MACQUARIE UNIVERSITY
FACULTY OF BUSINESS AND ECONOMICS
UNIT OUTLINE

Unit: ECON634 Econometrics & Business Statistics
Year and Semester: 2012, Semester 2
Unit Convenor: Daehoon Nahm
Credit Points: 4

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.

About This Unit

This is an introductory postgraduate econometrics unit that is designed for students with no background in econometrics. The unit is a prerequisite for econometrics electives in the postgraduate program. Starting from first principles, the unit outlines standard econometric methods to the extent necessary for students to understand key concepts, apply basic methods, and interpret empirical research results in economics, finance and business.

Topics covered include descriptive statistics, probability distributions, sample statistics and sampling distributions, point estimation and interval estimation, hypothesis testing and an introduction to regression analysis. The unit material also includes an elementary discussion of violations of the standard assumptions for a regression model.

Teaching Staff

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Contacting Staff

Consultation Times:
Wednesday 3 – 4, and
(Tuesday 1:00 – 3:00: This consultation time is mainly for ECON241 students.)

Students are encouraged to seek help from a staff member during their regular consultation hours. In special circumstances, an appointment may be made outside regular consultation hours. For short questions, students may utilise the online discussion forum or email. Staff will check ongoing discussions regularly and provide relevant comments if necessary. If a query is explicitly directed toward teaching staff, staff will provide an answer online as long as doing so is feasible.
**Classes**

There is one 3-hour class each week (**Wednesday, 9 am – 12 pm, in E4B 214**). 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 texts is covered in the unit, and not all the unit material is covered in the texts. In some places text deals with issues in greater depth than is necessary for the unit, and in other places it doesn't go deep 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.

**Required and Recommended Texts and/or Materials**

Useful references include:


**Technology Used and Required**

1) Students will require a **non-programmable calculator** for tutorials, tests and the final examination.

Students will also require access to a **computer**, on which the following programs are installed.

2) **Gretl**: the software package used for econometric analysis. It is free, open-source software. Visit the Gretl website: [http://gretl.sourceforge.net/](http://gretl.sourceforge.net/), and choose the operating system of your computer from the menu on the left-hand side. Download and install the program onto the computer.

Download also the **manual** and all the **data**.
(3) An internet browser, such as Firefox and Internet Explorer, to access iLearn.

(4) Adobe Acrobat Reader: to read course material downloaded from iLearn. The program can be downloaded from http://www.adobe.com/downloads/.

**Unit Web Page**

Course material is available on the learning management system (iLearn).

Students are strongly advised to check the unit web page regularly for new material and announcements.

**Learning Outcomes**

By successfully completing this unit, students are expected to:

- understand the principles of econometrics,
- be able to apply basic econometric techniques to applied problems,
- be able to interpret empirical research results, and
- 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 the opportunity to develop general critical-analysis and problem-solving skills.

**Graduate Capabilities**

In addition to the discipline-based learning objectives, all academic programs at Macquarie seek to develop the capabilities the University’s graduates will need to develop to address the challenges, and to be effective, engaged participants in their world.

This unit contributes to this by developing the following graduate capabilities:

1. Numeracy and computational skills
2. Critical, analytical and integrative thinking
3. Problem-solving and research capability

**Learning and Teaching Activities**

This unit is taught as a traditional lecture course. Students should attend class and read the relevant parts of texts and course material each week. Exercise questions will be set and made available on the unit homepage throughout the semester. Students should attempt all the exercises by themselves. Solutions to the exercise questions will be provided. The recommended texts also contain many examples and exercises which students should work through as part of
their private study. Students may ask any questions arising from exercises in class.

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

Research and Practice

- This unit uses research from both internal and external sources.
- This unit gives you practice in applying research findings in your exercises.

Assessment Tasks and Their Weighting

Assessment will be based on the three tasks listed below.

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

(1) The Mid-Semester Test

The mid-semester test will be held on Wednesday 5th of September (Week 6) at 10:50 am in the usual class. It will be a multiple-choice test of less than one hour’s duration. The main purpose of the mid-semester test is to provide students with an opportunity to review the material covered up to Week 5 and check if their approach to study is appropriate.

Absence from the test will result in a zero mark for the component unless special consideration is granted. 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.
(2) The Assignment

The assignment questions will be made available at the unit web page about three to four weeks before the due date. The completed assignment must be submitted to the lecturer at the beginning of the lecture on the due date (Wednesday 24 October 2012 – Week 11). The assignment question sheet will include instructions that must be followed closely. Late assignments will be accepted, 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 concise.

(3) The Final Exam

A two hour final examination for this unit will be held during the University examination period. The University examination period in Semester 2 of 2012 is from 12 November to 30 November. 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 for 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.

Relationship Between Assessment and Learning Outcomes

The purpose of the assessment tasks within this unit is to assist you in achieving the learning objectives and graduate capabilities set out. These tasks are also used to determine your final grade for this course.

The assessment tasks will evaluate the extent to which students have satisfied the learning objectives listed above by requiring them to correctly answer questions about the unit material.
### Academic Honesty

The nature of scholarly endeavour, dependent as it is on the work of others, binds all members of the University community to abide by the principles of academic honesty. Its fundamental principle is that all staff and students act with integrity in the creation, development, application and use of ideas and information. This means that:

- all academic work claimed as original is the work of the author making the claim
- all academic collaborations are acknowledged
- academic work is not falsified in any way
- when the ideas of others are used, these ideas are acknowledged appropriately.

Further information on the academic honesty can be found in the Macquarie University Academic Honesty Policy at [http://www.mq.edu.au/policy/docs/academic_honesty/policy.html](http://www.mq.edu.au/policy/docs/academic_honesty/policy.html)

### Grades

Macquarie University uses the following grades in coursework units of study:

- HD – High Distinction
- D – Distinction
- CR – Credit
- P – Pass
- F – Fail

Grade descriptors and other information concerning grading are contained in the Macquarie University Grading Policy, which is available at: [http://www.mq.edu.au/policy/docs/grading/policy.html](http://www.mq.edu.au/policy/docs/grading/policy.html)

### Grading Appeals and Final Examination Script Viewing

If, at the conclusion of the unit, you have performed below expectations, and are considering lodging an appeal of grade and/or viewing your final exam script please refer to the following website which provides information about these processes and the cut-off dates in the first instance. Please read the instructions provided concerning what constitutes a valid grounds for appeal before appealing your grade.


### Special Consideration

The University is committed to equity and fairness in all aspects of its learning and teaching. In stating this commitment, the University recognises that there may be circumstances where a
A student is prevented by unavoidable disruption from performing in accordance with their ability. A special consideration policy exists to support students who experience serious and unavoidable disruption such that they do not reach their usual demonstrated performance level. The policy is available at:  
http://www.mq.edu.au/policy/docs/special_consideration/policy.html

**Student Support Services**

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at http://www.student.mq.edu.au

**IT Condition of Use**

Access to all student computing facilities within the Faculty of Business and Economics is restricted to authorised coursework for approved units. Student ID cards must be displayed in the locations provided at all times.

Students are expected to act responsibly when using University IT facilities. The following regulations apply to the use of computing facilities and online services:

- Accessing inappropriate web sites or downloading inappropriate material is not permitted. Material that is not related to coursework for approved units is deemed inappropriate.
- Downloading copyright material without permission from the copyright owner is illegal, and strictly prohibited. Students detected undertaking such activities will face disciplinary action, which may result in criminal proceedings.

Non-compliance with these conditions may result in disciplinary action without further notice.

Students must use their Macquarie University email addresses to communicate with staff as it is University policy that the University issued email account is used for official University communication.