ECO671: Topics in Applied Econometrics.
Spring 2003

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Course Description: This course discusses statistical methods applied to micro data to test economic hypotheses. Starting with a review of the classical linear model and hypothesis testing, the course will proceed to more advanced econometric methods for addressing specific problems generated by either the nature of the data or the economic relationships being examined. The course will develop your econometric skills in several ways. First, several commonly used models will be discussed in class, and you will read corresponding textbook treatments. Second, you will be asked to solve problems and interpret results associated with the models discussed. Third, to assist in the development of your modeling, computer, and interpretative skills, you will apply some of the techniques to data that I provide. This work could be assigned individually or as team projects. The topics to be covered, relevant reading material, and the grading process are described below.

TOPICS AND READINGS

The abbreviations used in listing the readings are as follows:


I. The Linear Model (3 days)
   (PR Appendix 4.3, Ch. 5.2-5.4; Appendix 5.1; Appendix 6.1)
   The classical linear model.
   Biases: Omitted variables, errors in variables.
   Hypothesis testing: multiple parameter restrictions.
   Dummy variables: intercepts, slopes.
   Generalized Least Squares

II. Simultaneous Equations Models. (2 days)
   [PR, Ch. 11, including appendix.]
   Simultaneous Equations Bias.
   The identification problem -- rank and order conditions.
   Estimation Methods -- two and three stage least squares, instrumental variables.
   Testing exogeneity -- the Hausman test.*
III. Maximum Likelihood Estimation. (2 days)
   [MD1, p. 171-181.]
   The Likelihood Function.
   Properties of Maximum Likelihood Estimators.
   The gradient and information matrix.
   Numerical Optimization Methods.
   The likelihood ratio test.

IV. Qualitative Dependent Variable Models (3 days)
   [GR 635-647, 664-675]
   Dichotomous choice: the linear probability model, probit, and logit.
   Multiple choice models: multinomial logit and probit.
   Ordered probit.*

V. Limited Dependent Variable Models (3 days)
   [GR p. 682-696, 706-714.]
   Truncation: the Tobit model.
   Censored regression and sample selection bias: the Heckit model.

VI. Panel Data (2 days)
   [GR Ch. 16]
   Fixed and random effects models.

VII. Special Topics (Readings to be provided.)*
   Quantile Regressions
   Duration models

[* indicates that these topics will be covered only if time permits.]

Grades. Your grades will be based on 3 class assignments, 2 midterm exams, and a final exam. The exams will each cover approximately one third of the course. Exam dates will be announced at least one week in advance. The class is scheduled to finish on 3/20. The final exam will be held the following week. There will be one graded assignment for each one-third of the course. Each assignment will have computer based and/or analytical problems.

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Computing: This course will require that you become familiar with STATA to estimate several of the econometric models we discuss. I will hold a lab session early in the semester to show you some of the basics of the program. As time goes by, you will be expected to search through the on-line manual to figure out the necessary routines as they are assigned for homework problems.