

EIB E247: Econometric Impact Evaluation for Development
The Fletcher School, Tufts University
Spring 2024
Location and Time: Thursday, 9:30-11:50 EST

Instructor's Information:

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Course Objectives:

One of the primary challenges for policymakers, development practitioners, donors and non-governmental organizations (NGOs) is understanding what policies and interventions are the most effective in improving the welfare of the world's poor. While monitoring and evaluation (M&E) is useful in determining whether a program is on the "right track", this does not tell us whether a particular intervention, policy or program causes changes in development outcomes. Yet such information is crucial in the context of limited financial and human resources in development.

The objective of this course is to provide students with a set of theoretical, econometric and practical skills to estimate the causal impact of a policy or program, with a particular focus on development programs. We will go beyond estimating the simple causal effect of an intervention on an outcome of interest to identifying the channels and mechanisms through which the causal effect was achieved. Examples will be drawn from a variety of sectors, including agriculture, health, education, financial services and governance.

The course will introduce students to a variety of econometric techniques in impact evaluation and a set of analytical skills that will assist them in becoming both consumers and producers of applied empirical research. Students will not only learn how to critically analyze evaluation research and gauge how convincing it is in establishing a causal relationship, but also use these skills to conduct an impact evaluation of an existing development project. The curriculum will be very applied.

Learning Outcomes:

By the end of this course, a student should be able to:

1. Understand the value and practice of impact evaluation within the development community.

2. Understand and apply a variety of quantitative methods for estimating the impact of a development program, including randomized controlled trials (RCTs), quasi-experimental designs (regression discontinuity design and difference-in-differences) and non-experimental approaches (matching and instrumental variables)
3. Critically analyze impact evaluation research and gauge the validity of the findings
4. Design your own impact evaluation
5. Analyze data from a development project using impact evaluation techniques and present the results

Pre-requisites:

Introductory econometrics (EIB E213) or an equivalent intermediate econometrics course is required. Econometrics may not be taken concurrently with this course, as lectures and assignments will assume a certain level of econometrics and STATA that will not be covered until later in the semester in EIB E213. There will be no exceptions to this pre-requisite. All relevant statistical and econometric concepts will be reviewed as they arise, but the reviews will be brief. If you struggled in econometrics (in other words, if you received below an A- in EIB E213 or an equivalent), then you will struggle in this course. ***Students must take an online econometrics quiz during the first week of class..***

Methods of Instruction:

Concepts will be presented in class via lectures and case studies, which will also serve as the basis for class discussion and small group activities. Lectures will present key topics and summaries of the readings and will be posted on Canvas in the morning before class. Case studies will highlight research from Africa, Asia, and South America and cover programs related to agriculture, education, financial services, governance, health and social protection. Group work (problem sets and a group project) will provide hands-on experience with research design and data analysis.

There will also be online videos for each class. These videos will be either review or will provide additional detailed information on topics that will be covered more briefly during class lectures. There will be two review videos for econometrics and statistics prior to the start of class.

This course is a hybrid course, and 2/3 of courses will be held in-person, with an online option available. These will be identified in the calendar, so that students can plan accordingly.

Finally, for the first time, I will also provide a “advanced” resources for some sessions, for those of you who may be interested. This may involve advanced readings, videos or resources for those of you interested.

Office Hours

For any questions about concepts, assignments or data, please sign up for office hours. If you cannot make office hours during the pre-assigned time slot and would like to set up a different appointment, please e-mail me with the header "Office Hours Meeting". I will not be able to respond to individual e-mails with questions about readings, class concepts, assignments or tests.

Registration

Please note that I will not be teaching this class again after Spring 2024, as this will be my final semester at the Fletcher School.

Requirements and Grading:

There will be weekly online quizzes, four problem sets, two exams and one group research project. Grades will be calculated based upon the following weights:

Problem sets:	28%
Exams:	40%
Final project:	30%
Weekly quizzes:	2%

These weights may not reflect the actual time spent on each assignment.

While technical concepts and readings will be presented in lecture, other aspects of the course will focus on a discussion of the readings. Students are expected to prepare for class by completing the required readings before each class, taking the quizzes associated with the topic, attending each class and actively participating in class discussion.

A formal grade will not be provided for participation or attendance, but attendance, thoughtful class participation (i.e., a meaningful contribution to critiques and ideas discussed in class) and strong performance on the quizzes will improve your grade if you are on the margin (i.e., an A from an A-, an A- from a B+).

There will be four problem sets, which can be submitted in a group of **4-5 people**. All problem sets should be submitted in electronic version on Canvas.

The midterm and final examinations will be closed book exams, but students will be allowed to use one 3 X 5 index card of formulas and notes for each exam.

The research project will be due at the end of the session, with intermediate deliverables throughout.

The main deliverable for the research project will be a final presentation. You will also be asked to give a practice presentation prior to the final presentations; and fill out a confidential evaluation of your other group members at the end of the semester.

Students will be offered a choice of datasets from field projects from different international organizations, as well as the necessary program documents (project document, results framework, indicators, questionnaires and the evaluation reports).

This group project is an *in-class consultancy for an actual development organization*. Certain organizations have kindly agreed to share their datasets and program documents with the class for the fall semester course, and we will use these datasets for the consultancy project. For this reason, we are unable to share these datasets with other parties without the permission of the organization, and we cannot share our findings with other individuals (other than the organization).

Incubator Course for the Capstone Project

Fletcher has moved to a capstone project to replace the traditional thesis. EIB E247 is an “incubator course” for the capstone project. Students who are interested in using their final project for their capstone requirements will need to build upon their group work (presentation and group consultancy report) and write a 25-page econometric research paper for their capstone. The paper should use the group analysis as a basis, but will need to significantly expand upon the econometric analysis and use technical jargon.

Diversity Statement

While this is a class on quantitative methods, as you will see throughout this course, there is no such thing as perfectly objective social science. The social science fields we use to learn impact evaluation and econometrics have historically been built on a small set of privileged voices. I acknowledge that it is possible that there may be both overt and covert biases in the material due to the lens with which it was written, even if the material is primarily of a technical nature. Integrating a diverse set of experiences is important for a more comprehensive understanding of policy analysis tools and their application to real-world problems. I will attempt to bring in more viewpoints in the examples and cases that we discuss throughout this case. Please contact me if you have suggestions to improve the diversity of the course material.

Furthermore, I would like to create a learning environment in this class that supports a diversity of thoughts, perspectives, and experiences, and honors your identities. If something is said in class, by me or anyone else, that made you feel uncomfortable, please talk to me about it as soon as possible. As a participant in course discussions, you should also strive to honor the diversity of your classmates.

Texts and Reading Materials:

This course will draw heavily from the following readings:

- Glewwe, Paul and Petra Todd. 2022. “Impact Evaluation in International Development: Theory, Methods and Practice.” <http://hdl.handle.net/10986/37152>

1. Glewwe, Paul and Petra Todd. 2022. "Impact Evaluation in International Development: THEORY, METHODS, AND PRACTICE." <http://hdl.handle.net/10986/37152>
2. Gertler, Paul J., Sebastian Martinez, Patrick Premand, Laura B. Rawlings, and Christel M. J. Vermeersch. 2016. *Impact Evaluation in Practice*. Washington, D.C.: World Bank Publications. www.worldbank.org/ieinpractice. (GMPRV in the reading list below).
3. Khandor, Shahidur R., Gayatri B. Koolwal and Hussain A. Samad. 2010. *Handbook on Impact Evaluation: Quantitative Methods and Practices*. The World Bank: Washington, D.C. (KKH in the reading list below).
4. Glennerster, Rachel and Kudzai Takavarasha. 2013. *Running Randomized Evaluations: A Practical Guide*. Princeton University Press. (GT in reading list below). The full text of this book is available via <https://books.google.com/books/princeton?hl=en&q=&vid=ISBN9781400848447>.
5. Cunningham, Scott. 2021. *Causal Inference: The Mixtape*. <https://mixtape.scunning.com/index.html>

The first two documents provide a nice overview of impact evaluation and are quite intuitive (although the first document has more technical components in later chapters). However, you cannot and should not rely on these documents alone; you need to read carefully and understand the "econometric language of impact evaluation" that is presented in the textbooks. For this reason, you should plan to digitally access the Cunningham book, as well as the GT book. The World Bank documents will be uploaded onto Canvas.

Typically, each class will draw on two theoretical and two applied readings, as specified in the syllabus. Students are responsible for reading the required materials (marked with a *). They are also encouraged to read the recommended readings, some of which will be used for in-class case studies.

In addition to the above, there are some useful online resources:

- On randomized experiments and data analysis:
 - <https://www.povertyactionlab.org/resource/introductionrandomized-Evaluations>. This provides practical guidance on conducting RCTs and includes templates, checklists, STATA codes, and concrete advice based on J-PAL's experience in implementing field research projects.
 - <https://www.povertyactionlab.org/resource/data-analysis>. This resource is literally a condensed version of what you want to know in this course. Read it!
- On Causal Inference methods: <https://egap.org/methods-guides/>
- Teaching material on Causal Inference Methods: https://egap.github.io/theory_and_practice_of_field_experiments/

I also personally like the book by Myoung-Jae Lee. 2005. *Microeconometrics for Policy, Program and Treatment Effects*. It is a short, concise and highly technical book on impact evaluation, which is great as a reference.

Finally, for those interested, students will receive a free copy of Professor Aker's new book, "Mobile Phones and Development in Africa: Does the Evidence Meet the Hype?" This book is not about impact evaluations per se, but we review literature that using experimental and non-experimental techniques to measure the causal impact of digital technology (broadly speaking) on a number of outcomes.

Important or Unusual Dates

Due to the nature of the final project, we will schedule the colloquium on Friday, April 26th. **This is an additional class and attendance at this last class is required.** We will also have a mandatory practice review session on the night prior to the colloquium. Please note this date accordingly, and make necessary accommodations. If you have another class or work obligation on that date that you cannot miss, please inform me as soon as possible.

Finally, given research in Niger, I may need to reschedule one class this semester. If I do so, I will let you know in advance.

Course Outline

0. Preparing for this course

If you feel as if you have forgotten your statistics and econometrics over the summer, please review the review videos, as well as Scott Cunningham's book ("Probability and Regression Review") *before the first week of class*. The first class will start off quickly, and we will continue!

I. Introduction to impact evaluation in economic development

*GMPRV, Chapters 1 and 2.

*KKH, Chapter 2.

*GT, Chapter 1

*Aker, Jenny C. "Jenny Aker on Rigor for the Rest of Us." Savings Revolution Blog, June 28, 2011. <http://savings-revolution.com/blog/2011/6/28/jenny-aker-on-rigor-for-the-rest-of-us.html>

This American Life "I was just trying to help." August 13, 2013. <http://www.thisamericanlife.org/radio-archives/episode/503/i-was-just-trying-to-help?act=1>

II. Causal Inference

*GMPRV, Chapter 3.

*Khander et al, Chapter 2, pp. 22-28.

*Cunningham, Section 4.1. Physical Randomization and Potential Outcomes

*Angrist and Pischke, Chapter 1, pp. 1-11; Chapter 3, pp. 97-115. *If you need a review of statistical inference and regression analysis, also read Chapter 1 (Appendix) and Chapter 2 (including the Appendix).*

Lee, Chapter 2, pp. 7-13; pp. 21-24.

The movie "Sliding Doors", 1998, with Gwyneth Paltrow, John Hannah, John Lynch.

III. Randomized Evaluations

Theory

*GMPRV, Chapter 4

*Angrist and Pischke, Chapter 1 (pp. 11-32); Chapter 6, pp. 214-217 (bad controls).

*David McKenzie, “When should you cluster standard errors?” World Bank Development Blog.
<https://blogs.worldbank.org/impactevaluations/when-should-you-cluster-standard-errors-new-wisdom-econometrics-oracle>.

Duflo, Esther, Rachel Glennerster, and Michael Kremer. 2008. “Using Randomization in Development Economics Research: A Toolkit”, Chapter 61, *Handbook of Development Economics*. Sections 2.1, 2.2, 3.1., 5.1., 5.2. and 8.2.

Lee, Chapter 2, pp. 18-21

Practice

*GT, Chapter 2 (Modules 2.1. and 2.3), Chapter 4.

*Aker, Jenny C. and B. Kelsey Jack. 2021. “Harvesting the Rain: The Adoption of Environmental Technologies in the Sahel.” NBER Working Paper

*Najy Benhassine, Florencia Devoto, Esther Duflo, Pascaline Dupas, and Victor Pouliquen. 2015. “Turning a Shove into a Nudge? A “Labeled Cash Transfer” for Education. *AEJ: Applied Economics*.

McKenzie, David. June 1, 2020. “An Overview of Multiple Hypothesis Testing Commands in STATA.”
<https://blogs.worldbank.org/impactevaluations/overview-multiple-hypothesis-testing-commands-stata>

Todd, Petra and Kenneth Wolpin. 2023. “The Best of Both Worlds: Combining RCTs with Structural Modeling.” *Journal of Economic Perspectives*.

IV. **Regression Discontinuity Design (RDD)**

Theory

*GMPRV, Chapter 6

*Angrist and Pischke, Chapter 5

Lee, Chapter 3, Section 3.3.

Practice

*Kazianga, Harounan, Dan Levy, Leigh L. Linden and Matt Sloan. 2013. “The Effect of “Girl-Friendly” Schools: Evidence from the BRIGHT School Construction Program in Burkina Faso.” *American Economic Journal: Applied Economics*, 5(3): 41-62.

*Manacorda, Marco, Edward Miguel and Andrea Vigorito. 2011. “Government Transfers and Political Support.” *American Economic Journal: Applied Economics*.

V. Differences-in-Differences

Theory

*GMPRV, Chapter 7

*Cunningham, Chapter 2, 9.1 and 9.2. (up to 9.2.2)

Ozler, Berk. “Why is Difference-in-Difference Estimation still so Popular in Experimental Analysis?” *Development Impact Blog*, World Bank. <https://blogs.worldbank.org/impacetevaluations/why-difference-difference-estimation-still-so-popular-experimental-analysis>.

Lee, Chapter 4, Sections 4.5. and 4.6.

Practice

*Aker, Jenny C.. 2010. “Information from Markets Near and Far” *American Economic Journal: Applied Economics*.

*Shamdasani, Yogita. 2021. “Rural Road Infrastructure & Agricultural Production: Evidence from India.” *Journal of Development Economics*, Volume 152.

*Roth, Jonathon et al. May 2022. “What’s Trending in Difference-in-Differences ? A Synthesis of the Recent Econometrics Literature.”

VI. Matching and Propensity Score

Theory

*GMPRV, Chapter 8

*Peter C. Austin, 2011. “An Introduction to Propensity Score Methods for Reducing the Effects of Confounding in Observational Studies. *Multivariate Behav Res.* May 2011; 46(3): 399–424.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3144483/>

Lee, Chapter 4, Section 4.3.

Practice

*Van de Walle, Dominique and Ren Mu. 2007. “Fungibility and the Flypaper Effect of Project Aid: Microevidence for Vietnam.” *Journal of Development Economics.* 84: 667-685.

*Özler, Berk, Çiğdem Çelik, Scott Cunningham, P. Facundo Cuevas, Luca Parisotto. 2021. “Children on the move: Progressive redistribution of humanitarian cash transfers among refugees.” *Journal of Development Economics.* Volume 153.

Bernard, Tanguy, Alemayehu Seyoum Taffesseb, Eleni Gabre-Madhin. 2008. “Impact of cooperatives on smallholders’ commercialization behavior: evidence from Ethiopia.” *Agricultural Economics* 39(2): 147–161.

VII. Instrumental Variables

Theory

*GMPRV, Chapter 5

*Angrist and Pischke, Chapter 3

Lee, Chapter 5, Sections 5.5. and 5.6.

MHE Sections 4.1., 4.4.1.-4.4.2.

Practice

*Devoto, Florencia, Esther Duflo, Pascaline Dupas, William Parienté, and Vincent Pons. 2012. "Happiness on Tap: Piped Water Adoption in Urban Morocco." *American Economic Journal: Economic Policy*, 4 (4): 68-99.

*Nunn, Nathan and Nancy Qian. 2014. “U.S. Food Aid and Civil Conflict.” *American Economic Review.*

VIII. Data Quality and Attrition

Theory

*GT, Chapter 7 (Module 7.2.), Chapter 8 (pp. 349-354).

*Ozler, Berk. September 2017. [“Dealing with Attrition in Field Experiments.”](#) World Bank Blog.

Practice

*Aker, Jenny C., B. Kelsey Jack and Malam Maigari. 2022. “The Reliability of Self-Reported Data in Agriculture: Evidence from Niger.”

IX. Power Calculations

Theory

*GT, Chapter 6 (pp. 241-297).

Practice

*Berk Ozler. “Beware of Studies of a Small Number of Clusters.”

<http://blogs.worldbank.org/impac evaluations/beware-of-studies-with-a-small-number-of-clusters>

X. Cost Benefit and Cost Effectiveness Analyses

Theory

*GT, Chapter 9 (Module 9.3)

*McEwan, Patrick. June 2012. “Cost Effectiveness Analysis of Education and Health Interventions in Developing Countries.” *Journal of Development Effectiveness*, Vol 4 (No 2).

Practice

*Dhaliwal, Iqbal, Esther Duflo, Rachel Glennerster, Caitlin Tulloch. August 2011. “Comparative Cost-Effectiveness Analysis to Inform Policy in Developing Countries: A General Framework with Applications for Education.” Abdul Jameel Poverty Action Lab.

*World Bank Development Blog. “How much do our impacts cost?” February 2012.

<http://blogs.worldbank.org/impac evaluations/how-much-do-our-impacts-cost-guest-post-by-alaka-holla>

J-PAL March 30, 2010. *J-PAL Cost Effectiveness Methodology*. Cambridge, MA: MIT.

XI. **Summing Up**

A Guide to Critically Reading Impact Evaluations

As you read the articles assigned for this course, please keep the following questions in mind:

Main Research Questions

1. What is the main research question being asked in this paper? Do you think that this question is interesting from a development, policy and economics perspective?
2. What is the main causal question being asked in the paper? (In other words, “What is the effect of X on Y ?”)
3. What are the other variables (Z) that can affect Y ? Which of these are observable? Which are unobservable?

Study Design and Identification Strategy

4. How do the authors identify the causal effect of X on Y ?
5. Who is the treatment group? Who is the control group?
6. If the study used randomization to construct a counterfactual, answer the following questions:
 - What units did the program randomize across?
 - Are there any potential concerns with this randomization approach?
 - Did the randomization “work”? How do you know?

Findings, Internal and External Validity

7. What are the key findings of the paper? Are these effects economically and statistically important?
8. What are the main threats to internal validity of the findings? (Are the falsification tests and robustness checks convincing?)
9. What are the limits to external validity?
10. Would you recommend that this program be expanded to other areas or countries? Why or why not?
11. Is this the best way to answer the causal question of interest? Is there a better methodology, sample or context?