E604 - Econometric Methods III
Course Information

Meetings: Fridays: 1-4 (or there abouts) p.m. in Littlefield 103.

Overview
This is the second course in the GSB’s graduate econometrics sequence. It begins with the linear regression model. It covers extensions of the linear model, including nonspherical errors and instrumental variables. The nonlinear regression model is introduced, as are generalized method of moments and maximum likelihood estimators. We will devote substantial time to discussing computational issues and inference procedures.

This course has E603, E270 or permission of the instructor as a prerequisite. I realize that there will be considerable variance in the population distribution of student backgrounds. I will deal with this in two ways. One is I will suggest additional problems and readings as we go. If you feel you have a good background, consider these additional readings and problems mandatory. For students who feel less comfortable, you too have extra work. Where possible you should struggle with more examples and perhaps be reading a second text (e.g., Greene).

I will emphasize practical issues associated with particular estimators and tests. There is, however, no substitute for hands-on experience. I strongly urge you to experiment and develop your own examples to make the material more tangible.
Requirements

Your grade will be determined as follows:

1. Homeworks: 40 Percent
2. Final Exam: 60 Percent

There will roughly seven or eight homeworks. The homework assignments are likely to be challenging. They will often address calculations that we do not do in class (for lack of time). Assignments are to be done individually. You are not to collaborate with others unless I indicate otherwise. The final will be during Exam Week, as scheduled by the Registrar. It will be three hours, open books and open notes.

Computing

You are expected to be literate in the basics of Unix, enough to use a text editor and Matlab, S+, or Gauss. I prefer that you use Matlab or Gauss. There is a course Web page which can be accessed through my Web page (listed above) by clicking on courses.

Logistics, Readings and Course Outline

The course currently is scheduled to meet Friday afternoons from 1-4. We might consider changing both the time slot and once-weekly meetings at our second class meeting.

I have attached a preliminary course outline based on the once per week schedule and a set of assumptions about what you learned in E603. The required text is:


I will hand out outline revisions and additional readings as we go. You must do the required readings. You are urged to go beyond what is required as interest arises. I plan to assemble readings from journal articles and a few textbooks. The following texts may complement what is in Hayashi. They have been placed on reserve in Jackson Library.


Preliminary Course Outline

**Sessions 1 and 2.** Review of the Linear Regression Model

*(Hayashi 1-46, 60-87 and/or Greene Sections 6.1-6.9.)*

A Tale of Two Applied Models
The Classical and Neo-classical Linear Models
  Comparison
  Analysis of Assumptions
The Estimator
  Digression on Projection Operators
  Small Sample Properties
  Fit
  Testing
  Outliers
Some Violations of the Classical Assumptions

**Session 3 and 4.** Large Sample Properties of Linear Estimators

*(Hayashi 88-149 and/or Greene 9.1-9.4.)*

Review(?) of Asymptotic Theory
  Laws of Large Numbers
  Central Limit Theorems
  Continuous Mapping Theorem
  Expansions
  Framework for Extremum Estimators

Large Sample Distribution of OLS
  Time Series Issues
Testing
Back to Model Violations and GLS
  Conditional Heteroscedasticity
  Autocorrelation
  Feasible GLS
Informal assignment for Session 2. (You are not required to turn this assignment in for grading, but you must do it.)

1. Read Hayashi Section 1.7 carefully. Make sure you could explain in class under what conditions OLS is appropriate for (1.7.4). In particular, come prepared to explain why we would not make log(Q) the dependent variable and log(TC) the independent variable.

2. Be prepared to interpret the economic meaning of the OLS estimates of (1.7.4) Prepare answers to (b)-(h) on pages 77-81.

3. How do your estimates of (1.7.4) change if you omit the fuels prices? How would you know whether the omission was a problem?