Econometric Methods for Applied Research II
HKS API-115 / ECON 2115 / HBS 4175
Course Syllabus—Spring 2024

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Course Description:
Economics 2110 and 2115 comprise a two-course sequence for first-year graduate students seeking training in econometric methods at a level that prepares them to conduct professional empirical research. Economics 2115 (spring) begins by reviewing the foundations of causal inference, covering potential outcomes, the selection problem, and randomized evaluations. The course will then cover instrumental variables, regression discontinuity, and difference-in-differences methods, presenting both the basics and most recent developments of each method.

Note that this course has a more applied focus than ECON 2140, the second class in the Economics Department's PhD econometrics sequence. So, for example, when studying a given method, we will place a heavier emphasis on what the method is doing, when to use it, and how to interpret its results, as opposed to the mathematical proofs underpinning the method. Foundations of empirical analysis will be coupled with hands-on examples and assignments involving the analysis of data sets.

The goal is that by the end of the course you will be able to:

1. Conceptually understand the statistical methods studied in the course and be able to apply them to your own research.
2. Understand the assumptions underlying a wide range of empirical strategies, as well as common threats to identification.
3. Fluently understand and evaluate the methods used in the literature most relevant to your own research interests.

Class Meetings:
Classes: Mondays and Wednesdays, 1:30 pm – 2:45 pm, Rubenstein 304
Review Sessions: Fridays, 1:30 pm – 2:45 pm, Littauer 280

Office Hours:
Professor Dobbie: By appointment
Federico Gonzalez: TBD

Prerequisites:
A doctoral level foundation in econometrics, such as Economics 2110, is a prerequisite.

Target Students:
The two-course sequence is open only to qualified PhD students from HKS, HBS, GSE, and HSPH, but occasionally others may be admitted at the discretion of the instructor (if the instructor is convinced that such individuals can perform well and would not negatively affect the nature and pace of the course).

Texts and Other Course Materials:
There is no required textbook for this course.

Recommended Background Textbooks:
Angrist, J.D. and Pischke, J.S., 2008. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.
Cunningham, S., 2020. *Causal Inference: The Mixtape.* https://scunning.com/causalinference_norap.pdf

Other Background Textbooks:
Angrist, J.D. and Pischke, J.S., 2014. *Mastering 'metrics: The Path from Cause to Effect*. Princeton University Press.
Duflo, E. and Banerjee, A., 2011. *Poor Economics*. PublicAffairs.

Software:
Students may complete problem sets using either Stata or R.

Course Website:
Course materials will be posted on the Canvas course website for API-115 (https://canvas.harvard.edu/courses/127142).

Grading:
The class grade will be based on the following criteria:

30% - Problem sets
30% - Midterm exam
40% - Final project

Problem Sets (30%)
There will be four major problem sets. They will give you hands-on experience with the analytic techniques introduced in class. You may work with other students but must write up your answers independently and submit your own copy of the solutions. Invest lots of time in these problem sets, as that is likely where the bulk of your learning will come from.

Problem sets not received by the deadline will be considered late. There will be no credit for late assignments.

Under the Harvard Kennedy School Academic Code, the problem sets for this course are "Type II" assignments unless indicated otherwise. You are encouraged to work in a study group but must write and submit your own solutions and programming scripts. Examples of assignments that are not in accordance with the HKS academic code include reprints of substantially identical assignments, printouts of substantially identical Excel tables or R scripts. Violations of the Academic Code are a serious violation of academic and professional standards and can lead to a failing grade in the course, failure to graduate, and even expulsion from the University. I take this issue seriously. If you have questions about the degree of collaboration allowed or about any other aspect of the Academic Code, please come to see me. The Kennedy School Academic Code is available here.

Instructions for submitting problem sets:

- Turn them in electronically via the Canvas course page.
- Submit them by 1:30 pm on the day they are due. Assignments submitted after class begins will be considered late.
- Indicate on the cover page the names of the classmates you worked with.

Midterm exam (30%)
Please note that midterm exam will be held on March 6th at 1:30 pm. More details will be provided later in the course.

Final project (40%)
Please note that final project will be due on April 24th at 1:30pm. More details will be provided later in the course.

Regrade Policy
Requests for reconsideration of grades on exams are not encouraged, and will be accepted only in writing, with a clear statement of what has been incorrectly graded, and within one week of receiving your graded exam. Please submit your full exam so grading on all questions can be reconsidered.

All course activities, including class meetings, problem sets, and exams are subject to the HKS Academic Code and Code of Conduct.

Other Items:

Recording Classes

Classes will be video-recorded, and recordings will be available. The recordings will be kept in a protected page that is accessible to you only via the course site. As a member of our learning community and to stimulate risk-taking and vigorous debate in class, you are expected to never make any recordings available outside of our learning community. If you are uncomfortable with classes being recorded, please come and speak with me.

Use of Data

Data may be collected in various forms in this course. Some forms of data collection will be obvious to you (such as when responding to a question on a survey) but others might not be (such as someone from our teaching team records class participation or the Canvas course website system recording activity while you are logged in). Whatever the form of data collection, I pledge to use the data to help improve my teaching and ultimately your learning. This includes using your responses to online quizzes to tailor a class better to the backgrounds and learning needs of students in the class, conducting research about the effectiveness of a particular teaching approach, etc. I also pledge to keep your data confidential so that it can only be used for the purposes of improving teaching and learning or to help you and other students connect with future professional opportunities. The university-wide policy on use of Canvas data can be found here.