Public Policy 713  
Causal Inference in Education Policy Research II: Postsecondary  
Winter 2022 M/W: 4:00-5:20pm  
Weill Hall 1220  
Professor Kevin Stange  
kstange@umich.edu

Course Objectives

This course introduces and applies various methods for causal inference in research on postsecondary education. The focus is on topics relevant to education policy, including student aid, the returns to postsecondary education, college transfer, funding, admissions, online instruction, and college quality. The course will cover three quasi-experimental techniques extensively (difference-in-differences, regression discontinuity, and instrumental variables) and demonstrate the application of several other methods (machine learning, synthetic controls, decomposition, discrete choice models, mixed methods). We will also gain some exposure to the “professional” aspects of education policy research, including the publication process, refereeing articles, and grant applications.

Prerequisites

The course assumes mastery of regression analysis, including fixed effects and basic panel data methods. The course is structured as the second half of a two-part sequence with Public Policy 712; mastery of the content of that course is also assumed, though successful completion of Public Policy 571 (Econometrics) or a similar course is also sufficient. Facility with a statistical programming language is also assumed.

Course Requirements and Grading

Course grades will be based on three data analysis exercises, the article referee report, and your participation in class discussions, in part via answering the reading questions. There will be no exams or quizzes.

Data Analysis Exercises (3)  45%

There are three required data analysis exercises (problem sets), each worth 15% of your grade. We will use real datasets to replicate and extend the analysis contained in three of the papers we’ll read. You may work singly or with up to two classmates; though you must submit your own version of your writeup and indicate your collaborators. Problem sets are due on February 7, March 7, and April 6. We will “workshop” each assignment about a week before each is due (look for “workshop” in the schedule), where we discuss the paper
to replicate and work through your progress so far. You will be expected to make a serious attempt beforehand and bring your code, output, and questions to class.

**Article Referee Report  15%**

One assignment will ask you read a draft article carefully and write up a 3-page “Referee Report” as you would do if you were asked to review an article for an academic journal. This is tentatively due April 25th, though I may switch the due date with that of assignment 3. I will provide guidance and examples of this.

**Reading Questions  30%**

I will post guiding questions about some of the readings to help guide you to the main points of each reading. I will ask you to send answers the night before class via Canvas. This will also be a mechanism through which I will know what aspects are most confusing and we should focus on.

**Class Participation  10%**

Students are expected to attend class regularly and to come prepared to discuss the readings. Since this is a discussion-based class, the quality of our discussions will depend on your participation! Everyone should get 100% on this.

**Research Project Proposal (only required for IES pre-doctoral fellows)**

Over the course of the year (encompassing both PubPol 712 and 713), students in the IES pre-doc training program are required to start an independent research project. This project can be the same project as the student is pursuing for other requirements of their program (e.g., the 3rd year paper that is required of students in the Economics PhD program). I will provide students with more details during 1-on-1 meetings.

**Readings**

The readings for the course will be, almost exclusively, empirical journal articles that apply one of the methods we are studying. You are expected to complete the assigned reading before class. There will typically be one or two articles assigned for each class, though I will also list other readings for your reference. You must read the assigned articles closely in order to understand what is going on. Read actively: circle what is unclear, highlight what you find most interesting, peruse the bibliography for useful sources, read the footnotes and tables especially closely. It may be useful to write a summary of the paper for your own files.

**Course Material**
All readings are available online or on the CANVAS site. Assignments will be listed under the relevant lecture.

Below is a list of useful references. As needed, I may assign chapters to supplement discussion articles.


Stock and Watson, *Introduction to Econometrics*, Third Edition. (This is the textbook used in PubPol 639, and may be a good resource for students who want a refresher on some of this material.)

Cunningham, Scott. *Casual Inference: The Mixtape*

**Software**

Students are welcome to use whatever programming language they prefer. Most students will choose Stata or R. I will not be formally teaching Stata or R as part of the course, but will instead provide general guidance and reference to helpful materials. I will also be available to answer questions and provide support in office hours. Students are strongly encouraged to purchase and/or otherwise obtain whichever software they plan to use. R is free for download, and Stata is available for students very cheaply. Order through the Stata website. It is possible to access Stata from computer labs on campus. It may also be possible to access Stata via Virtual Sites. However, because we will use statistical software during class throughout the semester, it will be much easier for students to have a copy of the software on a computer they bring to class. Note: I will be able to provide instruction and guidance in Stata. However, my knowledge of R is very limited and my guidance for R users mostly will involve pointing them to other resources for assistance.

**Ford School Inclusivity Statement**

Members of the Ford School community represent a rich variety of backgrounds and perspectives. We are committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- share their unique experiences, values and beliefs
be open to the views of others

honor the uniqueness of their colleagues

appreciate the opportunity that we have to learn from each other in this community

value one another’s opinions and communicate in a respectful manner

keep confidential discussions that the community has of a personal (or professional) nature

use this opportunity together to discuss ways in which we can create an inclusive environment in Ford classes and across the UM community

Accommodations for Students with Disabilities: If you believe you need an accommodation for a disability, please let your instructor know at your earliest convenience. Some aspects of courses may be modified to facilitate your participation and progress. As soon as you make your instructor aware of your needs, they can work with the Services for Students with Disabilities (SSD) office to help determine appropriate academic accommodations. Any information you provide will be treated as private and confidential.

Student Mental Health and Well-Being Resources: The University of Michigan is committed to advancing the mental health and wellbeing of its students. We acknowledge that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression, directly impacts students’ academic performance. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) and/or University Health Service (UHS). For a listing of other mental health resources available on and off campus, visit: http://umich.edu/~mhealth/

Please review additional information and policies regarding academic expectations and resources at the Ford School of Public Policy: http://fordschool.umich.edu/academics/expectations
READING LIST

* indicates required careful reading;  
+ indicates required skim  
others are optional and for your reference

Note that I am including many non-required readings in the list just so you have them for reference.

I. Introduction & Returns to Education

Wednesday, January 5: Trends in Postsecondary Education

For this class, just try to get a lay of the postsecondary landscape by reading the one article and browsing the figures contained in the references below. We will also discuss the various methods you’ll see in the class. Also read the Murnane and Willet chapter if you haven't already seen it.


*Murnane, R., & Willett, J. (2010). Chapter 1 in Methods matter (if you havent already) A pdf is posted on Canvas.

Browse the various figures contained in the Digest of Education Statistics 2019, focused on ones related to overall attainment and postsecondary education

Browse various publications by the College Board


Monday, January 10: Human Capital Model & Intro to Returns


*Murnane, R., & Willett, J. (2010). Chapter 3 in Methods matter (if you haven't already) A pdf is posted on Canvas


Reading questions (do not turn in answers)

1. What are the main factors that influence an individual's education decisions according to the human capital model?

2. What predictions does the human capital model make about who goes to and completes college?

3. What is missing from these models that is potentially important?

4. What does the model imply are the important policy levers?

5. Why might the factors described by the human capital model make it difficult to infer the causal effect of going to college?

6. What is one reason that the raw differences in earnings between college and high school graduates may *overstate* the causal effect of a college degree?

7. What is one reason that the raw differences in earnings between college and high school graduates may *understate* the causal effect of a college degree?

Wednesday, January 12: Returns to College I


*Pick one Regression Discontinuity chapter
• Murnane & Willett, Chapter 9 (also on Canvas)
• Angrist & Pischke-Mostly Harmless Econometrics - 2009, Chapter 6

**Monday, January 17: MLK Day, No class**

**Wednesday, January 19: Returns to College II: Heterogeneity**


Jorge Rodríguez, Sergio Urzúa, and Loreto Reyes Heterogeneous Economic Returns to Postsecondary Degrees: Evidence from Chile J. Human Resources published ahead of print November 30, 2015,


**Monday, January 24: Human Capital vs. Signalling**


II. Effects of Student Aid

Wednesday, January 26: Need-based Grant Aid

*Scott-Clayton, Judith, 2017. *Undergraduate Financial Aid in the United States*. (Cambridge, Mass.: American Academy of Arts & Sciences, 2017) - This provides a great overview of the history of financial aid, the main financial aid programs, and the empirical evidence. You should read these overviews in preparation for the discussion for the next two classes (you don’t need to get through them all before Wednesday). Try to get a sense of the different types of financial aid, their relative importance, and some of the empirical challenges to assessing their effects


Monday, January 31: Merit-based Grant Aid


Wednesday, February 2: Student Loans


Blatman, Chris (2010). The Discussant’s Art


Eaton et al, 2021. STUDENT DEBT CANCELLATION IS PROGRESSIVE: CORRECTING EMPIRICAL AND CONCEPTUAL ERRORS

Monday, February 7: Loan Nudges


Wednesday, February 9: Free College / Place-based

GUEST: ODED GURANTZ from University of Missouri


Monday, February 14: Free College in Reverse


OR


Wednesday, February 16: Mixed Methods

*IES Grant Proposal: Early First-Dollar Categorical Need-based Aid – A New Model for Making College Affordable? Stange (PI), Michelmore(co-PI), Tompkins-Stange (co-PI)
Monday, February 21: Differential Pricing

Methodologically we will discuss problems with the “two-way fixed effect” version of the difference-in-differences model and also workshop Assignment 2 as we discuss my paper on differential pricing.


Blog post by Pam Jakeila on the Bacon decomposition

Goodman-Bacon, Andrew, 2019. *So you’ve been told to do my difference-in-differences thing: A guide.*


Thread by @agoodmanbacon: In light of this question, I thought I’d do a little thread on purely practical event-study stuff. No theory, just a bunch of pictures of ho...

Summary of the summaries by David Makenzie:

Twitter thread: https://twitter.com/cdechaisemartin/status/1468593836976971780?s=11

DiD workshop: https://www.youtube.com/watch?v=I5wt3eE5Q5I

Wednesday, February 23: Affirmative Action Bans and Synthetic Controls


OR "Why might states ban affirmative action?" Brookings Brown Center Chalkboard. Friday, April 12, 2019

For reference:

Stata command synth


III. Transfer, Text as Data, & Course Content

Monday, March 7: Community College & Transfer I


* Mountjoy, Jack. 2019. Community Colleges and Upward Mobility, unpublished working paper. Watch this nice video summarizing this paper by Econimate: Community Colleges and Upward Mobility. This has some pretty advanced econometrics that we won’t fully get into. Just try to get the broad ideas.

Wednesday, March 9: Community College & Transfer II

GUEST: Rachel Baker from University of California at Irvine

Baker, Rachel, Elizabeth Friedmann, and Michal Kurlaender, 2021. Improving the Community College Transfer Pathway to the Baccalaureate: The Effect of California’s Associate Degree for Transfer EdWorkingPaper No. 21-359
Monday, March 14: Text as Data and Machine Learning Intro


Wednesday, March 16: ML to classify postsecondary content

Readings TBD

https://www.statlearning.com/

One application by Black, Denning, Rothstein 2021:

https://eml.berkeley.edu/~jrothst/workingpapers/top_ten_06_2021.pdf

Non-tech guide to random forest

https://towardsdatascience.com/random-forest-29cf337c68d4

From CJ: https://lost-stats.github.io/Machine_Learning/Machine_Learning.html
https://lost-stats.github.io/Machine_Learning/random_forest.html

And in stata:

https://statalasso.github.io/

Nick HK’s package in Stata that runs ML scripts in R

https://github.com/NickCH-K/MLRtime/
IV. Higher Education Funding

Monday, March 21: Funding and financing


Review just for background:


Wednesday, March 23: Funding and completion


Monday, March 28: Price caps & Spending


V. College Quality, College Choice, Online

Wednesday, March 30: College quality & accountability


+Mountjoy & Hickman


Monday, April 4: College choice (discrete choice models)


Wednesday, April 6 For-profits


**Monday, April 11: Online**

We’ll discuss, in a pretty unstructured way, many of the themes in the Deming article. What do you think will/should happen? The two other articles are key pieces of evidence on the effects of online.

Deming, David. 2020. *Online Learning Should Return to a Supporting Role* NYT April 9, 2020


Koefed Westpoint paper

**Wednesday, April 13: Reviewing others’ work**

TBD

**Monday, April 18: Wrap-up**
Holding Place for Other References

Diff-in-Diff References

Overview:


Twitter thread: https://twitter.com/cdechaisemartin/status/1468593836976971780?s=11

DiD workshop: https://www.youtube.com/watch?v=I5wt3eE5O5I

https://twitter.com/PossebomVitor/status/1444024095805526025

https://pedrohcgs.github.io/

Recent DD conference (see twitter)

1. Efficient Estimation for Staggered Rollout Designs Jonathan Roth, Pedro H. C. Sant’Anna
2. de Chaisemartin, Clément and d'Haultfoeuille, Xavier, Two-way Fixed Effects Regressions with Several Treatments (December 17, 2020). Available at SSRN: https://ssrn.com/abstract=3751060 or http://dx.doi.org/10.2139/ssrn.3751060

RD References

OLS References

1. Making sense of sensitivity: extending omitted variable bias Carlos Cinelli, Chad Hazlett
   First published: 17 December 2019 https://doi.org/10.1111/rssb.12348