Microeconometrics

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Logistics

Schedule

Lectures: Thu 9:30-11:00, 11:30 - 13:00;
Exercises: Mon 17:00-18:30;
Office hours: By appointment
TA: Juan Segura

Home assignments

Home assignments will include theoretical, computational, and empirical exercises. I strongly encourage you to use R for the coding problems. Home assignments should be done in groups with a minimal size of two and a maximal size of three students.

Grading

Grades will be based on group home assignments (10%), presentations (10%), and a final exam (80%).

Course Objectives

The primary goal of this course is to guarantee that students can (a) understand, (b) implement, and (c) discuss possible improvements of any empirical paper in economics/finance (from the econometric perspective). We will develop the necessary theory and will illustrate it with empirical exercises. A secondary goal is to introduce modern statistical techniques (ML and high-dimensional statistics) and show how they can be used to improve standard estimation procedures.

Prerequisites

First-year statistical and econometric courses should be sufficient. I will ask you to implement some of the procedures in R, which requires specific (pretty modest) coding skills.

Plan

1. Prediction: Empirical Risk Minimization and Regularization;
2. Basic Toolkit: Experiments, Weak Instruments, Unconfoundedness, RDD, Two-Way Models;
3. Beyond MHE: Selection Models, Marginal Treatment Effects;
4. General view: GMM and Related Problems;
5. Topics: Bipartite Networks, Quantile Methods, Shift-Share Designs;
6. Uncertainty Quantification: Design-Based vs. Model-Based Inference;

Literature

Textbooks

Lecture notes will be uploaded weakly on the course website. There is no textbook for the course, but the references below can be useful:

- Econometrics textbook by Bruce Hansen;
- "Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction", by Guido W. Imbens and Donald B. Rubin;
- Manuel Arellano's lecture notes (available on his website);
- Stefan Wager's lecture notes for STATS 361 (available on his website)
- "Mostly Harmless Econometrics" by Joshua D. Angrist & Jorn-Steffen Pischke;
- "Elements of Statistical Learning" by Hastie, Tibshirani, Friedman (available online).
- "Computer Age Statistical Inference" by Hastie and Efron (available online);

Papers

Lecture notes will be partially based on the papers below (the list will be updated throughout the course). I do not expect you to read all or any of them (some are very technical), but I will let you know the most useful ones.

References

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J. Bai. Panel data models with interactive fixed effects. *Econometrica*, 77(4):1229–1279, 2009.

A. Belloni, V. Chernozhukov, and C. Hansen. Inference on treatment effects after selection among high-dimensional controls. *The Review of Economic Studies*, 81(2):608–650, 2014.

M. Bertrand, E. Duflo, and S. Mullainathan. How much should we trust differences-in-differences estimates? *The Quarterly journal of economics*, 119(1):249–275, 2004.

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