

PA 881 - COST-BENEFIT ANALYSIS

Fall 2015
University of Wisconsin, Madison
La Follette School of Public Affairs
Ingraham 214
MW 2:30 - 3:45 p.m.
Office hours: Mondays 4-6 p.m. or by appointment

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What is cost-benefit analysis?

Cost-benefit analysis (CBA) is a technique for evaluating a project or investment by comparing the economic benefits with the economic costs of the activity. This may sound remarkably straightforward; during the course of the class you will learn that it is everything but.

Policy decisions always require trade-offs, some more difficult than others. Given scarce resources, deciding how to allocate funding requires careful thinking about what the opportunity costs of those funds are. If we devote more resources to, say, reducing pollution or boosting the resources available to public schools, the money spent can no longer be used for other purposes. CBA can be used as a decision rule to determine whether a project should be carried out, or to compare competing projects. In general, CBA aims to pin down what policy-options will maximize social welfare.

Course objectives

Throughout the course of the semester, you will learn the basics of CBA and discuss the advantages and limitations of the approach. At the end of the semester, I want each of you to be critical consumers of CBAs and to be able to identify weaknesses of existing CBAs – as well as ways of addressing these shortcomings.

Some of the readings might be challenging, as they occasionally make use of math or economic theory that you might not be 100% comfortable with. You should persevere. In your professional life, you are likely to encounter papers and reports outside your comfort zone and you will be forced to extract information from them. I won't expect you to understand all of the mathematical details; strive instead to grasp the gist of the arguments presented.

Course requirements & grades

Participation and attendance

Class sessions will mix lectures, discussion, and case studies to explore both the practical and conceptual aspects of CBA. I expect active participation in class and diligence in the completion of problem sets and other assignments, since class discussions will only be productive if you all do the assigned readings and/or problems prior to class, show up, and participate in the discussions.

If a religious observance will require you to miss class time, please notify me *within the first two weeks of class* of the specific days or dates on which you request relief. If the date you will miss is an exam, we will schedule a make-up exam time either before or after the regularly scheduled exam.

Grading

Your final grade will be composed of the following components:

Attendance and participation: 10%

Problem sets: 5 problem sets @ 10% each. Think of these as a means to putting the things we are learning in class into practice. You are welcome to collaborate on the problems, but I want you write up your solutions independently.

Midterm: 20%

Take-home final: 20%

I may occasionally ask you to prepare other exercises for class. While these will not be part of your problem set grade, they may instead affect your participation grade.

I strongly prefer that you submit course materials electronically through Learn@UW.

Academic integrity

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Dean of Students Office for additional review. For more information, or if you have any doubts about how the above terms are defined, please refer to <http://www.students.wisc.edu/doso/academic-integrity/>.

The UW Writing Center has a [handout](#) on acknowledging, paraphrasing and quoting sources. For the take-home exam in particular, please read this handout – especially if you have any doubts about how to cite sources.

Course materials

We will rely extensively on the assigned (required) textbook:

- 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).

I will additionally make other readings and class materials available via Learn@UW.

Schedule/overview

Rough outline of topics. Please note that I may add or drop readings during the semester; I will announce changes in class and update the syllabus on Learn@UW.

Date	Topic	Book chapter
Wed, Sep 02, 2015	Intro: What is Cost-Benefit Analysis? How is it used?	1
Mon, Sep 07, 2015	<i>Labor Day</i>	
Wed, Sep 09, 2015	Case: Water, sanitation & health in developing countries	
Mon, Sep 14, 2015	Conceptual foundations: CBA decision rules	2
Wed, Sep 16, 2015	Conceptual foundations: CBA decision rules [PS 1]	2
Mon, Sep 21, 2015	Conceptual foundations: Welfare measures	3
Wed, Sep 23, 2015	Valuing C & B when markets exist - primary markets	4
Mon, Sep 28, 2015	Valuing C & B when markets exist - primary markets	4
Wed, Sep 30, 2015	Valuing C & B when markets exist - 2 ^{ary} markets [PS 2]	5
Mon, Oct 05, 2015	Discounting: mechanics	6
Wed, Oct 07, 2015	Discounting/social discount rate	6, 10
Mon, Oct 12, 2015	Social discount rate, time preferences	6, 10
Wed, Oct 14, 2015	Uncertainty: Expected values and sensitivity analysis [PS 3]	7
Mon, Oct 19, 2015	Uncertainty: Value of information; quasi-option values	7
Wed, Oct 21, 2015	Uncertainty, cont.	7, 8
Mon, Oct 26, 2015	Uncertainty: Option price & value	8
Wed, Oct 28, 2015	Midterm	
Mon, Nov 02, 2015	Implications of behavioral economics	
Wed, Nov 04, 2015	Case: Early childhood interventions	
Mon, Nov 09, 2015	Revealed preferences: experiments and quasi-experiments	11, 12
Wed, Nov 11, 2015	Revealed preferences: demand curves and shadow prices [PS 4]	13, 14
Mon, Nov 16, 2015	Valuing life	16
Wed, Nov 18, 2015	Valuing time	16
Mon, Nov 23, 2015	Existence value and stated preferences	9, 15
Wed, Nov 25, 2015	CV in more depth [PS 5]	15
Mon, Nov 30, 2015	Environment: externalities, regulation, and subsidies	
Wed, Dec 02, 2015	Developing countries	17
Mon, Dec 07, 2015	Cost-effectiveness	18
Wed, Dec 09, 2015	TBD. #WormWars? Climate change?	
Mon, Dec 14, 2015	Review and discussion	

Detailed schedule

Week 1

Wednesday, September 02, 2015

Intro: What is Cost-Benefit Analysis? How is it used?

- BGVW, Chapter 1
 - Weiner, Zachary. “Ethical Fourier Transform.” Saturday Morning Breakfast Cereal. <http://www.smbc-comics.com/index.php?id=3831>
 - EPA. 2014. “Guidelines for Preparing Economic Analyses.” [Sections 1 & 3]
 - Arrow, Kenneth J., Maureen L. Cropper, George C. Eads, Robert W. Hahn, Lester B. Lave, Roger G. Noll, Paul R. Portney, et al. 1996. “Is There a Role for Benefit-Cost Analysis in Environmental, Health, and Safety Regulation?”
 - LeDuc, Daniel. 2014. “Results That Bring Change.” MacArthur Foundation, Trust.
 - Copenhagen Consensus, Post-2015 Consensus
 - Background: <http://www.copenhagenconsensus.com/post-2015-consensus/background>
 - Purpose: <http://www.copenhagenconsensus.com/post-2015-consensus/purpose>
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Week 2

Wednesday, September 09, 2015

Case: Water, sanitation & health in developing countries

- Whittington, Dale, Marc Jeuland, Kate Barker, and Yvonne Yuen. 2012. “Setting Priorities, Targeting Subsidies among Water, Sanitation, and Preventive Health Interventions in Developing Countries.” *World Development* 40 (8): 1546–68.
 - Schuster-Wallace, Corinne. 2013. “Water Goals Have Big Costs and Bigger Returns” *Our World*. December. <http://ourworld.unu.edu/en/water-goals-have-big-costs-and-bigger-returns>.
 - UNU, and UNOSD. 2013. “Water for Sustainability: Framing Water within the Post-2015 Development Agenda.” United Nations University Institute for Water, Environment and Health, UN Office of Sustainable Development and Stockholm Environment Institute.
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Week 3

Monday, September 14, 2015

Conceptual foundations: CBA decision rules

- BGVW, Chapter 2
- OECD. 2006. “Chapter 4: Decision Rules.” In *Cost-Benefit Analysis and the Environment: Recent Developments*. Paris: OECD.
- EPA. 2014. “Guidelines for Preparing Economic Analyses.” [Sections 4.1, 4.6 & 4.7]

Wednesday, September 16, 2015

Conceptual foundations, cont.

- **Problem set 1 due**
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Week 4

Monday, September 21, 2015

Conceptual foundations. Welfare measures

- BGVW, Chapter 3
- Chapter 3 should hopefully feel like review; if you need additional review, you might want to consult a microeconomics textbook. Please let me know if you would like suggestions.

Wednesday, September 23, 2015

Valuing C & B when markets exist - primary markets

- BGVW, Chapter 4
 - Eliasson, Jonas. 2009. "A Cost-benefit Analysis of the Stockholm Congestion Charging System." *Transportation Research Part A: Policy and Practice* 43 (4): 468–80.
 - Chicago Metropolitan Agency for Planning. 2012. "Congestion Pricing: An Analysis of the Go to 2040 Major Capital Projects."
 - Glaeser, Edward L. 2015a. "Is High-Speed Rail a Good Public Investment?." *Economix Blog*. <http://economix.blogs.nytimes.com/2009/07/28/is-high-speed-rail-a-good-public-investment/>.
 - ———. 2015b. "Running the Numbers on High-Speed Trains." *Economix Blog*. <http://economix.blogs.nytimes.com/2009/08/04/running-the-numbers-on-high-speed-trains/>.
 - ———. 2015c. "How Big Are the Environmental Benefits of High-Speed Rail?." *Economix Blog*. <http://economix.blogs.nytimes.com/2009/08/12/how-big-are-the-environmental-benefits-of-high-speed-rail/>.
 - ———. 2015d. "What Would High-Speed Rail Do to Suburban Sprawl?." *Economix Blog*. <http://economix.blogs.nytimes.com/2009/08/18/what-would-high-speed-rail-do-to-suburban-sprawl/>.
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Week 5

Monday, September 28, 2015

Valuing C & B when markets exist - primary markets, cont.

Wednesday, September 30, 2015

Valuing C & B when markets exist - secondary markets

- **Problem set 2 due**
- BGVW, Chapter 5
- Dugger, Celia W. 2007. "Ending Famine, Simply by Ignoring the Experts." *The New York Times*, December 2, sec. International / Africa. <http://www.nytimes.com/2007/12/02/world/africa/02malawi.html>.

- Filipski, Mateusz, and J. Edward Taylor. 2012. “A Simulation Impact Evaluation of Rural Income Transfers in Malawi and Ghana.” *Journal of Development Effectiveness* 4 (1): 109–29.

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Week 6

Monday, October 05, 2015

Discounting: mechanics

- BGVW, Chapter 6
- *Skim*: OMB Circular A-4, Office of Management and Budget’s guidance to Federal agencies on the development of regulatory analysis:
<https://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>

Wednesday, October 07, 2015

The social discount rate, time preferences

- BGVW, Chapter 10
- Arrow, Kenneth, Maureen Cropper, Christian Gollier, B. Groom, G. Heal, R. Newell, W. Nordhaus, et al. 2013. “Determining Benefits and Costs for Future Generations.” *Science* 341 (6144): 349–50.
- Fisher, Anthony C., and John V. Krutilla. 1975. “Resource Conservation, Environmental Preservation, and the Rate of Discount.” *The Quarterly Journal of Economics*, 358–70.

Week 7

Monday, October 12, 2015

Social discount rate, time preferences, cont.

Wednesday, October 14, 2015

Uncertainty: Expected values and sensitivity analysis

- **Problem set 3 due**
- BGVW, Chapter 7, pp. 167-187
- Mueller, John, and Mark G. Stewart. 2014. “Evaluating Counterterrorism Spending.” *The Journal of Economic Perspectives* 28 (3): 237–47.
- Sunstein, Cass R. 2003. “Terrorism and Probability Neglect.” *Journal of Risk and Uncertainty* 26 (2-3): 121–36.

Week 8

Monday, October 19, 2015

Uncertainty: Value of information; quasi-option values

- BGVW, Chapter 7, pp. 188-197
- Arrow, Kenneth J., and Anthony C. Fisher. 1974. “Environmental Preservation, Uncertainty, and Irreversibility.” *The Quarterly Journal of Economics*, 312–19.

- OECD. 2006. “Chapter 10: Quasi-Option Value.” In *Cost-Benefit Analysis and the Environment: Recent Developments*. Paris: Organisation for Economic Co-operation and Development.

Wednesday, October 21, 2015

Uncertainty, cont.

Week 9

Monday, October 26, 2015

Uncertainty: Option price & value

- BGVW, Chapter 8
- Camerer, Colin F., and Howard Kunreuther. 1989. “Decision Processes for Low Probability Events: Policy Implications.” *Journal of Policy Analysis & Management* 8 (4): 565–92.

Wednesday, October 28, 2015

Midterm

Week 10

Monday, November 02, 2015

Implications of behavioral economics

- Portney, Paul R. 1992. “Trouble in Happyville.” *Journal of Policy Analysis and Management* 11 (1): 131–32.
- Salanié, François, and Nicolas Treich. 2009. “Regulation in Happyville.” *The Economic Journal* 119 (537): 665–79.
- Robinson, Lisa A., and James K. Hammitt. 2011. “Behavioral Economics and Regulatory Analysis.” *Risk Analysis* 31 (9): 1408–22.
- Beshears, John, James J. Choi, David Laibson, and Brigitte C. Madrian. 2008. “How Are Preferences Revealed?” *Journal of Public Economics, Special Issue: Happiness and Public Economics*, 92 (8–9): 1787–94.

Wednesday, November 04, 2015

Case: Early childhood interventions

- *Skim:* Karoly, Lynn A. 2008. “Valuing Benefits in Benefit-Cost Studies of Social Programs.” Report
 - Reynolds, Arthur J., Judy A. Temple, Barry A. B. White, Suh-Ruu Ou, and Dylan L. Robertson. 2011. “Age 26 Cost–Benefit Analysis of the Child-Parent Center Early Education Program.” *Child Development* 82 (1): 379–404.
 - Gertler, Paul, James Heckman, Rodrigo Pinto, Arianna Zanolini, Christel Vermeersch, Susan Walker, Susan M. Chang, and Sally Grantham-McGregor. 2014. “Labor Market Returns to an Early Childhood Stimulation Intervention in Jamaica.” *Science* 344 (6187): 998–1001.
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Week 11

Monday, November 09, 2015

Revealed preferences: experiments and quasi-experiments

- BGVW, Chapter 11, 12

Wednesday, November 11, 2015

Revealed preferences: demand curves and shadow prices

- **Problem set 4 due**
- BGVW, Chapter 13, 14
- Weimer, David L., and Michael J. Wolkoff. 2001. "School Performance and Housing Values: Using Non-Contiguous District and Incorporation Boundaries to Identify School Effects." *National Tax Journal* 54 (2): 231–53.
- Ahlfeldt, Gabriel M., Pantelis Koutroumpis, and Tommaso M. Valletti. 2015. "Speed 2.0 - Evaluating Access to Universal Digital Highways." SSRN Working paper ID 2560715. Rochester, NY: Social Science Research Network.

Week 12

Monday, November 16, 2015

Valuing life

- BGVW, Chapter 16, pp. 406 - 419
- Leon, Gianmarco, and Edward Miguel. 2015. "Risky Transportation Choices and the Value of Statistical Life." Working paper.
- Sandel, Michael J. 2013. "Market Reasoning as Moral Reasoning: Why Economists Should Re-Engage with Political Philosophy." *The Journal of Economic Perspectives* 27 (4): 121–40.
- Hammitt, James K., and Kevin Haninger. 2010. "Valuing Fatal Risks to Children and Adults: Effects of Disease, Latency, and Risk Aversion." *Journal of Risk and Uncertainty* 40 (1): 57–83.
- Mann, Ted. 2013. "Rail Safety and the Value of a Life." *Wall Street Journal*, June 18.
<http://on.wsj.com/11Vs9K4>.

Wednesday, November 18, 2015

Valuing time

- BGVW, Chapter 16, pp. 419 - 423
- Wolff, Hendrik. 2014. "Value of Time: Speeding Behavior and Gasoline Prices." *Journal of Environmental Economics and Management* 67 (1): 71–88.
- Fezzi, Carlo, Ian J. Bateman, and Silvia Ferrini. 2014. "Using Revealed Preferences to Estimate the Value of Travel Time to Recreation Sites." *Journal of Environmental Economics and Management* 67 (1): 58–70.
- Belenky, Peter. 2011. "Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis." *pp. 1-2, 11-14, skim the rest*

Week 13

Monday, November 23, 2015

Existence value and stated preferences

- BGVW, Chapter 9, 15
- Larson, Douglas M. 1993. “On Measuring Existence Value.” *Land Economics* 69 (4): 377.
- Kopp, Raymond J. 1992. “Why Existence Value Should Be Used in Cost–benefit Analysis.” *Journal of Policy Analysis and Management* 11 (1): 123–30.
- Rosenthal, Donald H., and Robert H. Nelson. 1992. “Why Existence Value Should Not Be Used in Cost-Benefit Analysis.” *Journal of Policy Analysis and Management* 11 (1): 116–22.

Wednesday, November 25, 2015

CV in more depth

Journal of Economic Perspectives Symposium on Contingent Valuation:

- **Problem set 5 due**
- BGVW, Chapter 15
- Kling, Catherine L., Daniel J. Phaneuf, and Jinhua Zhao. 2012. “From Exxon to BP: Has Some Number Become Better than No Number?” *The Journal of Economic Perspectives*, 3–26.
- Carson, Richard T. 2012. “Contingent Valuation: A Practical Alternative When Prices Aren’t Available.” *The Journal of Economic Perspectives* 26 (4): 27–42.
- Hausman, Jerry. 2012. “Contingent Valuation: From Dubious to Hopeless.” *The Journal of Economic Perspectives* 26 (4): 43–56.

Week 14

Monday, November 30, 2015

Environment: externalities, regulation, and subsidies

- The Economist. 2012. “The Rule of More,” February 18. <http://www.economist.com/node/21547772>.
- Bergerson, Joule A., and Lester B. Lave. 2005. “Should We Transport Coal, Gas, or Electricity: Cost, Efficiency, and Environmental Implications.” *Environmental Science & Technology* 39 (16): 5905–10.
- Holland, Stephen P., Erin T. Mansur, Nicholas Z. Muller, and Andrew J. Yates. 2015. “Environmental Benefits from Driving Electric Vehicles?” National Bureau of Economic Research working paper.
- Sexton, Steven E., and Alison L. Sexton. 2014. “Conspicuous Conservation: The Prius Halo and Willingness to Pay for Environmental Bona Fides.” *Journal of Environmental Economics and Management* 67 (3): 303–17.

Wednesday, December 02, 2015

Developing countries

- BGVW, Ch 17
- Samphantharak, Krislert, and Robert M. Townsend. 2012. “Measuring the Return on Household Enterprise: What Matters Most for Whom?” *Journal of Development Economics, Symposium on Measurement and Survey Design*, 98 (1): 58–70.
- “Underinvestment in a Profitable Technology: The Case of Seasonal Migration in Bangladesh.” 2014. *Econometrica* 82 (5): 1671–1748.

- Olken, Benjamin A., and Rohini Pande. 2012. “Corruption in Developing Countries.” *Annual Review of Economics* 4 (1): 479–509.
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Week 15

Monday, December 07, 2015

Cost-effectiveness

- BGVW, Ch 18
- Profit, Jochen, Diana Lee, John A. Zupancic, LuAnn Papile, Cristina Gutierrez, Sue J. Goldie, Eduardo Gonzalez-Pier, and Joshua A. Salomon. 2010. “Clinical Benefits, Costs, and Cost-Effectiveness of Neonatal Intensive Care in Mexico.” *PLoS Medicine* 7 (12): 1–10.
- Emanuel, Ezekiel J. 2014. “Why I Hope to Die at 75.” *The Atlantic*, October.
<http://www.theatlantic.com/magazine/archive/2014/10/why-i-hope-to-die-at-75/379329/>.
- Shepard, Donald S., Robert L. Robertson, C. S. Cameron 3rd, P. Saturno, M. Pollack, J. Manceau, P. Martinez, P. Meissner, and J. Perrone. 1989. “Cost-Effectiveness of Routine and Campaign Vaccination Strategies in Ecuador.” *Bulletin of the World Health Organization* 67 (6): 649.

Wednesday, Dec 09, 2015

TBD

Week 16

Monday, Dec 14, 2015

Review and discussion