ECON334

Financial Econometrics

S2 Day 2018

Dept of Economics

Contents

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General Information

Unit convenor and teaching staff
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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.

Understand 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 cover all material **up to and including Week 5**.

Non-programmable calculators without alphabetic storage capability and an A4 page with hand-written or typed notes are allowed.

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 examinations. However, 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**. If the application is successful, a supplementary assessment will be given (this could include an oral task) and the date of the assessment will be designated by the unit convenor.

On successful completion you will be able to:
- Apply econometric methods to modelling, analysing and forecasting financial data.
- Critically evaluate empirical econometric work.

Individual Assignment

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

The assignment is due at **4pm on Friday of Week 11**. It will cover all material up to and including Week 10.

It is intended that students will work on the assignment independently. Students who collude or otherwise violate the Academic Honesty Policy will face further action which may result in failure in the unit and more severe penalties.

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 - 20% penalty). This penalty does not apply for cases in which an application for special consideration is made and approved. No submission will be accepted after solutions have been posted.

Students are strongly recommended to keep a photocopy of their assignment to ensure against loss. In early Week 11, tutorial boxes designated ECON334 will be prepared in the Business and Economics Student Services (BESS) where students can submit their assignments. In addition, students must also submit an electronic copy through iLearn.

There are no set minimum or maximum lengths for the assignment. However, assignments should be complete and concise.

On successful completion you will be able to:
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- 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%**

A two-hour examination will be held in the final examination period. The final examination will be based on all the work covered throughout the duration of the semester. It will consist of multiple-choice questions and short-answer questions.

Computer outputs and statistical tables are provided. Non-programmable calculators without alphabetic storage capability and an A4 page with hand-written or typed notes are allowed into the examination room. The time and venue of the exam will be organised and announced in due time by the University.

You are expected to attend the final 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. http:// exams.mq.edu.au/.

The only exception to not sitting the examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for special consideration. The University's special consideration policy is available at https://students.mq.edu.au/study/my-study-program/special-consideration.

If a Supplementary Examination is granted the examination will be scheduled after the conclusion of the official examination period.

The Macquarie university examination policy details the principles and conduct of examinations at the University. The policy is available at: http://www.mq.edu.au/policy/docs/examination/policy.htm.

On successful completion you will be able to:

- Apply econometric methods to modelling, analysing and forecasting financial data.
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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
- 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 9 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.

• The following information will be available on iLearn:

- Unit Guide
- Announcements
- Lecture Slides
- Selected Tutorial Solutions
- Information on Assessments
- Staff Consultation Hours and Contact Details
- Other relevant material

You are strongly encouraged to regularly visit the website and use it as a resource centre to assist with your learning. If you are unable to access the website because you are not aware of or have forgotten your username and password, please contact the IT helpdesk located on Level 1 of the Library on 9850 6500. The IT helpdesk will also be able to assist you with using iLearn. Please remember to log out when you have finished using iLearn. Failure to do so could result in unauthorised access to your account.

Learning and Teaching Activities

This unit is taught as a mix of tutorials and lectures. The lectures are designed to provide the tools which can then be applied in tutorials. Tutorials are based mainly on empirical applications

which require the use of econometric software packages. How to use these packages is taught in tutorials which are held in the computer labs.

- Lectures – large group learning (2 hour each teaching week)
- Self-study activities – learning by doing (about 6 hours each teaching week and 9 hours each week during the 2-week mid-semester recess)
- Tutorials –small group learning (1 hour each teaching week)

Unit Schedule

The list below is a proposed study plan, but this may be modified as we progress through the semester to allow us to take more or less time with different sections of the course as required.

Week No.	Lecture Topic	Tutorials
1	**Characteristics of Financial Data; Revision of Basic Mathematical and Statistical Concepts** Textbook: Chapter 1 and Chapter 2, all sections. Lecture Notes.	
2	**Correlation and Basic Regression Methods** Textbook: Chapter 3, all sections, excluding the appendix. Lecture Notes.	Tutorial Week 2
3	**Multiple Linear Regression Model** Textbook: Chapter 4, Sections 4.1 to 4.8 inclusive, Section 4.10. Lecture Notes.	Tutorial Week 3
4	**Regression Model Diagnostics** Textbook: Chapter 5, all sections. Lecture Notes.	Tutorial Week 4
5	**Time Series Models** Textbook: Chapter 6, Sections 6.1 to 6.5. Lecture Notes.	Tutorial Week 5
6	**Identification of Time Series Models** 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** 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** 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.** Textbook: Chapter 9, Sections 9.10 to 9.16 inclusive, Section 9.18. Lecture Notes.	Tutorial Week 10
11	**Models with Trends and Asset Price Bubbles** Textbook: Chapter 8, Sections 8.1. Lecture Notes. **Assignment due Friday 4pm at BESS.**	Tutorial Week 11
12	**Long-Run Relationships in Finance** Textbook: Chapter 8, Sections 8.1, 8.3 to 8.6 inclusive. Lecture Notes.	Tutorial Week 12
13	**Bivariate Autoregressive Models** 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 shown in *iLearn*, 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.

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

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

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.

http://www.businessandeconomics.mq.edu.au/new_and_current_students/undergraduate_current_students/how_do_i/grade_appeals/

Special Considerations Policy

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 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:

https://students.mq.edu.au/study/my-study-program/special-consideration

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

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.
- Understand 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.
- Understand different estimation methodologies.
- Critically evaluate empirical econometric work.

Assessment tasks

- Class Test
- Individual Assignment
- Final Examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Apply econometric methods to modelling, analysing and forecasting financial data.
- Critically evaluate empirical econometric work.

Assessment task

- Individual Assignment

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 task

- Individual Assignment

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.

6. Arora, V. and Shi, S. (2016). Energy Consumption and Economic Growth in the United States, *Applied Economics,* Vol. 48: 3763-3773.

7. Phillips, P., Shi, S., & Yu, J. (2014). Specification Sensitivity in Right-tailed Unit Root Testing for Explosive Behaviour. *Oxford Bulletin of Economics and Statistics*, Vol. 76 (3), 315 - 333.

8. Phillips, P., Shi, S., and Yu, J. (2015). Testing for Multiple Bubbles: Historical Episodes of Exuberance and Collapse in the S&P 500. *International Economic Review,* Vol. 56 (4), 1043 - 1078.

9. Clements, A., Hurn, S., and Shi, S. (2017). An Empirical Investigation of Herding in the U.S. Stock Market, *Economic Modelling*, Vol**.** 67, 184-192.

10. Deng, Y., Girardin, E., Joyeux, R. and Shi, S. (2017). Did Bubbles Migrate from the Stock Market to the Housing Market in China between 2005 and 2010? *Pacific Economic Review,* Vol. 22 (3): 276-292.

- 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