ch. 2
 - **Samuelson, P. A.** (1955): “Diagrammatic Exposition of the Theory of Public Expenditures,” *Review of Economics and Statistics*, November.
 - **Samuelson, P. A.** (1954): “The Theory of Public Expenditures,” *Review of Economics and Statistics*, November.
 - **Foley, D. K.** (1970): “Lindahl’s Solution and the Core of an Economy with Public Goods,” *Econometrica*, Vol. 38, 66-72.
 - **Tiebout, C.** (1956): “A Pure Theory of Local Expenditures,” *Journal of Political Economy*, Vol. 64, 416-424.
 - **Buchanan, J.** (1965): “An Economic Theory of Clubs,” *Economica*, Vol. 32, 1-14.
 - **Clarke, E.** (1971): “Multipart Pricing of Public Goods,” *Public Choice*, Vol. 11, 17-33.

- **Groves, T. and J. Ledyard** (1977): “Optimal Allocation of Public Goods: A Solution to the ‘Free Rider’ Problem,” *Econometrica*, Vol. 45, 783-809.
5. Government failure
 - a. The principle-agent problem in bureaucracies
 - b. The efficiency properties of voting and the Arrow impossibility theorem
 - c. Planning mechanisms and their limitations.
 6. Cost Benefit Analysis-the basic approach.
 - a. Calculating the present value of a stream of net benefits
 - b. Calculating the internal rate of return
 - c. Choosing projects when the capital constraint is binding
 - d. An aside on reswitching
 - **Gramlich** ch. 3 and 6
 - **Dasgupta, Sen and Marglin** ch. 1, 2 and 3
 7. Valuations of Costs and benefits
 - a. Market prices and shadow prices the project is “small”.
 - b. Market prices and shadow prices the project is “large”.
 - c. General equilibrium considerations.
 - d. Labor, land and accounting
 - e. Foreign exchange
 - **Gramlich** ch. 4 and 5
 - **Dasgupta, Sen and Marglin** ch. 4, 5 and 16
 - **Willig, R.** (1976): “Consumer’s Surplus Without Apology,” *American Economic Review*, September.
 8. Intangibles
 - a. The value of a life
 - b. Equity
 - c. Quality of life issues
 - **Gramlich** ch. 7 and 8
 - **Dasgupta, Sen and Marglin** ch. 6, 7, 8, 9, 10, and 12

9. The social discount rate
 - a. Different perspectives
 - b. The marginal product of capital
 - c. Taking into account uncertainty
 - **Gramlich** ch. 6
 - **Dasgupta, Sen and Marglin** ch. 13
 - **Arrow, K. and R. Lind** (1970): “Uncertainty and the Evaluation of Public Investment Decisions,” *American Economic Review*, Vol. 60, 364-378.
 - **Graham, D. A.** (1981): “Cost-Benefit Analysis Under Uncertainty,” *American Economic Review*, Vol. 71, 715-725.