

ECON 9720 - Econometrics 2

Spring 2011

Instructor: Judex Hyppolite, Ph.D.
Office: AYSPS, room 553
Office hours: 3:15 pm - 4:30 pm on Mondays and Wednesdays or by appointment
E-mail: TBA
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Time and Location:
12:00 p.m. to 1:15 p.m., General Classroom Building, room 231
1:30 pm - 2:45pm, General Classroom Building, room 425

Course Objectives

This course is intended to be an in-depth treatment of multiple linear regressions using matrix algebra. The focus will be both on theories and empirical applications. At the end of the course students are expected to acquire the capacity to:

1. identify the appropriate model to use to answer a given economic question
2. derive the estimators
3. derive their finite sample and asymptotic properties
4. test hypotheses implied by economic theories
5. understand the consequences of the violation of key assumptions and identify possible remedies
6. implement the majority of the computations using a matrix-based programming language

Required Textbook

William Greene, *Econometric Analysis*, 6th edition, 2008

Other useful textbooks

- Davidson and Mackinnon, *Econometric Theory and Methods*
- Hayashi, *Econometrics*
- Wooldridge, *Econometric Analysis of Cross section and Panel Data*
- Johnston and Dinardo, *Econometrics Methods*
- John F. Monahan, *A Primer on Linear Models*

Software

R - Free language and environment for data manipulation

Pre-requisite

ECON 9710 or MGS 9920 or equivalent

Grading Policy

- Homework 30% (5 or 6)
- Midterm 30% (February 23rd)
- Final 40% (Section 17199: Monday, May 2, 10:45 - 13:15, Section 17200: Wednesday, April 27, 13:30 - 16:00). Please consult the exam schedule for the Spring semester at <http://www.gsu.edu/es/18448.html>

The last day to withdraw from a course is February 25th.

Policies

If you are taking this course, you are expected to follow all the rules and regulations of Georgia State University. In particular, inappropriate behavior in the classroom such as talking to a classmate, talking on cell phones, or any other action likely to disturb the overall class will not be allowed. **Please turn off your cell phones during lectures.** You can read Georgia State University student code of conduct at <http://www2.gsu.edu/~wwwdos/codeofconduct.html>.

We will follow the policy of GSU on Academic Honesty. Students are responsible to go through relevant information on the university's website (<http://www2.gsu.edu/~wwwfhb/sec409.html>).

If, under some extraordinary circumstances (such as accidents, illness), you have to miss an exam, and if you contact me by phone or by e-mail before the exam, you may get my approval for missing the exam **provided that you send me appropriate documents proving that it was impossible for you to take part in the given exam.** If you are not physically able to inform me before the exam, you have to do so (possibly via a third party) before the next class following the exam; otherwise, you will automatically get a zero for the missed exam. Approval will not be given for missing the final exam unless you can prove that you were hospitalized or you had some major health problem that impaired your physical ability to attend the exam. Students who miss an exam with my approval will have the grade of their final exam adjusted to take account of the missed exam. If the missed exam is the final exam the student will have to make arrangements with me to take a make up exam. If it is impossible for the student to take the make up exam before the official date for the submission of the final grades, the student will receive the grade of incomplete (I) and will have to make arrangements to take the exam within the period specified by the university rules.

Tentative Course Outline

Week 1 (chapters 1,2,3)

- (a) Classical linear regression model
- (b) Assumptions
- (c) Least square algebra

Week 2 (chapters 4, 5: 5.1-5.3)

- (a) Finite sample properties of OLS estimators.
- (b) Gauss-Markov theorem
- (c) Small sample tests
- (d) Bootstrap

Week 3 (chapter 4)

- (a) Asymptotic properties of OLS estimators
- (b) Asymptotic tests
- (c) Delta method

Week 4 (chapter 16: 16.1 - 16.6)

- (a) Maximum likelihood estimation
- (b) Likelihood ratio test, Wald test and Lagrange multiplier test

Week 5 (chapter 6)

- (a) Functional form
- (b) Test of non-linear restrictions

Week 6 (chapter 7)

- (a) Overfitting and underfitting
- (b) Data problems (Multicollinearity, autocorrelation)
- (c) Heteroskedasticity

Week 7 (chapter 8)

- (a) Generalized linear model
- (b) Midterm (February 23rd)

Week 8 (chapter 10)

- (a) Seemingly unrelated regression

Week 9 (chapter 12)

- (a) Endogeneity

- (b) Simultaneous equations models
- (c) Instruments
- (d) Generalized method of method of moments (GMM) and Instrumental variable estimation (IV)

Week 10 (chapter 15: 15.1-15.4)

- (a) Large sample properties of GMM
- (b) EMM

Week 11 (chapter 15: 15.5 - 15.7)

- (a) Small sample properties of GMM
- (b) Inference

Week 12

- (a) Missing observations
- (b) Expectation Maximization

Week 13 (chapter 19: 19.1 - 19.9)

- (a) Introduction to time series

Week 14

- (a) Review