

Rutgers University Department of Economics  
**Econ 509 Applied Econometrics for Microeconomics: Spring 2018**

Professor Jennifer Hunt  
New Jersey Hall 411  
(732) 932-8654  
jennifer.hunt@rutgers.edu

Class time: TF 9.50-11.10 pm  
Class room: Scott 201  
Office hours: W 1.30-3.15 pm

### Learning goals

The aim is for students to master the techniques in the main econometric approach used in labor, public and development economics, namely the estimation of causal effects using natural or randomized experiments. Structural modeling, the main approach in industrial organization, will not be covered, although criticisms of the experimental approach will be discussed, and possible contributions of machine learning considered. Nuts and bolts of designing randomized controlled trials will not be covered. Mastery implies some familiarity with the econometric theory, but especially an understanding of when and how to apply appropriate techniques in one's own work, as well as the ability to evaluate the quality of the research of others.

### Assessment

1. Problem sets (6)	25%	Every second Tuesday
2. Exam 1	20%	In class, Friday 23 February
3. Exam 2	20%	In class, Friday 13 April
3. Final exam	30%	In exam period
4. Class participation	<u>5%</u>	
	100%	

Problems sets are due 23 January; 6, 20 February; 9, 27 March; 10 April. These are all Tuesdays except Friday 9 March (since I am out of town Tuesday 6 March you can hand it in later). Problem sets will involve using microdata, which I will post on the web in Stata format. Stata should be available on department computers; the university has a site license if you want to download it onto your own computer for free: <https://oit-nb.rutgers.edu/service/university-software-portal>. You can use another language if you prefer, though you will have to use software to convert the data.

### Class Meetings

I will miss class Tuesday 6 March and possibly Friday 16 February. We will make up these classes.

### Integrity

Note Rutgers' integrity policy at [academicintegrity.rutgers.edu/policy-on-academic-integrity](http://academicintegrity.rutgers.edu/policy-on-academic-integrity).

### Readings

The required textbook is *Mostly Harmless Econometrics: An Empiricist's Companion* by Angrist and Pischke, available at the bookstore at a low price. An optional text is their undergraduate book *Mastering Metrics: The Path from Cause to Effect*, also at the bookstore. A textbook covering more topics than the class in more technical detail but with less context and practical guidance is Jeffrey M. Wooldridge *Econometric Analysis of Cross Section and Panel Data*: this could be a useful reference where Angrist and Pischke are unclear or incomplete.

## I. Regression review and the experimental approach to analyzing data

*Mostly Harmless* Chapters 1, 2, 3.1, 3.2

LaLonde, Robert. 1986. "Evaluating the Econometric Evaluations of Training Programs with Experimental Data," *American Economic Review*, 76(4): 604-619.

Vandenbroucke, Jan. 2009. "The HRT controversy: observational studies and RCT's fall in line". *Lancet*, 372: 1233-1235.

## II. Matching, weighting

*Mostly Harmless* Chapters 3.3, 3.4.1

Calonico, Sebastian and Jeffrey Smith. 2017. "The Women of the National Supported Work Demonstration". *Journal of Labor Economics*, 35(S1): S65-S97.

Solon, Gary, Steven J. Haider, and Jeffrey Wooldridge. 2015. "What Are We Weighting For?" *Journal of Human Resources*, 50(2): 301-316.

## III. Limited dependent variables

*Mostly Harmless* Chapters 3.4.2

## IV. Instrumental variables

### 1. Basic

*Mostly Harmless* Chapters 4.1, 4.2.1, 4.6.1, 4.6.4

Angrist, Joshua and Alan Krueger. 1991. "[Does Compulsory School Attendance Affect Schooling and Earnings?](#)" *Quarterly Journal of Economics*, pp. 979-1014.

### 2. Interpretation with heterogeneous outcomes (LATE, ITT, TOT)

*Mostly Harmless* Chapter 4.4

Gibson, John, David McKenzie, Halahingano Rohorua and Steven Stillman. 2017. "The Long-term Impacts of International Migration: Evidence from a Lottery". *World Bank Economic Review*, 1-21.

### 3. Other [If time permits]

*Mostly Harmless* Chapters 4.3, 4.5, 4.6.2, 4.6.3

## V. Non-experimental approaches to examining data

### 1. How good is the experimental approach?

Angrist, Joshua and Jörn-Steffen Pischke. 2010. "The Credibility Revolution in Empirical Economics: How Better Research Design Is Taking the Con Out of Econometrics". *Journal of Economic Perspectives*, 24(2): 3-30.

Deaton, Angus and Nancy Cartwright. 2018. "Understanding and misunderstanding randomized controlled trials". *Social Science and Medicine*, doi: 10.1016/j.socscimed.2017.12.005.

Deaton, A. (2010) "Instruments, Randomization and Learning about Development." *Journal of Economic Literature*, 48(2): 423-455.

### 2. Structural modeling

Nevo, Aviv and Michael Winston. 2010. *Journal of Economic Perspectives*, 24(2): 69-82.

Gaurisankaran, Gautam, John Geweke and Robert Town. 2003. "Bayesian Inference for Hospital Quality in a Selection Model". *Econometrica*, 71: 1215-1238.

### 3. Machine learning

- Mullainathan, Sunil and Jann Spiess. 2017. "Machine Learning: An Applied Econometric Approach". *Journal of Economic Perspectives*, 31(2): 87-106.
- Breiman, Leo. 2001. "Statistical Modeling: The Two Cultures". *Statistical Science*, 16(3): 199-2015.
- Cowgill, Bo. 2017. "Automating Judgement and Decisionmaking: Theory and Evidence from Résumé Screening." Columbia University working paper.

## VI. Panel data, fixed effects and differences in differences

*Mostly Harmless* Chapter 5

- Abadie, Alberto, Diamond, A., and J. Hainmueller. 2010. "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program." *Journal of the American Statistical Association*, 105(490): 493-505.

## VII. Regression discontinuity and regression kink design

*Mostly Harmless* Chapter 6

- Abdulkadiroğlu, Atila, Joshua Angrist and Parag A. Pathak. 2014. "The Elite Illusion: Achievement Effects at Boston and New York Exam Schools". *Econometrica*, 82(1): 137-196.
- Lee, David S. and Thomas Lemieux. 2010. "Regression Discontinuity Designs in Economics." *Journal of Economic Literature*, 44(2): 281-355
- Lee, David S. and Alexandre Mas. 2012. "Long Run Impacts of Unions on Firms: New Evidence from Financial Markets, 1961-99," *Quarterly Journal of Economics*, 127: 333-78.
- Card, David, David S. Lee, Zhuan Pei and Andrea Weber. 2016. "Regression Kink Design: Theory and Practice". NBER Working Paper 22781.

## VIII. Standard Errors

*Mostly Harmless* Chapter 8

- Abadie, Alberto, Susan Athey, Guido W. Imbens, Jeffrey Wooldridge. 2017. "When Should You Adjust Standard Errors for Clustering?" NBER Working Paper 24003.

## IX. Quantile regression [if time permits]

*Mostly Harmless* Chapter 7