MACQUARIE UNIVERSITY
DIVISION OF ECONOMIC AND FINANCIAL STUDIES

ECON233 – FINANCIAL ECONOMETRICS
Second Semester 2007

UNIT OUTLINE

1.   UNIT DESCRIPTION

This is one of the two 200-level Econometrics units currently offered in the Department of Economics. The unit introduces students to the basic statistical and econometric concepts needed to understand and criticise empirical work in finance. The unit is of particular interest to students majoring in Applied Econometrics and to Finance students who wish to strengthen their quantitative skills.

The mathematical knowledge necessary for this course (a priori) beyond arithmetic and basic algebra is the concepts of differentiation, functions, and the summation operator. The topics included are listed below.

During the course students will be required to use a spreadsheet package such as Microsoft Excel or OpenOffice Calc. Matlab, and Shazam an econometrics computer will also be used. Although the computing itself is not examinable, the ability to understand and interpret its output is. Prior-knowledge of this software is not required.

2.   PREREQUISITES

ECON233 has the following prerequisites:

> ECON232
> or
> 3 credit points from units in the range STAT270 - STAT273
> together with ECON110 or ECON111.

3. Unit Objectives

- To introduce the basic economics, statistics and computation necessary for equilibrium pricing and hedging arguments for contingent claims securities. The unit material will specifically deal with options, but has much wider applicability.

- To introduce students to concepts and models of time series processes that are relevant for the analysis of financial market data.

- To extend students' knowledge of time series econometrics beyond that taught in ECON232, and prepare them to study econometrics at the 300-level.

4. Learning outcomes

Students who successfully complete this unit will be able to:

- Understand the basic economic theory of option pricing and risk management.

- Choose and implement alternative computational procedures for option pricing and hedge parameter estimation.

- Understand basic time series concepts.

- Estimate ARIMA models

- Estimate and analyse GARCH models

- Test hypotheses about cointegration and conditional volatility

5. Generic Skills

Students who successfully complete this unit will enhance their general critical thinking skills, improve their understanding of the roles that economic, statistical and computational theories can play in the solution of practical problems, and develop their software and general computer skills.

6. Teaching and Learning Strategy

- Since the unit does not closely follow any particular textbook, it is vital that students attend all classes so that they can understand what the unit objectives and content are.

- Students should complete all tutorial exercises. Some of these will be marked and count towards the final grade.

- Students must submit an assignment and sit a mid-semester test.

- In addition to working on set exercises, students are encouraged to set their own exercises. Rather than working though prescribed exercises, it is often more interesting to choose a practical application of the unit material and work through it. The internet has many sources of free, up-to-date financial market data which students can utilise. Staff are happy to discuss these applications with students.

- Students should attend all classes and devote considerable effort to the tutorial work and the assignment. It should be noted however, that private study is a

large component of learning at university. In total, it is expected that the average student would spend around 12 hours per week working on ECON233.

7. TEXT AND REFERENCE BOOKS

The unit does not follow any single textbook closely. However, the following recommended texts will be useful for many parts of the unit.

Brooks, Chris
Introductory Econometrics for Finance
Cambridge University Press
and/or

Watsham, Terry J. and **Parramore,** Keith
Quantitative Methods in Finance
International Thomson Business Press

Gujarati, Damodar N.
Basic Econometrics
3rd edition, McGraw-Hill

References to the following texts will also be given where appropriate:

Cuthbertson, Keith
Quantitative Financial Economics, Stocks, Bonds and Foreign Exchange
John Wiley,1996

Ramanathan, Ramu
Introductory Econometrics with Applications
3rd edition, Dryden Press

Pindyck, Robert S. and **Rubinfeld**, Daniel L.
Econometric Models and Economic Forecasts
3rd edition, McGraw-Hill

Reading material will also be available from the unit web site and from the Library e-Reserve.

8. LECTURE TOPICS

Week 1: Introduction to options, Risk-neutral valuation

Week 2: Lattice methods

Week 3: Lattice methods

Week 4: Lattice methods

Week 5: Monte Carlo methods

Weeks 5 and 6: Inference in Multiple Regression Models
  (Brooks, chapters 1-4)
  (Gujarati, chapters 1-8, 10-13)
  (Watsham & Parramore, chapters 5 and 6)
Application: The Capital Asset Pricing model

Week 7: ARIMA Models
  (Brooks, chapter 5)
  (Gujarati, chapters 21, 22)
  (Watsham & Parramore, chapter 7)
Applications: Stylised facts of financial returns.

Week 8: Class Test and ARIMA Models
  (Brooks, chapter 5)
  (Gujarati, chapters. 22)
  (Watsham & Parramore, chapter 7)

Weeks 9 and 10: Trends and Unit Roots, Tests of the Random Walk Hypothesis and Cointegration
  (Brooks, chapter 7)
  (Gujarati, chapters 21, 22)
  (Watsham & Parramore, chapter 7)

Weeks 11, 12 and 13 : Volatility and Applications of ARCH and GARCH models in Forex and Stock returns
  (Brooks, chapter 8)
  (Gujarati, chapter 12)
Applications: Volatility tests for efficiency and bubbles in financial markets.

9.   ASSESSMENT

The format for assessment is as follows:

Class Test	15%
Assignment	15%
Tutorials	10%
Final Examination	60%

Class Test

There will be a class test in **Week 8 (Tuesday 2nd October).** It will be of *approximately* one hour duration to be held from 9.05am on the material covered in Weeks 1 - 7. Non-programmable calculators are needed.

Assignment

The Assignment is due in Week 10, Tuesday 16ᵗʰ October, by 1 pm in the ECON233 box provided in ERIC.

Tutorials
Tutorials 3, 6 and 7 will be marked. Due dates will be announced in lectures.

Final Examination

This will cover all of the material discussed in the course and will be of three-hour (plus 10 minute-reading time) duration. The schedule for this examination will be determined by the University examination section, and thus it is individual student's responsibility to find the time and venue for the examination when the information becomes available.
To pass the unit you need to pass the final examination.

10.   CLASSES

Students are expected to attend a two-hour lecture each week. Tutorials will be held on the following weeks and days:

4	August 21
5	August 28
6	September 4
7	September 11
8	October 2
9	October 9

Assignment due in Week 10, Tuesday October 16

11	October 23
12	October 30

Most tutorials will be held in room E7B-163, but some will be in the computing laboratories.
Tutorials will not necessarily be held from 11am to 12 noon, rather it will be left to the discretion of the lecturer. On weeks where no tutorial has been scheduled lectures will be held from 9 to 11am.

11.   WEB PAGE

The ECON233 web page is located on WebCT:
http://online.mq.edu.au/
On this page you will find links to the assignments, the tutes, the data sets and a bulletin board.

12. Grades

Grades will be awarded in accordance with the University's Grading Policy (http://www.handbook.mq.edu.au/PDFs/2007/ug-general-student-info.pdf, p.43). Students should note that marks will be scaled to reflect the academic judgement of the lecturer-in-charge of the performance of students with respect to the objectives and learning outcomes of the unit. Furthermore, students who do not pass the final exam will not be considered for a passing grade in the unit, irrespective of their performance in other components of the assessment.

13. Special Consideration

Students who suffer from an unavoidable, unforeseeable disruption to their studies which interrupts previously satisfactory work and significantly affects their likely final grade should consider applying for special consideration. Relevant information is available at
http://www.efs.mq.edu.au/student_support/important_processes/special_consideration

14. Appeals Against Grades

Students considering appealing against their grade in the unit should consult http://www.efs.mq.edu.au/student_support/important_processes/important_processes__grade_appeal_and_exam_script_viewing and
http://www.handbook.mq.edu.au/PDFs/2007/ug-general-student-info.pdf, p.43.

15. Lecturers

Chris Heaton (Weeks 1-5)
Office: E4A-526
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Email: cheaton@efs.mq.edu.au

Stefan Trueck (Weeks 6-9)
Office: E4A-432
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Daehoon Nahm (Weeks 10-13)
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Consultation Hours: to be announced after the lecturers' time schedules are confirmed.