ACST859

Contingent Payments 1

S2 Day 2016

Dept of Applied Finance and Actuarial Studies

Contents

General Information

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

Lecturer
David Pitt
david.pitt@mq.edu.au
Contact via iLearn Forum
E4A 611
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.

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

Understand the concepts of select and ultimate mortality rates and their applications.

Be able to efficiently calculate premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.

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	Due
Online Quiz 1	15%	22/08/2016 11:59pm
Online Quiz 2	15%	12/09/2015 11:59pm
Assignment	10%	4/10/2015 12 noon
Final Examination	60%	Exam Period

Online Quiz 1

Due: **22/08/2016 11:59pm**
Weighting: **15%**

Online quiz on Week 1 and 2 lectures.

You should complete the quizzes online. They are on this unit's iLearn web site.

Once you start a quiz, you have a maximum of 2 hours to complete it. This quiz becomes available at 12:01 am on Saturday 20 August and becomes unavailable at 11:59pm on Monday 22 August. That is, the quiz is available for 2 minutes less than 3 days. (We are avoiding using midnight as a cutoff time due to confusion as to whether "midnight Saturday" means "midnight at the start of Saturday" or "midnight at the end of Saturday".) You may start the quiz anytime within that range, but if you start it within 2 hours of the end of that range then it still closes at the end of that range, meaning you get less than 2 hours to complete it. The days on which the quizzes open and close can also be viewed on the calendar tool within iLearn.

In answering the online quizzes, you may consult your notes or any textbooks you like, but you may not seek assistance from any humans in any way whatsoever. This includes seeking assistance in interpreting what the questions mean. You should not discuss any of the quiz questions with any of your class mates until after the deadline for submitting the quiz has passed, even if you have already submitted the quiz and so can no longer change your answers, because you cannot be sure whether your class mates have submitted their quiz.

No extensions will be granted. Students who have not submitted the task prior to the deadline will be awarded a mark of 0 for the task, except for cases in which an application for special consideration is made and approved.

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

Online Quiz 2

Due: **12/09/2015 11:59pm**
Weighting: **15%**

Online quiz on Week 3 to 5 lectures.

See the description of Online Quiz 1 for general information that applies to both quizzes.

This quiz becomes available at 12:01 am on Saturday 10 September and becomes unavailable at 11:59pm on Monday 12 September. As for the first quiz, a 2 hour limit applies.

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

Assignment

Due: **4/10/2015 12 noon**
Weighting: **10%**

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. Students who have not submitted the task prior to the deadline will be awarded a mark of 0 for the task, except for cases in which an application for disruptions to studies is made and approved.

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

Final Examination

Due: **Exam Period**
Weighting: **60%**

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.
- Be able to calculate expected present values and variances of benefits for various life insurance contracts.
- Understand the concepts of select and ultimate mortality rates and their applications.
- Be able to efficiently calculate premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- 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/2016/

Required and Recommended Texts and/or Materials

No textbooks are prescribed for this unit. Detailed notes, exercises and solutions are available on the unit's web site. If you want additional printed resources, you could purchase the ActEd CT5 notes.

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 may find it useful to be able to construct spreadsheets to verify your solutions to tutorial exercises. You will also be required to use a spreadsheet for the assignment. 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.

Unit Web Site

The web site for this unit can be accessed at http://ilearn.mq.edu.au

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

New Assessment Policy in effect from Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy_2016.html. For more information visit http://students.mq.edu.au/events/2016/07/new_assessment_policy_in_place_from_session_2/

Assessment Policy prior to Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy prior to Session 2 2016 http://mq.edu.au/policy/docs/grading/policy.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 http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

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.
- Be able to calculate expected present values and variances of benefits for various life insurance contracts.
- Understand the concepts of select and ultimate mortality rates and their applications.
- Be able to efficiently calculate premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Be able to analyse the profit arising from life insurance contracts.

Assessment tasks

- Online Quiz 1
- Online Quiz 2

- 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

- Understand simple survival models and related properties.
- Be able to calculate expected present values and variances of benefits for various life insurance contracts.
- Understand the concepts of select and ultimate mortality rates and their applications.
- Be able to efficiently calculate premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Be able to analyse the profit arising from life insurance contracts.

Assessment tasks

- Online Quiz 1
- Online Quiz 2
- Assignment
- 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

- Understand simple survival models and related properties.
- Be able to calculate expected present values and variances of benefits for various life insurance contracts.
- Understand the concepts of select and ultimate mortality rates and their applications.
- Be able to efficiently calculate premiums and policy values for various life insurance

contracts, both with and without allowance for operating expenses.

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

Assessment tasks

- Online Quiz 1
- Online Quiz 2
- Assignment
- Final Examination

Changes from Previous Offering

The assessment scheme has been adjusted to comply with the new University Assessment Policy, which first applies for Session 2, 2016.

Research and Practice, Global and Sustainability

Survival analysis and the valuation of contingent payments has a long history. The techniques we are using can be found in textbooks on mathematics of finance, 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.