



# ECFS871

## Risk and Portfolio Construction

AFC Term 3 City 2019

*Department of Applied Finance*

### Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	3
<u>Delivery and Resources</u>	6
<u>Unit Schedule</u>	7
<u>Learning and Teaching Activities</u>	8
<u>Policies and Procedures</u>	9
<u>Graduate Capabilities</u>	10
<u>Changes from Previous Offering</u>	12
<u>Important Notice</u>	12
<u>Changes since First Published</u>	12

#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Lecturer

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Contact via Email

Credit points

2

Prerequisites

(Admission to MAppFin or MAppFin(Adv) or GradDipAppFin) and (AFCP801 or ECFS865)

Corequisites

Co-badged status

Unit description

This unit deals with the key issues relating to the building of institutional portfolios. Students will learn how to identify, measure and control various risks within a portfolio. Building on this knowledge the unit examines practical and theoretical aspects in the application of Modern Portfolio Theory (MPT) to the real world. Several extensions of MPT and alternative portfolio construction approaches are also examined. Emphasis is placed on the impact that errors in inputs and incorrect assumptions have on portfolio outcomes. Teaching uses a mixture of lectures and hands-on spreadsheets to illustrate the ideas.

## 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:

Identify and measure sources of institutional portfolio risks.

Understand, apply and interpret strategies to control portfolio risks, including their appropriate applications and limitations.

Distinguish the key attributes of alternative portfolio construction techniques, including their appropriate applications and limitations. Apply appropriate alternative portfolio construction and risk control techniques to 'real world' situations.

Understand, apply and interpret a range of return forecasting methods.

Construct and effectively manage an institutional portfolio.

## General Assessment Information

To pass this unit the student needs to (1) Achieve an aggregate mark of 50 or more, and; (2) Pass the Final Exam.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Pre-unit Assignment</u>	5%	No	First class
<u>Assignment</u>	35%	No	Refer to iLearn
<u>Final Exam</u>	60%	Yes	Refer to Timetable

### Pre-unit Assignment

Due: **First class**

Weighting: **5%**

#### Summary of Assessment Task

**Individual / Group:** Individual.

**Due Date:** At first class.

**Submission Method:** At start of first class.

**Duration:** Refer to Assignment coversheet.

#### Extension Requests:

- No extensions will be granted.
- There will be a deduction of 10% of the total available marks for each 24 hour period or part thereof. This penalty does not apply for cases in which an application for Special Consideration has been made and approved.
- No submission will be accepted after solutions have been discussed or posted by the lecturer. As this normally occurs on day 2 of classes, students need to be aware that submissions are rarely accepted beyond the first 24 hour late period.
- Note: Applications for Special Consideration must be made within 5 (five) business days of the due date and time.
- Refer to MAFC Program Rules at <https://mafcstudents.mq.edu.au/> for information on the University's Special Consideration Policy.

On successful completion you will be able to:

- Identify and measure sources of institutional portfolio risks.

## Assignment

Due: **Refer to iLearn**

Weighting: **35%**

### Summary of Assessment Task

**Individual / Group:** Individual.

**Due Date:** Refer to the unit's iLearn site.

**Submission Method:** Online via Turnitin on the unit's iLearn site.

**Duration:** Refer to Assignment coversheet.

### Extension Requests:

- 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). This penalty does not apply for cases in which an application for Special Consideration is made and approved.
- Late submissions will be accepted up to 96 hours after the due date and time.
- Note: Applications for Special Consideration must be made within 5 (five) business days of the due date and time.
- Refer to MAFC Program Rules at <https://mafstudents.mq.edu.au/> for information on the University's [Special Consideration Policy](#).

**Other Information:** The Assignment will be placed on iLearn.

On successful completion you will be able to:

- Identify and measure sources of institutional portfolio risks.
- Understand, apply and interpret strategies to control portfolio risks, including their appropriate applications and limitations.
- Distinguish the key attributes of alternative portfolio construction techniques, including their appropriate applications and limitations. Apply appropriate alternative portfolio construction and risk control techniques to 'real world' situations.
- Understand, apply and interpret a range of return forecasting methods.
- Construct and effectively manage an institutional portfolio.

## Final Exam

Due: **Refer to Timetable**

Weighting: **60%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

### **Summary of Assessment Task**

**Individual / Group:** Individual.

**Due Date:** Refer to Timetable.

**Submission Method:** As per MAFC Program Rules at <https://mafcstudents.mq.edu.au/>.

**Duration:** 2 hours plus 10 minutes reading time.

### **Examination Conditions:**

- The final exam is closed book. A single A4 sheet of paper, both sides filled with any relevant material, may be brought into the exam.
- Exam times and locations are noted in the unit timetable at <https://www.mq.edu.au/about/about-the-university/faculties-and-departments/business/study-with-us/macquarie-applied-finance-centre/timetables>.
- Refer to MAFC Program Rules at <https://mafcstudents.mq.edu.au/>.

### **Extension Requests:**

- You are expected to present yourself for examination at the time and place designated in the relevant MAFC Timetable at <https://www.mq.edu.au/about/about-the-university/faculties-and-departments/business/study-with-us/macquarie-applied-finance-centre/timetables>.
- Deferral of an examination is not permitted unless an application for Special Consideration is made and approved.
- Students who do not attend receive a mark of zero. This penalty does not apply in cases where an application for Special Consideration has been made and approved.
- Note: Applications for Special Consideration must be made within 5 (five) business days of the due date and time.
- Refer to MAFC Program Rules at <https://mafcstudents.mq.edu.au/> for information on the University's [Special Consideration Policy](#).

On successful completion you will be able to:

- Identify and measure sources of institutional portfolio risks.
- Understand, apply and interpret strategies to control portfolio risks, including their appropriate applications and limitations.
- Distinguish the key attributes of alternative portfolio construction techniques, including

their appropriate applications and limitations. Apply appropriate alternative portfolio construction and risk control techniques to 'real world' situations.

- Understand, apply and interpret a range of return forecasting methods.
- Construct and effectively manage an institutional portfolio.

## Delivery and Resources

### **CLASSES**

**Face-to-Face Teaching:** Generally 20 hours.

**Timetable:** Detailed timetable for classes are available at: <https://www.mq.edu.au/about/about-the-university/faculties-and-departments/business/study-with-us/macquarie-applied-finance-centre/timetables>.

#### **Consultation Times:**

Students who wish to contact any of the teaching staff may do so through:

- The unit's iLearn site, in relation to general queries (so that all students may benefit); or
- Individual consultation with the lecturer by email in the first instance, if necessary.

### **REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS**

**Text:** Nil

#### **Additional Readings:**

- Additional readings are available on iLearn.
- **Students should assume these readings are examinable unless otherwise advised.**

**Lecture Notes:** Available via iLearn.

**Laptop Computer:** Spreadsheet examples are used frequently to illustrate course content. It is *recommended* that you bring a laptop computer to most effectively participate in class exercises. This is not compulsory. If you do not have access to a laptop you can do the exercises at another time.

**Study Problems:** Students are required to work systematically through suggested technical examples. These examples will not be collected but they will help you prepare for the exams. Answers to the examples will be posted on iLearn.

**Calculators:** In examinations, hand held calculators are permitted. Mobile phones and computers are not permitted.

**Pre-unit Materials:** Students should have a thorough understanding of the statistical topics from the AFCP812 Quantitative and Economic Analysis gateway unit and all topics in AFCP801 Portfolio Management and Valuation.

**Assumed Access:** Access to a computer with word processing and spreadsheet capability is

assumed, as is general student computer literacy.

## **TECHNOLOGY USED AND REQUIRED**

### **Unit iLearn Site:**

- Found by logging on to iLearn [ilearn.mq.edu.au](https://ilearn.mq.edu.au), then clicking on **ECFS871 Risk and Portfolio Construction**.
- This is where you will find forums, downloadable resources and links to important pages.
- The forum allows you to communicate with other students and lecturer(s) and may provide supplementary material.
- You are requested to post your questions on the forums at least 24 hours prior to the assignment submission date or the examination date. Questions posted after that time may not be answered. **Please try to not leave your questions to the last few days.**

### **Important:**

- It is important that you familiarise yourself with the unit's iLearn site.
- Students should check the unit's iLearn site regularly (minimum twice a week and prior to all lectures) and look for updates and distribution of materials (including case studies) related to the unit or assessments and, if relevant, participate in forum discussions.

## **Unit Schedule**

### **Sources of Portfolio Risk**

- Deconstructing the investment process
- Sources of portfolio risks: market, competitor, absolute (e.g. volatility), relative (e.g. tracking error vs a benchmark), downside, upside, legal, behavioural
- Control of risks using qualitative means: what risks can be controls and how
- Quantitative: pros and cons of alternative metrics
- Decomposing quantitative risk and how that's used for risk budgeting and alpha transport
- Benchmarking – principles and issues

### **Sources of Error and their Implications**

- What types of errors occur in a portfolio construction process? What are their impacts? Are some more serious than others? Is an optimiser an error maximiser?
- How can we mitigate the impact of errors?
- Topics covered are: utility theory, optimisation algorithms, statistical characteristics of financial data, measurement of errors, the impact of errors, shrinkage estimators

## Factor Models

- Types of factor models: macroeconomic, statistical and fundamental
- Building a returns model
- Performance attribution using a fundamental factor model
- Building a risk model

## Alternative Portfolio Construction Approaches

- Reverse optimisation/Implied returns
- Black-Litterman
- Asset-Liability modelling
- Using resampling – Monte-Carlo techniques
- Life Cycle Investing
- Risk focused strategies – minimum variance, risk parity
- Capital protection strategies - using derivatives

## Forecasting Returns

- Smart Beta
- Theoretically consistent forecasts

## Case Studies

- Small groups will be formed to review and present a relevant paper to the class. This is not assessable.

## Learning and Teaching Activities

### Strategy

The Master of Applied Finance degree adopts a deep teaching and learning strategy, in which students acquire and retain knowledge and also are able to make sense of the issues and concepts and apply them in the “real world”. The degree relies heavily on student engagement and participation by: (a) Continuous learning throughout the term. This is encouraged through a combination of students undertaking prescribed reading throughout the units and/or completion of practice problems, case studies, assignments, class presentations etc and interaction via forums in the unit’s iLearn site; and (b) Assessments, which enable the student to demonstrate his/her understanding of the learning objectives achieved through the continuous learning.

### Student Participation

Students participate in this unit by: (a) Attending lectures and participating in class discussion; (b) Before each class, completing the recommended readings of notes and text, and working systematically through suggested problem sets; (c) Interacting on the unit’s iLearn site; and (d) Completing all assessment tasks and exams. On average, the unit will require students to



complete, for every hour of class time, approximately 3 hours private study.

## 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) (<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) (<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) (<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](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

Students should also consult the MAFC Program Rules found at <https://mafcstudents.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](http://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 enquiry service (MAFC-specific)

For all student enquiries, please contact [studentsupport@mafc.mq.edu.au](mailto:studentsupport@mafc.mq.edu.au)

## 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](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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

### PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

### Learning outcomes

- Identify and measure sources of institutional portfolio risks.
- Understand, apply and interpret strategies to control portfolio risks, including their appropriate applications and limitations.
- Distinguish the key attributes of alternative portfolio construction techniques, including their appropriate applications and limitations. Apply appropriate alternative portfolio

construction and risk control techniques to 'real world' situations.

- Understand, apply and interpret a range of return forecasting methods.
- Construct and effectively manage an institutional portfolio.

## **Assessment tasks**

- Assignment
- Final Exam

## **PG - Critical, Analytical and Integrative Thinking**

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

## **Learning outcomes**

- Identify and measure sources of institutional portfolio risks.
- Understand, apply and interpret strategies to control portfolio risks, including their appropriate applications and limitations.
- Distinguish the key attributes of alternative portfolio construction techniques, including their appropriate applications and limitations. Apply appropriate alternative portfolio construction and risk control techniques to 'real world' situations.
- Construct and effectively manage an institutional portfolio.

## **Assessment tasks**

- Pre-unit Assignment
- Assignment
- Final Exam

## **PG - Research and Problem Solving Capability**

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

## **Learning outcomes**

- Identify and measure sources of institutional portfolio risks.

- Understand, apply and interpret strategies to control portfolio risks, including their appropriate applications and limitations.
- Distinguish the key attributes of alternative portfolio construction techniques, including their appropriate applications and limitations. Apply appropriate alternative portfolio construction and risk control techniques to 'real world' situations.
- Construct and effectively manage an institutional portfolio.

## Assessment tasks

- Pre-unit Assignment
- Assignment
- Final Exam

## Changes from Previous Offering

The final exam is closed book (open book in previous terms).

## Important Notice

This Unit Guide may be subject to change. Students will be advised, via an "Announcement" on iLearn, if the Unit Guide is changed.

The latest version is available at <https://unitguides.mq.edu.au/>.

Students should read the Unit Guide carefully at the start of term. It contains important information about the unit. If anything is unclear, please consult one of the unit lecturers.

## Changes since First Published

Date	Description
17/07/2019	Assessment Tasks section updated.