

Econometrics of Panel Data

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Class Hours: Friday 1:00-4:00

Class Room: TBA

Course Description

This is a second Ph.D. course in applied econometrics though advanced undergraduates are welcome. 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 interest.

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>.

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, 02/08: Introduction to Time Series Data

Week 02, 02/15: Panel Data I : Fixed Effects, Random Effects, Clustering
PS 1 Due

Week 03, 02/22: Maximum Likelihood and Duration Models

Week 04, 03/01: Discrete Choice and Multinomial Choice
PS 2 Due

Week 05, 03/08: Bayesian Methods and MCMC

Week 06, 03/15: Panel Data II : Dynamic Panel, Causal FE, Empirical Bayes, Hierarchical Models
PS 3 Due

Break, 03/22: **SPRING BREAK (3/18-3/24)**

Week 07, 03/29: Treatment Effects and Potential Outcomes
PS 4 Due

Week 08, 04/05: Treatment Effects and Potential Outcomes

Week 09, 04/12: Nonparametric Methods (Kernels, Nearest Neighbors, Bootstrap)
PS 5 Due

Week 10, 04/19: Nonparametric Methods (Kernels, Nearest Neighbors, Bootstrap)

Week 11, 04/26: Machine Learning: Model Selection and Regularization (LASSO, RIDGE, PCA)

Week 12, 05/03: Topics based on interest: Duration Models, Dynamic Discrete Choice, Tree Models, Model Averaging Boosting/Bagging, etc.
PS 6 Due

Week 13, 05/10: Topics based on interest (continued)