Advanced Impact Evaluation

Winter 2024

Class meetings: Twice a week (TBA)
  12 sessions: February 13th 2024 - 28th March 2024

Course Number: DOPP5383

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Office hours: WED: 15.30 - 16.30, QS C403

Course overview

Evidence-based policymaking relies on the ability to combine causal methods and work with data. The course builds on the causal inference methods used to evaluate programs and policies, using the statistical software R.

We begin with a quick review of potential outcomes and the causal graph framework to build an understanding of cause. We then extend the toolkit with advanced difference-in-difference methods such as event-study design, regression discontinuity design, instrumental variables, and techniques for correct statistical inference.

Session format: Short lectures on the concepts followed by lab work
Prerequisites: Impact Evaluation or adequate training in econometric methods.

Course methods and materials

Program and policy evaluation requires practice. The in-class lab work, homework assignments, and group projects are designed to help students master the techniques. The concepts will be presented via lectures and case studies, while the lab work with R aims to build data skills. Students are encouraged to work in groups on the assignments. Class attendance and participation are highly encouraged, and unjustified absences will be noted.

Students are required to prepare for class with the assigned readings. Additional materials (available as e-books in the CEU library) for those interested include:

1. Demystifying Causal Inference (2023) by Vikram Dayal and Anand Murugesan

2. Mastering 'Metrics: The Path from Cause to Effect (2014) by Joshua Angrist and Jörn Steffen Pischke.

3. Causal Inference: The Mix Tape (2021) by Scott Cunningham

Course deliverables

- 2 Assignments (30%)

- Group/individual project presentation (20%)

- Discussion forum (10%)

- Individual term paper (40%)

Term paper have the highest weight as the course is designed to assist students in crafting an empirical paper (e.g., that can feed into their thesis). Assignments are weighted as implementation causal methods require learning-by-doing, followed by weight on individual presentations on their project (progress of the term paper). Discussions outside the classroom and preparation for the class are encouraged with the discussion forum points. The assignments and deadlines are designed to improve the learning outcomes from the course. Students with emergencies, such as medical issues, who need an extension on the deadlines are requested to contact the department coordinator – extensions can be granted as required.

Grading scale

96	$\leq$	A	$\leq$	100
88	$\leq$	A $-$	$<$	95
80	$\leq$	B $+$	$<$	87
71	$\leq$	B	$<$	79
63	$\leq$	B $-$	$<$	70
58	$\leq$	C $+$	$<$	62
0	$\leq$	F	$<$	57

Outline of sessions

1. Review of methods and discussion

   - Each student will discuss/present her goals in the course and make a 5-minute presentation on the research idea they would like to pursue (data, identification strategy, proposed methods)
   - Lecture on Elaborate Theories

2. Clustering and inference

   - Bertrand, Duflo, and Mullainathan (2004): "How Much Should We Trust Differences- In-Differences Estimates?" QJE, 119 (1): 249–275
   - Abadie, A., Athey, S., Imbens, G.W. and Wooldridge, J., 2017. When should you adjust standard errors for clustering? (No. w24003). National Bureau of Economic Research.
   - King, G. and Roberts, M.E., 2015. How robust standard errors expose methodological problems they do not fix, and what to do about it. Political Analysis, 23(2), pp.159-179.

3. Randomization: Baseline, balance, and spillovers

   - Bruhn and McKenzie (2009): "In Pursuit of Balance: Randomization in Practice in Development Field Experiments," AEJ: Applied **pp. 200 - 207**

- Malani et al. (2021): "Effect of Health Insurance in India: A Randomized Controlled Trial," NBER Working paper **(required)**
- McKenzie (2012): "Beyond baseline and follow-up: The case for more T in experiments," Journal of Development Economics, 2: 210–221 (recommended)
- Miguel, E. and Kremer, M., 2004. Worms: identifying impacts on education and health in the presence of treatment externalities. Econometrica, 72(1), pp.159-217. (recommended)

4. Difference-in-Differences and Synthetic Control Method

- *Demystifying Causal Inference* (Chapter 11, p. 237 - 253 required)
- Abadie, A., Diamond, A. and Hainmueller, J., 2015. Comparative politics and the synthetic control method. American Journal of Political Science, 59(2), (pp.495 - 505, required)
- Mix Tape Ch. 10 (supplementary)
- How Do Right-to-Carry Laws Affect Crime Rates? Coping with Ambiguity Using Bounded-Variation Assumptions, (pp 232 - 238, required)
- Roth, J., Sant'Anna, P.H., Bilinski, A. and Poe, J., 2022. What's Trending in Difference-in-Differences? A Synthesis of the Recent Econometrics Literature. arXiv preprint arXiv:2201.01194.

    Assignment 1 released

5. Panel data: Event-Study Design and Staggered DID

- Implementing the Panel Event Study (2020) by Clark and Schythe
- Borusyak, K., Jaravel, X. and Spiess, J., 2021. Revisiting event study designs: Robust and efficient estimation. arXiv preprint arXiv:2108.12419.
- Cengiz, D., Dube, A., Lindner, A. and Zipperer, B., 2019. The effect of minimum wages on low-wage jobs. The Quarterly Journal of Economics, 134(3), pp.1405-1454.

6. Regression discontinuity design

- *Demystifying Causal Inference* (Chapter 9)
- Cunningham Scott (2021) The Mixed Tape. Ch. 6 on RDD
- Mastering 'Metrics: The Path from Cause to Effect (Ch. 4)
- Asher and Novosad (2020), Rural Roads and Local Economic Development, AER (supplementary reading for a recent application)
- Klasnja, M., and Titiunik, R. (2017), "The incumbency curse: Weak parties, term limits, and unfulfilled accountability," American Political Science Review, 111, 129–148.

    Assignment 1 due

7. R Session (Synthetic Control, DID, RDD)

8. Instrumental variables

- *Demystifying Causal Inference* (Chapter 8, pp. 135 - 149)

- Angrist and Pishke (2009): Mostly Harmless Econometrics, chapter 4

- R Application: Acemoglu et al. (2001), The Colonial Origins of Comparative Development (required reading: sections 1, 2, and 3)

- Angrist, J.D. and Keueger, A.B., 1991. Does compulsory school attendance affect schooling and earnings? The Quarterly Journal of Economics, 106(4), pp.979-1014.

   Assignment 2 released

9. Instrumental variables II (+ R session)

   - *Demystifying Causal Inference* (Chapter 8, pp. 150 - 168)

   - Cunningham Scott (2018) Causal Inference: The Mixed Tape. Ch: Instrumental Variables

   - R Applications: Colantone and Stanig (2018), Global Competition and Brexit

   - Andrews, I., Stock, J.H. and Sun, L., 2019. Weak instruments in instrumental variables regression: Theory and practice. Annual Review of Economics, 11, pp.727-753.

10. Meta-analysis for policymaking

    - *Demystifying Causal Inference* (Chapter 12)

    - Doing Meta-Analysis with R (Sections 1.1, 3.1, 3.3, 4.1, 13. 1)

    - Target validity paper (suggested reading)

    Assignment 2 due

11. Dynamic panel models

    - *Demystifying Causal Inference* (Chapter 10, pp. 202 - 226)

    - Imai and Kim (2019), When Should We Use Unit Fixed Effects Regression Models for Causal Inference with Longitudinal Data? (required pp. 467 - 473)

    - Acemoglu et al. (2019), Democracy does cause growth

12. Student Presentations