

Introduction to Econometrics

ECON 345-001
Tuesday / Thursday, 12:00 - 1:15
Fall 2019
Buchanan Hall D003

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Office Hours: By Appointment
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Introduction

Econometrics is the field of study within economics that applies statistical methods to economic questions. The field offers a set of tools, built from a foundation of probability theory and statistics, that serve as the primary empirical resources for economists. To better resolve economic questions and to better understand economic data, economists apply the tools developed by econometricians. This course will focus on helping you to develop a better understanding of the basic econometric tools that are available, and to apply these tools in interesting ways.

Course Objectives

The objective of this course is to teach you the basic empirical skills used in economic analysis. We will focus on (i) the statistical foundations of regression modeling; (ii) the use of Ordinary Least Squares (OLS) regression; and (iii) some techniques built upon OLS. You will have the opportunity to use common statistical software packages and hopefully become proficient. In addition to learning the basic foundations of econometrics, you will have the opportunity to consider an economic question that is meaningful to you through an empirical lens and to apply the techniques learned in the course to better understand that question.

Books

This course will largely follow the Wooldridge's *Introductory Econometrics* through chapter 14.

I also highly recommend Stigler's *The Seven Pillars of Statistical Wisdom* for a richer understanding of some very basic concepts that are often taken for granted. *Freakonomics* is an interesting popular economics book in which you can find some examples of applications of econometric techniques to everyday economic questions. While we will be using Stata instead of R, select portions of *An Introduction to Statistical Learning* by Gareth James, et al. may be of use in better understanding some of the models that we will use; the authors have made a PDF of the text available online. You will have the opportunity to earn additional quiz points if you give the assigned chapters in the optional books a thorough read.

Required:

1. Wooldridge, Jeffrey M. *Introductory Econometrics: A Modern Approach, 6th Edition*. Cengage Learning, 2016. ISBN-13: 9781305270107.

Optional:

1. Stigler, Stephen M. *The Seven Pillars of Statistical Wisdom*. Harvard University Press, 2016. ISBN-13: 978-0674088917
2. James, Gareth, et al. *An Introduction to Statistical Learning: with Applications in R*. Springer, 2017. PDF made available by the authors here.
3. Levitt, Steven D. and Stephen Dubner. *Freakonomics*. Harpercollins, 2006.

Grading Policy

Your grade will depend on weekly quizzes, a series of homework assignments, an exam to be held in week 12, a research proposal and final paper. The grade breakdown will be as follows:

Quizzes: 20%
Homework: 20%
Exam: 20%
Research Proposal: 15%
Final Paper: 25%

Quizzes

There will be 10 quizzes administered on select Tuesdays in the first few minutes of class. Each quiz will consist of 5 multiple choice questions on the material covered in each week's required reading. A sixth bonus question will be offered each week pertaining to the optional reading. While each quiz is graded out of 5 points, the bonus question each week offers students the opportunity to improve their final average for the course by up to 4 percentage points. Students are required to submit their answers to each week's quiz on a scantron form. Students who arrive to class after the quiz has begun will miss the opportunity to take that week's quiz. The lowest quiz grade will be dropped.

Homework

A series of homework assignments will be collected select Thursdays. Homeworks will consist of (i) problem sets to test your ability to apply the concepts learned from the reading and in class; and (ii) submission of basic components of what will become your final paper. A hard copy of all homework assignments must be submitted. Email submissions will not be accepted.

Several of the problem sets will involve the use of Stata, a commonly used statistical software package. I will often provide you with the data set to use, and you will be required to analyze and interpret the data. George Mason University students can access Stata online through the Virtual Computing Lab at <http://www.vcl.gmu.edu/>.

Exam

An exam will be administered approximately $\frac{3}{4}$ of the way through the course. The exam will be in two parts: (i) 30 multiple choice questions; and (ii) a series of short-answer questions. Five of the multiple choice questions on the final exam will come directly from your weekly quizzes, so thoroughly understanding the reading and learning from any earlier mistakes is strongly advised.

The last few topics that will be covered in class are best understood by working through examples; proficiency in these topics is best demonstrated by how well you can articulate the the nuances of the problems we'll be dealing with. My hope is that you will dedicate any time you would have spent studying for a final exam toward improving your final paper.

Research Proposal

You are required to submit a research proposal in week 8, demonstrating that you are well on your way toward producing a final paper. A satisfactory proposal should include (i) a description of your research question; (ii) a brief discussion of background information and an explanation as to why your research question matters; (iii) a discussion of your research design; (iv) a brief overview of any preliminary data you have collected; and (v) how your research will contribute to the field of study.

Final Paper

A 10 - 12 page final paper (excluding cover page and references) will be due on the last day of class. You will be graded on (i) the economic heft of your analysis; (ii) the quality of your written presentation of the material; and (iii) the materiality of your research. A hard copy of all final papers are to be submitted in person on the last day of class. All papers are to have a cover page with the title of your work, your name, and a 150 - 250 word abstract on your work. All papers are to be double spaced, using 12 pt Times New Roman font and 1-inch margins. All resources are to be cited appropriately and included in a list of references.

Grading Scale

Students' final averages for the course will earn them a letter grade. The University's standard undergraduate grading scale applies and can be found here.

Letter Grade	Range	Letter Grade	Range
A+	100 - 98	C+	79 - 77
A	97 - 93	C	76 - 73
A-	92 - 90	C-	72 - 70
B+	89 - 88	D	69 - 60
B	87 - 83	F	< 60
B-	82 - 80		

Tentative Schedule

Week	Topic	Reading Due	Assignments Due
Week 1	Introduction	8/27: W., Ch. 1; Stigler, Ch. 1*	8/29:
Week 2	Simple Regression	9/3: W., Ch. 2, ; Stigler, Ch. 5*	9/5: Derivation HW (pg. 25 - 26)
Week 3	Multiple Regression Model	9/10: W., Ch. 3, LD, Ch. 5*	9/12: Offer Research Question
Week 4	Inference	9/17: W., Ch. 4; LD, Ch. 4*	9/19: Interpreting Results I
Week 5	Data Decisions I	9/24: W., Ch. 5 - 6; Stigler Ch. 2 - 3*	9/26: Interpreting Results II
Week 6	Data Decision II	10/1: W., Ch. 6 Cont.***, Stigler Ch. 6*	10/3: Model Estimation I
Week 7	Binary Variables	10/8: W., Ch. 7**	10/10: Offer List of Resources
Week 8	Logit Models	10/15: NO CLASS***	10/17: Read W. Ch. 17.1; James Ch. 4.3*; Research Proposal Due
Week 9	Heteroskedasticity	10/22: W., Ch. 8; Stigler Ch. 7*	10/24: Model Estimation II - Identifying Heteroskedasticity
Week 10	Data Decisions III	10/29: W., Ch. 9	10/31: Model Estimation III
Week 11	Estimation and Interpretation Exercises I	11/5: NONE**	11/7: Deliver Any Preliminary Data
Week 12	Estimation and Interpretation Exercises II	11/12: Exam	11/14: Model Estimation IV
Week 13	Time Series I	11/19: W., Ch. 10; Stigler, Ch. 5*	11/21: Comparing Assumptions
Week 14	Time Series II	11/26: W., Ch. 11 - 12; *****	11/28: NO CLASS*****
Week 15	Panel Data I	12/3: W., Ch. 13, 14.1, 14.2; *****	12/5: Final Papers Due

* Indicates an Optional Reading Assignment

** No Quiz

*** Monday Classes Meet on 10/15

**** Thanksgiving

***** Optional: Watch this: <<https://www.youtube.com/watch?v=ouahL4HbwBE>>

***** Optional: Watch this: <https://www.youtube.com/watch?v=T_8-lp5zbf0>

Disability Accommodations

If you have a documented disability or other condition that may require accommodations you should (i) make sure this documentation is on file with Disability Services (SUB I, Rm. 4205; 993-2474; <http://ds.gmu.edu>) to determine the accommodations you need; and (ii) talk with me to discuss your accommodation needs.

Email and Student Privacy

Due to the requirements of the Family Educational Rights and Privacy Act (FERPA), students must use their MasonLive email account to receive important University information, including communications related to this class. I will not respond to messages sent from or send messages to a non-Mason email address.

Academic Integrity

The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (i) all work submitted be your own; (ii) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (iii) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited. More information on the Honor Code may be found at <https://oai.gmu.edu/mason-honor-code/>.

Sexual Harassment, Sexual Misconduct, and Interpersonal Violence

George Mason University is committed to providing a learning, living and working environment that is free from discrimination and a campus that is free of sexual misconduct and other acts of interpersonal violence in order to promote community well-being and student success. We encourage students who believe that they have been sexually harassed, assaulted or subjected to sexual misconduct to seek assistance and support. University Policy 1202: Sexual Harassment and Misconduct speaks to the specifics of Mason's process, the resources, and the options available to students.

As a faculty member and designated "Responsible Employee," I am required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per university policy 1412. If you wish to speak with someone confidentially, please contact the Student Support and Advocacy Center (703-380-1434), Counseling and Psychological Services (703-993-2380), Student Health Services, or Mason's Title IX Coordinator (703-993-8730; cde@gmu.edu).