Econ 421: Microeconometrics

Instructor: Dr. David T. Jacho-Chávez, Rich 331, 727-1381 (Econ. Dept: 727-4639), e-mail: djachocha@emory.edu.

Time and Location: Monday 08:30 am – 09:45 am, Rich Building 103, Wednesday 08:30 am – 09:45 am, Rich Building 103.

Note: Classes begin on 01/17/2018 and end on 04/30/2018. Classes do not meet on 03/12/2018 and 03/14/2018. There will no office hours on 03/06/2018, 03/13/2018, and 04/03/2018.

Office Hours: Tuesday 08:00 am – 11:00 am, Rich 331.

Pre-requisite: Students must have taken Econ 420 – Econometrics, Econ 220 – Introduction to Statistical Methods before enrolling in this course.

Course Objective: This course is designed to provide students with the necessary methodological tools to understand and implement empirical studies dealing with microeconomic issues. The course discusses various extensions of the simple linear regression model geared to address the distinctive features of microeconomic data such as discreteness, nonlinearities, heterogeneity, natural experiments, and repeated sampling. After taking this course, students should be able to:
1. Identify the correct econometric method to address a particular microeconomic question.
2. Understand the conditions needed for these techniques to be applicable in particular situations.
3. Understand empirical research as depicted in the news media and published research reports.


Software: Computing tutorials will be held during some lectures. This is designed to help students to understand the practical implications of the theoretical content of the lectures, and familiarize themselves with the use of powerful and widespread econometric software such as STATA. STATA is available on computers in the Econ lab (Rich 301), Woodruff Library, and Cox Hall.

Canvas: All announcements, syllabus, home assignments, lecture notes, data files, and other course-related material will be posted on Canvas. You should check canvas web-site regularly for updates.

Grading: The final grade will be determined by a weighted average of scores in 1st written in-class exam (20% on 02/21/2018, Rich Building 103, 08:30 am – 09:45 am), 2nd written in-class exam (20% on 03/28/2018, Rich Building 103, 08:30 am – 09:45 am), homework (20% throughout the semester), and a written comprehensive final exam (40% on 0X/0X/2018, Rich 103, 0X:00 Xm – 0X:30 Xm). All exams are open-book.
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**Exams:** Each in-class midterm exam will last exactly 75 minutes and will consist of 3 questions. Question 1 is compulsory, but 1 and only 1 question of the remaining 2 must be answered by all candidates. The final exam will consist of 4 questions. 3 out of these 4 questions must be answered by all candidates. Material covered in exams is cumulative. Only handheld calculators are allowed.

**Home Assignments:** There will be 5 assignments.

**Policies**

**General:** Students are expected to adhere to the Emory College Honor Code as well as its Conduct Code, see [http://college.emory.edu/home/academic/policy/conduct_code.html](http://college.emory.edu/home/academic/policy/conduct_code.html). Specifically the honor code is in effect throughout the semester. By taking this course, you affirm that it is a violation of the code to cheat on exams, to plagiarize, to deviate from the teacher’s instructions about collaboration on work that is submitted for grades, to give false information to a faculty member, and to undertake any other form of academic misconduct. You agree that the teacher is entitled to move you to another seat during examinations, without explanation. You also affirm that if you witness others violating the code you have a duty to report them to the honor council.

**Special circumstances:** Students requiring any type of special classroom/testing accommodation for a disability, religious belief, scheduling conflict, or other impairment that might affect his or her successful completion of this course must personally present the requested remedy or other adjustment in written
form (signed and dated) to the instructor, i.e. supporting memorandum of accommodation from the Office of Disabilities Services, http://www.ods.emory.edu/. Requests for accommodations must be received and authorized by the instructor in written form no less than two weeks in advance of need. No accommodation should be assumed unless so authorized. In the event of needs identified later in the course, or for which an adjustment cannot be made on a timely basis, a grade of “I,” Incomplete for the course, will be given to accommodate the unanticipated request.

**Exam absences & missed assignments:** Emory College of Arts and Sciences does not have an attendance policy and, therefore, does not provide absence excuses. In the event of a catastrophic (and documented) occurrence which necessitates an absence from a scheduled exam or assignment, the student should immediately seek help from the Office of Undergraduate Education (OUE), http://college.emory.edu/home/administration/office/undergraduate/index.html. The Family Educational Rights and Privacy Act (FERPA) and the Health Insurance Portability and Accountability Act of 1996 (HIPPA) regulations (U.S. Department of Health and Human Services and U.S. Department of Education) dictate that students do not have to provide medical documentation or disclose personal/medical issues with professors. However, the OUE class deans and academic advisers may collect this documentation and could provide verification to professors upon students’ requests. *This must be done within 48 hours after missing the exam or assignment deadline.* If approval is granted by the instructor, the weight of the student’s scores for the missed exam or assignment will be transferred to the next chronologically scheduled exam or assignment. If a letter (or e-mail) from the OUE is not received by the instructor within 48 hours, or approval is not explicitly obtained from the instructor, after a missed exam or assignment, the missed exam or assignment will receive a score of zero points.

In case, the student obtains a verification letter (or e-mail) from the OUE for chronologically the final exam or last assignment, and the instructor’s approval is also granted, the weight of the student’s scores for the missed final exam or last assignment will be transferred to the previous exam or assignment where the student scored the lowest.

It is understood that any student seeking a verification letter (or e-mail) from the OUE, is also forfeiting all extra points earned throughout the duration of the course, including those from answering correctly pop-quizzes, and questions in class.

⚠️ Regardless of whether a student can obtain a verification letter from the OUE for more than one missed exam (midterm or final), all students will need to have obtained marks in at least two written examinations to obtain a final grade for the course. Students failing to fulfill this minimum requirement will receive an automatic “I” (incomplete) for the course. The instructor will change this “I” to a grade once the student successfully takes all missed written examinations the next time the instructor teaches the course, i.e. Spring 2018.

**Dishonesty:** Any student who is found to have cheated or to have plagiarized will receive an “F” for the course. The university defines academic misconduct as:
“... Academic misconduct is an offense generally defined as any action or inaction which is offensive to the integrity and honesty of the members of the academic community...”

For full information about Emory's policy on academic misconduct, please check the following links: 
http://college.emory.edu/home/academic/policy/honor_code.html (see Articles 4, 5, 6 & 7)

Class attendance: Attendance is mandatory and encouraged. Marks from home assignments, pop-quizzes, class participation, and exams will only be credited if taken and handed-in during the session the student is officially enrolled in. If a student misses a lecture, the student should not expect the instructor to repeat the material at another time (such as the instructor’s office hours).

In/Out of classroom conduct: Students are expected to adhere to the Emory University Code of Conduct, see 
http://conduct.emory.edu/policies/code/index.html.

- Use of cell/smartphones during lecture time and exams is always prohibited, as is leaving the room to answer or make a call.

⚠️ Students planning to use laptops and/or tablets during lecture time only should sit in the last row of the classroom.

⚠️ Only scientific handheld calculators are permitted during exams.

- Basic classroom etiquette requires that you be quiet and attentive in class. This means that, except when we are engaged in-group discussion, only one person will be talking in the classroom at any time. Everyone in the room will give respectful attention to the sole speaker. Students creating disruptions in class will be asked to leave the class and will still be responsible for any material missed. Continued disruptions will be dealt with in accordance with university policy.

- Any level of ‘chatting’ with friends, sleeping, reading newspapers, leaving early, and/or eating in class are disruptive and rude to your classmates and me. If for some reason you have to leave early or arrive late on a particular day, please sit in the back of the class, leave or arrive quietly, and notify me via e-mail as far in advance as possible. This will be allowed as long as it is of an infrequent nature. Use the time in class wisely, appropriately, and efficiently.

- You are welcome to drop by my office during office hours and by appointment only. If you need to send me an e-mail, please remember that e-mail is a means of communication and you should be always respectful in your writings. I reserve the right to either answer your query via e-mail (within 24 hours after receiving it) or in person (by asking you to set up an appointment to meet later on).

Outline

Heteroskedasticity (Chapter 8)

1) Consequences of Heteroskedasticity for OLS.
2) Heteroskedasticity- Robust Inference after OLS Estimation.
   i. Computing Heteroskedasticity- Robust LM Tests.
3) Testing for Heteroskedasticity.
4) Weighted Least Squares Estimation.
   i. The Heteroskedasticity Is Known up to a Multiplicative Constant.
   ii. The Heteroskedasticity Function Must Be Estimated: Feasible GLS.
   iii. What If the Assumed Heteroskedasticity Function Is Wrong?

5) The Linear Probability Model Revisited.

More on Specification and Data Issues (Chapter 9)

1) Functional Form Misspecification.
   a. RESET as a General Test for Functional Form Misspecification.
   b. Tests against Nonnested Alternatives.
2) Using Proxy Variables for Unobserved Explanatory Variables.
   a. Using Lagged Dependent Variables as Proxy Variables.
   b. A Different Slant on Multiple Regression.
3) Models with Random Slopes.
4) Properties of OLS under Measurement Error.
   a. Measurement Error in the Dependent Variable.
5) Missing Data, Nonrandom Samples, and Outlying Observations.
   a. Missing Data.
   b. Nonrandom Samples.
   c. Outliers and Influential Observations.
6) Least Absolute Deviations Estimation.

Pooling Cross Sections across Time: Simple Panel Data Methods (Chapter 13)

1) Pooling Independent Cross Sections across Time.
   i. The Chow Test for Structural Change across Time.
2) Policy Analysis with Pooled Cross Sections.
3) Two-Period Panel Data Analysis.
   i. Organizing Panel Data.
4) Policy Analysis with Two-Period Panel Data.
5) Differencing with More Than Two Time Periods.
   i. Potential Pitfalls in First Differencing Panel Data.

Advanced Panel Data Methods (Chapter 14)

1) Fixed Effects Estimation.
   i. The Dummy Variable Regression.
   ii. Fixed Effects or First Differencing?
   iii. Fixed Effects with Unbalanced Panels.
2) Random Effects Models.
   i. Random Effects or Fixed Effects?

Instrumental Variables Estimation and Two Stage Least Squares (Chapter 15)

1) Motivation: Omitted Variables in a Simple Regression Model.
   i. Statistical Inference with the IV Estimator.
   ii. Properties of IV with a Poor Instrumental Variable.
   iii. Computing R-Squared after IV Estimation.
2) IV Estimation of the Multiple Regression Model.
3) Two Stage Least Squares.
   i. A Single Endogenous Explanatory Variable.
   ii. Multicollinearity and 2SLS.
   iii. Multiple Endogenous Explanatory Variables.
   iv. Testing Multiple Hypotheses after 2SLS Estimation.
4) IV Solutions to Errors-in-Variables Problems.
   i. Testing for Endogeneity.
   ii. Testing Overidentification Restrictions.
6) 2SLS with Heteroskedasticity.
7) Applying 2SLS to Pooled Cross Sections and Panel Data.

Simultaneous Equations Models (Chapter 16)
2) Simultaneity Bias in OLS.
3) Identifying and Estimating a Structural Equation.
   i. Identification in a Two-Equation System.
   ii. Estimation by 2SLS.
4) Systems with More Than Two Equations.
   i. Identification in Systems with Three or More Equations.
   ii. Estimation.

Limited Dependent Variable Models and Sample Selection Corrections (Chapter 17)
1) Logit and Probit Models for Binary Response.
   i. Specifying Logit and Probit Models.
   iii. Testing Multiple Hypotheses.
   iv. Interpreting the Logit and Probit Estimates.
2) The Tobit Model for Corner Solution Responses.
   i. Interpreting the Tobit Estimates.
3) The Poisson Regression Model.
4) Censored and Truncated Regression Models.
   i. Censored Regression Models.
   ii. Truncated Regression Models.
5) Sample Selection Corrections.
   i. When Is OLS on the Selected Sample Consistent?
   ii. Incidental Truncation.