Overview

This course introduces econometric methods widely used in applied economics research, with a focus on “reduced form” applications. The main goal of the class is for you to make significant progress in your ability to conduct high quality, econometrically sound empirical analysis. Concepts, applications, and practice are emphasized, as opposed to technical derivations of estimators and their properties. The focus is on linear (least squares) and non-linear (e.g. quantile, discrete, count, two-part, and duration) regression models. We cover several modern research designs in detail - difference-in-difference, selection on observables (matching), instrumental variables, synthetic controls, regression discontinuity, and bunching.

Readings

The reading list comprises published articles and some working papers, which should be read prior to class. The papers have been chosen to illustrate the application, generally recent, of different empirical methods and strategies. While the reading list is extensive, I will typically ask students to read 2 papers (thoroughly) per class. The remaining papers are listed as useful references. I will post required papers on Canvas. While there is no assigned text book for the class, we will closely follow Mostly Harmless Econometrics: An Empiricist’s Companion by Angrist and Pischke, as well as some chapters from Andrew Jones’ primer, Applied Econometrics for Health Economists: A Practical Guide (OHE Research, 2nd ed., 2007). You may also refer to J. Wooldridge, Econometric Analysis of Cross Section and Panel Data.

Logistics

The class will meet every Monday 3-6 pm, Colonial Penn Center. Chestnut Room.
Office hours by appointment.

Teaching Assistant

Molly Frean, HCMG PhD student, mfrean@wharton.upenn.edu

Other Requirements and Grading

In addition to reading the assigned papers prior to class, you are required to:

- Complete 3-4 homework assignments. These will mainly involve hands-on data analysis using a supplied data set drawn from the Medical Expenditure Panel Survey or replicate existing papers.
- Attend selected research seminars as requested and possible.
- Conduct an econometric analysis of data and present results to the class (replicate or extend an existing paper or original research).
- Present to the class a paper from the reading list
- Final exam – this will draw on the class material and homework.

Grading: Project – 25%; participation and assignments – 35%; final – 40%
Course outline and Readings

* Indicates student presentation of a paper from the reading list for that class (45 min)
† Indicates papers to be read prior to the class

I. Jan 16 - Introduction and background [**Note: This is a Wednesday**]
   A. Course overview
   B. Potential outcomes and causal inference
      MHE Chapter 2

Jan 21 – No class, MLK Day

II. Jan 28 - Classical estimation and testing
   A. Recap of basic estimators (OLS, GLS, WLS) and inference
   B. Weighting
      MHE Chapters 2, 3 (excl. 3.3)

III. Feb 4 - Classical estimation and testing (contd.) and Matching
   A. Transformation
   B. Matching / propensity score
      MHE Chapter 3.3

**IV. Feb 11 - Instrumental variables (Part 1)**

A. Basic concepts

MHE Chapter 4


**V. Feb 18 - Instrumental variables (Part 2)**

A. LATE applications


**VI. Feb 25 - Instrumental variables (Part 3) and Student proposals**

A. MTE

B. Proposal presentations (10-15 min each)

Heckman, James J., Sergio Urzua, and Edward Vytlacil. "Understanding instrumental variables in


March 4 - Spring Break

VII. March 11 - Panel data approaches (Part 1)
A. Fixed effects, Random effects
B. Differences in differences, D-D-D

MHE Chapter 5


VIII. March 18 - Panel data approaches (Part 2)
A. Synthetic controls
B. Clustering


IX. March 25 – Density based designs
A. RD, RD-DD
B. RK
April 1 – Density based designs (contd.) and Quantile regression

A. Bunching
B. Quantile regression

X. MHE Chapter 7


XI. April 8 – Limited dependent variables
A. Logit, Probit
B. Count data models
   Jones Chapters 3-6, 9-10

XII. April 15 – Selection models and Duration models
A. Selection models
B. Duration models
XIII. April 22 - Field experiments and Duration models (contd.)
   A. Designing field experiments – Prof. David Abrams (Law) and Mark Neuman (Penn Med)
   B. Duration models

XIV. April 29 - Student project presentations

   Final Exam (May TBD)