PPHA58102: Economic Analysis II, Introduction to Cost-Benefit Analysis
Spring 2025

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Course Description

Cost-benefit analysis (CBA) is the primary tool used to provide objective and transparent, quantitative evidence to inform public policy decisions. Ideally, the use of CBA will improve the efficiency of public policy by identifying public policies/projects that create the most "value" for society. The concept of CBA is easily understood. For any project/policy under consideration (versus current state of the world), do the following: add up all of the current and future monetary costs of the project/policy; add up all of the current and future monetary benefits of the project/policy; and then compare the benefits to costs. If benefits are greater than costs, then the project/policy makes society better off and is candidate to be implemented. Seems straightforward, right? Conceptually it is, although there are a few theoretical and philosophical issues that arise that complicate the analysis. The conceptual difficulties, while important, are few in comparison, however, to the practical difficulties associated with conducting a CBA. Cost-benefit analysis is an activity that is aptly characterized by the phrase the "the devil is in the details." In this course, we will review the theoretical/conceptual foundations of CBA as applied in the public sector—mainly the executive branch of the federal government. The course will also present the basic structure of CBA and review the major tools of analysis used in CBA.

Course Objectives:

- Obtain a working knowledge of the role and importance of each of the key steps in conducting a CBA, such as the issue of who has standing, the importance of transparency and the use of sensitivity analysis.
- Understand the microeconomic foundations of cost-benefit analysis including how to measure consumer willingness-to-pay, consumer surplus, opportunity cost of providing goods, producer surplus and the Kaldor-Hicks Criteria
- Recognize the philosophical objections and criticism of Kaldor-Hicks Criteria and know alternative approaches for assessing whether a public policy increases social welfare
- Develop skills to use supply and demand analysis to examine effects of public policies and to assess changes in social welfare of public policies—i.e., conduct simple cost-benefit analyses using supply and demand including cases in which there are market failures.
- Understand the origins and justifications of important "prices" used in CBA, such as the value of a statistical life, the social cost of carbon, the value of time, and the appropriate discount rate to use.
- Know common techniques (revealed and stated preference methods) to value benefits of a policy when market prices do not exist.
- Understand the most common practical problems that arise in CBA including the appropriate discount rate, uncertainty, the efficacy of contingent valuation, and how to measure the statistical value of a life.

Course Outcome:

Students will learn how to be astute consumers of CBA, and acquire basic skills needed to begin to conduct CBAs.

Course Materials

Books:

- Anthony E. Boardman, David H. Greenberg, Aidan R. Vining, and David L. Weimer, *Cost- Benefit Analysis: Concepts and Practice*, 5th ed. 2018, (Cambridge University Press) ISBN: 9781108415996 (Cheaper 4th edition is available, cheaper and very similar—but if you go this route it is at your own risk)

- Weekly Readings: Posted on canvas.

Course Format

The class will meet in-person. Attendance is required.

Students are expected to complete all assigned readings prior to class. There are almost weekly in-class activities (assignments) that are intended to be student directed. For each activity, I expect students to be ready to engage with me and each other. The in-class activities are intended to allow students to articulate course content in their own words, deepen their understanding of the course content and to provide an opportunity for students to learn from one another. Everyone is expected to participate and everyone should feel comfortable expressing their view. I understand that it may be difficult for some students to speak publicly, but the class is a welcoming, respectful community. The class discussions are an active learning process and by definition learning means not knowing already. So, feel free to think creatively and openly even though sometimes it will be a miss hit.

Relationship to Curriculum

This is a course in applied economic analysis focused on assessing whether programs and policies increase social welfare.

This course is intended to build on the foundation of microeconomics provided in the core economics class. Accordingly, there will be some overlap with the material presented in microeconomics course because Cost-Benefit analysis is based largely on microeconomic analysis of markets. To the extent that there is overlap and review, this will serve to strengthen your understanding of microeconomic analysis. However, this course will focus more on welfare economics (market surplus, market failure and government intervention). Cost-benefit analysis also depends on empirical estimates of costs and benefits, and this aspect of the course will build on your training in statistics and empirical methods (e.g., program evaluation). Finally, applications of cost-benefit analysis span several areas of public policy, including health, education and the environment.

Course Policies:

Use of Web and Email: I will post course materials to the university's CANVAS web-based course management system: the URL is http://courses.uchicago.edu/. Students are responsible for any and all material posted there. I encourage the use of email and I try to respond in a timely fashion. My email address is kaestner@uchicago.edu. Please be sure to set your notifications on CANVAS so that you receive all communications from me sent through this platform.

Attendance is required. I understand that circumstances may sometimes require you to miss a class, although with a 9-week schedule, any absence represents a significant loss of time. Students who need to miss class because of illness (or other reasons) shall notify me in a timely manner as to when they will be absent.

Late Assignments: Unless explicitly agreed upon in advance, late assignments will not be accepted.

Disability Accommodation:

The University of Chicago seeks to provide an environment conducive to learning, teaching, working, and conducting research that values the diversity of its community. The University strives to be supportive of the academic, personal, and work-related needs of each individual and is committed to facilitating the full participation of students with a disability in the life of the University. Students with a disability, particularly those that require an accommodation, should contact Student Disability Services (https://disabilities.uchicago.edu/).

Academic Integrity: (https://studentmanual.uchicago.edu/Policies)

“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.”

Artificial Intelligence (AI) Tools

Students are not allowed to use any AI powered tool, program, plugin, chatbox or any similar tool to complete (e.g., write) assignments. This means that tools like ChatGPT, Google Bard, Microsoft Co-pilot or any similar tool that facilitates the completion of a graded assignment is strictly prohibited.

The Harris Team has an AI detector program within Canvas that automatically scans code at the point of submission, when the AI detector program flags a submission, the TA Team will proceed to investigate and determine if a submission violates the Harris Integrity Policy. Any submission found to be in violation of the policy shall be reported and students will receive an automatic zero.

Students may use AI tools to gather information much in the way that a research assistant is used to increase scholar productivity. A good rule is that AI tools are allowed pre-writing: before content is created, writers can use some tools to research topics, collect examples, brainstorm ideas, craft outlines, etc. For example, AI tools are helpful to identify studies/citations that have addressed the problem, or a similar problem, to the problem in the assignment. AI tools are also useful for retrieving a definition/discussion of a concept related to course material, or to generate a basic supply and demand graph (much like a Google image search) that will be modified for the assignment, or to see how a concept is discussed by other authors.

Students using AI should be transparent about their use and make sure it aligns with academic integrity. If AI tools have been used, then that use must be properly documented and credited:

- In-text citation format: example: (OpenAI, 2023), or (OpenAI, 2023; see appendix A for the full transcript).
- Reference list format: Example: OpenAI. (2023). ChatGPT (May 3 Version) [Large language model]. https://chat.openai.com

Grades and Grading

Assignments

- There are seven short (1-2 pages), take-home assignments that relate to material that will be covered in class. Assignments and the due dates (by beginning of relevant class) are listed below. Please make sure you identify the due dates.
- **All assignments are to be completed independently without assistance except from TAs or Professor.**
- Grades for assignments are: 4 (A)=excellent (professional preparation, provided clear, direct and well-reasoned answers that reflect full understanding of the course material), 3(B)=good (professional preparation, provided clear, direct and well-reasoned answers that reflect a good but not full understanding of the course material), 2(C)=average (professional preparation, provided answers that were adequate but lacked clarity or an adequate understanding of the course material). 1(D)=unacceptable (unprofessional preparation, incomplete and/or incoherent answers).
- Total possible points on assignments are 28 (7*4=28).
- Assignments account for 60% of the final grade.
- The numerical grade for assignments will equal total points on assignments plus 32. So, if you get the maximum points, then your grade would be 60 (100%).

Problem Sets

- There are two, take-home problem sets. Each will account for 20% of the final grade (total of 40%).
- **Problem Sets are to be completed independently without assistance except from TAs or Professor.**

Final Grade

- **Points on assignments (maximum of 60) plus points on problem sets (maximum of 40).**

Assignments

#	Assignment	Due Date
1	Assignment 1--Due April 1 Read: Wang, Buyi, Meredith Slopen, Irwin Garfinkel, Elizabeth Ananat, Sophie M. Collyer, Robert Paul Hartley, Anastasia Koutavas, and Christopher Wimer. The Benefits and Costs of Paid Family Leave. No. w33279. National Bureau of Economic Research, 2024. https://www.nber.org/papers/w33279 Prepare a two-page (max) document (1-inch margins, 11–12-point font, single or double spacing) that does the following: 1. Discuss whether the article addressed each of Boardman's 10 Steps for conducting a CBA. For each step that was addressed by the authors, briefly comment on the appropriateness of their approach. Some questions you might consider: What assumptions are the authors making? Did authors include all costs and benefits? Did the authors incorrectly in/exclude any benefits, or incorrectly in/exclude any costs? Did authors use reasonable/justifiable monetary values in the CBA? Were other important metrics reasonable/justifiable? Were the authors transparent and open about their assumptions and choices? 2. For each step that was not addressed by the authors, if any, briefly comment on the importance of that omission and your suggested remedy.	April 1
2	Assignment #2-April 8 Use supply and demand analysis to conduct a CBA of the Chips Act: H.R.4346 - CHIPS and Science Act117th Congress (2021-2022) https://www.congress.gov/bill/117th-congress/house-bill/4346#:~:text=Research%20and%20Development.-,The%20act%20establishes%20and%20provides%20funding%20for%20the%20Creating%20Helpful,supply%20chain%20activities%2C%20including%20to Focus on: The CHIPS Act allocated $53 billion in federal incentives for domestic semiconductor manufacturing and research and development, of which $39 billion is set aside for a financial assistance program—also called the CHIPS for America Fund—administered by the U.S. Department of Commerce to build new and expand existing semiconductor facilities. Companies are also eligible for a 25 percent tax credit. U.S. and foreign companies with facilities in the United States are eligible for the federal incentives. Prepare a two-page (max) document (1-inch margins, 11–12-point font, single or double spacing) that describes the analysis and your conclusions. Make sure to identify the market surplus with and without this policy and use the NPV rule to make a recommendation. No outside research is necessary. Graphs are not part of the one-page count, and you can draw pictures by hand and take a picture and upload if that is easier than creating the graph in Word or Adobe.	April 8

3	Assignment 3-Due April 15 Read: Alsukait, Reem, Parke Wilde, Sara N. Bleich, Gitanjali Singh, and Sara C. Folta. "Evaluating Saudi Arabia's 50% carbonated drink excise tax: Changes in prices and volume sales." Economics & Human Biology 38 (2020): 100868. https://www.sciencedirect.com/science/article/pii/S1570677X19302515 Use a supply and demand analysis to conduct a simple CBA of the sugar-sweetened beverage tax in KSA. Prepare a two-page document (1-inch margins, 11–12-point font, single or double spacing) that describes the analysis and your conclusions. Make sure to discuss the motivation for this policy and identify the market surplus with and without this policy. Use the NPV rule to make a recommendation. No outside research is necessary. Graphs are not part of the one-page count, and you can draw pictures by hand and take a picture and upload if that is easier than creating the graph in Word or Adobe.	April 15
4	Assignment 4--Due April 22 Use supply and demand analysis to conduct a CBA of the Tax Credit for Electric Vehicles (see: https://www.energy.gov/save/electric-vehicles#:~:text=Tax%20credits%20up%20to%20%247%2C500,storage%2C%20each%20up%20to%20%241%2C000.) Keep it simple and treat the credit as a subsidy and ignore further details about the credit. Make sure to include any secondary markets of importance in your analysis and address the issue of standing--whose benefits and costs count in this case. Prepare a two-page document (1-inch margins, 11–12-point font, single or double spacing) that describes the analysis and your conclusions. Graphs are not part of the one-page count, and you can draw pictures by hand and take a picture and upload if that is easier than creating the graph in Word or Adobe.	April 22
5	Assignment 5--Due May 6 From Curtis, E.M. and Marinescu, I., 2023. Green Energy Jobs in the United States: What Are They, and Where Are They?. Environmental and Energy Policy and the Economy, 4(1), pp.202-237. "Green jobs are created in occupations that are about 21 percent higher paying than average. The pay premium is even higher for jobs with a low educational requirement. Finally, green jobs tend to locate in counties with high shares of employment in fossil fuel extraction. Overall, our results suggest that the growth of renewable energy leads to the creation of relatively high paying jobs, which are more often than not located in areas that stand to lose from a decline in fossil fuel extraction jobs." Prepare a one-page document (1-inch margins, 11–12-point font, single or double spacing) that discusses the issues. • Whether a cost-benefit analysis of the Inflation Reduction Act, which increases investments in green industries, should include the jobs in those industries as benefits. • Regardless of your answer above, assume that jobs would be measured and discuss why green jobs create surplus	May 6

6	Assignment 6-May 13 Use the Ramsey model to come up with a value for the discount rate for policies/projects intended to address climate change in the following countries: USA, China, Indonesia. Base your calculation on reasonable/justifiable values used in Ramsey formula. Cite your sources. The goal of this assignment is to further your understanding of how the discount rate used in projects that span generations, such as climate change policy, is formulated and how that formulation may differ by country and cause countries to have different incentives to invest in climate change. Prepare a two-page (max) document (1-inch margins, 11–12-point font, single or double spacing) that discusses the issues.	May 13
7	Assignment 7-May 20 Read: Chay, Kenneth Y., and Michael Greenstone. "Does Air Quality Matter? Evidence from the Housing Market." Journal of Political Economy 113, no. 2 (2005): 376–424. https://doi.org/10.1086/427462. https://www.journals.uchicago.edu/doi/abs/10.1086/427462?casa_token=mMN3nZxDZnkAAAAA:ARM5zwcY3foDuGSBBNVtPPrcOP8CkVgUMMVh0Puoqkew8d37kbK5HF2PJOWL5nALEGbHIw1Rcayp&casa_token=wsSo2HPWaokAAAAA:TVU8WNrXGW59CfNBsgvoes8eqWwByd5qWpM2XE-mcpacL-hCUX9hJWviqT4ieTZh-1-Dhtpdzh-H Discuss the following: 1. What is the goal of the article--empirical analysis? 2. How does this goal relate to cost-benefit analysis? 3. Discuss the hedonic regression approach that was used and its advantages or disadvantages. 4. How would you use the results of the article in a cost-benefit analysis? How reasonable is your proposed use of the results? Any problems with using theses results that you would discuss? Prepare a two-page (max) document (1-inch margins, 11–12-point font, single or double spacing) that discusses these issues.	May 20

Course Outline

Week	Topic	Reading
March 25	What is CBA?	Boardman Chapter 1 Jason Furman, WSJ
	Origins and history of CBA	Office of Management and Budget. Circular A-4. 2003. Office of Management and Budget. Circular A-4. Revision. 2023. Trump Executive Order 14192
	Ex-ante vs. ex-post CBA	Flyvbjerg, Bent and Bester, Dirk W., The Cost-Benefit Fallacy: Why Cost-Benefit Analysis Is Broken and How to Fix It (September 6, 2021). Journal of Benefit-Cost Analysis, October, pp. 1-25
	Boardman's 10 Steps for conducting a CBA	Boardman Chapter 1
	CBA practices in other countries	Abelson, Peter. "A partial review of seven official guidelines for cost-benefit analysis." Journal of Benefit-Cost Analysis 11, no. 2 (2020): 272-293.
	A CBA of a child subsidy	Garfinkel, Irwin, Laurel Sariscsany, Elizabeth Ananat, Sophie M. Collyer, Robert Paul Hartley, Buyi Wang, and Christopher Wimer. The Benefits and Costs of a US Child Allowance. No. w29854. National Bureau of Economic Research, 2022.
April 1	Kaldor-Hicks Criteria Supply and Demand—measuring market Surplus	Boardman Chapters 3 and 6
	CBA decision rules	World Bank, "Cost-Benefit Analysis: Evaluation Criteria (Or: "Stay away from the IRR")", Knowledge Brief, 2008.
	Examples of using supply and demand for simple CBA	Rent Control: Diamond et al., 2019. "The Effects of Rent Control Expansion on Tenants, Landlords, and Inequality: Evidence from San Francisco," American Economic Review, 109:3365-94 Lordan, G., Neumark, D., 2018. People versus machines: The impact of minimum wages on automatable jobs. Labour Economics 52, 40–53.

April 8	Essential aspects of demand for CBA Elasticity of demand and its use in CBA An example of using elasticity of demand—Mexico City subway policy Internalities and externalities related to demand and welfare improving government intervention Cost-benefit analysis of sugar-sweetened beverages Behavioral economics or when do we trust the consumer?	Boardman et al. Chapter 3, Appendix A Tuncel, Tuba and James K Hammitt. "A new meta-analysis on the WTP/WTA disparity." Journal of Environmental Economics and Management, 175-187. Davis, Lucas, Estimating the Price Elasticity of Demand for Subways: Evidence from Mexico (December 2020). NBER Working Paper No. w28244, Available at SSRN: https://ssrn.com/abstract=3753153 Hunt Allcott & Benjamin B. Lockwood & Dmitry Taubinsky, 2019. "Should We Tax Sugar-Sweetened Beverages? An Overview of Theory and Evidence," Journal of Economic Perspectives, vol 33, pages 202-227 Reem Alsukait, Parke Wilde, Sara N. Bleich, Gitanjali Singh, Sara C. Folta, Evaluating Saudi Arabia's 50% carbonated drink excise tax: Changes in prices and volume sales, Economics & Human Biology, 2020 Sunstein, C. (2020). Behavioral Welfare Economics. Journal of Benefit-Cost Analysis, 11(2), 196-220
April 15	Definitions of primary and secondary markets Supply and demand analysis to measure benefits in primary markets Market failures—measuring benefits in primary and secondary markets Measuring costs in primary markets with and without market failures Approaches to measuring impacts in secondary markets	Boardman Chapters 5 and 7
April 22	Fundamental Theorems of Welfare Economics Distributional weights Marginal cost of public funds	Boardman Chapter 19 Boardman, A., Greenberg, D., Vining, A., & Weimer, D. (2020). Efficiency without Apology: Consideration of the Marginal Excess Tax Burden and Distributional Impacts in Benefit–Cost Analysis. Journal of Benefit-Cost Analysis, 11(3), 457-478

April 29	Counting jobs as benefits in CBA CBA of infrastructure	Bartik, Timothy J. “Including Jobs in Benefit-Cost Analysis” Annual Review of Resource Economics 4 (2012): 55-73. Glaeser, Edward and James Poterba, "Economic Perspectives on Infrastructure Investment," in Rebuilding the Post-Pandemic Economy, ed. Melissa S. Kearney and Amy Ganz (Washington D.C.: Aspen Institute Press, 2021). Liscow, Zachary. "Getting infrastructure built: the law and economics of permitting." *Journal of Economic Perspectives* 39, no. 1 (2025): 151-180.
May 6	Discounting projects within a generation Discounting projects that span generations Social cost of carbon	Boardman et al. Chapters 9 and 10 Arrow, K., M. et al. Cropper, C. Gollier, B. Groom, G. Heal, R. Newell, W. Nordhaus, R. Pindyck, W. Pizer, P. Portnoy, T. Sterner, R.S.J. Tol, and M. Weitzman; “Determining Benefits and Costs for Future Generations,” Science 26 July 2013; Vol. 34: 349-350 Council of Economic Advisers, “Discounting For Public Policy: Theory And Recent Evidence On The Merits Of Updating The Discount Rate,” MacAskill, William. “The Case for Longtermism” New York Times August 5, 2022 Drupp, Moritz A., Mark C. Freeman, Ben Groom, and Frikk Nesje. "Discounting disentangled." *American Economic Journal: Economic Policy* 10, no. 4 (2018): 109-134. Carleton, Tamma and Greenstone, Michael, Updating the United States Government's Social Cost of Carbon (January 14, 2021). University of Chicago, Becker Friedman Institute for Economics Working Paper No. 2021-04

May 13	Overview of revealed preference methods Intermediate goods approach Kalamazoo Promise CBA	Boardman Chapters 14 and 15 Bartik, T., Hershbein, B., & Lachowska, M. (2016). The Merits of Universal Scholarships: Benefit-Cost Evidence from the Kalamazoo Promise. Journal of Benefit-Cost Analysis, 7(3), 400-433
	Hedonic regression	Gibbons, Stephen, Susana Mourato, and Guilherme M. Resende. "The amenity value of English nature: a hedonic price approach." Environmental and Resource Economics 57 (2014): 175-196. Black, Sandra E. "Do better schools matter? Parental valuation of elementary education." *The quarterly journal of economics* 114, no. 2 (1999): 577-599. Collins, Courtney A., and Erin K. Kaplan. "Capitalization of school quality in housing prices: Evidence from boundary changes in shelby county, tennessee." American Economic Review 107, no. 5 (2017): 628-632. Currie, Janet, Lucas Davis, Michael Greenstone, and Reed Walker. "Environmental health risks and housing values: evidence from 1,600 toxic plant openings and closings." *American Economic Review* 105, no. 2 (2015): 678-709.
	Value of a statistical life (VSL)	Cropper, Maureen and Hammitt, James K. and Robinson, Lisa A., Valuing Mortality Risk Reductions: Progress and Challenges (October 2011). Annual Review of Resource Economics, Vol. 3, Issue 1, pp. 313-336, 2011. Aldy, J. E., & Viscusi, W. K. (2008). Adjusting the Value of a Statistical Life for Age and Cohort Effects. Review of Economics and Statistics, 90 (3), 573-581
	Travel cost approach	Jaung W, Carrasco LR. Travel cost analysis of an urban protected area and parks in Singapore: a mobile phone data application. J Environ Manage. 2020 May 1;261:110238.
	Value of time	Goldszmidt, Ariel et al. 2020. “The Value of Time in the United States: Estimates from Nationwide Natural Field Experiments", National Bureau of Economic Research", http://www.nber.org/papers/w28208

May 20	Stated preference approach	Boardman Chapters 13 and 16 L. Kling, Daniel J. Phaneuf and Jinhua Zhao. 2012. “From Exxon to BP: Has Some Number Become Better Than No Number?” Journal of Economic Perspectives Vol. 26, No. 4, pp. 3-26. http://www.aeaweb.org/articles.php?doi=10.1257/jep.26.4 Carson, Richard. 2012. “Contingent Valuation: A Practical Alternative When Prices Aren't Available” Journal of Economic Perspectives Vol. 26, No. 4, pp. 27-42. Hausman, Jerry. 2012. “Contingent Valuation: From Dubious to Hopeless” Journal of Economic Perspectives Vol. 26, No. 4, pp. 43-56.
	Empirical evidence of comparison of contingent valuation, or stated preference approach, with revealed preference approach	
	Casse studies	Alberini, Anna, Maureen Cropper, Alan Krupnick, and Nathalie B. Simon. "Does the value of a statistical life vary with age and health status? Evidence from the US and Canada." In Distributional Effects of Environmental and Energy Policy, pp. 365-388. Routledge, 2017. Ludwig, J., Cook, P.J. The Benefits of Reducing Gun Violence: Evidence from Contingent-Valuation Survey Data. Journal of Risk and Uncertainty 22, 207–226 (2001) Al-Hanawi, M., Alsharqi, O., & Vaidya, K. (2020). Willingness to pay for improved public health care services in Saudi Arabia: A contingent valuation study among heads of Saudi households. Health Economics, Policy and Law, 15(1), 72-93. Haefele, Michelle, John B. Loomis, and Linda J. Bilmes. "Total economic valuation of the National Park units and National Park Service cooperative programs: Results of a survey of the American public." In *Valuing US National Parks and Programs*, pp. 16-44. Routledge, 2019.