Econometrics of Panel Data

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Spring 2021

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Class Hours: Tuesday 9:00-12:00
Class Room: Zoom (email for link)

Course Description

This is a second Ph.D. course in applied econometrics though advanced undergraduates are welcome. The main audience are PhD students not studying economics or finance at Stern (Accounting, Marketing, TOPS, Strategy) as well as other students at NYU (including Ph.D. students at Wagner).

The focus is on microeconometrics and panel data. It is a continuation of Prof. Scott's course, though once the basics are covered we will have more opportunity to explore topics related to student intererst.

Problem Sets: I have designed the problem sets in R, though you are free to use whichever statistical software you would like.

Books

I will follow two main textbooks.

- Greene (2017). *Econometric Analysis*. ISBN: 0134461363
- Tibshirani, Hastie, Friedman (2016), *The Elements of Statistical Learning*. ISBN: 0387848576. Available online at https://web.stanford.edu/~hastie/Papers/ESLII.pdf.
- Hansen. Econometrics (2020). https://www.ssc.wisc.edu/~bhansen/econometrics/Econometrics.pdf.

Course Policy

You are expected to attend every lecture and it is expected that you have done the reading BEFORE the class. This is a Ph.D. course which means you will be expected to read a lot on your own.

Grading Policy

- 60% of your grade will be performance on 6 problem sets (10% each).
- 30% of your grade will be performance on the final exam.
- 10% of your grade will be participation in class.

Academic Dishonesty Policy

Don't cheat. It is helpful to work with a partner on debugging code, but my expectation is that assignments are 100% your own work (including computer code).

Week 01, 02/02: Review of Linear Estimators, Asymptotics, and Simulation

Week 02, 02/09: Maximum Likelihood and Generalized Method of Moments
PS 1 Due

Week 03, 02/16: Delta Method and Bootstrap

Week 04, 02/23: Intro to Nonparametrics
PS 2 Due

Week 05, 03/02: Model Selection and Intro to Machine Learning

Week 06, 03/09: Program Evaluation and Selection Models
PS 3 Due

Week 07, 03/16: Matching and Local Average Treatment Effects
PS 4 Due

Break, 03/23: SPRING BREAK ?!?!

Week 08, 03/30: Diff in Diff and Regression Discontinuity

Week 09, 04/06: Synthetic Control and Marginal Treatment Effects
PS 5 Due

Week 10, 04/13: Discrete Choice

Week 11, 04/20: Machine Learning: Model Selection and Regularization (LASSO, RIDGE, PCA)

Week 12, 04/27: Advanced Panel Data
PS 6 Due

Week 13, 05/04: Topics based on interest: Duration Models, Dynamic Discrete Choice, Tree Models, Model Averaging Boosting/Bagging, etc