

ECON 626: Empirical Microeconomics

(“Mostly Painless Econometrics”)

Department of Economics
University of Maryland, College Park
Fall 2016

Course Information

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Office Hours: Mondays from 3:30 to 5:30 PM

Lectures

Time: Friday from 12:00 to 3:00 PM

Location: 4103 Tydings...

...except on Sep 5, Oct 21, and Oct 28, when we are in ASY 3217 (Art-Sociology Building)

Course Website

<http://economics.ozier.com/econ626.html>

Course Description

This course provides an overview of modern microeconomic methods. Topics include linear and nonlinear models, causal inference (instrumental variables, difference-in-differences, regression discontinuity), and techniques for correct statistical inference (clustering, etc).

Course Objectives

1. To provide a foundation in linear models in microeconomics, emphasizing both the practical implementation of these models and the application of these models to the question of causal inference.
2. To introduce students to more advanced techniques that are used both to assess data needs before empirical work and to carry out robustness checks in the completion of such work.
3. To familiarize students with modern statistical and econometric software (Stata and MATLAB) in order to use these models and techniques.
4. To equip students with the basic econometric tools needed to implement non-linear models in modern software.

Prerequisites

This course is intended for PhD students in the ECON and AREC departments who have completed their department's first-year courses.

Readings & Lecture Notes

Many readings are academic articles and working papers which are available online (either through JSTOR or via the authors' websites).

Required textbooks:

- Angrist, Joshua, and Jörn-Steffen Pischke. (2008) *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.
- Train, Kenneth. (2009) *Discrete Choice Methods with Simulation*. Cambridge University Press. *Available for free on Train's website.*

The following econometric references are not required, but will prove useful (both in this class and in life):

- Cameron, Colin, and Pravin Trivedi. (2005) *Microeconometrics: Methods and Applications*. Cambridge University Press.
- Gerber, Alan S. and Donald P. Green. (2012) *Field Experiments*. W. W. Norton & Company.
- Imbens, Guido W. and Donald B. Rubin. (2015) *Causal Inference for Statistics, Social, and Biomedical Sciences*. Cambridge University Press.
- Wooldridge, Jeffrey. (2010) *Econometric Analysis of Cross Section and Panel Data*. MIT Press.

Assignments & Grading

- **Problem sets:** you will complete six problem sets, each worth 10 points. Each problem set will involve applied work with Stata, MATLAB, or both. You are encouraged to work in groups, but each student must turn in his or her own write-up of the solutions.
- **Research notes:** you will complete five short writing assignments of a page or two, each worth 4 points. The purpose of these assignments is to keep you active in generating research ideas, and to provide feedback that can improve your written articulation of those ideas.
- **Class participation:** your participation in class over the course of the semester (attendance, asking questions, having done the readings) will be worth 17 points in total. To receive full credit, you must attend class regularly and participate in class discussions in a manner that demonstrates familiarity with the readings and course material.
- **Midterm and Final exams:** you will take two exams during this course, each worth 20 points. The midterm (October 21) is intended to cover the material in the first half of the course, roughly through regression discontinuity. The final (December 9) will focus on the second half of the course, but since the second half depends on the first, there will be some overlap. Exams will be closed-book.

The total number of points above is 137; the grade is a score out of 137.

Assignments will typically be handed out or announced during lecture. Supporting documents will be made available online.

Office Hours

Professor Jakiela and Professor Ozier will hold joint office hours on Fridays from 3:00 PM to 4:00 PM. TA Thomas Hegland will hold office hours on XXX from YYY to ZZZ. We encourage you to come by Tydings 4118F during office hours to introduce yourself or discuss any topic related to the course material or economics more broadly. If you cannot attend these office hours, please email us to set up an appointment.

Tentative Schedule

The schedule below is approximate, and will be updated as we progress through the semester.

1. Linear Models: Empirical Approaches to Causal Inference (6 classes)
 - (a) Sep. 2: Rubin Causal Model, Experimental Ideal
 - (b) Sep. 9: Regression, Data Generating Processes
 - (c) Sep. 16: Difference-in-Differences
 - (d) Sep. 23: Instrumental Variables

- (e) Sep. 30: Regression Discontinuity
- (f) Oct. 7: Conditional Independence, Selection on Observables

2. Linear Models: Advanced Variations (4 classes)

- (a) Oct. 14: Statistical Power: Calculation and Simulation
- (b) Oct. 28: Baseline, Stratification, Balance
- (c) Nov. 4: Randomization Inference, Multiple Testing, Wild Cluster Bootstrap
- (d) Nov. 11: Attrition, Bounds

3. Non-linear Models (2 classes)

- (a) Nov. 18: Probit, Censoring, Maximum Likelihood, Stata and MATLAB
- (b) Dec. 2: Logit, Mixed Logit

The Midterm exam will take place in-class on October 21; the Final exam will take place in-class on December 9. Note that because of the Thanksgiving holiday, there will be no class on November 25.

Readings by week/topic

1. Linear Models: Empirical Approaches to Causal Inference (6 classes)

(a) Sep. 2: Rubin Causal Model, Experimental Ideal

Required readings:

Angrist and Pishke (2009): *Mostly Harmless Econometrics*, chapters 1 and 2

Optional readings:

Gerber and Green (2012): *Field Experiments*, chapters 1 and 2

Imbens and Ruben (2016): *Causal Inference*, chapters 1 and 2

(b) Sep. 9: Regression, Data Generating Processes

Required readings:

Angrist and Pishke (2009): *Mostly Harmless Econometrics*, chapter 3

Optional readings:

Cameron and Trivedi (2005): *Microeconomics*, chapter 4

(c) Sep. 16: Difference-in-Differences

Required readings:

Angrist and Pishke (2009): *Mostly Harmless Econometrics*, chapter 5

Optional readings:

Bertrand, Duflo, and Mullainathan (2004): “How Much Should We Trust Differences-In-Differences Estimates?” *QJE*, 119 (1): 249–275

(d) Sep. 23: Instrumental Variables

Required readings:

Angrist and Pishke (2009): *Mostly Harmless Econometrics*, chapter 4

Optional readings:

Imbens and Angrist (1994): “Identification and Estimation of Local Average Treatment Effects,” *Econometrica*, 62(2): 467–475

(e) Sep. 30: Regression Discontinuity

Required readings:

Angrist and Pishke (2009): *Mostly Harmless Econometrics*, chapter 6

Optional readings:

Lee and Lemieux (2010): “Regression Discontinuity Designs in Economics,” *JEL* 48: 281–355

Hahn, Todd, and Van Der Klaauw (2001): “Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design,” *Econometrica*, 69(1): 201–209

(f) Oct. 7: Conditional Independence, Selection on Observables

Required readings:

Altonji, Elder, and Taber (2005): “Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools,” *JPE*, 113 (1): 151–184

Optional readings:

Oster (2016): “Unobservable Selection and Coefficient Stability: Theory and Validation,” working paper, available from Author’s website

2. Linear Models: Advanced Variations (4 classes)

(a) Oct. 14: Statistical Power: Calculation and Simulation

Required readings:

Duflo, Glennerster, and Kremer (2007): “Using Randomization in Development Economics Research: A Toolkit,” *Handbook of Development Economics*, Volume 4, 2007, Chapter 61, pages 3895–3962, available from Elsevier or MIT/CEPR

Optional readings:

Gerber and Green (2012): *Field Experiments*, chapter 3

(b) Oct. 28: Baseline, Stratification, Balance

Required readings:

Bruhn and McKenzie (2009): “In Pursuit of Balance: Randomization in Practice in Development Field Experiments,” *AEJ: Applied*, 1(4): 200–232

McKenzie (2012): “Beyond baseline and follow-up: The case for more T in experiments,” *Journal of Development Economics*, 2: 210–221

Optional readings:

Imbens (2010): “Better LATE Than Nothing: Some Comments on Deaton (2009) and Heckman and Urzua (2009),” *JEL*, 48: 399–423

Gerber and Green (2012): *Field Experiments*, chapter 4

(c) Nov. 4: Randomization Inference, Multiple Testing, Wild Cluster Bootstrap

Required readings:

Young (2016): “Channelling Fisher: Randomization Tests and the Statistical Insignificance of Seemingly Significant Experimental Results,” working paper, available from MIT

Anderson (2008): “Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects,” *JASA*, 103(84): 1481–1495

Optional readings:

Cameron and Miller (2015): “A Practitioner’s Guide to Cluster-Robust Inference,” *Journal of Human Resources*, 50(2): 317–372

Cameron, Gelbach, and Miller (2008): “Bootstrap-based improvements for inference with clustered errors,” *REStat*, 90(3): 414–427

(d) Nov. 11: Attrition, Bounds

Required readings:

Lee (2009). “Training, Wages, and Sample Selection: Estimating Sharp Bounds

on Treatment Effects,” *REStud*, 76: 1071-1102

Optional readings:

Gerber and Green (2012): *Field Experiments*, chapter 7

3. Non-linear Models (2 classes)

(a) Nov. 18: Probit, Censoring, Maximum Likelihood, Stata and MATLAB

Required readings:

Train (2003): *Discrete Choice Methods with Simulation*, chapters 1, 2, and 5

(b) Dec. 2: Logit, Mixed Logit

Required readings:

Train (2003): *Discrete Choice Methods with Simulation*, chapters 3 and 6