

Spring 2021, PPHA 41300, Cost Benefit Analysis Class Meeting Time: Tuesdays and Thursdays 11:20 a.m. - 12:40 p.m.

Instructor: Robert Kaestner **Office:** Keller 3057

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Office Hours: Email anytime; Synchronous Sessions TH. 10:00-11:00; and by appt.

Teaching Assistants:

TBD **Office:** Remote Meetings, **Office Hours:** TBD **Office:** Remote Meetings, **Office Hours:** TBD

Course Description

Cost-benefit analysis (CBA) is the primary tool used to provide 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 straightforward, 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. I can think of few issues that merit the characterization "the devil is in the details" more than CBA. In this course, we will review the theoretical/conceptual foundations of CBA as applied in the public sector. We will also review some of the philosophical issues central to the validity of CBA and practical difficulties in conducting CBA.

Ideally, the course will provide a foundation to be an astute consumer of CBA and a beginner producer of CBAs.

Course Format

Asynchronous, pre-recorded lectures to be viewed prior to weekly class meetings Synchronous meetings during scheduled class time. Students will be divided into groups of 15 to 25 and each group will meet once per week (either Tuesday or Thursday 11:20 am to 12:40 pm)

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 two-course, core economics sequence. Accordingly, there will be some overlap with the material presented in those courses 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). Costbenefit analysis also depends on empirical estimates of costs and benefits, and this aspect of the course will build on your training in statistics and program evaluation. Finally, applications of cost-benefit analysis span several areas of public policy, including health, education and the environment.

Course Objectives:

- Obtain a thorough understanding of the microeconomic foundations of CBA.
- Understand the Hicks-Kaldor Criterion and philosophical objections and criticism of it and concerns over the distributional impacts and how they are accounted for in CBA.
- Acquire the skill to use supply and demand analysis to measure benefits and costs tin primary and secondary markets that are used in CBA.
- Learn common techniques to value benefits when market prices do not exist.
- Have 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 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 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.

Course Policies:

Attendance (By ZOOM Meeting Platform):

As working professionals, I understand that work may sometimes require you to miss a class, although with a 10-week quarter, any absence represents a significant loss of time. Students who need to miss class because of work (or other reasons) shall notify me in a timely manner as to when they will be absent. I will make every reasonable effort to honor the request, not penalize the student for missing the class, and if an examination or project is due during the absence, give the student an exam or assignment equivalent to the one completed by those students in attendance. A similar process for notifying me should be followed for students who wish to observe their religious holidays. Again, I will make every reasonable effort to honor the request and not penalize the student for missing the class.

Late Assignments and Missed Exams: 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/).

Course Requirements

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)

Assignments and Exams:

Grades will be based on eight, take-home assignments. **Assignments and the due dates are listed in the course outline below**. Please make sure you identify the due dates.

Grading:

Grades for assignments are 4=excellent (professional preparation, answered specific questions directly and germanely, provided interesting analysis/insight), 3=good (professional preparation, answered specific questions directly and in most cases germanely), 2=average (professional preparation, answered specific questions directly but with some error). 1=unacceptable (unprofessional preparation, incomplete answers to specific questions, mostly incorrect answers).

Final grades are letter grades and follow the common grading policy of University and Harris Public Policy: https://registrar.uchicago.edu/records/grading/. The mapping of numerical grades to letter grades is as follows:

A: >=30, A-: 28-29, B+: 25-27, B: 21-24, B-: 19-20, C+: 17-18, C: 15-16, C-:<15

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."

Brief Course Outline

Week of: March 30	Introduction to CBA
Week of: April 6	Microeconomics Review, Hicks Kaldor Criterion, CBA Decision Rules
Week of: April 13	Market Failure and Government Failure
Week of: April 20	Measuring benefits and costs in primary markets
Week of: April 27	Measuring benefits and costs in secondary markets
Week of: May 4	Discounting
Week of: May 11	Risk and Uncertainty
Week of: May 18	Indirect Methods to Measure Costs and Benefits
Week of: May 25	Stated Preference and Contingent Valuation

Detailed Course Outline

Important Note: Changes may occur to the course schedule depending on the progress made in class and in response to ideas/issues that arise as the class progresses. When changes are made, students will be notified via Canvas and in-class announcement.

Date	Topic/Readings	
Week of:	Asynchronous Recordings (To be Watched Before Class)	
March 30	hat is CBA? story of CBA and Codification of CBA for Public Policy se Basic Steps of CBA	
	 Boardman et al. Chapter 1 Scott Farrow, How Not to Lie with Benefit-costs Analysis, <i>The Economists Voice</i>, 10:45-50 Dudley, S., Belzer, R., Blomquist, G., Brennan, T., Carrigan, C., Cordes, J., Zerbe, R. (2017). Consumer's Guide to Regulatory Impact Analysis: Ten Tips for Being an Informed Policymaker. Journal of Benefit-Cost Analysis, 8(2), 187-204. 	
	 (Skim—Look Briefly) Office of Management and Budget. Circular A-4. 2003. https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf (Skim Table of Contents and Skim—Look Briefly at Chapters) EPA, Guidelines for Preparing Economic Analyses, https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses 	
	Synchronous Meeting	
	Finding the 10 Steps in a CBA: Gambling in Maryland • Video Slot Machines in Maryland, Farrow, Scott and Judith Shinogle, "Are There Net State Social Benefits or Costs from Legalizing Slot Machine Gambling?"	
Assignment Due April 6 by 11 am	Read: • Regulatory Impact Analysis for the Proposed Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program (https://www.epa.gov/sites/production/files/2018- 08/documents/utilities ria proposed ace 2018-08.pdf)	
	Using Boardman et al.'s 10 Basic Steps, identify (note if step not included) and briefly discuss each step used in the analysis highlighting any incomplete, incorrect, controversial or omitted elements. Almost all of the information necessary to complete assignment is contained in Executive Summary and Introduction. You can review other chapters if you want to provide more detail about a step.	
	Minimum 1-page and Maximum 2-pages (1-inch margins, 11-12 pt. font)	

Week of April 6

Asynchronous Recording (To be Watched Before Class)

Review of Microeconomic Basics

• Boardman et al. Chapter 3 and Chapter 3, Appendix A

Fundamental Theorems of Welfare Economics

Hicks-Kaldor Criterion and Alternatives

The Cost of Public Funds

- Boardman et al. Chapters 2 and 19
- (Read Casually) Joseph Persky. 2001. Cost-benefit Analysis and the Classical Creed. *Journal of Economic Perspectives*, Volume 15, Number 4, Pages 199 –208
- Banzhaf, Spencer. 2011. "Regulatory Impact Analyses of Environmental Justice Effects," Journal of Land Use and Environmental Law 27(1), 2011, pp. 1-30

CBA Decision Rules

 World Bank, "Cost-Benefit Analysis: Evaluation Criteria (Or: "Stay away from the IRR")", Knowledge Brief, 2008.

Synchronous Meeting

Applying Supply and Demand to Analyze Markets and Identify Changes in Surplus

- 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
- Minimum wage
- Tobacco taxes and child care subsidies

Tulsa's Individual Retirement Account

• Greenberg, D. (2012). A cost-benefit analysis of Tulsa's IDA program: Findings from a long-term follow-up of a random assignment social experiment (CSD Working Paper No. 12-58). St. Louis, MO: Washington University, Center for Social Development

Assignment Due April 13 by 11 am

Read:

• Should College Education Be Free? Wall Street Journal, March 20, 2018, https://www.wsj.com/articles/should-college-education-be-free-1521558856

Use supply and demand analysis to examine the consequences of making college free. Analyze the market for college attendance and one other market that may be affected by the policy. For each market identify the change in consumer surplus, producer surplus, and government surplus.

Minimum 1-page and Maximum 3-pages (1-inch margins, 11-12 pt. font) including graphs. You need to include supply and demand graphs. You can draw them by hand and there does not need to be specific numbers in graphs or in answers. It is sufficient to show analytically what are the consequences.

Week of April 13

Asynchronous Recording (To be Watched Before Class)

Market Failures and Policies to Address Them:

Externalities, Internalities, Information Problems, Imperfect Competition, Public Goods

• Boardman et al. Chapter 5

Government Failure

• (Read Casually Chapters 1,2, and 6-8) Winston, Clifford. 2006. Government Failure Versus Market Failure. Brookings Institution Press and AEI.

Synchronous Meeting

CBA of Sugar-sweetened Beverages

- 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(3), pages 202-227
- John Cawley, David Frisvold, David Jones. 2019. The Impact of Sugar-Sweetened Beverage Taxes on Purchases: Evidence from Four City-Level Taxes in the U.S. NBER Working Paper No. 26393

Assignment Due April 20 by 11 am

Read:

• Petimar, J., Ramirez, M., Rifas-Shiman, S.L. *et al.* Evaluation of the impact of calorie labeling on McDonald's restaurant menus: a natural experiment. *Int J Behav Nutr Phys Act* **16**, 99 (2019). https://doi.org/10.1186/s12966-019-0865-7

First, discuss the rationale/justification for government intervention in this situation. Second, use the findings of the study, and a supply and demand analysis, to assess the effect of mandatory calorie labelling on the market for fast food. Discuss whether the policy should be implemented based on CBA criteria. Identify changes in consumer, producer and government surplus.

Minimum 1-page and Maximum 3-pages (1-inch margins, 11-12 pt. font) including graphs. You need to include supply and demand graphs. You can draw them by hand and there does not need to be specific numbers in graphs or in answers. It is sufficient to show analytically what are the consequences.

Week of April 20

Asynchronous Recording (To be Watched Before Class) Valuing Inputs and Outputs in Primary Market

- Boardman et al. Chapters 4, 5 and 6
- Abrantes, Pedro. (2015). The Economic Value of Bus Subsidy. Transportation Research Procedia. 8. 247-258. 10.1016/j.trpro.2015.06.059.

Synchronous Meeting Mexico City Subways

 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

Assignment Due April 27 by 11 am

Read:

• 2014 California High-Speed Rail (HSR) Benefit-Cost Analysis

Illustrate and discuss the analytical framework that underlies the measurement of benefits in the primary market of the high-speed rail (HSR) project and identify the size of the benefits (analytically). Calculate the "full" travel cost of train travel for both the baseline (AMTRAK) of no HSR and for HSR. Assume the travel time for AMTRAK is 9 hours and the travel time for HSR is 3 hours. Use information in Table 7 on the value of time in your calculation of the "full" cost. The monetary price of AMTRK ticket is \$100 and for HSR the monetary price is \$200. Calculate the "full" travel cost elasticity of demand for HSR in Bay to Basin segment. Additional data necessary for this calculation is found in Table 4 (2030 Bay to Basin data); assume that there were 6 million AMTRAK rides per year between San Francisco and LA (Bay to Basin segment) at baseline. Assume that the benefits in Table 21 are based on the elasticity of demand you calculated. Discuss the implications for the CBA if the elasticity was cut in half.

Minimum 1-page and Maximum 3-pages (1-inch margins, 11-12 pt. font) including graphs.

Week of April 27

Asynchronous Recording (To be Watched Before Class)

Valuing Inputs and Outputs in Secondary Markets

• Boardman et al. Chapter 7

Are Jobs a Benefit?

• (Read Casually) Bartik, Timothy J. "Including Jobs in Benefit-Cost Analysis" Annual Review of Resource Economics 4 (2012): 55-73.

Synchronous Meeting

Infrastructure, Multipliers and Cost-benefit Analysis

 (Read Casually) Edward L. Glaeser and James M. Poterba . 2020. "Introduction to "Economic Analysis and Infrastructure Investment", in "Economic Analysis and Infrastructure Investment", University of Chicago Press, http://www.nber.org/chapters/c14351

Co-benefits: Mercury and Air Toxics Standards

- (Read Executive Summary and Chapter 1) Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards, https://www3.epa.gov/ttnecas1/regdata/RIAs/matsriafinal.pdf
- Sunstein, Cass: https://www.bloomberg.com/opinion/articles/2018-10-03/epa-mercury-regulations-should-reflect-all-benefits-and-all-costs
- Bloomberg, Scott:
 https://www.nera.com/content/dam/nera/publications/2016/Scott Bloomberg Cobenefits BNA Insights Published.pdf

Indirect Measurement of Primary Benefits

• 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. doi:10.1017/bca.2016.22

Assignment Due May 4 by 11 am

Read:

• Reynolds, A. J., Temple, J. A., White, B. A., Ou, S. R., & Robertson, D. L. (2011). Age 26 cost-benefit analysis of the child-parent center early education program. *Child development*, 82(1), 379–404. doi:10.1111/j.1467-8624.2010.01563.x

What is the primary market? Were the benefits and costs assessed using the primary market? Discuss why or why not. Summarize and evaluate the appropriateness of secondary benefit (impact) categories and the quality of empirical evidence supporting estimates. Were any important benefit categories omitted?

Approximately 2-pages (1-inch margins, 11-12 pt. font) including graphs. No more than 3 pages.

Week of May 4

Asynchronous Recording (To be Watched Before Class)

Discounting

- 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
- (Read Sections 1-3) Drupp M, Freeman M C, Groom B and Nesje F (2018). 'Discounting Disentangled'. Forthcoming in the American Economic Journal: Economic Policy. Working paper version: Grantham Research Institute on Climate Change and the Environment Working Paper No. 172
- Council of Economic Advisers, "Discounting For Public Policy: Theory And Recent Evidence On The Merits Of Updating The Discount Rate," January 2017

Synchronous Meeting

Social Cost of Carbon and the Discount Rate

Richard Newell, Unpacking the Administration's Revised Social Cost of Carbon

Assignment Due May 11 by 11 am

Read the first 17 pages of:

Chapter 6: National Academies of Sciences, Engineering, and Medicine. 2017. Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide. Washington, DC: NAP

Describe/explain each component of the social discount rate (i.e., Ramsey formula) in Table 6.1. Discuss whether there is "right" value of reach component. Discuss the issue illustrated by Figures 6-3 and 6.4 and Table 6.2 and its practical importance to a CBA.

Approximately 2-pages (1-inch margins, 11-12 pt. font). No more than 3 pages.

Week of May 11

Asynchronous Recording (To be Watched Before Class)

Risk and Uncertainty

- Boardman et al. Chapters 11 (Section 1.1) and 12
- (Read Casually) Sunstein, Cass R., "Irreversible and Catastrophic," 91 Cornell Law Review 841 (2006)

Synchronous Meeting

Tulsa's Individual Retirement Account

• Greenberg, D. (2012). A cost-benefit analysis of Tulsa's IDA program: Findings from a long-term follow-up of a random assignment social experiment (CSD Working Paper No. 12-58). St. Louis, MO: Washington University, Center for Social Development

Haitian Nutrition CBA

 Wong, B., & Radin, M. (2019). Benefit-Cost Analysis of a Package of Early Childhood Interventions to Improve Nutrition in Haiti. Journal of Benefit-Cost Analysis, 10(S1), 154-184. doi:10.1017/bca.2019.1

Week of May 18

Asynchronous Recording (To be Watched Before Class)

Measuring Program/Policy Impacts: Revealed Preference and Indirect Methods

• Boardman et al. Chapters 14, 15, 17

Hedonic Regression and Tradeoff Method: Measuring the Value of Communication Antennas

 Locke, S. L.; Blomquist, G. C. The Cost of Convenience: Estimating the Impact of Communication Antennas on Residential Property Values. Land Economics, v. 92, n. 1, p. 131– 147, 2016

Measuring the 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.

Synchronous Meeting COVID-19 and VSL

 Robinson, L.A., Sullivan, R. and Shogren, J.F. (2021), Do the Benefits of COVID-19 Policies Exceed the Costs? Exploring Uncertainties in the Age–VSL Relationship. Risk Analysis. https://doi.org/10.1111/risa.13561

Value of Time: Application to Zonal Travel Cost and Other CBA Methods

 Goldszmidt, Ariel and List, John A and Metcalfe, Robert D and Muir, Ian and Smith, V. Kerry and Wang, Jenny. 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"

Assignment Due May 25 by 11 am

Read:

 Cheng, C., Mayer, W.J. and Mayer, Y. (2018), The Effect Of Legalizing Retail Marijuana On Housing Values: Evidence From Colorado. Econ Inq, 56: 1585-1601. https://doi.org/10.1111/ecin.12556

Describe the method that is being used to obtain the value of legalizing retail marijuana. Describe the results and discuss any potential problems with the method. What would be an alternative way to estimate the benefits of legalizing retail marijuana? Discuss.

Week of May 25

Asynchronous Recording (To be Watched Before Class)

Measuring Program/Policy Impacts: Stated Preference and Contingent Valuation

- Boardman et al. Chapters 13, 16
- Catherine 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. http://www.aeaweb.org/articles.php?doi=10.1257/jep.26.4
- Hausman, Jerry. 2012. "Contingent Valuation: From Dubious to Hopeless" *Journal of Economic Perspectives* Vol. 26, No. 4, pp. 43-56.
 http://www.aeaweb.org/articles.php?doi=10.1257/jep.26.4
- Tuncel, Tuba and James K Hammitt. "A new meta-analysis on the WTP/WTA disparity." Journal of Environmental Economics and Management, 175-187.

Synchronous Meeting

Measuring the Value of Reductions in Gun Violence

 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). https://doi.org/10.1023/A:1011144500928

Measuring the Value of Corporate Crime

• Cohen, M. (2015). Willingness to Pay to Reduce White-Collar and Corporate Crime. Journal of Benefit-Cost Analysis, 6(2), 305-324

Assignment Due June 1 by 11 am

Read:

 Haefele et al. "Total Economic Valuation of the National Park Service Lands and Programs: Results of a Survey of The American Public" (https://www.nationalparks.org/sites/default/files/NPS-TEV-Report-2016.pdf)

Critically discuss two to three issues that you think made the study good and two to three issues that limited the value of the study.

Approximately 2-pages (1-inch margins, 11-12 pt. font) including graphs. No more than 3 pages.