

## International Economics

Academic year 2024-2025

## Impact Evaluation

### EI041 - Spring - 6 ECTS

Wednesday 14h15 - 16h00

## Course Description

We will discuss and employ various econometric techniques to estimate and analyze causal impacts of policies: difference in differences, regression discontinuity design, propensity score matching, randomized control trials, and instrumental variables. The econometrics courses of the program are a prerequisite for this course. We will work through specific examples from the literature using the statistical software Stata or R (depending on students' preferences).

The grading will be based on a replication exercise done in groups.

## > PROFESSOR

[Michele Pellizzari](#)

[Office hours](#)

## > ASSISTANT

Hossein Tohidimehr

[Office hours](#)

## IMPORTANT

**Regular attendance** is compulsory, and any absence must be promptly communicated to the teacher. In the event of missing more than two sessions, students are expected to provide well-documented justifications for unforeseeable circumstances (e.g. illness, accident, death of a relative), directly to the Direction of Studies. Failure to justify absences beyond two sessions will result in the assignment of code N.

Students are also reminded of the following legal rules:

The teacher owns the **copyright** on the material they created for this course. As such, any reproduction or distribution of this document, in whole or in part, as well as of any other material created by the teacher for the course, is prohibited unless permission is granted by the author.

Recording (as video or audio) a course without the consent of the teacher and other participants is strictly forbidden.

# Syllabus

## List of Topics with references

### 1. What is a causal effect? The potential outcome framework and the missing counterfactual References:

- Chapter 2 in Angrist, Joshua D. and Jorn-Steffen Pischke. 2009. Mostly Harmless Econometrics. Princeton University Press.

### 2. Randomized Controlled Trials (RCT)

2.1 Mean comparison and OLS equivalence

2.2 Compliance and other implementation issues

#### References:

- Athey, S. and Imbens, G. W. (2017). The Econometrics of Randomized Experiments. In Handbook of Economic Field Experiments, vol. 1. Elsevier, 73–140.
- Alwyn Young, Channeling Fisher: Randomization Tests and the Statistical Insignificance of Seemingly Significant Experimental Results, *The Quarterly Journal of Economics*, Volume 134, Issue 2, May 2019, Pages 557–598,

### 3. Matching estimators: Propensity Score and Synthetic Control

#### References:

- Dehejia, R.H. and S. Wahba (2002), Propensity Score Matching Methods for Non-Experimental Causal Studies, *The Review of Economics and Statistics*, February 2002, 84(1): 151-161.
- Abadie, Alberto, Alexis Diamond, and Jens Hainmueller. 2010. Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program. *Journal of the American Statistical Association* 105 (490): 493–505.

### 4. Instrumental Variables (IV) and Local Average Treatment Effects (LATE)

#### References:

- Chapter 5 in Wooldridge, Jeffrey M. 2010. Econometric Analysis of Cross Section and Panel Data. Second edition. MIT Press.
- Imbens, Guido W. and Joshua D. Angrist (1994), Identification and Estimation of Local Average Treatment Effects, *Econometrica* 62, 467–475.

### 5. Differences-in-Differences (DiD): classical 2x2 version and modern staggered/dynamic versions

#### References:

- Clément de Chaisemartin, Xavier D'Haultfoeulle, Two-way fixed effects and differences-in-differences with heterogeneous treatment effects: a survey, *The Econometrics Journal*, Volume 26, Issue 3, September 2023, Pages C1–C30, <https://doi.org/10.1093/ectj/utac017>

### 6. Regression Discontinuity Design (RDD)

#### References:

- Imbens, Guido W. & Lemieux, Thomas, 2008. Regression discontinuity designs: A guide to practice, *Journal of Econometrics*, Elsevier, vol. 142(2), pages 615-635, February.
- Cattaneo and Titiunik (2022): Regression Discontinuity Designs. *Annual Review of Economics* 14: 821-851.

## Prerequisites

Knowledge of the basic econometric techniques is expected, both linear and non-linear models.

## General references

There is no single textbook for this course however almost all the material that we will cover is presented in one or more of the following books :

- Athey, Susan, and Guido W. Imbens. 2017a. "The State of Applied Econometrics: Causality and Policy Evaluation." *Journal of Economic Perspectives* 31 (2): 3–32.
- Angrist, Joshua D. and Jorn-Steffen Pischke. 2009. *Mostly Harmless Econometrics*. Princeton University Press.
- Cameron, A. Colin, and Pravin K. Trivedi (2005). *Microeconometrics: Methods and Applications*. Cambridge . University Press, New York.
- Wooldridge, Jeffrey M. 2010. *Econometric Analysis of Cross Section and Panel Data*. Second edition. MIT Press.
- Imbens, Guido W., Donald B. Rubin, *Causal inference for statistics, social, and biomedical sciences : an introduction*. Cambridge University Press. 2015.

Additional references are indicated in the list of topics.

## Grading

The grading will be based on a replication exercise done in groups and presented in class. The exact format will be discussed with the students and will be adapted to the size of the class.

### Preliminary schedule

Date	Topic	References
19.02.2025	Introduction: policies, impacts and causality	Presentation slides on the website
26.02.2025	Causality in the potential outcome framework	A.P. Ch. 2; C.T. Ch 25.1-25.3; references in syllabus
05.03.2025	Randomized experiments	A.P. Ch. 1; references in syllabus
12.03.2025	The curse of dimensionality and matching estimators	C.T. Ch. 25.4; references in syllabus
19.03.2025	Instrumental variables and causality	Lecture notes; W. Ch. 5; A.P. Ch. 4.1; references in syllabus
26.03.2025	LATE interpretation of IV	A.P. 4.4-4.5; references in syllabus
02.04.2025	Difference-in-Differences: the classical 2x2 case	A.P. Ch. 5.2; C.T. 25.5; references in syllabus

09.04.2025	Staggered/Dynamic Difference-in-Differences	A.P. Ch. 5.2; C.T. 25.5; references in syllabus
16.04.2025	Regression Discontinuity	A.P. Ch.6.1; references in syllabus
30.04.2025	<i>Buffer session</i>	
07.05.2025	<i>Students' presentations</i>	
14.05.2025	<i>Students' presentations</i>	
21.05.2025	<i>Students' presentations</i>	
28.05.2025	<b>Review session</b>	

**Notes:**

\* C.T. = Cameron, A. Colin, and Pravin K. Trivedi (2005). Microeconometrics: Methods and Applications. Cambridge University Press, New York

\* A.P. = Angrist, Joshua D. and Jorn-Steffen Pischke. 2009. Mostly Harmless Econometrics. Princeton University Press.

\* W. = Wooldridge, Jeffrey M. 2010. Econometric Analysis of Cross Section and Panel Data. Second edition. MIT Press.