

**Public Affairs 881: Cost-Benefit Analysis**  
**Fall 2011**

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**Class Meetings:** Mondays/Wednesdays  
9:30 to 10:45 a.m.  
Birge 346

Office Hours: Mondays and Wednesdays, 11 a.m. to noon, 201 La Follette  
Tuesdays 1:00 to 3:00 p.m., 215 North Hall  
Appointments at 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 (**November 2**) 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 5**. December 5, 7, 12, and 14 will be devoted to presentation of the projects. A revised draft is due **December 20** 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 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 **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 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<sup>th</sup> ed. (Upper Saddle River, New Jersey: Prentice Hall, 2011).

You may use the 3<sup>rd</sup> 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 4<sup>th</sup> 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 on learn@UW.

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

1. In 2009, Meriter Hospital and community partners piloted Helping Educate and Link the Homeless (HEALTH) as an outreach program to address some of the barriers to good health among the homeless and transitionally housed. Staffed by a part-time physician, a full-time nurse, and 45 volunteers, the program offers basic health screening, case management, and referrals to primary or acute care providers. The HEALTH program is available each weekday in locations that are easily accessed by homeless and transitionally housed populations. The primary site is located in donated space adjacent to the city's largest food pantry and a daytime drop-in shelter. One night per week, the program rotates through one of four homeless shelters. A team of researchers from UW–Madison and Meriter Hospital is conducting an evaluation of HEALTH. Using preliminary results from this evaluation, demonstrate the proper assessment of social costs and benefits as well as net fiscal impacts on Meriter Hospital and the State of Wisconsin. Your

analysis should take advantage of any available literature relating disease management to improved health outcomes and productivity. One product of the demonstration should be a template for analysis that can be used when the evaluation is completed. Client: Lisa Urban, Development Coordinator-Grants and Governance, Meriter Foundation, [lurban@meriter.com](mailto:lurban@meriter.com).

2. In April 2010 the Juneau County District Attorney's Office implemented a program to divert mainly young offenders (ages 17 to 25) from criminal prosecution of certain offenses, primarily misdemeanors. A key component of the diversion program is the training of Juneau County citizens to become mentors, and assignment of mentor-volunteers to diversion program participants. The program offers potential benefits from avoided criminal justice system costs, reduced recidivism, greater connection with one's community and references achieved by performing community service and attending workshops where presentations highlight ethics, making good choices, transferable skills, interviewing skills, credit ratings, basic budgeting, and other topics. Your task is to use available data from Juneau County and possibly other Wisconsin counties [Monroe County] to estimate the impacts of diversion and mentorship and assess net fiscal and social benefits. Client: Sheryl Albers, Diversion Program Coordinator, Juneau County District Attorney's Office, [Sheryl.Albers@da.wi.gov](mailto:Sheryl.Albers@da.wi.gov).

3. Over-development of land on a lakeshore or riverside eliminates wildlife habitat, degrades water quality, and ultimately lowers property values for the landowner and their neighbors. However, some landowners believe that zoning rules infringe too heavily on their property rights. The Department of Natural Resources has authority to set minimum standards for shoreland zoning in unincorporated areas of Wisconsin. The new budget calls for an economic impact analysis of proposed regulations and a comparison with the approaches of other states. Contingent valuation and hedonic analysis techniques will be used to estimate the value of the owner's freedom to develop land, the value of clean water to property owners, and the value of water-related recreation to individuals and to the state's economy. The team will work in conjunction with the phosphorus water standards team to create a comprehensive measure of the cost of phosphorus pollution in Wisconsin waters. Client: Tim Ryan, Water Resources Engineer, Wisconsin Department of Natural Resources, [Tim.Ryan@wisconsin.gov](mailto:Tim.Ryan@wisconsin.gov).

4. Phosphorus that enters surface water can cause excessive algae growth (eutrophication), compromising water quality and ecosystem health. In December 2010, the Wisconsin Department of Natural Resources adopted a new set of rules aimed at significantly reducing the amount of phosphorus pollution from point-source dischargers. Algal blooms resulting from excess phosphorus negatively affect fisheries, property values, water recreation, businesses, and human and wildlife health. Opponents of the rules claim that compliance with them is too costly for industries and municipal wastewater treatment facilities. The new budget calls for an economic impact analysis of the new rules that assess their effect on specific businesses and business sectors, public utility rate payers, local governmental units, and the state economy on the whole. Your task is to answer these questions and prepare a cost-benefit analysis of the rules. Client: Tim Ryan, Water Resources Engineer, Wisconsin Department of Natural Resources, [Tim.Ryan@wisconsin.gov](mailto:Tim.Ryan@wisconsin.gov).

5. The University of Wisconsin Center for Tobacco Research and Intervention wishes to develop a model that will allow the estimation of the net social benefits and medical savings from a person of a particular age and sex quitting smoking. David Weimer has developed the “beta” version of such a model. The project team is asked to do the following: First, assess the beta version in terms of its structure, assumptions, and fit to known patterns of smoking outcomes. Second, identify revisions that address weaknesses of the model. Third, implement and document these revisions and assess the extent to which they improve in the model. Fourth, demonstrate application of the model to the multiple-treatments experiment currently being completed by the Center. Client: Stevens Smith, [Sss@ctri.wisc.edu](mailto:Sss@ctri.wisc.edu).

6. Screening, brief intervention and referral to treatment (SBIRT) is a process of universal screening, intervention, and treatment for risky substance use. Between March 2007 and September 2010, the *Wisconsin Initiative to Promote Healthy Lifestyles* (WIPHL) implemented SBIRT as a routine service in 29 diverse health care sites, including one trauma center and one emergency department, throughout Wisconsin. The University of Wisconsin Population Health Institute has been contracted to conduct the evaluation of WIPHL’s SBIRT program. As one barrier to universal screening is coverage and reimbursement by public and private insurance agencies, as part of the evaluation, the PHI and WIPHL will be conducting a cost analysis on the health care impacts of SBIRT. In addition to the health care impacts, PHI and WIPHL would also like to include an analysis of the broader social impacts attributed to SBIRT. In order to accomplish this, the evaluation team requires a template and statistical model that could be used to estimate and monetize these impacts with the data available from the WIPHL program and public databases in Wisconsin (Dept of Transportation, Dept of Justice, etc.). Client: Jason Paltzer, UW Population Health Institute, [jpaltzer@wisc.edu](mailto:jpaltzer@wisc.edu).

7. As with any segment of the health system in the United States, there have been many efforts to improve the quality of mental health services. The most widely advocated and employed strategy for improving outcomes in routine care is to transport treatments shown to be effective in randomized clinical trials (RCTs)—often called *evidence-based treatments* (EBTs)—to routine care. Transporting EBTs to routine care involves costs, including costs in training therapists to deliver the EBT, supervising the therapists, and ensuring that the therapists deliver the EBTs to a standard comparable to that attained in the RCTs. This project involves estimating the cost/effectiveness and net benefits of transporting EBTs to routine care of anxiety/depression in outpatient adult mental health services. Various meta-analyses are available to estimate the effect produced by transporting EBTs. As well, there are a variety of means to estimate the costs for various systems of care. The aim of the project is to estimate the cost of each additional success that would be achieved by transporting EBTs to routine care. Client: Bruce Wampold, Patricia Wolleat Professor of Counseling Psychology, University of Wisconsin, [bwampold@wisc.edu](mailto:bwampold@wisc.edu).

8. Between 1999 and 2009 the budget of the Wisconsin Department of Corrections rose by over 70 percent to \$1.2 billion. Substantial increases in costs have been projected for the next ten years. Community-based alternatives to corrections, including diversion, deferred prosecution,

and alternatives to parole revocation, can potentially reduce prison costs and crime. Community Advocates Public Policy Institute believes that some funding for adult corrections should be “reinvested” in the community to implement such evidence-based alternatives to incarceration. The goals to be realized through the implementation of this reinvestment strategy include the reduction in adult recidivism, incarceration, and re-incarceration; lower overall costs at both the state and local levels than with current policies that focus overwhelmingly on incarceration; and maintained or enhanced public safety. Accordingly, the Institute is requesting that you prepare a cost-benefit analysis of evidence-based programs and policies that are either currently operating or could potentially be implemented in Wisconsin for the adult population of offenders. You will work closely with the Institute to identify candidate policies to analyze and you will use the cost-benefit model developed by the Washington State Institute for Public Policy to estimate their impacts. Client: Debra Kraft, Community Advocates Public Policy Institute, [debrak@communityadvocates.net](mailto:debrak@communityadvocates.net).

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. 7)

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](mailto:learn@UW).

#### ***Class Discussion of Team Projects from Previous Years*** (Sept. 12)

BGVW, Chapter 11

#### ***Conceptual Foundations*** (Sept. 14 and 19)

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

#### ***Valuing in Primary Markets*** (Sept. 21, 26, and 28)

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

***Valuing in Secondary Markets*** (Oct. 3)

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

***Basics of Discounting for Time/Social Discount Rate*** (Oct. 5 and 10)

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](http://www.bls.gov/data/inflation_calculator.htm))

Spreadsheet Exercise 6.6

***Expected Values, Value of Information, and Sensitivity Analysis*** (Oct. 12, 17, 19)

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.

Nicholas Z. Muller, “Linking Policy to Statistical Uncertainty in Air Pollution Damages,” *Journal of Economic Analysis and Policy* 11(1) 2011, 1–27.

**(Oct. 17) Hand-in write-up of exercise 5 — Spreadsheet Exercise 7.5**

**Project report due (Oct 19):** 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. 24)

BGVW, Chapter 8

Spreadsheet Exercise 8.3

***Life-Cycle Analysis*** (Oct.26)

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.

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

BGVW, Chapter 12 (Prepare exercise 2 for class)

***Midterm Examination*** (November 2)

***Estimation Based on Revealed Preferences: Natural Experiments*** (Nov. 7 and 9)

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.

***Contingent Valuation*** (Nov. 14, 16 and 23)

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.

***Cost-Effectiveness*** (Nov. 28)

BGVW, Chapter 18 (Prepare exercise 2 for class)

Spreadsheet Exercise 18.3

***Shadow Prices in Developing Countries*** (Nov. 30)

BGVW, Chapter 17

Spreadsheet Exercise 17.4

**Team reports due December 5.**

***Presentations*** (Dec. 5, 7, 12, and 14)

***Revised project reports (PDF file) and explanation of revisions due*** (Dec. 20)

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