

ECO671: Topics in Applied Econometrics.

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Course Description: This course discusses statistical methods applied to micro data to test economic hypotheses. Starting with a brief review of the classical linear model and hypothesis testing, the course will proceed to more advanced econometric methods that have been developed 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 on the next page.

TOPICS AND READINGS

The abbreviations used in listing the readings are as follows:

GR: William Greene, *Econometric Analysis*, Second Edition.

MD1: G.S. Maddala, *Econometrics*, First Edition.

MD2: G.S. Maddala, *Introduction to Econometrics*, First Edition.

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

HS: Cheng Hsiao, *Analysis of Panel Data*, First Edition.

GHJ: Wm. Griffiths, R. Carter Hill, and George Judge, *Learning and Practicing Econometrics*.

With the exception of GHJ, all readings will be on reserve at King library.

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. (3 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 for simultaneity.

Seemingly Unrelated Regressions.

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 -- Newton/Raphson, Scoring.

The likelihood ratio test.

IV. Qualitative Dependent Variable Models (3 days)

[PR, p.248-281; GR 635-647, 664-675, .]

Dichotomous choice: the linear probability model, probit, and logit.

Multiple choice models: multinomial logit and probit.

*Ordered probit.

*Bivariate probit model.

V. Limited Dependent Variable Models (3 days)

[GR p. 682-696, 706-721.]

Truncation: the Tobit model.

Censored regression and sample selection bias: the Heckit model.

Hazard models and duration data.

VI. Panel Data (2 days)

[GR Ch. 16; HS Ch. 1, 3 & 6]

Advantages of panel data.

Fixed effects models.

*Random effects models.

*Variable coefficient models.

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

GRADES

Your grades will be based on 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 final exam for this course will be held after 10 weeks of course work. This means that the final exam will be during the week that starts with 3/29/98. There will be at least one graded assignment for each third of the course. Each assignment will have computer based and/or analytical problems.

Exam 1	25%
Exam 2	25%
Final	25%
Assignments	25%

Computing: This course will require that you become familiar with one or more statistical packages. I will provide you with data and some basic information necessary to get started. However, I expect you to be willing to search through the necessary computer manuals to figure out some of the necessary details.