

**ECON 637**  
**Econometrics I**  
**Spring 2017**  
**Department of Economics**  
**George Mason University**

**Instructor:**

Thomas Stratmann

Office: Arlington Campus, Metropolitan Building, 3434 Washington Blvd, 4th Floor, Rm 4013, Arlington, VA 22201

Phone: (703) 993-2317

Email: tstratma@gmu.edu

Classes: Tuesday, 7:20 p.m. - 10:00 p.m., Fairfax Campus, Enterprise Hall 274

Office Hours: Tuesday, 10 a.m. - 11 a.m. and by appointment

ECON 637 is the first course in the graduate-level econometrics sequence. The prerequisites for the course are basic knowledge of probability and statistics, and some matrix algebra.

---

**Textbooks**

Required

**Angrist, Joshua and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics*. Princeton: Princeton University Press.**

**Jeffrey M. Wooldridge, *Introductory Econometrics, 6th edition, 2015*, Cengage Learning.**

Both books give a very good discussion of issues in modern econometrics. The Angrist/Pischke book focuses on causal inference and identification and the Wooldridge is good for developing intuition for the underlying theory.

Recommended

**William H. Greene, *Econometric Analysis, 7th edition, 2008* Prentice Hall.** The Greene book discusses estimators. This book is more technical and we will cover some chapters of this book in this class. – I believe Greene has many of these chapters as PDF files, for free, on his website.

Not required, is Jeffrey Wooldridge's *Econometric Analysis of Cross Section and Panel Data*. It is a more advanced treatment of the analysis of micro data, quite useful, and I require this book in the applied micro-econometrics class I teach in the Fall of 2017.

Another useful book is Peter Kennedy's *A Guide to Econometrics (Sixth Edition)*. I found it to be very useful as a graduate student.

At the bottom of the syllabus I include some papers, most of which we will discuss in class.

---

**Homework assignments/Midterm/Final/Paper**

I will not accept late homework assignments.

Lecture notes are on <https://mymasonportal.gmu.edu>. Suggested answers to problem sets and reading

assignments will be posted on this site.

The midterm exam is a closed book exam. There will be no makeup midterm. If you miss the midterm with a valid excuse, its weight will be shifted to the final.

The final will be cumulative.

---

### **Term Paper**

You are required to write a paper for this class. The paper can be short. State your hypothesis, and present results. Look at the AER, JPE, and QJE how results are presented (Tables, description of results). You will not be graded on whether you do find or do not find statistically significant results, but on clarity of exposition and the innovation of your paper relative to the existing literature on the topic of your choosing.

You will turn in three copies of a 1-2 page proposal for your paper. Each student will be responsible for a peer review of two proposals. Your revised paper proposal, along with a description of the data that you will be using in your paper, is due the following week. Both, the initial and updated proposal will count as twenty percent of the paper grade.

---

### **Problem Sets and Quizzes**

The problem sets will cover some theoretical material as well as computational exercises; they are an important part of the course. Some parts of the assignment in the problem sets have not been explicitly discussed in class. You may have to reach into your undergraduate knowledge of statistics to answer those questions. While you can work in a group work on the problem sets, I expect that you work on your own and do not turn in someone else's product.

At the beginning of some classes, I plan to have a short quiz, which may cover the previous class or the previous two classes. The quiz will take 10 minutes max. The quiz will require you to give roughly 5 to 10 short answers.

---

Be sure to check the class web page frequently.

Please familiarize yourself with the Honor Code, <http://www.gmu.edu/catalog/apolicies/>. Suspected cases of academic dishonesty including plagiarism will be sent immediately to the Honor Committee.

---

### **Applied Computing**

This course will include applied computing, using Stata. You will learn how to use Stata and solve statistical problems by learning-by-doing. In either case, your work must be your own. Thus, please don't hand in someone else's work product.

I will provide more information on computing assignments throughout the semester.

For the empirical work on the problem sets, we will be using the econometrics software Stata. Stata is available on in some computer labs around campus, including the Public Choice Center.

I recommend that you purchase STATA 14. This software is probably the most favored statistical package used by applied economists. This software is also installed on some computers at the Public Choice Center and Enterprise Hall, and you are welcome to use it there. But it is probably best for you to purchase the

software. You will get information about the software and reduced prices for students <http://www.stata.com/order/new/edu/gradplans/student-pricing/>. I suggest you do not purchase the small STATA version, since some of the data sets that we'll be using have more observations than that version allows. Since you are most likely to do some more data analysis over the course of your graduate studies, you might want to consider purchasing a perpetual license.

I have no financial interest in what type of option you chose and whether you chose to purchase this software at all.

You might find helpful books on learning STATA here, <http://www.stata.com/bookstore>. However, there is much online material on how to use STATA, and those online tutorials, including on <https://www.youtube.com/>

---

**Grades:**

Midterm Exam	25%
Final Exam	35%
Problem Sets and Computer Assignments	15%
Quizzes in class	5%
Paper – Due on the day of the Final Exam	20%

**Final Exam:** According to schedule of classes.

---

**Tentative Course Outline**

Class 1

Introduction

Moving from correlation to causation,

The bivariate regression model

**Required Reading**

Wooldridge 1.1 - 1.4

Wooldridge 2.1 - 2.6

Wooldridge Appendices A – D

**Recommended Reading**

Greene Ch. 1 - 2

---

## Class 2

The bivariate regression model  
The multivariate regression model - in scalar terms

### **Required Reading**

Wooldridge 2.1 – 2.6 (Yes, read it again till you really know it. Do some of the problems!)  
Wooldridge 3.1 – 3.6

### **Recommended Reading**

Greene Ch. 3

---

## Class 3

Bivariate regression model  
Stata tutorial (bring your laptops with Stata installed!)  
Planning and writing an empirical paper  
Open review of Wooldridge Appendices

---

## Class 4

Wooldridge Appendices  
The multivariate regression model - in scalar terms  
The multivariate regression model - in matrix terms  
Deriving the estimates in multivariate models  
Omitted variables bias in the multivariate model  
The “partialling” out property of multivariate models  
A note on variances in multivariate models

### **Required Reading**

Wooldridge 3.1 – 3.6

### **Recommended Reading**

Greene 4.1 – 4.3

---

## Class 5

Multivariate regression  
Inference about 1 parameter  
Tests of multiple parameters

### **Required Reading**

Wooldridge Ch. 4

### **Recommended Reading**

Greene 4.5, Ch. 5

---

Class 6

Dummy variables in regression models

**Required Reading**

Wooldridge Ch. 7

**Recommended Reading**

Greene Ch. 6

---

Class 7

**Midterm**

**Due: Paper proposal (3 paper copies)**

---

Class 8

**Due: Paper proposal peer reviews (2 paper copies – 1 for author, 1 for grade)**

How to interpret regression coefficients

Class Discussions:

Bertrand and Mullinathian, Discrimination in the job market

Sacerdote, Testing for nature vs. nurture

Black, How parents' value school quality

Carrell et al., Peer effects in physical fitness

Dale and Krueger, The returns for attending a more selective college

**Required Reading**

(above papers)

Wooldridge 4.2, 4.4 – 4.6, 7.2, 7.7

**Recommended Reading**

Wooldridge Ch. 19

---

Class 9

Large sample properties of OLS estimates

Notes on the consistency of OLS estimates

Notes on measurement error in X

**Required Reading**

Wooldridge 5.1, Ch. 9.

**Recommended Reading**

Greene 4.4

---

Class 10

**Due: Revised paper proposal, data (digital submission) and data explanation** Topics in Time Series Analysis

Autocorrelated processes

Wilcox paper

Efficient Market Hypothesis

Autocorrelated errors

Durbin-Watson Statistic

**Required Reading**

Wooldridge Ch. 10

**Recommended Reading**

Greene Ch. 20

---

Class 11

Pooled time series/cross sectional data sets

**Required Reading**

Wooldridge Ch. 13

**Recommended Reading**

Greene Ch. 11

---

Class 12

Two-stage least squares

Detailed derivations

Examples

**Required Reading**

Wooldridge Ch. 15

**Recommended Reading**

Greene Ch 8

---

Class 13

Regression discontinuity design models

---

Class 14

Maximum Likelihood, Logit, Probit

**Required Reading**

Wooldridge Ch.17

**Recommended Reading**

Greene Ch. 17

---

Final

**Due: Term paper**

## Reading list

The papers we will discuss will be posted on the class web site.

- 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.
- Duggan, Mark, and Steven Levitt, "Winning Isn't Everything: Corruption in Sumo Wrestling," *American Economic Review*, 92(5), 2002, 1594-1605.
- Fisman, Ray and Edward Miguel, "Corruption, Norms and Legal Enforcement: Evidence from Diplomatic Parking Tickets," September 2007, *Journal of Political Economy*.
- Sacerdote, Bruce, "How Large Are the Effects from Changes in Family Environment? A Study of Korean American Adoptees," *Quarterly Journal of Economics*, 121(1), 2007, 119-157.
- Klick, Jonathan and Thomas Stratmann (Spring 2008). "Abortion Access and Risky Sex Among Teens: Parental Involvement Laws and Sexually Transmitted Diseases." *Journal of Law, Economics and Organization*.
- Makowsky, Michael and Thomas Stratmann (2008). "Political Economy at Any Speed: What Determines Traffic Citations?" *American Economic Review*.
- David Wilcox, "Social Security Benefits, Consumption Expenditures, and the Life Cycle Hypothesis," *Journal of Political Economy*, 97, April 1989, 288-304.
- Richard Thaler, "Anomalies: Weekend, Holiday, Turn of the Month, and Intraday Effects," *Journal of Economic Perspectives*, 1, Fall 1987, 169-78.
- Meyer, B., W.K. Viscusi, and D. Durbin (1995), "Worker' Compensation and Injury Duration: Evidence from a Natural Experiment," *American Economic Review*, Vol. 85, 322-40.
- Almond, D., K. Chay, D. Lee, "The Costs of Low Birth Weight," *Quarterly Journal of Economics*, 120, 2005, 1031-1084.
- Geronimus, A., and S. Korenman, "The Socioeconomic Consequences of Teen Childbearing Reconsidered," *Quarterly Journal of Economics*, 1992, 1187-1213.
- 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.
- 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.