

Public Affairs 881: Cost-Benefit Analysis
Fall 2012

Instructor: Dave Weimer
Phone: 263-2325
E-mail: weimer@lafollette.wisc.edu

Class Meetings: Mondays/Wednesdays
9:30 to 10:45 a.m.
Education L185

Office Hours: Mondays and Wednesdays, 11:00 a.m.—noon, 215 North Hall
Mondays 4:00 p.m.— 5:00 p.m., 215 North Hall
Appointments for other times welcome.

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. Those taking the course should have completed Public Affairs 880 and Public Affairs 818, or their equivalents.

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 (**October 29**) 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. During the semester, each team will make several oral and written progress reports. A complete report is due on **December 3**. December 3, 5, 10, and 12 will be devoted to presentation of the projects. A revised draft is due **December 19** in PDF

format. 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 a high 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 **distributed December 20 and due December 22 at noon**. *Twenty percent* of your course grade will be based on the final examination. If class attendance after the midterm examination 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*, 4th ed. (Upper Saddle River, New Jersey: Prentice Hall, 2011).

You may use the 3rd 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.

Copies are available in the bookstore and a copy is on reserve in the College Library. Other readings and class materials will be made available at learn@UW.

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

1. In response to concerns about untreated mental health problems, United Way Fox Cities and other community partners piloted a school-based mental health access project in the Menasha Joint School District. The project, known as PATH (Providing Access to Healing) for Students, was designed to provide evidence-based, mental health therapy to elementary, middle, and high school students experiencing barriers to care elsewhere in the community. Some of the barriers include: limited financial resources, lack of reliable transportation, parent work schedules, and lack of parental engagement. A school-based program was created for several reasons: a school is a safe and accepting environment, on-site therapy eliminates transportation concerns, and on-site therapy greatly reduces missed appointments and missed classroom time. The pilot operated

over a three-year period (May 2008 through June 2011) and the licensed therapists were provided by a consortium of agencies: Catholic Charities, Family Services, and Lutheran Social Services. Following the success of the pilot project, nine other school districts in the Fox Cities expressed a desire for this program. United Way and its community partners developed a two-phase expansion plan to be implemented over a two-year period. Phase one was implemented in September 2011 with PATH's expansion to a portion of the Appleton Area School District (Lincoln Elementary School, Wilson Middle School, and West High School) and the Kaukauna, Kimberly, and Little Chute school districts. Phase two is planned for September 2012 when PATH will be offered to the Freedom, Hortonville, Neenah, Seymour, and Shiocton school districts. Estimate the net benefits of PATH, both for the program already in place and its expansion, taking account of benefits such as reduced hospitalizations and other health care services, reduced use of social services, fewer criminal justice system contacts, improved school performance, and increased quality of life for participants and their families.

Client: Mary Wisnet, Community Development Program Officer, Health & Healing and Strengthening Families, United Way Fox Cities, Mary.Wisnet@UnitedWayFoxCities.org.

2. Low intake of fruits and vegetables has been associated with rising obesity rates in children, which in turn increases their risk for chronic diseases such as type II diabetes, heart disease, and cancer. Farm-to-School (F2S) programs provide a promising approach for increasing access to and intake of fruits and vegetables among school children across the state of Wisconsin. Implementation of F2S programs varies widely across the state. In addition to local food procurement, comprehensive F2S programs include: 1) nutrition and agricultural education, 2) school gardening, and 3) student engagement activities such as food taste-testing and farm field trips. Currently, there are about 45 comprehensive F2S programs in Wisconsin. F2S programs face many barriers to implementation: for example, school budget limitations make it difficult for schools to purchase local products. The Comprehensive Cancer Control (CCC) Program wants to determine the costs and benefits of an increase in the state meal reimbursement rate, with the amount of increase tied directly to local purchasing. Additionally, CCC is interested in what the state meal reimbursement would have to be in order for school budgets to accommodate local purchasing. Client: Emily Reynolds, Community Outreach Specialist, Cancer Control Program, Health First WI, ereynolds.communityoutreach@gmail.com.

3. Beginning in 2007, the Wisconsin Office of Justice Assistance, the Department of Corrections, and Department of Health Services coordinated to provide grants to counties to establish and evaluate Treatment Alternative and Diversion (TAD) program. The University of Wisconsin-Madison Population Health Institute has facilitated the collection of data to assess the criminal justice system impacts of the TAD projects. Using these data, estimate the net benefits of continuing the TAD programs implemented in the TAD counties and the net benefits of expanding the programs to other counties. Resource person: Jason Paltzer, University of Wisconsin Population Health Institute, jpaltzer@wisc.edu. Clients: Ray Luick, WI Office of Justice Assistance, Ray.Luick@Wisconsin.gov; Kit R. Van Stelle, Researcher/Principal Investigator, University of Wisconsin Population Health Institute, kvanste@wisc.edu.

4. Consolidation of services has been of interest to local governments for many years, particularly during the recent economic downturn. The impacts of state mandates on municipal budgets are creating even more pressure to find ways to reduce costs, while citizens continue to demand improved levels of service. Consolidation of fire services has been attempted in various communities throughout Wisconsin, with varying levels of success reported. The City of Fitchburg, the City of Verona, and the Town of Verona have successfully consolidated emergency medical services (FitchRona) through an intergovernmental agreement. There is strong potential that consolidation of Fire services among these jurisdictions could be accomplished successfully and expanded to include the Village of Oregon. Current fire service is provided by three separate organizations, including two fire districts and one city department. Mayors, administrators and fire chiefs from the three jurisdictions have initiated positive discussions about consolidation and are now ready to engage in the assessment of its costs and benefits. The project team will evaluate alternatives along a spectrum of consolidation, including shared training and personnel, shared equipment, and a joint fire district. The team will assess the fiscal impacts and net social benefits of each alternative. Findings and recommendations will be presented to elected officials in each jurisdiction for consideration. Client: Mike Gracz, 608-835-3118, mgracz@vil.oregon.wi.us.

5. The Milwaukee Community Response Program (M-CRP) is a targeted prevention initiative designed to prevent child abuse and neglect by assisting families at risk for child maltreatment to access economic resources and reduce financial stressors. Despite the wealth of evidence that family income and poverty status are correlated with child maltreatment, it is unknown whether such economic factors play a causal role with regard to child abuse and neglect. An experiment is being conducted to determine if these factors do in fact affect child maltreatment prevention. The target population is families who have been reported to child protective services (CPS) in Milwaukee, Wisconsin, but for whom maltreatment allegations have been unsubstantiated. Approximately 1,800 families will be randomly assigned to either a control group (community referrals only) or a treatment group (community referrals plus M-CRP). Key features of M-CRP include an assessment of families' self-identified needs, a comprehensive eligibility assessment for an array of public and private economic supports and assistance accessing these resources, opportunities to participate in financial planning activities, and (in some cases) access to one-time emergency cash supplements to alleviate immediate financial stressors. The sample will be enrolled over a 12-month period with a 12-month follow-up period after random assignment. Study objectives include estimating (1) the impact of M-CRP on the primary outcome, substantiated child maltreatment/CPS-identified child safety concerns within 12 months of random assignment; (2) the extent to which differential access to economic resources explain between-group differences in future maltreatment. Additionally, the study seeks to examine (3) whether economic resources, CPS case characteristics, and family characteristics at the time of random assignment are associated with program take-up and differential rates of future child maltreatment among treatment group members, and whether (4) the benefits of delivering the intervention outweigh the costs in the short-term. The task of the CBA team is to develop a protocol for assessing the costs and benefits of the M-CRP program (objective 4) and demonstrating its application with the best available evidence from prior studies of child

maltreatment. Client: Dr. Lonnie Berger, UW–Madison Department of Social Work, lmberger@wisc.edu.

6. Biogas can be produced economically at large publicly-owned wastewater treatment plants. Medium and small public wastewater treatment plants may wish to consider investing in, or partnering with private industry, to install anaerobic pretreatment options located at or near the private industry that produces the high strength organic waste stream. Your tasks are to develop benefit-cost and fiscal analysis templates for assessing these anaerobic pretreatment options, construct templates in an Excel spreadsheet that can be used easily by treatment plant managers, identify potential public-private ownership and operation models, and demonstrate application of the templates and business models for a particular treatment plant selected by the project partners (Wisconsin Public Service Commission staff and staff from a selection of Wisconsin wastewater treatment plants). Client: Gary Radloff, Director of Midwest Energy Policy Analysis, Wisconsin Bioenergy Initiative, gradloff@wbi.wisc.edu.

7. Biogas is typically used to generate electricity. The continuous production of biogas means that about 60 percent of the electricity it produces is generated off-peak. Storing the biogas and producing more of electricity during on-peak hours when electricity prices are higher could increase the value of the electricity. Your tasks are to identify gas storage options, develop benefit-cost and fiscal analysis templates for assessing biogas storage options, implement these templates in an Excel spreadsheet that can be easily used by the operators of biogas producing facilities, and demonstrate application of the templates for a particular facility selected by the project partners (Wisconsin Public Service Commission staff and staff from a selection of Wisconsin wastewater treatment plants). Client: Gary Radloff, Director of Midwest Energy Policy Analysis, Wisconsin Bioenergy Initiative, gradloff@wbi.wisc.edu.

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

Introduction (Sept. 5)

BGVW, Chapter 1

Scan: EPA Guidelines

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

Team projects organized

Note: Projects from several previous years and spreadsheets for exercises are available at learn@UW.

Class Discussion of Team Projects from Previous Years (Sept. 10)

BGVW, Chapter 11

Conceptual Foundations (Sept. 12 and 17)

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

Valuing in Primary Markets (Sept. 19, 24, and 26)

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

Project report due (Sept. 24): Each team should prepare a five- to seven-page (double-spaced) report that describes the issue being addressed in the project.

Valuing in Secondary Markets (Oct. 1)

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

Spreadsheet Exercise 5.4

Basics of Discounting for Time/Social Discount Rate (Oct. 3 and 8)

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

Project report due (Oct. 8): Each team should prepare an annotated bibliography of the

ten most relevant studies to its topic that it can find. Give highest priority to finding published CBAs on similar topics.

Expected Values, Value of Information, and Sensitivity Analysis (Oct. 10, 15, 17)

BGVW, Chapter 7 (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.

(Oct. 15) Hand-in write-up of exercise 5 — Spreadsheet Exercise 7.5

Project report due (Oct 17): 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.*

Option Price and Option Value (Oct. 22)

BGVW, Chapter 8

Spreadsheet Exercise 8.3

Life-Cycle Analysis (Oct.24)

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> and do the tutorial for the EIO-LCA model.

Midterm Examination (Oct. 29)

Estimation Based on Revealed Preferences: Demonstrations and Experiments (Oct. 31)

BGVW, Chapter 12 (Prepare exercise 2 for class)

Estimation Based on Revealed Preferences: Natural Experiments (Nov. 5 and 7)

BGVW, Chapter 13 (Prepare exercises 1 for class)

BGVW, Chapter 14 (**Bring write-up of exercise 3 to class on Nov. 7**)

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.

Trudy Ann Cameron, "Euthanizing the Value of a Statistical Life," *Review of Environmental Economics and Policy* 4(2) 2010, 161–178.

Contingent Valuation (Nov. 12, 14 and 19)

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/>

EcoResources Consultants, *Evidence of the Socio-Economic Importance of Polar Bears for Canada*, June 2011.

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.

James K. Hammitt and Kevin Haninger, "Valuing Fatal Risks to Children and Adults: Effects of Disease, Latency, and Risk Aversion," *Journal of Risk and Uncertainty* 40(1) 2010, 57–83.

Project Consultation (Nov. 21)

Cost-Effectiveness (Nov. 26)

BGVW, Chapter 18 (Prepare exercise 2 for class)

Spreadsheet Exercise 18.3

Shadow Prices in Developing Countries (Nov.28)

BGVW, Chapter 17

Spreadsheet Exercise 17.4

Team reports due December 3.

Presentations (Dec. 3, 5, 10, and 12)

Revised project reports (PDF file) and explanation of revisions due (Dec. 19)

Final Examination (distributed December 20 by e-mail; due at noon December 22)