



AFIN2070

Stochastic Methods in Applied Finance

Session 2, Special circumstances 2021

Department of Applied Finance

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Session 2 Learning and Teaching Update

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of [units with mandatory on-campus classes/teaching activities](#).

Visit the [MQ COVID-19 information page](#) for more detail.

General Information

Unit convenor and teaching staff

Unit Convenor

Kai Li

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Credit points

10

Prerequisites

50cp at 1000 level or above including (AFIN100 or AFIN102 or AFIN1002 or ACST152 or ACST1052) and (STAT150 or STAT1250 or STAT170 or STAT1170 or STAT171 or STAT1171)

Corequisites

Co-badged status

Unit description

Quantitative modelling and analysis are significant components in the discipline of applied finance. The models employed by practitioners and researchers are based on assumptions about the stochastic properties of financial variables and time series. This unit covers a variety of stochastic models for use in applied finance and includes extensive use of Excel spreadsheets. The topics include discrete and continuous probability distributions, extreme events, joint probability distributions, copulas, bayesian analysis, regression models, time series models, and risk-neutral pricing.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://students.mq.edu.au/important-dates>

Learning Outcomes

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

ULO1: Use a range of probability distributions to model different financial variables.

ULO2: Assess the dependence between financial variables with suitable statistical tools.

ULO3: Apply regression models and time series models to various financial time series.

ULO4: Examine the concepts of no-arbitrage principle and risk-neutral pricing.

ULO5: Perform mathematical computations on Excel spreadsheets for practical problems.

General Assessment Information

Assessment criteria (including information about late submissions and extensions) for all assessment tasks will be provided on the unit iLearn site.

Assessment Tasks

Name	Weighting	Hurdle	Due
Online Quiz	5%	No	Week 3
Mid Session Test	20%	No	Week 8
Assignment	15%	No	Week 10
Final Examination	60%	No	University Examination Period

Online Quiz

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 1 hours

Due: **Week 3**

Weighting: **5%**

The online quiz will be conducted through iLearn and consist of multiple choice questions, and calculation based questions, where a numerical value will need to be entered.

On successful completion you will be able to:

- Use a range of probability distributions to model different financial variables.

Mid Session Test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 12 hours

Due: **Week 8**

Weighting: **20%**

A practical test of 60 minutes will be held to give students practice on a summative task and to provide feedback on their progress midway through the session.

On successful completion you will be able to:

- Use a range of probability distributions to model different financial variables.
- Assess the dependence between financial variables with suitable statistical tools.
- Apply regression models and time series models to various financial time series.

Assignment

Assessment Type **1**: Quantitative analysis task

Indicative Time on Task **2**: 10 hours

Due: **Week 10**

Weighting: **15%**

The assignment will cover quantitative analysis of the materials taught in the class.

On successful completion you will be able to:

- Use a range of probability distributions to model different financial variables.
- Assess the dependence between financial variables with suitable statistical tools.
- Apply regression models and time series models to various financial time series.
- Examine the concepts of no-arbitrage principle and risk-neutral pricing.

Final Examination

Assessment Type **1**: Examination

Indicative Time on Task **2**: 20 hours

Due: **University Examination Period**

Weighting: **60%**

A two hour exam will be held during the University Examination Period.

On successful completion you will be able to:

- Use a range of probability distributions to model different financial variables.
- Assess the dependence between financial variables with suitable statistical tools.
- Apply regression models and time series models to various financial time series.
- Examine the concepts of no-arbitrage principle and risk-neutral pricing.
- Perform mathematical computations on Excel spreadsheets for practical problems.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Learning Skills Unit](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Learning and Teaching Activities:

The content for each week will comprise of a lecture recording and a set of tutorial questions (Problem Sets).

Lectures

A lecture recording will be uploaded each week. Lecture notes will be available on iLearn.

Tutorials

Students will need to register for a tutorial. Tutorials are considered compulsory but no marks are allocated. Tutorials will be available for most, but not all weeks of the session. In weeks where there aren't any live (on-campus or online) tutorials, a recording will be provided to cover the relevant material.

The tutorial schedule will be made available on iLearn.

Tutorial enrolment or change of tutorial can be made through *eStudent* in the first two weeks of the session. No tutorial changes are allowed after Week 2. Students should attend their allocated tutorial, but exceptions may occur on a one-off basis. That is, where circumstances prevent you from attending your own tutorial in a given week, you may attend an alternative tutorial if room available.

Students are expected to complete the '*Tutorial Questions*' as a self-directed study activity before attending a tutorial. Additional learning support will be available in tutor consultation times.

The timetables for classes can be found on the University website at: <https://timetables.mq.edu.au/2021/>

(Excel workshops) will commence in Week 1.

Recommended Text:

Rachev S.T., Hoehstoetter M., Fabozzi F.J., and Focardi S.M., 2010, *Probability and Statistics for Finance*, John Wiley & Sons.

Unit Web Page:

Lecture handouts are available for download from iLearn before lectures. Students are expected to read the handout and the corresponding textbook chapter(s) before each lecture.

Technology Used and Required:

Students will be required to use iLearn, Excel, PDF, Word, and a non-programmable calculator.

Unit Schedule

Week	Topic
Week 1	Measures of Location and Spread
Week 2	Discrete Probability Distributions
Week 3	Basic Option Pricing Techniques
Week 4	Continuous Probability Distributions
Week 5	Modelling Extreme Events
Week 6	Joint Probability Distributions
Week 7	Copulas and Dependence Measures
Week 8	Mid Session Test
Week 9	Regression Models
Week 10	Time Series Models
Week 11	No-Arbitrage Pricing
Week 12	Business Ethics
Week 13	Revision

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). 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](#)

Students seeking more policy resources can visit [Student Policies](https://students.mq.edu.au/support/study/policies) (<https://students.mq.edu.au/support/study/policies>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/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 help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Enquiry Service

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

Equity 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.

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.