

III. Public Affairs: Cost-Benefit Analysis

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Course Objectives: Cost-benefit analysis (CBA) has both narrow and broad applications. In its narrow application, it serves as a decision rule for selecting policies for maximizing economic efficiency. In its broader application, it provides concepts, techniques, and conventions for assessing economic efficiency, or components of economic efficiency, when efficiency is only one of the social goals relevant to policy choice. This course provides the conceptual foundations and craft skills to prepare you to be sophisticated consumers and producers of CBA.

Prerequisites: Some familiarity with the basic concepts of microeconomics and statistics is assumed.

Course Requirements and Grades: Four requirements promote the course objectives:

First, I expect active participation in class and diligence in the completion of problem sets and other assignments. Our class time will be split between lectures and discussion. If this format is to be effective for both you as an individual and your classmates, then you must be prepared to participate in discussion. Sometimes discussion will be around assigned problems, including some that require reading about topics not yet covered in lecture. It is important that you put effort into these problems so that you can fully participate in their discussion. The effort will also reward itself in terms of the depth of your understanding of course material. *Ten percent* of your course grade will be based on class participation and assignments.

Second, an in-class midterm examination will give you an opportunity to demonstrate your mastery of the basic concepts of CBA. *Thirty percent* of your course grade will be based on your performance on the midterm examination.

Third, although the theory of CBA can be easily learned in the classroom, the craft for actually doing it in a complex world, with inevitable limitations on the availability time, data, and expertise, probably cannot. To get practice in actually doing CBA, you will participate in a team project on a real issue for an actual client. The teams and projects will be randomly assigned. During the semester, each team will make several oral and written progress reports. You should also plan on participating in a briefing on the final report at your client's convenience, most likely after the end of the semester. As most policy analysts work in teams, you should view your participation in the project as an important part of your development as a policy analyst. I expect team members to be professional in interactions with their clients as well as among themselves. I also expect each team member to be fully engaged with the project, and I reserve the right to penalize individuals who are not fully familiar with their teams' products. I will ask each team member to evaluate the effort and contributions of other team members, and I will consider the responses in assigning individual grades. *Forty percent* of your course grade

will be based on the team project. I cannot overemphasize the importance of the effort you put into the project for your future ability to do cost-benefit analysis. Please do not take this course if you are unwilling or unable to give the project your highest priority. I reserve the right to lower the grade of anyone who does not contribute fully to his or her team. I also reserve the right to give a failing grade in the course for anyone who acts unprofessionally.

Fourth, there will be a take-home final examination. *Twenty percent* of your course grade will be based on the final examination. If class attendance after the midterm is regular (almost everyone attending each class), and a majority of the class wishes, then I will waive the final and allocate its grade percentage to the final project.

Textbook: We will make extensive use of the following text (BGVW):

Anthony E. Boardman, David H. Greenberg, Aidan R. Vining, and David L. Weimer, *Cost-Benefit Analysis: Concepts and Practice*, 4 th ed. (Upper Saddle River, New Jersey: Prentice Hall, 2011).

You may use the 3 rd edition as a substitute, but it will require some additional effort to obtain the updated material. The tentative schedule lists chapters and exercises from the 4th edition.

Team Projects: The topics for team projects are as follows:

1. A recent report by the U.S. Postal Service Office of Inspector General (*Analyzing the Postal Service's Retail Network Using an Objective Modeling Approach* , June 14, 2010, RARC-WP-10_004) argues that the density of retail facilities in rural areas is too high from the perspective of economic efficiency. Review the model developed by George Yezer that is the analytical basis for the study. Modify it as appropriate from a cost-benefit perspective. Choose a rural region in Wisconsin, propose alternatives for reducing the density of retail postal facilities in that region, and assess the net social benefits of each alternative. Client: Alan Robinson, Center for the Study of the Postal Market.

2. The market share of resource-efficient (Energy Star) clothes washers in Wisconsin has been about 50 percent for the past few years. Focus on Energy ran rebate programs on washers several years ago, but as market share increased, so did free riding. Free riders combined with the high incremental cost of a resource-efficient washer compared to a standard washer have made washing machine rebates appear not cost-effective when only energy savings are counted. Would a program become cost effective if either (a) water savings are included; or (b) the program delivery model is changed to reduce free ridership? Client: Eileen Hannigan, Senior Research Analyst, Wisconsin Energy Conservation Corporation.

3. The federal government estimates that nearly seven-million Americans abuse prescription drugs—more than the total number abusing cocaine, heroin, ecstasy, and other recreational drugs. A recent study in Wisconsin found that one out of every five high school students admits to abusing prescription medication. In response to

prescription drug abuse, several states have started to implement programs to address prescription drug abuse, addiction, and diversion, such as Prescription Drug Monitoring programs (PDMPs). Thirty-three states currently have operating PDMPs, while an additional nine states have laws allowing for the establishment of a PDMP. While the models used vary across states, generally PDMPs have the following objectives: (1) to support access to legitimate medical use of controlled substances, (2) to help identify and deter or prevent drug abuse and diversion, (3) to facilitate and encourage the identification, intervention with and treatment of persons addicted to prescription drugs, (4) to help inform public health initiatives through outlining of use and abuse trends and (5) to help educate individuals about PDMPs and the use, abuse and diversion of and addiction to prescription drugs. On May 18, 2010, Governor Doyle signed a bill directing the Pharmacy Examining Board to establish a PDMP in Wisconsin. The Board is tasked with designing a program that follows the guidelines established within the act while the Department must procure funding for the program through available Federal grants. The Pharmacy Examining Board has requested a cost-benefit analysis of alternatives for assessing the impact that implementing the programs would have on the state. As this is a mandated program, and limited funds are available for implementation, the Board and Department are looking at costs, but highlighting potential long-term benefits of a program and any potential net benefits will be extremely valuable in supporting program choice. Client: Nora Wilson, Pharmacy Examining Board, Department of Regulation and Licensing.

4. The revenue generated by the sales tax depends both on its rate and its base. Wisconsin currently exempts services from its sales tax. What would be the social costs and increase in revenue from applying the sales tax to all or most services? How high would the rate have to be raised on the existing base to generate an equivalent amount of revenue and what would be its social costs? Client: Karen Bogenschneider, Director, Wisconsin Family Impact Seminars.

5. Motor fuels are not subject to the Wisconsin sales tax. What would be the revenue implications and net benefits of applying the sales tax to motor fuels? Consider modifications of the tax that would initially impose no additional net burden on consumers. Conduct the analysis both with standing only for Wisconsin residents and for all U.S. residents. Client: Karen Bogenschneider, Director, Wisconsin Family Impact Seminars.

6. The Washington State Institute for Public Policy (WSIPP) has identified a number of criminal justice programs with potential for reducing costs and crime. Use the WSIPP analysis to identify a set of promising policies for Wisconsin. Estimate the fiscal implications and net benefits of these policies. Client: Karen Bogenschneider, Director, Wisconsin Family Impact Seminars.

7. In Wisconsin, 17-year olds are considered adults for purposes of the prosecution of crime. That is, rather than the default being treatment within the juvenile justice system, it is prosecution and punishment within the adult system. The costs of handling cases within these two systems differ. Research also suggests that outcomes, such as

recidivism, also differ. Estimate the net benefits of making treatment within the juvenile justice system the default for 17-year olds in Wisconsin. Client: Jim Moeser, Wisconsin Council on Children and Families.

I will evaluate each team in terms of how much progress it makes in light of the scope of the topic, the complexity of the issue, and the availability of information. My assessment will reflect comments from the client on the usefulness of the product and the professionalism of the team.

Tentative Schedule

Session 1 - Introduction

BGVW, Chapter 1

Scan: EPA Guidelines

(<http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>)

Team projects organized

Session 2 - Class Discussion of Team Projects from Previous Years

BGVW, Chapter 11

Sessions 3 and 4 - Conceptual Foundations

BGVW, Chapter 2 (Prepare exercises 2, 3, and 4 for class)

Sessions 5, 6, and 7 - Valuing in Primary Markets

BGVW, Chapter 3 (Prepare exercises 1 and 2 for class)

BGVW, Chapter 4 (Prepare exercises 1, 2, and 3 for class)

Spreadsheet Exercise 3.3

Spreadsheet Exercise 4.4

Session 8 - Valuing in Secondary Markets

BGVW, Chapter 5 (Prepare exercises 1, 2, and 3 for class)

Project report due: Each team should prepare a five- to seven-page (double-spaced) report that describes the issue being addressed in the project.

Spreadsheet Exercise 5.4

Sessions 9 and 10 - Basics of Discounting for Time/Social Discount Rate

BGVW, Chapter 6 (Prepare exercises 1, 3, and 4 for class)

BGVW, Chapter 10 (Prepare exercise 1 for class)

Scan: OMB Guidelines

(<http://www.whitehouse.gov/OMB/circulars/A004/A-4.PDF>)

(<http://www.whitehouse.gov/omb/circulars/a094/a094.html>)

UK Guidelines

(<http://greenbook.treasury.gov.uk/>)

CPI Calculator
(http://www.bls.gov/data/inflation_calculator.htm)
Spreadsheet Exercise 6.6

Sessions 11 and 12 - Expected Values and the Value of Information

BGVW, Chapter 7, pp. 156–166, 176– 85 (Prepare exercises 1, 3, 4, and 6 for class)

David L. Weimer and Mark A. Sager, “ Early Identification and Treatment of Alzheimer’s Disease: Social and Fiscal Outcomes,” *Alzheimer’s & Dementia* 5(3) 2009, 215–226.

Session 13 - Sensitivity Analysis

BGVW, Chapter 7, pp. 166-176 (**Hand-in write-up of exercise 5 — Spreadsheet Exercise 7.5**)

Project report due: Each team should prepare a list of the relevant categories of costs and benefits, and indicate how each can be measured. *Read BGVW, Chapter 16, to get an idea of available shadow prices from secondary sources.*

Session 14 - Option Price and Option Value

BGVW, Chapter 8
Spreadsheet Exercise 8.3

Session 15 - Life-Cycle Analysis

Joule A. Bergerson and Lester B. Lave, “Should We Transmit Coal, Gas, or Electricity: Cost, Efficiency, and Environmental Implication,” *Environmental Science and Technology* 39(16) 2005, 5905–5910.

Visit: [http:// www.eiolca.net](http://www.eiolca.net) and do the tutorial for the EIO-LCA model.

Session 16 - Midterm Examination

Session 17 - Estimation Based on Revealed Preferences: Demonstrations and Experiments

BGVW, Chapter 12 (Prepare exercise 2 for class)

Sessions 18 and 19 - Estimation Based on Revealed Preferences: Natural Experiments

BGVW, Chapter 13 (Prepare exercises 1 for class)

BGVW, Chapter 14 (**Hand-in write-up of exercise 3**)
Spreadsheet Exercise 13.2

David L. Weimer and Michael Wolkoff, “School Performance and Housing Values: Using Non-Contiguous District and Incorporation Boundaries to Identify School Effects,” *National Tax Journal* 54(2) 2001, 231–253.

W. Kip Viscusi and Joseph E. Aldy, “The Value of a Statistical Life: A Critical Review of Market Estimates Throughout the World,” *Journal of Risk and Uncertainty* 27(1) 2003, 5–76.

Sessions 20, 21 and 22 - Contingent Valuation

BGVW, Chapter 9 (Passive use)

BGVW, Chapter 15 (Prepare exercise 2 for class)

Prior to beginning of section, complete survey at:

<http://www.unm.edu/~rberrens/gcc/>

Bruce Johnson and John C. Whitehead, "Value of Public Goods from Sports Stadiums: The CVM Approach," *Contemporary Economic Problems* 18(1) 2000, 48–58.

Dale Whittington, "Improving the Performance of Contingent Valuation Studies in Developing Countries," *Environmental and Resource Economics* 22(1&2) 2002, 323–367.

Mark Dickie and Victoria L. Messman, "Parental Altruism and the Value of Avoiding Acute Illness: Are Kids Worth More than Parents?" *Journal of Environmental Economics and Management* 48(3) 2004, 1146–1174.

Sessions 23 and 24 - Cost-Effectiveness

BGVW, Chapter 18 (Prepare exercise 2 for class)

Spreadsheet Exercise 18.3

Session 25 - Shadow Prices in Developing Countries

BGVW, Chapter 17

Spreadsheet Exercise 17.4

Team reports due

Sessions 26, 27, and 28 - Presentations

***Session 29 - Revised project reports (PDF file) and explanation of revisions due.
Final Examination.***