

POLS 5385 Causal Inference

Fall 2023

Professor: Kevin Grier

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Class meets at 3:30 pm on Thursdays in Holden Hall 00233

Office Hours by appointment.

Course description:

We study the problem of causal inference, the experimental ideal, and methods that attempt to produce causal estimates of policies / treatments from observational data. A basic knowledge of linear regression and stats is assumed. We will study selection bias and internal vs. external validity. We will study some underappreciated problems with regression analysis in. Then we cover the 4 main quasi-experimental methods which are: Difference in Differences, Matching, Synthetic Control, and Regression Discontinuity.

Learning objectives

After taking this class, students will be able to identify studies with problematic identification, and be able to implement valid causal inference in their own research using the methods learned in the class. This is crucial for achieving high quality publications in the social sciences.

Grading

Grades will be based on 4 statistical homework assignments (10% each), Class participation in discussions and presentations (15%) and a semester long research project (45%). See the final page of this document for a timeline on the project.

Class Materials

Beyond the articles listed in the course outline, we will use a free, online book from the World Bank, called Impact Evaluation in Practice. Here is the link:

<http://www.worldbank.org/en/programs/sief-trust-fund/publication/impact-evaluation-in-practice>

I have recorded a set of videos on these topics, aimed at a master's level audience that you all might find useful or amusing. They cover at an introductory level, much of what we will cover intensively in the class. You can access them from here:

https://www.youtube.com/watch?v=MWFiwCBh6h0&list=PLTve54sz-eh_B8tR8ZGoPWgVKwiOMC0jK

Finally, the homework and statistical analysis in the project can be done with any software you choose. However, Stata is the software that will be discussed in the class and sample Stata code to help you get started can often be provided and explained.

Course outline:

I Overview of causal inference

Video: The Problem of Causality in Observational Data

The potential outcomes approach to causal inference.
C Samii, "Causal empiricism in quantitative research", The Journal of Politics 78 (3), 941-955, 2016

II Regression and its complaints

PM Aronow, C Samii, “Does regression produce representative estimates of causal effects?” *American Journal of Political Science* 60 (1), 250-267, 2016.

CE Gibbons, JCS Serrato, MB Urbancic, “Broken or fixed effects?” NBER, 2014.

Miller, Shenhav and Michel Grose, “Selection into Identification in Fixed Effects Models with Application to Head Start. NBER #2614, August 2019.

King, Gary and Langche Zeng. “The dangers of extreme counterfactuals.” *Political Analysis* 14(2):131–159 2006.

Lal, Lockhart, Xu, and Zu. “How Much Should We Trust Instrumental Variable Estimates in Political Science? Practical Advice based on Over 60 Replicated Studies” 2021 working paper.

CH Achen, “Let's put garbage-can regressions and garbage-can probits where they belong” *Conflict Management and Peace Science*, 2005

L Pritchett, “Understanding patterns of economic growth: searching for hills among plateaus, mountains, and plains”, *The World Bank Economic Review*, 2000

III Difference in Differences

Videos: Difference in Differences pt1 and pt2

EJ Malesky, CV Nguyen, A Tran, “The impact of recentralization on public services: A difference-in-differences analysis of the abolition of elected councils in Vietnam” *American Political Science Review*, 2014

A Fowler, "Electoral and Policy Consequences of Voter Turnout: Evidence from Compulsory Voting in Australia" Quarterly Journal of Political Science, 2013

JG Montalvo, "Voting after the bombings: A natural experiment on the effect of terrorist attacks on democratic elections" Review of Economics and Statistics, 2011

KB Grier, DL Hicks, W Yuan, "Marriage Market Matching and Conspicuous Consumption in China" Economic Inquiry 54 (2), 1251-1262, 2016

Goodman-Bacon, A., 2021. Difference-in-differences with variation in treatment timing. *Journal of Econometrics*.

Callaway, B. and Sant'Anna, P.H., 2021. Difference-in-differences with multiple time periods. *Journal of Econometrics*.

IV Matching

Videos: Propensity Score Matching pt1, pt2 and pt3

DE Ho, K Imai, G King, EA Stuart, "Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference" Political analysis, 2007

CD Kam, CL Palmer, "Reconsidering the effects of education on political participation" The Journal of Politics, 2008

CL Boyd, L Epstein, AD Martin, "Untangling the causal effects of sex on judging" American journal of political science, 2010

M Caliendo, S Kopeinig, "Some practical guidance for the implementation of propensity score matching" Journal of economic surveys, 2008

RH Dehejia, S Wahba, "Propensity score-matching methods for nonexperimental causal studies" *The review of economics and statistics*, 2002

Gilligan, Michael J. and Ernest J. Sergenti. "Does Peacekeeping Cause Peace? Using Matching to Improve Causal Inference." *Quarterly Journal of Political Science* 3:89–122. 2008

Grier, K.B. and Grier, R.M., 2021. The Washington consensus works: Causal effects of reform, 1970-2015. *Journal of Comparative Economics*, 49(1), pp.59-72.

V Synthetic Control

Video: Synthetic Control

Abadie, A., 2021. Using synthetic controls: Feasibility, data requirements, and methodological aspects. *Journal of Economic Literature*, 59(2), pp.391-425.

Alberto Abadie, Alexis Diamond, Jens Hainmueller, "Comparative Politics and the Synthetic Control Method" *AJPS* April 2015

Alberto Abadie, Alexis Diamond & Jens Hainmueller, "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program" *JASA* 2010

K Grier, N Maynard , "The economic consequences of Hugo Chavez: A synthetic control analysis" *Journal of Economic Behavior & Organization*, 2016

Ashok Kaul, Stefan Klossner, Gregor Pfeifer, Manuel Schieler , "Synthetic Control Methods: Never Use All Pre-Intervention Outcomes as Economic Predictors" Working Paper, June 3, 2017

Cavallo, E., Galiani, S., Noy, I. and Pantano, J., 2013. Catastrophic natural disasters and economic growth. *Review of Economics and Statistics*, 95(5), pp.1549-1561.

VI Regression Discontinuity

Video: Regression Discontinuity

D Caughey, JS Sekhon, "Elections and the regression discontinuity design: Lessons from close US house races, 1942–2008" *Political Analysis*, 2011

AC Eggers, A Fowler, J Hainmueller, "On the validity of the regression discontinuity design for estimating electoral effects: New evidence from over 40,000 close races" *American Journal of Political Science*, 2015

P Pettersson-Lidbom, "Do parties matter for economic outcomes? A regression - discontinuity approach" *Journal of the European Economic Association*, 2008

GW Imbens, T Lemieux, "Regression discontinuity designs: A guide to practice" *Journal of econometrics*, 2008

J McCrary, "Manipulation of the running variable in the regression discontinuity design: A density test" *Journal of econometrics*, 2008

DS Lee, T Lemieux, "Regression discontinuity designs in economics" *Journal of economic literature*, 2010

Timeline and suggestions for the research project

Topics submitted by September 12 (email, as much detail as you can)

Topic approved by September 18th

Data search completed to confirm viability of topic by September 27th

Data Collected and Cleaned by October 18

Literature Review by October 27

Preliminary Results submitted by November 14

Revised Results submitted by November 30

Rough Draft due December 5

Final Turn in, December 11th At 5:00 pm Lubbock time

There is no restriction on topic, just on technique: DD, Event Study, (with matching!) Synthetic Control or Regression Discontinuity).

I will allow you to double submit in another class **if that class's instructor also agrees**. Feel free to consult with your primary advisor about a topic and how you can use this assignment to further your publishing / dissertation goals.