

Public Policy 413: Cost Benefit Analysis

Harris School of Public Policy
University of Chicago
Winter 2014

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Course Description: The goals of this course include learning (1) how to conduct the basic steps of cost-benefit analysis (CBA); (2) how to incorporate elements of cost-benefit analysis into policy work; and (3) when CBA is a good tool to use and when it isn't. This class also presents an opportunity to reflect on "big picture" issues of how to treat uncertainty and risk; how to discount costs and benefits received in the future; how to value lives saved; and other difficult matters.

Prerequisites: Two quarter core microeconomics sequence at Harris or its equivalent.

Relation to other courses at Harris: Some of you may be taking/have taken related classes in program evaluation, cost effectiveness analysis, or environmental issues. While there is some overlap of material and approach, this class offers a "soup to nuts" treatment of the cost benefit analysis methodology, with attention devoted to the microeconomic underpinnings of the technique as well as applications drawn from many areas, including health, the environment, and public goods. I will not spend much, if any, time on training, education, workforce development, or related topics, as these are typically covered in depth in other classes at Harris.

Class and office hours: Class meets on Tuesdays and Thursdays in the Harris lecture hall from 10:30 to 11:50 am. I am generally available in my office (Harris #183) after class on Tuesdays and Thursdays, and I am usually around most of Monday and Wednesdays. However, I don't keep a specific schedule, so please email or otherwise contact me to let me know you will be stopping by. I will hold specific office hours ahead of exams and will post the specifics on Chalk.

Teaching assistants: Class TAs will be Danny Lutkus dlutkus@uchicago.edu and Congyi Zhou zhoucongyi@gmail.com. Weekly section meetings will be scheduled with details TBA. TA office hours and locations will be posted to Chalk as well.

Use of web and email: I will post course materials to the university's "Chalk" web-based course management system: the URL is <http://chalk.uchicago.edu>. Students are responsible for any and all material posted there. I encourage the use of email and try to respond in a timely fashion.

Grading: Grades will be based on three problem sets (total 15%); a midterm exam (35%); a short writing assignment (15%); and a final exam (35%). Exam dates are set, and the other dates are pending:

Thursday, February 6	Midterm exam, in class at 10:30 am
Monday, March 17	Final exam, 1:00 to 3:00 pm

Academic integrity: Just a reminder about the importance of meeting the University's expectations regarding academic integrity: please review this excerpt from the University's Student Manual of University Policies and Regulations: Student Conduct
<https://studentmanual.sites.uchicago.edu/Policies#Honesty>

It is contrary to justice, to academic integrity, and to the spirit of intellectual inquiry to submit the statements or ideas of work of others as one's own. To do so is plagiarism or cheating, offenses punishable under the University's disciplinary system. Because these offenses undercut the distinctive moral and intellectual character of the University, we take them very seriously and punishments for them may include expulsion from the University.

Proper acknowledgment of another's ideas, whether by direct quotation or paraphrase, is expected. In particular, if any written or electronic source is consulted and material is used from that source, directly or indirectly, the source should be identified by author, title, and page number. Any doubts about what constitutes "use" should be addressed to the instructor.

Please note that these expectations apply to exam and problem set settings as well, in which your submitted work represents your commitment that it is your own independent work and that you have relied on no other individuals or resources, except as explicitly specified in the assignment instructions, in producing this work. I encourage any students with specific questions to contact me directly. You may also find this recent article interesting:
<http://www.nytimes.com/2010/08/02/education/02cheat.html?pagewanted=all>

Students with disabilities: Any students requesting accommodations related to disabilities should contact me to make proper arrangements. Please be prepared to share your documentation from the Dean of Students regarding appropriate accommodations.

Readings: One textbook is *required* for the class: *Cost-Benefit Analysis: Concepts and Practice*, 4th edition, by Boardman, Greenburg, Vining, and Weimer. (Prentice Hall, 2010). Other readings for the class are listed below with appropriate URL or source information; in a few special cases, no on-line versions are available, and I will post such files directly to Chalk. *I am also experimenting with Chalk's ability to offer "Library reserves" to reach some/all of the papers on the reading list. Please take a look as the term progresses.*

Note that for certain papers, the specific URLs are not stable, so I include only the link to the University library's "holdings" page for that journal, from which you can navigate to get the specific issue and article you seek. [In general, please be resourceful if a link seems to be broken: try opening the file in a new window or tab, or try going to the home page of the institution or author, for example.]

Course topics and readings: ROUGH SCHEDULE!

Week 1

Topic: What is Cost-Benefit Analysis?

Topic: CBA decision rules

Week 2

Topic: Measures of welfare

Topic: Costs and benefits when markets exist: primary markets

Week 3

Topic: Costs and benefits when markets exist: secondary markets

Topic: Economic impact analysis

Week 4

Topic: Discounting & Risk

Week 5

Topic: Uncertainty

Week 6

Topic: Indirect methods

Week 7

Topic: Contingent valuation

Week 8

Topic: Valuation of a statistical life (VSL) and statistical life-years (VSLY)

Week 9

Topic: Quality-adjusted life years (QALYs) and cost-effectiveness analysis

Week 10

Topic: Environmental regulation

Topic: Global warming

Course topics and readings

Week 1

Topic: What is Cost-Benefit Analysis?

Boardman, Chapter 1.

Smith, Kevin B., “Economic Techniques,” Chapter 36 in *The Oxford Handbook of Public Policy*, ed. Michael Moran, Martin Rein, and Robert E. Goodin, Oxford University Press, 2006.
[copy posted in *Course Documents* folder on Chalk]

U.S. Office of Management and Budget, “Analytical Perspectives, Fiscal Year 2013, Budget of the U.S. Government,” Chapter 9, Benefit Cost Analysis;
<http://www.whitehouse.gov/sites/default/files/omb/budget/fy2013/assets/spec.pdf> [note! chapter is only 10 pages long!]

[skim] Office of Management and Budget, Office of Information and Regulatory Affairs, “Draft 2013 Report to Congress on the Benefits and Costs of Federal Regulations and Unfunded Mandates on State, Local, and Tribal Entities, April 2013;
http://www.whitehouse.gov/sites/default/files/omb/info/2013_cb/draft_2013_cost_benefit_report.pdf

Topic: CBA decision rules

Boardman, Chapter 2; Chapter 19 (pp. 495-497).

Organisation for Economic Cooperation and Development, “Cost-Benefit Analysis and the Environment: Recent Developments,” Chapter 4, “Decision Rules”; 2006;
http://www.oecd-ilibrary.org/environment/cost-benefit-analysis-and-the-environment_9789264010055-en [note: this is only pp. 67-73]

World Bank, “Cost-Benefit Analysis: Evaluation Criteria (Or: “Stay away from the IRR””, Knowledge Brief for Bank Staff, February 22, 2008;
http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/02/05/000020953_20080205155606/Rendered/PDF/406190REVISED0irr06122301PUBLIC1.pdf

Week 2

Topic: Measures of welfare

Boardman, Chapter 3.

Perloff, Jeffrey, “Compensating and Equivalent Variation and Consumer Surplus,” Supplemental Material to Chapter 9, *Microeconomics*, 4th edition, Pearson Publishing,
http://wps.aw.com/aw_perloff_microecon_4/44/11320/2897981.cw/content/index.html

Topic: Costs and benefits when markets exist: primary markets

Boardman, Chapter 4

United States Congressional Budget Office, “Using Pricing to Reduce Traffic Congestion,” CBA Study, March 2009,
<http://www.cbo.gov/ftpdocs/97xx/doc9750/03-11-CongestionPricing.pdf>

Chicago Metropolitan Agency for Planning, “Economic Impacts of Express Toll Lanes in the Chicago Region,” December 5, 2012;
<http://www.cmap.illinois.gov/policy-updates/-/blogs/economic-impacts-of-express-toll-lanes-in-the-chicago-region>

Blankenhorn, Randy, “Putting the Speed Back in Speedway,” *Chicago Tribune*, November 21, 2013;
http://articles.chicagotribune.com/2013-11-21/site/ct-transportation-chicago-express-toll-20131121_1_congestion-pricing-traffic-lanes-new-lanes

Currie, Janet, and Reed Walker, “Traffic Congestion and Infant Health: Evidence from E-ZPass”, *American Economic Journal: Applied Economics* 3 (January 2011): 65-90.

Week 3

Topic: Costs and benefits when markets exist: secondary markets

Topic: Economic impact analysis

Boardman, Chapter 5

U.S. Conference of Mayors, “The Economic Impacts of High-Speed Rail on Cities and their Metropolitan Areas,” June 14, 2010;
<http://www.usmayors.org/highspeedrail/documents/report.pdf>

Todorovich, Petra; Daniel Schned; and Robert Lane, “High-Speed Rail: International Lessons for U.S. Policy Makers,” Lincoln Institute of Land Policy, Policy Focus Report, September 2011; http://www.lincolninst.edu/pubs/1948_High-Speed-Rail

de Rus, Gines, "The BCA of HSR: Should the Government Invest in High Speed Rail Infrastructure?" *Journal of Benefit-Cost Analysis* 2, 1 (2011): article 2;
<http://www.evaluaciondeproyectos.es/EnWeb/Results/Dissemination/Activities/jan11/viewcontent.pdf>

Four posts by Edward L. Glaeser in *The New York Times* blog Economix:

- "Is High-Speed Rail a Good Public Investment?" July 28, 2009;
http://economix.blogs.nytimes.com/2009/07/28/is-high-speed-rail-a-good-public-investment/?_r=0
- "Running the Numbers on High-Speed Trains," August 4, 2009;
<http://economix.blogs.nytimes.com/2009/08/04/running-the-numbers-on-high-speed-trains/>
- "How Big Are the Environmental Benefits of High-Speed Rail?" August 12, 2009;
<http://economix.blogs.nytimes.com/2009/08/12/how-big-are-the-environmental-benefits-of-high-speed-rail/>
- "What Would High-Speed Rail Do to Suburban Sprawl?" August 18, 2009;
<http://economix.blogs.nytimes.com/2009/08/18/what-would-high-speed-rail-do-to-suburban-sprawl/>

Week 4

Topic: Discounting

Boardman, Chapters 6 and 10 (please note we will read pp. 259-263 later in the course)

Week 5

Topic: Risk

Boardman, Chapters 7 and 8.

Organisation for Economic Cooperation and Development, "Cost-Benefit Analysis and the Environment: Recent Developments," Chapter 10, "(Quasi) Option Value"; 2006; [note: only pp. 145-154 of this work!]

http://www.oecd-ilibrary.org/environment/cost-benefit-analysis-and-the-environment_9789264010055-en

Walsh, Bryan, "Who Should Get Swine Flu Shots First?" *Time* magazine, August 21, 2009; <http://www.time.com/time/health/article/0,8599,1917707,00.html>

Week 6

Topic: Uncertainty

Sunstein, Cass R., "Irreversible and Catastrophic," 91 *Cornell Law Review* 841 (2006).

Sunstein, Cass R., "Terrorism and Probability Neglect," *Journal of Risk and Uncertainty* 26: 2/3 (2003): 121-136.

Saunders, Peter, "Use and Abuse of the Precautionary Principle," Institute of Science in Society, July 13, 2000; <http://www.i-sis.org.uk/prec.php>

Ramana, M.V., "Beyond our imagination: Fukushima and the problem of assessing risk," *Bulletin of the Atomic Scientists*, April 19, 2011, <http://thebulletin.org/beyond-our-imagination-fukushima-and-problem-assessing-risk-0>

Bailey, Ronald, "Weighing the Benefits & Costs of Offshore Drilling," *Reason Magazine*, May 4, 2010, <http://reason.com/archives/2010/05/04/weighing-the-benefits-costs-of>.

Leonhardt, David, "Spillonomics: Underestimating Risk," *New York Times*, May 31, 2010.

Week 7

Topic: Reflections: why CBA?

Sandel, Michael J., "Market Reasoning as Moral Reasoning: Why Economists Should Re-engage with Political Philosophy," *Journal of Economic Perspectives* 27, 4 (Fall 2013); 121-140; <http://pubs.aeaweb.org/doi/pdf/10.1257/jep.27.4.121>

Frank, Robert, "Why is Cost Benefit Analysis So Controversial?," *Journal of Legal Studies*, vol. XXIX (June 2000): 913-930; <http://www.jstor.org/stable/10.1086/468099>

Topic: Existence Value and Indirect Methods

Boardman, Chapters 9, 14

National Ocean Economics Program, "Environmental and Recreational (Non-Market) Values: Research Methodologies," <http://www.oceaneconomics.org/nonmarket/methodologies.asp>

"Travel Cost Method," Methods, Section 4, Ecosystem Valuation, http://www.ecosystemvaluation.org/travel_costs.htm; general website is <http://www.ecosystemvaluation.org/default.htm> (Organization is Chesapeake Biological Laboratory, University of Maryland).

Fleming, Christopher M., and Averil Cook, "The Recreational Value of Lake McKenzie, Fraser Island: An application of the travel cost method," *Tourism Management* 29 (2008): 1197-1205 (available via U of C library at <http://www.sciencedirect.com/science/article/pii/S0261517708000447>)

Rosenthal, Donald H., and Robert H. Nelson, "Why Existence Value Should *Not* Be Used in Cost-Benefit Analysis," *Journal of Policy Analysis and Management* 11, 1 (1992): 116-122.

Kopp, Raymond J., "Why Existence Value *Should* Be Used in Cost-Benefit Analysis," *Journal of Policy Analysis and Management*, 11, 1 (1992): 123-130; JSTOR.

Week 8

Topic: Contingent Valuation

Boardman et al., Chapter 15.

Journal of Economic Perspectives, Symposia, Contingent Valuation, Vol. 26, No. 4 (Fall 2012); three papers available here:

<http://www.aeaweb.org/articles.php?doi=10.1257/jep.26.4>

- "From Exxon to BP: Has Some Number Become Better Than No Number?" (pp. 3-26) Catherine L. Kling, Daniel J. Phaneuf and Jinhua Zhao
- "Contingent Valuation: A Practical Alternative When Prices Aren't Available" (pp. 27-42) Richard T. Carson
- "Contingent Valuation: From Dubious to Hopeless" (pp. 43-56) Jerry Hausman

Carson, Richard T.; Robert C. Mitchell; Michael Hanemann; Raymond J. Kopp; Stanley Presser; and Paul A. Ruud; "Contingent Valuation and Lost Passive Use: Damages from the Exxon Valdez Oil Spill," *Environmental and Resource Economics* 25: 257-286, 2003.

Week 9

Topic: Valuation of a statistical life (VSL) and statistical life-years (VSLY)

Boardman, Chapter 16 (pp. 406-419)

Viscusi, W. Kip, "Estimating the Value of a Statistical Life Using Census of Fatal Occupational Injuries Data," Vanderbilt University Law School, Law and Economics Working Paper Number 13-17, July 2013;

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2291727.

- Viscusi, W. Kip, "Valuing risks of death from terrorism and natural disasters," *Journal of Risk and Uncertainty* (2009) 38: 191-213.
- Covey, Judith; Angela Robinson; Michael Jones-Lee; and Graham Loomes, "Responsibility, scale and the valuation of rail safety," *Journal of Risk and Uncertainty* (2010) 40: 85-108.
- Chapman, Steve, "The Wrong Lesson of the Metro-North Accident," *Chicago Tribune*, December 12, 2013;
http://articles.chicagotribune.com/2013-12-12/news/ct-oped-chapman-1212-20131212_1_metro-north-accident-railroads-wrong-lesson
- Peters, Jeffrey C., and John Frittelli, "Positive Train Control (PTC): Overview and Policy Issues," Congressional Research Service, July 30, 2012;
http://www.purdue.edu/research/gpri/publications/documents/Peters_CRS_Report.pdf
- Wronski, Richard, "Deadly N.Y. train crash may boost 'fail-safe' system," *Chicago Tribune*, December 4, 2013; URL.
- Feigenbaum, Baruch, "Lawmakers Should Delay Implementing Positive Train Control," Reason Foundation, May 3, 2012;
<http://reason.org/news/show/lawmakers-should-delay-implementing>
- Sunstein, Cass R., "Lives, Life-Years, and Willingness to Pay," 104 *Columbia Law Review* 205 (2004).
- Ross, Lainie Friedman, and Benjamin E. Hippen, "How Not to Assign Kidneys," *New York Times*, March 5, 2011;
<http://www.nytimes.com/2011/03/06/opinion/06ross.html?pagewanted=all>
- Friedewald, John, "New Kidney Transplant Policy Will Save More Lives," *US News and World Report*, November 12, 2012;
<http://www.usnews.com/opinion/articles/2012/11/12/new-kidney-transplant-policy-will-save-more-lives>
- Mann, Ted, "Rail Safety and the Value of a Life," *The Wall Street Journal*, June 17, 2013;
<http://online.wsj.com/news/articles/SB10001424127887323582904578485061024790402>
- Ross, Lainie, "New Kidney Allocation Proposal is Ethically Unacceptable," *US News and World Report*, November 12, 2012;
<http://www.usnews.com/opinion/articles/2012/11/12/new-kidney-allocation-proposal-is-ethically-unacceptable>

Satel, Sally, "The Market for Kidneys, Livers, and Lungs," *The Wall Street Journal*, November 8, 2011;
<http://online.wsj.com/news/articles/SB10001424052970204554204577023623689583052>

Topic: Quality-adjusted life years (QALYs) and cost-effectiveness analysis

Boardman, Chapter 18.

Singer, Peter, "Why We Must Ration Health Care," *New York Times Magazine*, July 19, 2009, <http://www.nytimes.com/2009/07/19/magazine/19healthcare-t.html>

Reinhardt, Uwe E., "Pricing Human Life(-Years)", *New York Times Economix Blog*, March 20, 2009,
<http://economix.blogs.nytimes.com/2009/03/20/pricing-human-life-years/>

Weinstein, Milton C.; George Torrance; and Alistair McGuire, "QALYs: The Basics," *Value in Health* Vol 12, Supplement 1 (2009): S5-S9;
<http://www.ispor.org/meetings/invitational/QALY/Paper2revised.PDF>

Week 10

Topic: Environmental regulation

Atkinson, Giles, and Susana Mourato, "Environmental Cost-Benefit Analysis," *Annual Review of Environment and Resources* 2008 (33): 317-344;
<http://www.annualreviews.org/doi/pdf/10.1146/annurev.enviro.33.020107.112927>

"Measuring the impact of regulation: The rule of more," *The Economist*, February 18, 2012; <http://www.economist.com/node/21547772>

Dudley, Susan, "Perpetuating Puffery: An Analysis of the Composition of OMB's Reported Benefits of Regulation," *Business Economics* 47, 3 (2012): 165-176;
<http://www.palgrave-journals.com/be/journal/v47/n3/abs/be201214a.html>

U.S. Environmental Protection Agency, "Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards," Executive Summary, December 2011, EPA-452/R-11-011; <http://www.epa.gov/ttn/ecas/regdata/RIAs/matsriafinal.pdf>

Daly, Gabriel, "A New Cost of Cost-Benefit Analysis?" *Harvard Environmental Law Review* blog, November 7, 2013;
<http://www3.law.harvard.edu/journals/elr/2013/11/07/a-new-cost-of-cost-benefit-analysis/>

Topic: Global warming

Boardman, Chapter 10, pp. 259-263.

Davenport, Coral, "Large Companies Prepared to Pay Price on Carbon," *New York Times* December 5, 2013.

Foster, Joanna M., "The Social cost of Carbon: How to Do the Math?" *New York Times* September 18, 2012.

Johnson, Laurie T., and Chris Hope, "The social cost of carbon in U.S. regulatory impact analyses: an introduction and critique," *Journal of Environmental Studies and Sciences* 2012 (2): 205-221;
<http://link.springer.com/article/10.1007%2Fs13412-012-0087-7>

Goulder, Lawrence H. 2013. "Markets for Pollution Allowances: What Are the (New) Lessons?" *Journal of Economic Perspectives*, 27(1): 87-102;
<http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.27.1.87>

Schmalensee, Richard, and Robert N. Stavins. 2013. "The SO₂ Allowance Trading System: The Ironic History of a Grand Policy Experiment." *Journal of Economic Perspectives*, 27(1): 103-22;
<http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.27.1.103>

Kotchen, Matthew J.; Kevin J. Boyle; and Anthony A. Leiserowitz, "Willingness to Pay and Policy-Instrument Choice for Climate Change Policy in the United States," *Energy Policy* Volume 55 (April 2013), pp. 617–625;
<http://www.sciencedirect.com/science/article/pii/S0301421512011111>
