

Econ 345_D01
Introduction to Econometrics
Summer 2020
Department of Economics
George Mason University

Instructor: Yue Deng

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Office Hours: If you would like to talk with me by phone or set up a Cisco Webex or Zoom call, please send me an email to schedule an appointment.

Online Course Tool:

This is an online asynchronous class. I will post the course videos at 7:00PM (EST) every Tuesdays and Fridays. We will use Blackboard for all course-related materials.

Course Description:

This course covers the statistical tools needed to understand empirical economic research and to plan and execute independent research projects. Topics include statistical inference, regression, ordinary least squares, instrumental variables and evaluation of policies and programs.

Course Objectives:

- Understand how to use modern statistical techniques to estimate economic relations.
- Form a solid theoretical background in introductory level econometrics.

Prerequisites

The formal prerequisites for the course are ECON 306, ECON 311, STAT 250 and STAT 350 or STAT 344 and STAT 354. Fundamentally, the course requires basic knowledge of probability and statistics, as well as some algebra.

Textbooks

Jeffrey Wooldridge, *Introductory Econometrics: A Modern Approach*, 6th Edition, South-Western, Cengage Learning, 2016.

David Diez, Christopher Barr, Mine Çetinkaya-Rundel, *OpenIntro Statistics*, 2nd Edition, CreateSpace Independent Publishing Platform, 2013. <http://www.openintro.org/stat/textbook.php>

Grades

Problem Sets: 50%

Midterm Exam: 25%

Referee Report: 25%

Problem Sets

There will be six problem sets (PS) in total. Each PS will be assigned every two weeks. Please submit your solutions through blackboard **before 7:00PM (EST) on the due date**. I will not accept late submission. For due dates, see Course Schedule.

Part of the problem sets will include **applied computing**, using MS Excel and Stata. You will learn how to use these programs and solve statistical problems through learning-by-doing. In either case, your work must be your own. Thus, please don't hand in someone else's work product.

I recommend that you purchase Stata. This software is probably the most favored statistical package used by applied economists. You will get information about the software and reduced prices for students (the so-called grad-plan) at: <http://www.stata.com/order/new/edu/gradplan.html>.

The license for Stata (small Stata) starts at \$48. If you think you have use for it, purchase the perpetual license of Stata/IC for \$225. I have no financial interest in what type of Stata option you chose and whether you chose to purchase Stata.

A recommended book to learn STATA is '*Statistics with Stata: Version 12*' by Lawrence C. Hamilton. <https://www.stata.com/bookstore/statistics-with-stata/>. Since this book is not required, you can still learn Stata through online resources like channels on YouTube.

Midterm Exam

The midterm exam will be held on **June 30**. The midterm exam covers the material that we go through until (and including) June 26. The midterm exam will not involve any applied computing using MS Excel or Stata.

I will post the exam on Blackboard at **2:30 pm (EST) June 30**. Each student should send me the answers (via email) by **5:30 pm** at the same day (in MS Word/Hand-written version scanned in PDF). There will

be no makeup midterm. If you miss the midterm with a valid excuse, you will be required to write an empirical paper of at least 4 pages to evaluate a policy (imagined or implemented) or analyze a social phenomenon using econometric methods and submit it to me no later than 6 days after the missed midterm exam day.

Referee report

In lieu of a final exam, each student will need to submit a referee report for this course. Your referee reports should be around two pages, 1.5 line spacing and 12-point font. Your reports will be evaluated and graded on its content (summary, the econometric methods used/analyzed and your opinions) and writing. Please send your reports (in MS word or pdf) by email to ydeng9@gmu.edu before **7:00 pm (EST) Aug 6**. Your referee report needs to analyze one of the papers from the reading list below. For detailed instructions on how to write a referee, please read the ‘Referee Guidelines’ posted on Blackboard.

Course Outline (Schedule)

The standards, requirements and course schedule set forth in this syllabus may be modified at any time by the course instructor. Notice of such changes will be by announcement in class videos and via email in a timely manner.

DATE	TOPICS	READINGS	PROBLEM SETS
6/2	Why Econometrics, Moving from Correlation to Causation Inferences, data types	Woolridge Chapter 1	
6/5	The Bivariate Regression, Model and Residuals	Woolridge Chapter 2	PS 1 assigned
6/9	The Multivariate Regression Model and Interpreting Results	<i>OpenIntro Statistics</i> Chapter 8; Woolridge Chapter 3	PS 1 due
6/12	Hypothesis Tests	Woolridge Chapter 4	PS 2 assigned
6/16	Heteroskedasticity and Dummy Variables	Woolridge Chapter 7&8	PS 2 due
6/19	Graph plot		PS 3 assigned
6/23	Case Studies	Woolridge Chapter 19; Bertrand & Mullainathan; Duggan & Levitt	PS 3 due

6/26	Large Sample Properties of OLS	Woolridge Chapter 5	PS 4 assigned
6/30	Midterm exam: 2:30 pm (EST) – 5:30 pm (EST)		PS 4 due
7/3	No class		
7/7	Time series (Part 1)	Woolridge Chapter 10, and Wilcox	PS 5 assigned
7/10	The Efficient Markets Hypothesis	Woolridge Chapter 11; Thaler; Malkiel	PS 5 due
7/14	Time Series (Part 2), Difference- in-Differences (Part 1)	Woolridge Chapter 12	PS 6 assigned
7/17	Difference-in-Differences (Part 2), Panel Data Methods	Woolridge Chapters 13 & 14; Meyer et al; Card & Krueger; Linden & Rockoff;	PS 6 due
7/21	Two-Stage Least Squares	Woolridge Chapters 15	
7/24	Review		
8/6	Referee report due		

Honor Code:

Mason is an Honor Code university; please see the Office for Academic Integrity for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously, and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

Students with Disabilities:

Students with Faculty Contact Sheets for this class need to present them to the instructor as soon as possible. Other students requiring reasonable accommodations, as covered under the Americans with Disabilities Act, should contact the Disability Resource Center (DRC) to open up a DRC file and discuss

needed accommodations. Questions and requests for reasonable accommodations should be directed to DRC, 234 SUB I, phone (703) 993.2474 or online at <http://ds.gmu.edu>. Also, please contact me as soon as possible to discuss these accommodations.

Reading List

I will discuss some of these papers through the online asynchronous class.

Angrist, J.D., "Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records," *American Economic Review*, 80, 1990, 313-336.

Angrist, J.D., and W.N. Evans, "Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size," *American Economic Review*, 88(3), 1998, 450-477.

Ayres, Ian and Steven Levitt, "Measuring Positive Externalities from Unobserved Victim Precaution: An Empirical Analysis of Lojak," *Quarterly Journal of Economics*, 115(3), 2000, 755-789.

Becker, Sascha O., Irena Grosfeld, Pauline Grosjean, Nico Voigtländer, and Ekaterina Zhuravskaya, "Forced Migration and Human Capital: Evidence from Post-WWII Population Transfers." *American Economic Review*, 110 (5), 2020, 1430-63.

Bertrand, Marianne and Sendhil Mullainathan, "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination," *American Economic Review*, 94(4), 2004, 991-1013.

Card, D., and A.B. Krueger, "Minimum Wages and Employment: A Case Study of the Fast Food Industry in New Jersey and Pennsylvania," *American Economic Review*, September 1994, 722-794.

Duggan, M., and Steven Levitt, "Winning Isn't Everything: Corruption in Sumo Wrestling," *American Economic Review*, 92(5), 2002, 1594-1605.

Fisman, Raymond and Edward Miguel, "Corruption, Norms, and Legal Enforcement: Evidence from Diplomatic Parking Tickets," *Journal of Political Economy*, 2007, 115(6): 1020-1048

Hotz, Joseph, Susan Williams McElroy and Seth Sanders, "Teenage Childbearing and Its Lifecycle Consequences: Exploiting a Natural Experiment." *Journal of Human Resources*, 2005, 40(3): 683- 715.

Linden, Leigh L. and Jonah Rockoff. "Estimates of the Impact of Crime Risk on Property Values from Megan's Laws." *American Economic Review*, 2008, 98(3): 1103-27.

Malkiel, Burton G. "The Efficient Market Hypothesis and Its Critics," *Journal of Economic Perspectives*, 2003, 17(1), 59-82.

Meyer, Bruce D., W. Kip Viscusi and David L. Durbin (1995), "Worker's Compensation and Injury Duration: Evidence from a Natural Experiment," *American Economic Review*, 85(3): 322-340.

P Gray, S Gray, "Testing market efficiency: Evidence from the NFL sports betting market" *The Journal of Finance*, volume 52, 1997, p. 1725 - 1737

Richard Thaler, "Anomalies: Weekend, Holiday, Turn of the Month, and Intraday Effects," *Journal of Economic Perspectives*, 1, Fall 1987, 169-78.

Wilcox, David, "Social Security Benefits, Consumption Expenditures, and the Life Cycle Hypothesis," *Journal of Political Economy*, 97, April 1989, 288-304

Zhang, Y. Jane, "Culture, Institutions, and the Gender Gap in Competitive Inclination: Evidence from the Communist Experiment in China." *Economic Journal* 129 (617), 2019, 509–52.