FACULTY OF
BUSINESS AND ECONOMICS

MACQUARIE
UNIVERSITY

ECON840
Applied Econometrics I

Semester 1,   2010

Department of Economics

Unit: ECON840 Applied Econometrics 1
Year and Semester: 2010, semester 1
Unit Convenor: Dr Daehoon Nahm

Students in this unit should read this unit outline carefully at the start of semester. It contains important information about the unit. If anything in it is unclear, please consult one of the teaching staff in the unit.

1. About This Unit

This unit introduces statistical techniques used by economists in the analysis of economic and financial data. Topics covered include descriptive statistics, probability distributions, sample statistics and sampling distributions, point estimation and interval estimation, hypothesis testing and regression analysis. The unit material includes elementary discussions of violations of the standard assumptions and the functional forms of a regression model.

 ECON840 caters for students who previously have had only minimal exposure to mathematical and statistical theory. Starting from first principles, standard econometric methods will be outlined to the extent necessary for students to understand key concepts, apply basic methods, and interpret empirical research results in economics, finance and business.

2. Teaching Staff

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3. Classes

There is a single 3 hour class per week, each week of semester. The timetable for classes can be found on the University web site at: http://www.timetables.mq.edu.au/ . Class attendance is not compulsory and will not be recorded. However, students who miss classes put themselves at a considerable disadvantage for several reasons, including:

1) Not all of the material in the text is covered in the unit, and not all the unit material is covered in the text. In some places the text deals with issues in greater depth than is necessary for the unit, and in other places it doesn't go far enough. The lectures contain all the unit material taught at the level that is required for successful completion of the assessment tasks, and they are your guide to the content of the unit.
2) The approaches to some problems that are recommended by the lecturers are different to those in the text.

3) The lectures will include significant guidance about the style and content of the final exam and recommendations about study technique.
4) It is difficult (and often impossible) for staff to provide meaningful assistance to students outside class times on topics for which they did not attend the relevant lectures and tutorials.

It should be noted that class attendance is only one part of university study. In addition to class attendance, students will need to spend around six to nine hours per week in private study in order to perform well in the unit.

4.   Required and Recommended Texts and/or Materials

The prescribed text for the unit is

Gujarati, D. N. (2009) Essentials of Econometrics 4th ed., McGraw-Hill.

The software used in this unit is **gretl**.

The Windows version may be freely downloaded from http://gretl.sourceforge.net/win32/. For Mac/OS X version see http://gretl.sourceforge.net/osx.html.

5.   Unit Web Page

Publically available information for this unit can be found at:
http://www.econ.mq.edu.au/postgraduate_programs/units/econ840,

while the other course material and announcements for students enrolled in the course can be accessed from http://learn.mq.edu.au.

6.   Learning Objectives and Outcomes

The learning objectives of this unit are that successful students will understand the principles of econometrics, will be able to apply basic econometric techniques to applied problems, will be able to interpret empirical research results, and will be able to appreciate the relevance and limitations of the econometric methods they use. Students will also have the opportunity to develop their numeracy and computational skills as well as to develop general skills of critical analysis and problem-solving.

7.   Learning and Teaching Strategy

This unit is taught as a traditional lecture course. Students should attend class and read the relevant parts of the text each week. Tutorial exercises will be set and made available from the unit homepage throughout the semester. The solutions to these exercises will be discussed in class. Students should attempt all the exercises before they are covered in class. The text also

contains many examples and exercises which students should work through as part of their private study.

The following topics are covered in the unit:

Topic 1: Introduction
- What is econometrics?
- Methodology of econometrics
- The summation operator
- Numerical summary of data
- Graphical summary of data

Topic 2: Random Variables and Probability Distributions
- Random variables
- Probability distribution for discrete random variables
- Probability distribution for continuous random variables
- Joint, marginal and conditional probabilities
- The expectation operator
- Variance and covariance
- Population and sample

Topic 3: Some Important Probability Distributions
- Normal distribution
- Student's t distribution
- Chi-square distribution
- F distribution
- Sampling distribution of the sample mean
- Central limit theorem

Topic 4: Point Estimation and Interval Estimation
- Desirable properties of a point estimator
- Confidence intervals

Topic 5: Hypothesis Testing
- Concepts of hypothesis testing
- Test procedure
- Interpretation of a test result
- Types of errors
- Significance level and power of a test
- p-value method
- Confidence intervals and hypothesis testing

Topic 6: Regression Analysis
- Linear correlation and regression
- Simple regression and multiple regression
- Standard assumptions of linear regression models
- Ordinary Least Squares (OLS) estimation
- The Gauss-Markov theorem
- Population regression and sample regression
- Goodness of fit
- Reporting the results
- Interpretation of individual coefficients
- Confidence intervals and hypothesis tests for individual coefficients
- Tests on sets of regression coefficients
- Prediction

Topic 7: Other Issues
- Functional forms of the regression model
- Diagnostic checking (heteroscedasticity and autocorrelation)
- Stationarity of time-series data

8. Assessment

8.1 The Assessment Tasks and their Weighting

- Mid-semester test 20%
- Assignment 20%
- Final Exam 60 %

In order to be considered for a passing grade in the unit, students MUST PASS THE FINAL EXAM. This means that students who fail the final exam will not pass the unit, irrespective of their performance in the other assessment tasks.

8.2 The Mid-Semester Test

The mid-semester test will be held on Monday 29th of March (Week 6) at 6pm in class. It will be a multiple choice test of less than one hour duration. The main purpose of the mid-semester test is to provide students with early feedback on their performance in the unit.

Students who are prevented from sitting the test due to illness or misadventure may apply for special consideration. If special consideration is granted, this component will not be counted in deciding the final grade. No supplementary test will be available.

8.3 The Assignment

The assignment question will be distributed after the start of semester. The completed assignment must be submitted to the assignment box at Business and Economics Student Services (BESS) by 6pm on Monday 24th May (Week 12). The assignment question sheet will include instructions that must be followed closely. Late assignments will be accepted if they are submitted before the day of the final exam, but will be penalised at a rate of ten marks per day. There are no set minimum or maximum lengths for the assignment. However, assignments should be complete and concisely written.

8.4 The Final Exam

A two hour final examination for this unit will be held during the University examination period. The University examination period in first half year 2010 is from 7th June to 25th June. You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in draft form approximately eight weeks before the commencement of the examinations and in final form approximately four weeks before the commencement of the examinations. The draft and final timetables will be available from http://www.timetables.mq.edu.au/exam.

Students who do not sit for the final exam will be awarded a grade of FA (failed absent). The only exception to this rule will occur in cases where the student has been granted special consideration on the grounds of unavoidable disruption. Students who are prevented from sitting the final exam due to illness or unavoidable disruption may wish to consider applying for special consideration. Information about unavoidable disruption and the special consideration process is available at http://www.reg.mq.edu.au/Forms/APSCon.pdf. If a supplementary examination is granted as a result of the special consideration process the examination will be scheduled after the conclusion of the official examination period. If the student does not attend the supplementary examination at the scheduled time, a grade of FA will be awarded.

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, the final day of the official examination period.

8.5 Relationship Between Assessment and Learning Outcomes

The assessment tasks will evaluate the extent to which students have satisfied the learning objectives listed in Section 6 by requiring them to correctly answer questions about the unit material.

9.   Plagiarism

Plagiarism involves using the work of another person and presenting it as one's own. Plagiarism is a serious breach of the University's rules and carries significant penalties. You must read the University's practices and procedures on plagiarism. These can be found in the Handbook of Undergraduate Studies or on the web at http://www.student.mq.edu.au/plagiarism. The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if you are found guilty. Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Discipline Committee.

10.   Student Support Services

Macquarie University provides a range of Academic Student Support Services. Details of these services can accessed at
http://www.futurestudent.mq.edu.au/undergraduate/AccessingStudentSupport/index.html.