

ECO671: Topics in Applied Econometrics. Spring 2007

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Course Description: This course reviews a range of statistical methods that have been developed for testing economic hypotheses with micro level data. 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 generation process or the economic relationships being examined. The course will develop your econometric skills in several ways. First, the course will review several econometric models and in each case discuss the type of data the model is best suited for, how to test hypotheses, and the shortcomings. 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 use Stata to analyze data. The topics to be covered, relevant reading material, and the grading process are described below.

TOPICS AND READINGS

Readings will be selected from two books primarily:

PR: Robert Pindyck & Daniel Rubinfeld, *Econometric Models and Economic Forecasts*, Fourth Edition.

W: Jeffrey Wooldridge, *Introductory Econometrics: A Modern Approach*.

Additional readings will be assigned as needed.

I. The Linear Model (3 days)

The classical linear model. (PR appendix 4.3)

Hypothesis testing: multiple parameter restrictions (PR Ch. 5)

Dummy variables: intercepts, slopes.

Biases: Omitted variables, errors in variables, instrumental variables
(PR Ch. 7.1-7.3, appendix 7.1)

Generalized Least Squares (PR app 6.1)

II. Simultaneous Equations Models. (2 days)

[PR Ch 12, including appendix; W Ch 15]

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.*

Testing over-identifying assumptions.*

III. Maximum Likelihood Estimation. (2 days)

[PR Ch 10.2]

The Likelihood Function.

Properties of Maximum Likelihood Estimators.

The gradient and information matrix.

Numerical Optimization Methods.

The likelihood ratio, Wald, and Lagrange multiplier tests.

IV. Qualitative Dependent Variable Models (3 days)

[PR Ch 11, W Ch. 17.1-17.2]

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)

[W 17.3-17.5]

Truncation: the Tobit model.

Censored regression and sample selection bias: the Heckit model.

Treatment Effects Models.*

VI. Panel Data (2 days)

[W: Ch. 13, 14]

Fixed and random effects models.

VII. Special Topics (Readings TBA)*

Quantile Regressions

Duration models

Bootstrapping

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

Grades. Your grades will be based on 4 class assignments, a midterm exam, and a final exam. Each exam will cover approximately one half of the course. Exam dates will be announced at least one week in advance. The class is scheduled to finish on 3/22. The precise date of the final exam is yet to be determined. There will be two graded assignments for each one-half of the course. Each assignment will have computer based and/or analytical problems and may be assigned to teams of 2-3. The quality of your class participation will influence marginal grade decisions.

Midterm Exam	35%
Final	35%
Assignments	30%

Computing: This course requires that you become familiar with several aspects of STATA to estimate some of the econometric models we discuss. 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.