Empirical Methods for Public Policy Evaluation

Monica Martinez-Bravo

CEMFI Summer School
2021

Overview:

This course provides a practical introduction to the main tools used for policy evaluation. The cornerstone methodology of the course will be Randomized Control Trials. We will describe the advantages of experimental methodologies to uncover the causal effect of policies. We will discuss technical aspects such as sample size, design of treatment arms, and data analysis. We will also discuss threats to identification and issues of external validity. In a second part of the course, we will discuss non-experimental methods for policy evaluation, such as control functions, matching estimators, regression discontinuity design and difference-in-differences estimators. We will discuss how these methodologies can approximate randomized control trials in exploiting quasi-experimental variation. In a final section we will discuss the complementarities between the use of administrative data and randomized control trials.

Practical Information

Dates: 30 August – 3 September 2021

Hours. Main Lectures: 15:30 to 17 and 17:30 to 18:30 (CET, Madrid time)

Hours. Practical Lectures: 18:40 to 19:40, Tuesday to Friday

Office Hours: 12h to 13h, each day between 30 Aug - 3 Sept
(with main instructor)   Students can sign up for 20-minute slots through the
                                           intranet. Additional slots may be available upon demand.

Main Instructor: Monica Martinez-Bravo (Associate Professor, CEMFI)
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                              mmb@cemfi.es

Teaching Assistant: Daniela Solá
                              https://www.cemfi.es/people/faculty/profile_phd.asp?u=sola
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Materials: To access tutorials, slides, and datasets visit the course intranet.
https://css.cemfi.es/

Zoom Class Registration: You should have received an email with the link to join the lectures. You can use that link to join all the lectures. You can access the practical lessons using this link (Meeting ID: 831 1129 1902, Passcode: diC4rN). Further information in the course intranet.

Format: The Lectures will be online, live (not pre-recorded). The main lectures will be taught by Professor Monica Martinez-Bravo, the principal instructor.

Practical lectures will be led by Daniela Solá, the teaching assistant. These are one-hour lectures aiming at demonstrating the practical implementation of the different methodologies discussed in the lectures. Academic papers will be presented and replicated in class using the statistical software Stata. The steps and details to conduct the replications will be made available in the course intranet prior to each practical session. This material will also include a do-file with solutions to the replication task so that you can explore them before or after the class, but you are strongly encouraged to first try to undertake the replication on your own.

To make the most of the practical lectures you should have Stata installed in your computer. In the course intranet you can find a Stata tutorial "*Stata_Quick_Guide*" in the "Introduction_to_Stata" folder. Please, review the document before the first practical class if you are not familiar with Stata. All lectures will be held in English.

Breakout room: We will create small breakout rooms in zoom during the 30-minute break in between the afternoon lectures. Students will be randomly assigned to each group so that they can interact with one another.

Intended Audience: Researchers, economists, and policy practitioners.

Level and Prerequisites: The course aims to provide a toolkit to use state-of-the art modern applied econometric methods to policy practitioners or researchers. The emphasis will be in applications and practical aspects rather than on developing new methodologies. Some basic knowledge of probability or statistics is desirable. Individuals with undergraduate degrees in Economics, Statistics or related disciplines should be able to follow the course.

Course Schedule

	Monday 30	Tuesday 31	Wednesday 1	Thursday 2	Friday 3
12 -13	Office Hours	Office Hours	Office Hours	Office Hours	Office Hours
15:30 - 17	Introduction to Impact Evaluation	Analysis of Randomized Evaluations	Non-experimental Methods: Matching Estimators	Regression Discontinuity Design	Combining the Experimental Approach with Administrative Data
17:30 - 18:30	How to Design a Randomized Control Trial?	Threats to Identification	Difference-in-Differences	Instrumental Variables	The potential of Administrative Data
18:40 - 19:40		Practical Lecture: Randomized Evaluations	Practical Lecture: Randomized Evaluation	Practical Lecture: Difference-in-Differences	Practical Lecture: Regression Discontinuity

Outline of Lectures:

Day 1. Monday. Introduction to Impact Evaluation

This lecture will provide an introduction to the topic of evaluation of causal effects. We will discuss the notion of causality through a potential outcomes framework. We will present the experimental approach as the canonical methodology to the estimation of causal effects. In the second part of the lecture we will discuss Randomized Control Trials in practice. We will discuss sample size, design of treatment arms, methods of randomization, choice of partner institutions, among others.

Day 2. Tuesday. Randomized Control Trials in Detail

Practical Lecture: To motivate the benefits of RCTs, we will first exemplify the consequences of omitted variable bias in regression analysis. We will then illustrate key aspects of the design of RCTs. We will cover how to randomize and how to conduct power calculations. Potential limitations of RCTs (e.g. non-random attrition) will also be discussed.

Main lecture: We will cover topics related to analysis of data generated by Randomized Control Trials: regression analysis, interpretation of results, threats to the identification strategy. We will also discuss the limitations of Randomized Control Trials, such as lack of external validity and scalability issues.

Day 3. Wednesday. Non-Experimental Methods: Matching and Difference-in-Differences

Practical Lecture: We will replicate and discuss Dupas (2011) paper. This will allow us to cover fundamental aspects of empirical work relying on RCTs such as conducting balance checks, exploiting random assignment of an intervention to estimate its causal impact. We will also discuss how to use longitudinal information to assuage potential limitations of our experimental design.

Main Lecture: We will introduce non-experimental methods to estimate causal effects. We will cover the following methodologies: control functions, matching estimators, and difference-in-differences estimators.

Day 4. Thursday. Non-Experimental Methods: Regression Discontinuity Design and Instrumental Variables

Practical Lecture: This session will illustrate the Difference-in-Differences methodology by means of an extension of the standard framework to one in which we exploit cohort variation in exposure to treatment from a cross-sectional database following Duflo (2001). A brief discussion on binary instruments to estimate the returns to schooling will follow.

Main Lecture: We will present the following non-experimental methods for impact evaluation: regression discontinuity design and instrumental variables.

Day 5. Combining the Experimental Approach with Administrative Data

Practical Lecture: This session will illustrate the main features of the regression discontinuity methodology by replicating and discussing Beland (2015).

Main lecture: We will discuss the usage of administrative data for impact evaluation. We will discuss the potential of a new venue for policy evaluation: the combination of experimental approaches with access to administrative data. Hence, this lecture will provide a "sneak peek" to the (likely) future of impact evaluation.

Recommended Readings and Additional Resources

Angrist, Joshua and Pischke, Jorn-Steffen, 2009, Mostly Harmless Econometrics: An Empiricist's Companion, 1 ed., Princeton University Press.

Angrist, Joshua D. and Jörn-Steffen Pischke, 2014. "Mastering 'Metrics: The Path from Cause to Effect," Economics Books, Princeton University Press, edition 1, number 10363.

Beland, Louis-Philippe. 2015. "Political Parties and Labor-Market Outcomes: Evidence from US States." American Economic Journal: Applied Economics, 7 (4), pages 198-220.

Duflo, Esther. 2001. "Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment," American Economic Review, 91 (4), pages 795-813.

Duflo, Esther, Rachel Glennerster and Michael Kremer, 2008. "Using Randomization in Development Economics Research: A Toolkit," Handbook of Development Economics, in: T. Paul Schultz & John A. Strauss (ed.), edition 1, volume 4, chapter 61, pages 3895-3962, Elsevier.

Dupas, Pascaline, 2011. "Do teenagers respond to HIV risk information? Evidence from a field experiment in Kenya," American Economic Journal: Applied Economics, 3 (1), pages 1-34.

Glennerster, Rachel and Kudzai Takavarasha, 2013. "Running Randomized Evaluations: A Practical Guide," Economics Books, Princeton University Press, edition 1, number 10085.

NBER Summer Institute 2021 Methods Lecture-Causal Inference Using Synthetic Controls and the Regression Discontinuity Design (video here)

Jameel-Abdul Latif Poverty Action Lab (J-PAL)

Innovations for Poverty Action (IPA)

Nobel Prize in Economics 2019 Lecture, Abhijit Banerjee, Esther Duflo, Michael Kremer (link)

Social Experiments to Fight Poverty (Esther Duflo's Ted Talk)

Presentation of Monica Martinez-Bravo on the Panel Discussion on the Nobel in Economics 2019 at Fundación Ramón Areces (link) (In Spanish)