Econ 402: Econometrics

Course info

Instructor:

John Gardner Email: jrgardne@olemiss.edu Office: 318 Odom Office hours: TBD

Time: TBD Place: TBD Websites: http://blackboard.olemiss.edu and https://github.com/jrgcmu/econ402

Overview

Econometrics is doing economics with data. In this class, we'll develop the tools we need to use real-world data to uncover economic relationships. We will examine why these tools work in theory and see how to use them in practice.

Our focus will be on linear regression, a powerful and flexible tool for estimating relationships between variables. By the end of this course, you will understand the theory behind regression analysis and know how to estimate and test hypotheses about regressions in settings that are relevant for empirical economics.

Prerequisites

The prerequisite for this course is a C or better in Econ 230: Economic Statistics I.

Software

Most of the work we'll do in this class will involve using statistical software to work with actual data. We will do most of our work in R, an open-source program for statistics that works on all operating systems. You will also want to download R studio, a program that makes it easier to write R code. Let me know if you run into any trouble installing these programs.

Many employers want to hire people that know how to use R, so learning some of the basics will make you more competitive on the job market. On the other hand, R can also be a little bit of a pain. If you prefer, you can also do (most) of your work in gretl, another free econometrics program that is easier to use. Gretl can be downloaded from https://gretl.sourceforge.net. (I don't care which one you use, I think they're both cool.)

Textbook

I have created a fairly comprehensive set of lecture slides, so there is no required text. If (like me) you are the kind of student that likes to have a text, I have several favorites:

Econometrics texts

- *Introductory Econometrics: Intuition, Proof and Practice* by Zax. This is a great book if you want to do a deep dive on the theory behind the topics we'll discuss in this course. My lectures are inspired by, and loosely based around, this book.
- *Introductory Econometrics* by Wooldridge. This is a great book if you want to go beyond the topics covered in this course, or if you want even more examples on the topics that we will cover.

• *Mastering Metrics* by Angrist and Pischke. This is a great book if you want to learn more about some of the applied topics that we will cover at the end of the semester.

I didn't put any of these in the bookstore because it's often cheaper to find a used copy online.

Software texts and resources

I will show you the basics of statistical computing, but if you want to learn more, here are some nice resources:

- *Introduction to Econometrics with R* by Hanck, Arnold, Gerber and Schmelzer discusses how to use R for common econometric methods, and can be read for free online.
- *An Introduction to R* by Venables, Smith, et al. is a classic (and shortish) introduction to basic R, and can be downloaded for free.
- *FasteR: Fast Lane to Learning R* by Matloff is a good tutorial on R.
- *R for Data Science* by Wickham, Cetinkaya-Rundel, and Grolemund is a good introduction to some modern, and advanced, R programming, and is also free to read online.
- Using gret1 for Principles of Econometrics by Adkins is a nice guide that gives more information on using Gret1, and is a free download.

Assessment

I will assign grades based on your performance on

- Several homework assignments, worth a total of 25% of your score,
- Two exams, each worth 25% of your score, and
- An empirical economics project, worth 25% of your score.

The grading scale is 90+: A, 80-89: B, 70-79: C, 60-69: D, 59 or lower: F. No plus/minus grades will be awarded. I reserve the right to modify these criteria if it is warranted by the performance of the class.

I also reserve the right to take your attendance record into account when determining final grades. In accordance with University policy, excessive absences may result in receiving an F grade or being dismissed from the course.

Topics and	readings
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Торіс	Readings (from Zax)
Introduction	Ch. 1
Background	Ch. 2
Covariance and correlation	Ch. 3.1-3.4
Regression	Ch. 4
Properties of regression	Ch. 5
Inference	Ch. 7.1-7.4, 7.6 (you might also want to read Ch. 6 as a review)
Multiple regression	Ch. 11.1-11.2, 14.1-14.3 (see 11.3-11.5 and 12.2-12.6 for complete derivations)
Heteroskedasticity	Ch. 8.4-8.9

Торіс	Readings (from Zax)
Autocorrelation Endogeneity	Ch. 9.1-9.8 Ch. 10.1-10.6
Specification	Ch. 13

Tentative schedule

Midterm: TBD Final: TBD (this date is set in stone by the University)

Course policies

Attendance. Attendance is mandatory. It's also a good way to learn the material.

Missed exams. If you must miss an exam because of an official (University, civic, or recognized religious) obligation or a legitimate emergency and you (i) notify me at least one week in advance and (ii) adequately document your need to miss the exam, I will, at my discretion, either drop the exam from your score or provide a makeup exam.

Accommodations. If you require any accommodations (such as extra time, a different testing environment, etc.), please let me know as soon as possible. For more information on the University's policies regarding such accommodations, see http://sds.olemiss.edu.

Collaboration and plagiarism. All of the work that you submit for this course must be your own; any violation of this standard constitutes plagiarism. Any student found plagiarizing once will fail the assignment or exam; any student found twice will fail the course.

That said, you are permitted—indeed encouraged—to discuss and collaborate with each other on your homework assignments. However, each student must turn in their own completed assignment, demonstrating their own understanding of the material.

Collaboration is not allowed on the exams, which will be closed-book and closed-notes.

Late work. Absent extenuating circumstances, no credit will be awarded for late assignments.

Things with screens. They are not allowed. Put away your phone/laptop/tablet/watch/etc. and take notes on paper.