# DIVISION OF ECONOMIC AND FINANCIAL STUDIES

# ACCG352 APPLIED PORTFOLIO MANAGEMENT

# UNIT OUTLINE

**Year and Semester: 2005 Semester 2**

**Unit Convenor: Geoffrey Loudon**

**Prerequisites: ACCG329(P) or corequisite ACST305**

Students in this unit should read this unit outline carefully at the start of semester. It contains important information about the unit. If anything in it is unclear, please consult the unit convenor.

# 1   About this unit

This unit provides students with the analytical skills and techniques required to effectively manage diversified portfolios of securities. The first section of the unit reviews theoretical and practical issues relating to the management of portfolios containing options, futures and other derivatives. Section two prepares students for asset allocation management and performance assessment of diversified portfolios. Material presented has relevance for students interested in careers as security analysts, portfolio managers and corporate treasurers.

Credit Points:    3
Contact Hours:   3 per week

The unit complements the material covered in ACCG329 or ACST305. It emphasises the practical implementation of portfolio and option pricing theory within the context of portfolio management.

# 2   Teaching staff

| Name: | Dr Geoffrey Loudon* | Professor John Okunev** |
|---|---|---|
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Consultation hours will be advised in lectures.

\*     Lecturer–in–charge and unit administrator; Lecturer for weeks 1–6
\*\*    Lecturer for weeks 7–12

## 3  Classes

The weekly three hour class time for this unit consists of a two hour lecture and a one hour tutorial. There are no tutorials in the first week and no lecture in the last week. Weekly tutorials cover material based on the lecture of the previous week.

The timetable for classes is at http://www.timetables.mq.edu.au/

Attendance at tutorials is strongly recommended but optional. Students who choose to participate in a tutorial must attend the tutorial class in which they are enrolled. Tutorial attendance will be recorded and may be taken into account when considering any appeals for special consideration.

Please note that changes to tutorial classes must be done online and no later than the Friday of the first week of classes.

## 4  Required and recommended texts and/or materials

For section one of the unit, the *required* textbook is **J.C. Hull, Options, futures and other derivatives**, 5th edition, Prentice Hall. Students will need to use the software that comes with this textbook, i.e. DerivaGem for Excel, including The Applications Builder contained within the Excel worksheet DG-functions.xls. Students are not required, but may choose, to also acquire J.C. Hull, Options, futures and other derivatives: solutions manual, 5th edition, Prentice Hall.

Textbooks and references for section two of the unit are to be advised later.

## 5  Unit web page

The web page for this unit is http://online.mq.edu.au/pub/ACCG352/

Lecture notes, solutions to tutorial exercises, unit announcements and other reference materials will be posted to this site throughout the semester. It is therefore necessary to regularly check this site.

Students with login difficulties should contact the IT support staff on Level 1 of the library.

## 6  Learning outcomes

The broad learning outcomes of this unit are an enhanced ability by students to apply concepts in portfolio and option pricing theory to practical settings faced by portfolio managers. Specific learning outcomes for each topic are set out on the first content page of the weekly lecture notes.

In addition to the discipline–based learning objectives, all academic programs at Macquarie seek to develop students' generic skills in a range of areas. One of the aims of this unit is that students develop their generic skills, such as interpersonal, communication, critical analysis, problem solving, and creative thinking skills, in the effective accomplishment of finance related tasks. Foundation skills of numeracy and information technology are also enhanced by the use of specialised, derivatives software.

# 7 Teaching and learning strategy

The weekly three hour class time for this unit consists of a two hour lecture and a one hour tutorial. Lectures will explain and illustrate major ideas, and disseminate information about the operation and administration of the unit. Tutorials will reinforce the ideas introduced in the lectures, primarily through discussion and numerical exercises.

To help achieve the learning outcomes of the unit, you should

1. read the assigned references for the current week's lecture

2. attend the weekly lecture and review the lecture notes

3. prepare answers to the weekly assignment questions and problems in advance of the tutorial

4. identify any problems in relation to the lectures or tutorial problems and discuss these issues during the tutorial

5. develop reasoning skills and not only rely on the reproduction of textbook material.

# 8 Relationship between assessment and learning outcomes

Learning outcomes are assessed on three levels

1. your ability to display an adequate knowledge and understanding of unit concepts

2. your demonstrated competency to provide technical solutions for typical problems faced by portfolio managers

3. the extent to which you show an informed appreciation of the strengths and limitations of applying the unit material in practical situations.

Assessment is based on two projects and the final examination. Projects provide you with the opportunity to develop solutions to typical problems faced by portfolio managers, involving the quantitative analysis of real or simulated investment scenarios. Project details are in Section 13 of this document.

The final exam will have a variety of question styles to assess your individual performance in the three dimensions of learning outcomes listed above.

| The performance components and their weightings are | |
| --- | --- |
| Section 1 project | 15% |
| Section 2 project | 25% |
| Final examination: | |
| ⋄ Section 1 component | 35% |
| ⋄ Section 2 component | 25% |
| | |
| To pass the unit, students must pass the final examination. | |

No dictionaries of any kind are allowed in the final examination. Non–programmable calculators are allowed in the final examination, provided that they are not capable of storing text.

The University Examination period in Second Half Year 2005 is from 16 November to 30 November 2005.

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://www.timetables.mq.edu.au/exam

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. Information about unavoidable disruption and the special consideration process is available at http://www.reg.mq.edu.au/Forms/APSCon.pdf

Although all properly completed requests are considered, they are not automatically granted. Applications will not be considered unless previous work in the unit by the student has been satisfactory.

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.

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is the final day of the official examination period.

# 9 Plagiarism

The University defines plagiarism in its rules: "Plagiarism involves using the work of another person and presenting it as one's own." Plagiarism is a serious breach of the University's rules and carries significant penalties. You must read the University's practices and procedures on plagiarism. These can be found in the Handbook of Undergraduate Studies or on the web at http://www.student.mq.edu.au/plagiarism/

The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if you are found guilty. Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Discipline Committee.

# 10 University policy on grading

Academic Senate has a set of guidelines on the distribution of grades across the range from fail to high distinction. Your final result will include one of these grades plus a standardised numerical grade (SNG).

Your raw mark for a unit (i.e., the total of your marks for each assessment item) is not likely to be the same as the SNG which you receive. Under the Senate guidelines, results may be scaled to ensure that there is a degree of comparability across the university, so that units with the same past performances of their students should achieve similar results.

It is important that you realise that the policy does not require that a minimum number of students are to be failed in any unit. In fact it does something like the opposite, in requiring examiners to explain their actions if more than 20% of students fail in a unit.

The process of scaling does not change the order of marks among students. A student who receives a higher raw mark than another will also receive a higher final scaled mark.

For an explanation of the policy see http://www.mq.edu.au/senate/MQUonly/Issues/Guidelines2003.doc or http://www.mq.edu.au/senate/MQUonly/Issues/detailedguidelines.doc.

In particular, be aware that

- SNGs are not computed by simply adding up the marks given for each component of assessment, but provide a ranking of students based on marks obtained from all facets of the unit assessment

- The SNGs awarded in a particular unit are designed to indicate that the students in each performance band, from HD to PC, have satisfied the criteria for inclusion in that band and ranks them by their performance within that band

- Since the ranges of SNGs differ from band to band the relationship between raw marks and SNGs may differ from band to band even within the same unit

- The relationship between raw marks and SNGs almost always differ between units.

# 11  Student support services

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

The EFS Resource and Information Centre [ERIC] also provides support for EFS students at C5C244.

# 12  Lecture Topics, Readings and Assignment Questions

## 12.1  Section 1

The lecture notes and assignment questions define the content of the first section of the unit. Material in the textbook that is not mentioned in lectures, nor covered in assignment questions, is not examinable.

In completing the assignments, you are encouraged to use the software for numerical calculations, wherever possible, provided that you have an understanding of what is happening inside the "black box".

### 12.1.1  Unit Introduction and Structured products

**Readings:** Lecture for week 1.

- Lecture notes

**Assignment Questions:** Tutorial in week 2.

1. Select two distinct retail investment products offered by an investment bank that include embedded options. Obtain the Product Disclosure Statement [PDS] for each product selected. [*Hint:* Examples of such products and their PDS are available from the web sites of investment banks].

2. Carefully explain what basic securities are packaged together in each product.

3. Explain the risks and return characteristics from the point of view of the investor. If you had to choose to invest in one of these products, which one would you choose, and why?

4. Explain the risks faced by the investment banks issuing these product and suggest how they might manage these risks.

### 12.1.2  Managing portfolio risks and returns using derivatives

**Readings:** Lecture for week 2.

- Lecture notes
- Hull, Chapter 4, Sections 4.4, 5
- Hull, Chapter 5, Sections 5.13, 14
- Hull, Chapter 9, Section 9.1

- Hull, Chapter 13, Section 13.3

- Hull, Chapter 14, Section 14.12

- T. Brailsford, K. Corrigan and R. Heaney, 2001, A comparison of measures of hedging effectiveness: a case study using the Australian All Ordinaries Share Price Index Futures contract, Journal of Multinational Financial Management 11, 465-481

- B.H. Do, 2002, Relative performance of dynamic portfolio insurance strategies: Australian evidence, Accounting and Finance 42, 279–296

**Assignment Questions:** Tutorial in week 3.

1. Hull, Chapter 4, Questions and Problems 4.7, 18; Assignment Questions 4.25 [*Hint:* Use a spreadsheet to answer 4.25].

2. Hull, Chapter 5, Questions and Problems 5.23, 25, 26

3. Hull, Chapter 9, Questions and Problems 9.1

4. Hull, Chapter 13, Questions and Problems 13.23, 24

5. Hull, Chapter 14, Questions and Problems 14.16

### 12.1.3  Managing risks in derivatives positions

**Readings:** Lecture for week 3

- Lecture notes

- Hull, Chapter 14, Sections 14.1–11

- Hull, Chapter 19, Sections 19.6, 8, 10, 13, 14

- T.C. Green and S. Figlewski, 1999, Market risk and model risk for a financial institution writing options, Journal of Finance 54, 1465–1499.

- R.G. Tompkins, 2002, Static versus dynamic hedging of exotic options: an evaluation of hedge performance via simulation, Journal of Risk Finance 3, 6–34.

**Assignment Questions:** Tutorial in week 4

1. Hull, Chapter 14, Questions and Problems 14.9, 20; Assignment Questions 14.30.

2. Hull, Chapter 19, Questions and Problems 19.2, 11, 16; Assignment Questions 19.26, 28. [*Hint:* For 19.26, use the following portfolio of vanilla, European options to replicate the exotic — (a) a call with strike price 1.00, maturing in 2 years; (b) a put with strike price 0.80, maturing in 2 years; (c) a put with strike price 0.80, maturing in 1.5 years; (d) a put with strike price 0.80, maturing in 1 year; (e) a put with strike price 0.80, maturing in 0.5 years].

### 12.1.4  Implementing option pricing models in practice

**Readings:** Lecture for week 4

- Lecture notes

- Hull, Chapter 15

- Hull, Chapter 17, Sections 17.1–4, 6

- Hull, Chapter 18, Sections 18.6, 7 up to end of Control Variate technique

- Hull, Chapter 20, Sections 20.3, 4

- L. Ederington and W. Guan, 2002, Why are those options smiling? Journal of Derivatives, 9–34.

**Assignment Questions:** Tutorial in week 5

1. Hull, Chapter 15, Questions and Problems 15.1, 8, 12 [*Hint:* Use a spreadsheet to answer 15.12].

2. Hull, Chapter 17, Questions and Problems 17.4–8; Assignment Questions 17.18 [*Hint:* Use a spreadsheet to answer 17.18].

3. Hull, Chapter 18, Questions and Problems 18.13.

4. Hull, Chapter 20, Questions and Problems 20.4, 8, 16

### 12.1.5  Understanding credit risk and credit derivatives

**Readings:** Lecture for week 5

- Lecture notes

- Hull, Chapter 26

- Hull, Chapter 27, Sections 27.1–5

**Assignment Questions:** Tutorial in week 6

1. Hull, Chapter 26, Questions and Problems 26.1–3, 5, 7

2. Hull, Chapter 27, Questions and Problems 27.1, 3, 9, 10, 12, 17

### 12.1.6  Avoiding derivatives disasters

**Readings:** Lecture for week 6

- Lecture notes

- Hull, Chapter 30

**Assignment Questions:** Tutorial in week 7

1. *Case Study:* The National Australia Bank (NAB) is reported to have lost approximately \$360m in 2004 through so called 'rogue' trading in foreign currency derivatives.

   (a) Using publicly available information only, summarise the important facts of this derivatives debacle.

   (b) Identify the key factors that led to these losses being incurred.

   (c) What crucial lessons from previous derivatives disasters appear to have been ignored by the management of NAB?

2. *Model risk:* Refer to slide 18 of the lecture notes which shows the impact of estimation error in volatility on call prices.

   (a) Use DerivaGem to create a spreadsheet that produces a similar table but shows the effect of estimation error on the hedge parameters delta, gamma and vega.

   (b) Prepare a brief report setting out the qualitative lessons from this exercise.

## 12.2 Section 2

Lecture topics, readings and assignment questions for this section of the unit will be advised later.

# 13 Projects

## 13.1 Section 1

### 13.1.1 Project questions

The BXM$^{\text{SM}}$ is the S&P 500 BuyWrite Index provided by CBOE. It is a passive total return index based on (1) buying an S&P 500 stock index portfolio, and (2) writing (or selling) a slightly out-of-the-money, near-term S&P 500 Index call option. The call is held until expiration and cash settled, at which time a new one-month, near-the-money call is written. [Refer https://www.cboe.com/micro/bxm/introduction.aspx]. Historic data for the BXM$^{\text{SM}}$ is in the Excel file 35205proj01.xls downloadable from the unit web site.

The project has two parts, which are equally weighted for assessment purposes.

1. Prepare a report that provides a thorough, quantitative-based evaluation of the historic performance of the BXM$^{\text{SM}}$.

   [*Hint:* Your quantitative analysis will not only be assessed for accuracy but also for your ability to present meaningful risk and return measures for this particular index. Think carefully about your selection of performance metrics and what information they really convey.]

2. Suppose you work for an investment bank that offers a structured product which promises to pay holders an amount equal to the performance of the BXM$^{\text{SM}}$ with a capital guarantee. Prepare a report for your manager that explains how your company should (1) price this product, and (2) hedge the financial risks created by issuing this product.

   [*Hint:* Make sure that your response directly relates to the specific characteristics of this product. Avoid making general statements.]

### 13.1.2 Project rules

1. This project must be conducted by groups of four or five members. Form your groups as quickly as possible. Groups do not have to be made up of students in the same tutorial class.

2. Your report must include a statement, signed by all members, that sets out the percentage contribution of each member. It is expected that groups will allocate tasks so that each member makes a similar level of contribution. Marks may be adjusted where unequal contributions can be proved from individual log–books or other identifiable evidence.

3. The report must not exceed five typed, double–spaced pages (i.e. about 1500 words). You must properly acknowledge all source documents and include a full bibliography. Plagiarism will result in a zero mark and potential disciplinary action by the University.

4. A paper copy of your report must be submitted at the **start of the first lecture after the mid–semester break**. A copy of the spreadsheet used to prepare your answer to part 1 of the project must be emailed to the lecturer–in–charge no later than the same day that the report is due.

5. Marks will be deducted for late submission with the deduction increasing with the degree of lateness. Projects will not be accepted later than the first Friday after the due date.

## 13.2 Section 2

Details are to be advised later.