# ECON334

## Financial Econometrics

S1 Evening 2019

*Dept of Economics*

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# General Information

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Credit points
3

Prerequisites
27cp at 100 level or above including (6cp at 200 level including (ECON241 or STAT272))

Corequisites

Co-badged status

Unit description
This unit is highly recommended for students majoring in economics and finance. Finance professionals use econometric techniques in portfolio management, risk management and securities analysis. This unit is intended to provide students with the tools necessary for financial applications. Statistical techniques are developed within the context of particular financial applications. Recent empirical evidence is also discussed. Although ECON232 is not a prerequisite, it is highly recommended.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

# Learning Outcomes

On successful completion of this unit, you will be able to:

Apply econometric methods to modelling, analysing and forecasting financial data.

Demonstrate and explain different estimation methodologies.

Critically evaluate empirical econometric work.

Present results to a non-technical audience in a clear and understandable manner.

# Assessment Tasks

| Name | Weighting | Hurdle | Due |
|---|---|---|---|
| Class Test | 30% | No | Week 7 |
| Individual Assignment | 30% | No | Week 11 |
| Final Examination | 40% | No | University Examination Period |

## Class Test

Due: **Week 7**
Weighting: **30%**

The class test will be held during your assigned lecture in **Week 7**. The test will consist of multiple-choice questions, and will cover all material **up to and including Week 5**. A calculator is needed for the test and attendance is compulsory. If you fail to attend the test you will be awarded a zero mark. There will be no catch-up or supplementary tests. However, for students who experience serious misadventure and are unable to attend the test should apply for special consideration with appropriate documentary evidence **within 5 working days of the test**. For those students, missed assessment will be covered by a supplementary assessment that could include an oral component, which will be two weeks after the date of the original assessment.

On successful completion you will be able to:

- Apply econometric methods to modelling, analysing and forecasting financial data.
- Demonstrate and explain different estimation methodologies.

## Individual Assignment

Due: **Week 11**
Weighting: **30%**

The assignment is due at **4pm on Friday of Week 11**. Assignments are to be submitted electronically through iLearn. Late submission: No extensions will be granted. There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late (for example, 25 hours late in submission incurs a 20% penalty). Late submissions will be accepted up to 96 hours after the due date and time. This penalty does not apply for cases in which an application for Special Consideration is made and approved. Note: applications for Special Consideration Policy must be made within 5 (five) business days of the due date and time.

On successful completion you will be able to:

- Apply econometric methods to modelling, analysing and forecasting financial data.
- Demonstrate and explain different estimation methodologies.
- Critically evaluate empirical econometric work.
- Present results to a non-technical audience in a clear and understandable manner.

## Final Examination

Due: **University Examination Period**
Weighting: **40%**

The final exam is a closed book examination. Details of the content of the final examination will be provided on iLearn in due course. Only non-programmable calculators without alphabetic storage capability are allowed into the examination room.  Statistical tables are provided. The time and venue of the exam will be organised and announced in due time by the University.

On successful completion you will be able to:

- Apply econometric methods to modelling, analysing and forecasting financial data.
- Demonstrate and explain different estimation methodologies.
- Critically evaluate empirical econometric work.

# Delivery and Resources

## Classes

- Number and length of classes: 3 hours face-to-face teaching per week consisting of 1 x 2 hour lecture and 1 x 1 hour tutorial. Tutorials commence in Week 2.
- The timetable for classes can be found on the University web site at:http://www.timetables.mq.edu.au/

## Required and Recommended Texts and/or Materials

The prescribed textbook for the unit is:

Brooks, C. (2014) Introductory Econometrics for Finance, 3rd Edition, Cambridge University Press. ISBN: 9781107661455.

It can be purchased from the Macquarie University Co-op Bookshop, and it is also available in the Macquarie Library. Additional references, though useful but not required, include:

(i) Campbell, J., Lo, A., and Mackinlay, C. (1997) The Econometrics of Financial Markets, Princeton University Press. (This book is too advanced for our class, but contains a lot of interesting material).

(ii) Diebold, F. (2007) Elements of Forecasting, 4th Edition, South-Western College.

(iii) Enders, W. (2014) Applied Econometric Time Series, 4th Edition, Wiley.

• Material such as lecture slides, examples, and tutorial questions will be available on the unit home page. The text and lecture notes, together with the lectures and additional references will provide students with a clear indication of the basic content of the unit.

• It is recommended that students attend all lectures and tutorials for several reasons including:

• Not all the material in the text is included in the unit, and not all the material in the unit 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 required for the assessment tasks, and are your guide to the unit content.

• The approaches to some problems that are recommended by the lecturer are different to those in the text.

• The lectures will include guidance about the style and content of the final exam and recommendation about study technique.

• 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.

## Technology Used and Required

Students are required to use a computer to carry out certain tasks of the course, such as tutorials and assignments. The software programs used in this course include EViews 10 and Microsoft

Excel.

### Unit Web Page

• Course material is available on the learning management system (iLearn), which can be found at: http://ilearn.mq.edu.au.

# Unit Schedule

| Week No. | Lecture Topic | Tutorials |
|---|---|---|
| 1 | **Characteristics of Financial Data; Revision of Basic Mathematical and Statistical Concepts**<br>Textbook: Chapter 1 and Chapter 2, all sections. Lecture Notes. | |
| 2 | **Correlation and Basic Regression Methods**<br>Textbook: Chapter 3, all sections, excluding the appendix. Lecture Notes. | Tutorial Week 2 |
| 3 | **Multiple Linear Regression Model**<br>Textbook: Chapter 4, Sections 4.1 to 4.8 inclusive, Section 4.10. Lecture Notes. | Tutorial Week 3 |
| 4 | **Regression Model Diagnostics**<br>Textbook: Chapter 5, all sections. Chapter 10, Sections 10.1 to 10.3 inclusive. Lecture Notes. | Tutorial Week 4 |
| 5 | **Time Series Models**<br>Textbook: Chapter 6, Sections 6.1 to 6.5. Lecture Notes. | Tutorial Week 5 |
| 6 | **Identification of Time Series Models**<br>Textbook: Chapter 6, Sections 6.6 to 6.9. Lecture Notes. | Tutorial Week 6 |
| 7 | **Class Test** | Tutorial Week 7 |
| | **Mid-semester Break** | |
| 8 | **Forecasting with Time Series Models**<br>Textbook: Chapter 6, Sections 6.11 and 6.12. Lecture Notes. | Tutorial Week 8 |
| 9 | **Modeling Volatility: Specification and Estimation of ARCH and GARCH Models**<br>Textbook: Chapter 9, Sections 9.1 to 9.4 inclusive, Sections 9.6 to 9.9 inclusive. Lecture Notes. | Tutorial Week 9 |
| 10 | **Modeling Volatility: Extensions of ARCH and GARCH Models.**<br>Textbook: Chapter 9, Sections 9.10 to 9.16 inclusive, Section 9.18. Lecture Notes. | Tutorial Week 10 |

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|---|---|---|
| **11** | **Forecasting Volatility.**<br>Textbook: Chapter 9, Sections 9.17, 9.19. Lecture Notes.<br>**Assignment due Friday 4pm at BESS.** | Tutorial Week 11 |
| **12** | **Long-Run Relationships in Finance**<br>Textbook: Chapter 8, Sections 8.1, 8.3 to 8.6 inclusive. Lecture Notes. | Tutorial Week 12 |
| **13** | **Bivariate Autoregressive Models**<br>Textbook: Chapter 7, Sections 7.11, 7.13. Lecture Notes. | Tutorial Week 13 |

# Learning and Teaching Activities

## Lectures - large group learning (2 hour each teaching week)

Lectures are intended to provide an overview of statistical and econometrics techniques that are critical to the core themes of the unit. Students are expected to read the relevant chapters before each lecture. Additional reading material such as academic papers and research reports will be provided on the website.

## Self-study activities - learning by doing (about 6 hours each teaching week and 9 hours each week during the 2-week mid-semester recess)

ECON334 relies heavily on independent learning where students read the relevant chapter, revise the lecture notes, prepare answers to the pre-set tutorial questions and extend themselves by doing additional reading, questions, exercises and problems.

## Tutorials - small group learning (1 hour each teaching week)

Tutorials constitute a critical learning experience of this unit and students must attend them. The tutor will facilitate a highly student-centred discussion of answers to pre-set tutorial questions. A tutorial is also an active forum to present to the tutor difficulties you encountered when preparing for the pre-set tutorial questions. Ask your tutor questions and further guidance on how to approach questions. Students are expected to complete the tutorials empirical work and attempt the tutorial questions before each tutorial.

# Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy

- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Undergraduate students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

### Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/study/getting-started/student-conduct

### Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

## Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

### Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

## Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

## IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

# Graduate Capabilities

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

### Learning outcomes

- Apply econometric methods to modelling, analysing and forecasting financial data.
- Demonstrate and explain different estimation methodologies.
- Critically evaluate empirical econometric work.
- Present results to a non-technical audience in a clear and understandable manner.

### Assessment tasks

- Class Test
- Individual Assignment
- Final Examination

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

### Learning outcomes

- Apply econometric methods to modelling, analysing and forecasting financial data.
- Demonstrate and explain different estimation methodologies.
- Critically evaluate empirical econometric work.

### Assessment tasks

- Class Test
- Individual Assignment
- Final Examination

## Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

### Learning outcome

- Present results to a non-technical audience in a clear and understandable manner.

### Assessment tasks

- Individual Assignment
- Final Examination

# Research and Practice

- This unit uses research by Macquarie University researchers as follows:

1. Bui, A-T, and Fisher, L., (2016) "The Relative Term Structure and the Australian - US Exchange Rate", *Studies in Economics and Finance*, Vol. 33(3), 417-436.

2. Fisher, L, and Voss, G. (2004) "Consumption, Wealth and Expected Stock Returns in Australia", *Economic Record*, Vol. 80, 359-372.

3. Heaton, C, Milunovich, G, and Passé-de Silva, A., (2011) “International Commodity Prices and the Australian Stock Market”, *Economic Record*, Vol. 87, 37-44.

4. Milunovich, G. (2011) “Measuring the Impact of the GFC on European Equity Markets”, *Economics Bulletin*, Vol. 31(2), 1237-1246.

5. Milunovich, G. and Tan, A. (2013) “Testing for Contagion in US Industry Portfolios – A Four-Factor Pricing Approach”, *Applied Financial Economics*, Vol. 23(1), 15-26.

- This unit uses research from external sources (as referenced in the textbook)
- This unit gives you practice in applying research findings in your assignments
- This unit gives you opportunities to conduct your own research