ACST859

Contingent Payments 1

S1 Day 2017

Dept of Applied Finance and Actuarial Studies

Contents

General Information

Unit convenor and teaching staff
Convenor and Lecturer
Jim Farmer
jim.farmer@mq.edu.au
Contact via Contact via iLearn Forum
E4A 616
Refer to the unit's web site

Lecturer
Xian Zhou
xian.zhou@mq.edu.au
Contact via Contact via iLearn Forum
E4A 607
Refer to the unit's web site

Credit points
4

Prerequisites

Corequisites
ACST851 and (STAT806 or STAT810 or (ACST601 and ACST604))

Co-badged status

Unit description
This unit covers the analysis of cash flows dependent on uncertain events of mortality. Single decrement survival models will be used to evaluate the expected present values of payments under life insurance and annuity contracts, and calculate the premiums of such contracts. The concepts of pricing and reserving for future contingent liabilities are considered, and the methods of calculating required reserves will be discussed.

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:

Understand simple survival models and related properties, including allowance for select

and ultimate mortality rates.

Be able to calculate expected present values and variances of benefits for various life insurance contracts.

Be able to efficiently calculate sustainable premiums rates for various life insurance contracts, including allowance for operating expenses and variable benefits.

Be able to efficiently calculate policy values for various life insurance contracts, including allowance for operating expenses and variable benefits, and understand their use in assessing whether the insurance portfolio is sustainable.

Be able to analyse the profit arising from life insurance contracts.

General Assessment Information

Macquarie University uses the grades HD, D, Cr, P and F for grading the achievements of students in units of study. The meaning of each symbol is explained in Schedule 1 of the Assessment Policy, available at

http://www.mq.edu.au/policy/docs/assessment/schedule_1.html

When you work as an actuary or in any other profession, if you have a dangerous misunderstanding of a concept you may provide incorrect advice to a client, possibly with severe financial consequences for your client and yourself. However, if you realise that you don't understand a concept you may refrain from giving advice on it until you have filled the gaps in your knowledge. That is, dangerous misunderstandings have more serious consequences than a recognised lack of knowledge.

The grading philosophy and marking scales adopted in this unit (and in many other university units) reflect this situation. Correct relevant statements earn marks. Statements revealing dangerous misunderstandings result in the deduction of marks. If your answers reveal that your misunderstandings are very severe or numerous, you might earn a negative mark for a question. If a part of a question is worth x marks, the smallest mark you can be allocated for that part is –x marks.

As an example, a minor error when keying numbers into your calculator is not usually regarded as a dangerous error provided the resulting incorrect answer is plausible. However, if a calculator error results in an obviously unreasonable answer, such as an expected present value of benefits which exceeds the maximum possible benefit, and you fail to state that you realise this answer is unreasonable, this would be regarded as a dangerous misunderstanding.

It is the responsibility of students to view their marks for each within session assessment on iLearn within 20 working days of posting. If there are any discrepancies, students must contact the unit convenor immediately. Failure to do so will mean that queries received after the release of final results regarding assessment marks (not including the final exam mark) will not be addressed.

Assessment criteria for all assessment tasks will be provided on the unit iLearn site.

Assessment Tasks

Name	Weighting	Hurdle	Due
Test	10%	No	In class, 20 March
Assignment	30%	No	10am 8 May 2017
Final Examination	60%	No	Examination Period

Test

Due: **In class, 20 March**
Weighting: **10%**

Class test with multiple-choice and/or True/False questions.

Incorrect answers will incur a penalty set at a level which ensures the expected mark from outright guessing is zero. No penalties apply if you choose not to answer a question.

Duration: 45 minutes

It will be open book. Any paper materials are permitted.

Students are permitted to use non-programmable calculators with no text-retrieval capacity.

Schedule 4 of the Assessment Policy includes the rules students must abide by during University examinations. The schedule is available at: http://www.mq.edu.au/policy/docs/assessment/schedule_4.html

On successful completion you will be able to:

- Understand simple survival models and related properties, including allowance for select and ultimate mortality rates.
- Be able to calculate expected present values and variances of benefits for various life insurance contracts.

Assignment

Due: **10am 8 May 2017**
Weighting: **30%**

The assignment involves using a spreadsheet to investigate efficient calculation methods for some of the assurance and/or annuity functions considered in this unit.

Assignments should be submitted via the tool on the unit's iLearn web site.

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 disruption of studies is made and approved.

On successful completion you will be able to:
- Understand simple survival models and related properties, including allowance for select and ultimate mortality rates.
- Be able to calculate expected present values and variances of benefits for various life insurance contracts.

Final Examination

Due: **Examination Period**
Weighting: **60%**

Duration: 3 hours plus 10 minutes reading time.

Students are permitted to use non-programmable calculators with no text-retrieval capacity.

Schedule 4 of the Assessment Policy includes the rules students must abide by during University examinations. The schedule is available at: http://www.mq.edu.au/policy/docs/assessment/schedule_4.html

In the exam, you are required to write your answers on the ruled (right hand) pages of the answer booklet provided. Anything written on the unruled (left hand) pages will not be marked.

You are permitted ONE A4 page of paper containing reference material printed on both sides. The material may be handwritten or typed.

On successful completion you will be able to:
- Understand simple survival models and related properties, including allowance for select and ultimate mortality rates.
- Be able to calculate expected present values and variances of benefits for various life insurance contracts.
- Be able to efficiently calculate sustainable premiums rates for various life insurance contracts, including allowance for operating expenses and variable benefits.
- Be able to efficiently calculate policy values for various life insurance contracts, including allowance for operating expenses and variable benefits, and understand their use in assessing whether the insurance portfolio is sustainable.
- Be able to analyse the profit arising from life insurance contracts.

Delivery and Resources

Classes

There are 5 hours of face-to-face teaching per week consisting of 3 hours of lectures and 2 hours of tutorial.

Class times can be found at: https://www.timetables.mq.edu.au/2017/

Tutorials start in Week 1

Unit Web Page

• The web page for this unit can be found at: http://ilearn.mq.edu.au

Technology Used and required

You will require a calculator. For the final exam, you may only use non-programmable calculators which are not able to store text.

You will be required to use a spreadsheet for the assignment. It is also a useful learning exercise to build your own spreadsheet copy of the mortality tables used in this unit. We do not prescribe any particular brand of spreadsheet.

You require access to a computer to access material on the unit's iLearn web site.

Required and Recommended Texts and/or Materials

Lecture Notes are the required materials and will be posted on the website before the lectures.

If you want additional background reading, you can try the course notes for subject CT5 published by ActEd. CT5 covers both this unit and Contingent Payments 2.

Unit Schedule

Since students often seem to print the schedule of topics, it is provided as a separate printer-friendly document in the administration section of this unit's iLearn web site.

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://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration

In addition, a number of other policies can be found in the Learning and Teaching Category of 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/support/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.

Supplementary exams

• Information regarding supplementary exams, including dates, is available at: http://www.businessandeconomics.mq.edu.au/current_students/undergraduate/how_do_i/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

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

- Understand simple survival models and related properties, including allowance for select and ultimate mortality rates.
- Be able to calculate expected present values and variances of benefits for various life insurance contracts.
- Be able to efficiently calculate sustainable premiums rates for various life insurance contracts, including allowance for operating expenses and variable benefits.
- Be able to efficiently calculate policy values for various life insurance contracts, including allowance for operating expenses and variable benefits, and understand their use in assessing whether the insurance portfolio is sustainable.
- Be able to analyse the profit arising from life insurance contracts.

Assessment tasks

- Test
- Assignment
- Final Examination

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

- Be able to efficiently calculate policy values for various life insurance contracts, including allowance for operating expenses and variable benefits, and understand their use in assessing whether the insurance portfolio is sustainable.
- Be able to analyse the profit arising from life insurance contracts.

Assessment task

- Final Examination

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

- Be able to calculate expected present values and variances of benefits for various life insurance contracts.
- Be able to efficiently calculate sustainable premiums rates for various life insurance contracts, including allowance for operating expenses and variable benefits.
- Be able to efficiently calculate policy values for various life insurance contracts, including allowance for operating expenses and variable benefits, and understand their use in assessing whether the insurance portfolio is sustainable.
- Be able to analyse the profit arising from life insurance contracts.

Assessment tasks

- Assignment
- Final Examination

Changes from Previous Offering

There have been no significant changes to the unit content.

Research & Practice, Global contexts & Sustainability

Survival analysis and the valuation of contingent payments has a long history. The techniques we are using can be found in textbooks or the CT5 course notes, rather than needing to source recent research papers.

While some topics in this unit will use Australian jargon and mention Australian market features, the mathematical concepts in this unit are independent of any legislative constraints and so do not recognise national or planetary boundaries.