STAT402
Topics in Stochastic Finance
S2 Evening 2013

Statistics

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General Information

Unit convenor and teaching staff
Unit Convenor
Thomas Fung
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Credit points
3
Prerequisites
39cp including (STAT272(P) or STAT306(P) or STAT371(P))
Corequisites
Co-badged status
Unit description
This unit aims to integrate a basic understanding of how financial markets work with the analytic tools for modelling their time dependent structures. Since these structures are based on random (‘stochastic’) processes, stochastic models underpin the methods. Where feasible, analytic methods are developed. The aim is to present as much financial theory about securities markets as possible without requiring the advanced mathematics that is associated with continuous time models. Topics include: single period securities markets, valuation of contingent claims, portfolio management, stochastic volatility, the binomial model, value at risk, and credit modelling applications.

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:

- Have a basic understanding of the asset and derivatives pricing principles
- Have a basic understanding of the modern Economic theories like Markowitz and CAPM with practical problems
- Understand the no-arbitrages asset pricing principles in Block-Scholes-Merton model

https://unitguides.mq.edu.au/unit_offerings/6908/unit_guide/print
Understand the limitations of these models and compare them to actual data

## Assessment Tasks

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### Random Class tests

**Due:** Randomly  
**Weighting:** 15%

There will be three unannounced (i.e. taking place randomly) open book short class tests. Each worth 5% of the unit assessment.

Students will take these tests in class and each test will last for 20 minutes.

On successful completion you will be able to:
- Have a basic understanding of the asset and derivatives pricing principles
- Have a basic understanding of the modern Economic theories like Markowitz and CAPM with practical problems
- Understand the no-arbitrages asset pricing principles in Block-Scholes-Merton model

### Assignments

**Due:** 11 September and 23 October  
**Weighting:** 30%

There will be two assignments (problem-solving). Each worth 15% of the unit assessment. The first one is due in Week 7 and the second one is due in Week 11.

Students need to submit a hard copy of their assignments on the due date in class.

Marked assignments will be returned 2 weeks after the due date. Solutions will be handed out.

On-time submission of all assignments is compulsory. No extensions will be granted. Students who have not submitted assignments prior to the deadline will be awarded a mark of 0 for the assignment, except for cases in which an application for special consideration is made and approved.

On successful completion you will be able to:
- Have a basic understanding of the asset and derivatives pricing principles
Final examination

Due: To be advised
Weighting: 55%

A three-hour final examination for this unit will be held during the University Examination period. You may take 1 hand-written A4 pages (written on one or both sides) of summary notes into the exam.

To be eligible for a passing grade in this unit, a pass is required in the final examination.

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.

http://exams.mq.edu.au/

The only exception to not sitting an 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 policy on special consideration process is available at:

http://www.mq.edu.au/policy/docs/special_consideration/policy.html

A supplementary examination will only be granted if a student has satisfactory coursework (ie. at least 22 out of 45). 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.

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:

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Delivery and Resources

LECTURES
Wednesday 6-9 p.m. in E5A 180.

SOFTWARE
Matlab and R are the recommended software for solving assignments and some tutorial problems. Scilab is an open source alternative to Matlab and it can be downloaded free of cost from

TEXTBOOK
There is no textbook for this unit. The list of recommended texts can be found on iLearn.

INTERNET RESOURCES / TECHNOLOGIES USED
This unit has an iLearn website available at https://ilearn.mq.edu.au/login/MQ/
Lecture notes: these will be available on the iLearn site prior to the lecture.
Audio recordings: all lectures will be recorded and will be available after the lecture.
Consult the iLearn website frequently. Other resources available include a discussion board, assignments, administrative updates etc.

CHANGES SINCE LAST DELIVERY
This unit no longer has a textbook. There will be less emphasis on topics related to the foreign exchange market and Kelly Criterion and a Rule of Thumb will not be covered in this delivery.

Policies and Procedures
Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:
Academic Honesty Policy http://www.mq.edu.au/policy/docs/academic_honesty/policy.html
In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Support

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

UniWISE provides:

- Online learning resources and academic skills workshops http://www.students.mq.edu.au/support/learning_skills/
- Personal assistance with your learning & study related questions.
- The Learning Help Desk is located in the Library foyer (level 2).
- Online and on-campus orientation events run by Mentors@Macquarie.

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

Details of these services can be accessed at http://www.student.mq.edu.au/ses/.

IT Help

If you wish to receive IT help, we would be glad to assist you at http://informatics.mq.edu.au/help/.

When using the university’s IT, you must adhere to the Acceptable Use Policy. The policy applies to all who connect to the MQ network including students and it outlines what can be done.

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

• Have a basic understanding of the asset and derivatives pricing principles
• Have a basic understanding of the modern Economic theories like Markowitz and CAPM with practical problems
• Understand the no-arbitrages asset pricing principles in Block-Scholes-Merton model
• Understand the limitations of these models and compare them to actual data

Assessment tasks

• Random Class tests
• Assignments
• 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

• Have a basic understanding of the asset and derivatives pricing principles
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• Understand the no-arbitrages asset pricing principles in Block-Scholes-Merton model
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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

- Have a basic understanding of the asset and derivatives pricing principles
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