

Syllabus
Introduction to Econometrics - Economics 4818-001 - Fall 2005
MWF 2:00-2:50 - ECON 117

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Hours: Monday 9-11; Thursday 2-3:30
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Introduction

Economics 4818 is a course in introductory econometrics, designed to provide you with the theoretical tools and practical experience necessary to do applied econometric research. The prerequisite for this course is a previous course in economic statistics such as Economics 3818. The essential background in probability and statistics is also reviewed in Chapter 2 of our text.

You will be actively involved with computer exercises in this course using the Eviews econometrics program, available in the Economics Computer Lab. Throughout the course you will use Eviews to implement a series of econometrics exercises designed to provide experience with various tests and estimation procedures. The instructions for these exercises and the data required for their implementation are posted on our WebCT site. In addition to these exercises, you will complete your own applied econometrics project as described below. It is not required that you use Eviews if you prefer another program. However, Eviews is extremely easy to use, yet relatively powerful in terms of the variety of econometrics tests and procedures it can perform. It is also possible to purchase a student version of Eviews that is capable of implementing most of the assignments in this course (see www.eviews.com for more information).

Evaluation

Your grade in this course will be based on three components. There will be two hourly exams and a final exam, each counting towards 20% of the course grade. The individual econometrics project counts towards 30% of your final grade. The remaining 10% of the grade is based on the econometrics lab exercises. You may work on these exercises in teams and submit one set of results and answers for the group. Late or seriously incomplete exercises will only receive half credit. I will also encourage you to work problems throughout the course, although these will not be submitted for evaluation. However, working problems and doing the computer exercises are both essential to learning econometrics and to succeeding on the examinations.

Individual Econometrics Projects

Throughout your training in economics you have been presented with theoretical or empirical relations among economic variables. A fundamental example is a demand function, which expresses the quantity of a good demanded as a function of its price, the price of alternatives, and consumer incomes. If we have data on these four variables over time, then regression analysis can be used to estimate the elasticities of this demand function. The regression model can also be used to perform statistical tests on the elasticities (e.g., is demand inelastic?), or to project future levels of demand conditional on assumed levels of the explanatory variables. There are numerous statistical problems that can arise in the estimation of a model such as this, and the field of econometrics is concerned with procedures for testing whether such problems exist and developing treatments for these problems.

Your assignment is to construct an econometric model of a functional relation that is interesting to you, collect the relevant data, and estimate the model dealing with possible statistical problems that might arise. You can find ideas for possible projects from examples in our text or in the econometrics lab projects, from questions that are raised in other economics classes, or from economics journals that publish applied econometric research, such as *The Review of Economics and Statistics*, *Applied Economics*, *The Journal of Applied Econometrics*, and various journals in the applied fields of economics. See the Project Aids module on our WebCT site for further ideas, sample student papers from previous semesters, and links to electronic sources.

I will impose very few restrictions on the nature of this project; the application does not necessarily have to be an economic relation. However, there are some projects that are likely to be less suitable than others, because of unavailable data or lack of interesting testable hypotheses. Therefore, to guarantee that you are on the right track with a project, you are required to submit a one or two page project proposal on or before October 17. Your proposal should (1) identify the topic you will investigate and general questions to be addressed, (2) sketch a tentative model to be estimated, including the relevant variables in the model, (3) cite at least two papers that present a similar econometric model, and (4) identify your data sources, the nature of the sample (time series or cross section), and the number of observations. In your proposal be clear what your units of measurement will be. For example, if you were to propose a model of wage determination, would you observe wages of individuals at a point in time, or would you model average wages in the US over time, or possibly average wages of states observed across states? Clear thinking about this issue is vital to developing a reasonable econometric model.

I realize that some of the pieces of the proposal may be incomplete or tentative, but you should submit your proposal on October 17 in any case. Failure to submit a proposal by October 17 will result in a five point deduction from your final project score. I will try to respond to all proposals indicating whether your idea is reasonable and to make any suggestions that I can.

Once we have agreed on a project, you should collect the data and begin estimation. You will probably want to try several alternative specifications of your model, and you will undoubtedly encounter various statistical problems. An important part of the project is the testing and treatment of these various econometric problems, using procedures presented in the course. You should document your use of these procedures by submitting the relevant computer output with your paper.

The write-up summarizing your project should follow the format of empirical articles in economics journals. Typically, these papers include:

1. Overview of the research question; statement of objectives, hypotheses to test.
2. Presentation of theory and review of relevant theoretical work.
3. Discussion of related empirical work in the area; critique of this work and statement of how your research is a contribution.
4. Specification of model to be estimated; variable definitions; data sources.
5. Presentation of estimation results; estimated equations and summary statistics; diagnostic test statistics; discussion of tests and procedures for dealing with econometric problems
6. Substantive conclusions; implication of your results for theory and policy; comparison with other empirical results.

Your final paper is due on Monday, December 5. Be sure to include supporting computer

output, guiding me through this morass of paper in the text. Late papers will be penalized by 10 percentage points if I receive it by December 12, and by 20 percentage points if it is any later.

Text. Ramanathan, Ramu, *Introductory Econometrics with Applications*. (Fifth edition) Harcourt, 2002.

Readings and Assignments

I. Introduction to regression and Eviews.

Reading: Introduction; Chapter 1.

Computer exercise 1: (Introduction to Eviews). Due 9/2

II. Classical two-variable regression model; properties of estimators; hypothesis testing..

Reading: Chapters 2 and 3.

Exercises 3.5, 3.16, 3.22, 3.23, and Practice Exercises on Expectation (on WebCT under Exercises module)

Computer exercise 2: (Industrial Profits: Basic Regression). Due 9/9

III. Multiple regression: estimation, hypothesis testing.

Reading: Chapter 4, sections 4.1-4.4

Exercises 4.1, 4.8, 4.12, 4.16

Computer exercise 3 (Production Function) Due 9/21

First hourly examination: September 26

IV. Multicollinearity; Specification error.

Reading: Chapter 4, sections 4.5-4.9 and Chapter 5.

Exercises 5.1, 5.2, 5.4, 5.9

V. Alternative functional forms.

Reading: Chapter 6.

Exercises 6.2, 6.8, 6.15

Project Proposals Due: October 17

VI. Dummy variables.

Reading: Chapter 7.

Computer Exercise 4 (Dummy variables). Due 10/19

Second hourly examination: October 24

VII. Single equation problems of regression: heteroscedasticity, autocorrelation.

Reading: Chapters 8, 9

Exercises 8.4, 8.6, 8.9, 8.11, 8.22; 9.2, 9.8,

Computer exercise 5 (Education expenditures: heteroscedasticity). Due 11/4

Computer exercise 6 (Female labor supply: autocorrelation). Due 11/14

VIII. Qualitative choice and limited dependent variable models

Reading: Chapter 12

Computer exercise 8 (Discrete choice). Optional

IX. Simultaneous equations models

Reading: Chapters 13

Simultaneous equations exercises (on WebCT under Exercises module).

Computer exercise 7 (Two-stage least squares) Due 11/30

X. Dynamic models, unit roots, and cointegration; Pooling (Panel data)

Reading: Chapters 10

Computer exercise 9 (unit root testing). Optional

Computer exercise 10 (pooling). Optional

Projects Due: December 5

Final examination: Saturday December 10, 1:30-4:00 pm.