ACST860

Contingent Payments 2

S1 Evening 2019

Department of Actuarial Studies and Business Analytics

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General Information

Unit convenor and teaching staff Unit Convenor Jiwook Jang jiwook.jang@mq.edu.au E4A 613 Dialogue Tool on the teaching website
Credit points 4
Prerequisites ACST859
Corequisites
Co-badged status
Unit description Topics covered in this unit include: - multiple decrement models; - valuation of benefits and contributions under superannuation plans; - pricing and valuation of policies involving two lives; - cash flow and profit test models for life insurance products including traditional products, unbundled unit linked contracts and disability income products; - pricing and valuation for future contingent liabilities; and - the effect of the pricing and valuation basis on the emergence of profit. Students gaining a grade of credit or higher in both ACST859 and this unit may apply for exemption from subject CT5 of the professional exams of the Institute of Actuaries of Australia.

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:

> Extend the techniques learned in ACST255/859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
>
> Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and

demonstrate understanding of the relationship with associated single decrement tables. Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies. Define, calculate and analyse the use of various single figure indices, explain the rationale behind the indices, and explain the advantages and disadvantages of the indices for summarising and comparing actual experience in different scenarios. describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur. Demonstrate the ability to identify key unit concepts and to integrate them to solve, create and analyse novel problems.

General Assessment Information

Assessment Criteria

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

GradeBook

Assignment and class test marks are available on GradeBook. 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.

Feedback Prior to the Census Date

Self-assessment exercise question(s) will be released in Week 3 for feedback prior to the census date. Its answer will be also provided before the census date in Week 4.

Assessment Tasks

Name	Weighting	Hurdle	Due
Class Test	20%	No	Wednesday 10 April
Assignment	20%	No	Monday 27 May 12:00noon
Final Examination	60%	No	University Examination Period

Class Test

Due: **Wednesday 10 April**
Weighting: **20%**

Class test will be 95 minutes written papers with no reading time, held during the lecture time.

You are permitted ONE A4 page of paper containing reference material printed on both sides.

The material may be handwritten or typed. The page will be returned to the students at the end of the class test. Nonprogrammable calculators with no text-retrieval capacity are allowed. Dictionaries are not permitted.

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:

- Extend the techniques learned in ACST255/859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
- describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur. Demonstrate the ability to identify key unit concepts and to integrate them to solve, create and analyse novel problems.

Assignment

Due: **Monday 27 May 12:00noon**
Weighting: **20%**

Assignment has to be submitted via both on **iLearn** and ACST860 **Assignment Box** in BESS.

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. No submission will be accepted after solutions have been posted.

On successful completion you will be able to:

- Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.
- Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.
- describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur. Demonstrate the ability to identify key unit concepts and to integrate them to solve, create and analyse novel problems.

Final Examination

Due: **University Examination Period**

Weighting: **60%**

The final examination will be a three-hour written exam with ten minutes reading time, held during the University Examination period.

You are permitted ONE A4 page of paper containing reference material printed on both sides. The material may be handwritten or typed. The page will be returned to the students at the end of the final examination. Non-programmable calculators with no text-retrieval capacity are allowed. Dictionaries are not permitted.

On successful completion you will be able to:

- Extend the techniques learned in ACST255/859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
- Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.
- Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.
- Define, calculate and analyse the use of various single figure indices, explain the rationale behind the indices, and explain the advantages and disadvantages of the indices for summarising and comparing actual experience in different scenarios.
- describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur. Demonstrate the ability to identify key unit concepts and to integrate them to solve, create and analyse novel problems.

Delivery and Resources

Classes

The timetables for classes can be found on the University website at: http://www.timetables.mq.edu.au. Tutorials will commence in week 2 of the session. There is no tutorial in Week 8. All lecture classes for weeks 8, 9 and 10 will be held in in the Faculty PC lab, 6 Eastern Rd - 104.

Required and recommended texts and / or materials

Optional text. Detailed lecture materials are provided and it is not envisaged that you will require a text.

Lecture handouts. Lecture handouts are available for downloading from the website in advance of lecture classes. Print these (at 100% size) and bring them to the relevant lecture. It is expected that you will have these notes in all lectures.

Tables. The Formulae and Tables for Actuarial Examinations book is not required for this unit, and will not be provided in the examination. Instead, you will be asked to generate your own set of tables, based on up-to-date UK mortality tables. There will be Tables Tasks exercises set in the early weeks of the unit that will give you details of how to construct the tables and provide results to spot check your answers. In addition to generating results for your future use, the aim of these tasks is to help you to revise relevant results from ACST255/859. It is important that you keep up-to-date with the Tables Tasks so that you can use your tables to answer questions throughout this unit.

Technology used and required

You will be required to use the teaching website, Excel and Word.

Unit webpage

Course material is available on the learning management system (iLearn). To access the teaching website, go to http://ilearn.mq.edu.au and login using your usual login and password.

Teaching and learning activities

Lectures. The unit material is covered in the three hours of lectures each week.

Tutorials. The tutorial is an opportunity for you to discuss the exercises available for each section of work with your tutor. The tutorials will cover the lecture material from the same week, and tutorials commence in week 2. There is no tutorial in Week 8.

Computer lab classes. These will replace all of the lecture classes in weeks 8, 9 and 10.

Material to bring to classes. You are expected to bring to all classes the relevant lecture handout printout for the current and previous weeks, blank paper to complete exercises, a calculator, and your completed Tables Tasks.

Unit Schedule

Week	Week Beginning	Lecture and tutorial (Monday & Wednesday)	
	25 Feb	Unit introduction and Section 1: Joint life and last survivor statuses	
	4 March	Section 2: Simple annuities and assurances involving two lives	
	11 March	Section 3: Contingent and reversionary benefits	
	18 March	Section 4: Competing risks	
	25 March	Section 5: Multiple decrement tables	

Week	Week Beginning	Lecture and tutorial (Monday & Wednesday)	
	1 April	Section 6: Superannuation funds	
	8 April	Class Test	Wednesday 10 April
	15 April 22 April	MID-SEMESTER STUDY BREAK	
	29 April	Section 7: Profit testing - conventional business	
	6 May	Section 8: Profit testing - unit-linked business	
	13 May	Profit testing revision	
	20 May	Section 9: Mortality risk factors and selection	
	27 May	Section 10: Mortality indices	Assignment due (Monday 27 May 12:00noon)
	3 June	Revision and exam information	

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). 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). 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).

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 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 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

If you are a Global MBA student contact 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/.

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.

Supplementary Examinations

Further information regarding supplementary exams, including dates, is available here

http://www.businessandeconomics.mq.edu.au/current_students/undergraduate/how_do_i/disruption_to_studies

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

- Extend the techniques learned in ACST255/859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
- Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.
- Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.
- Define, calculate and analyse the use of various single figure indices, explain the rationale behind the indices, and explain the advantages and disadvantages of the indices for summarising and comparing actual experience in different scenarios.

Assessment tasks

- Class 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

- Extend the techniques learned in ACST255/859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
- Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.
- Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.
- describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur. Demonstrate the ability to identify key unit concepts and to integrate them to solve, create and analyse novel problems.

Assessment tasks

- Class Test
- 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

- Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.

- describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur. Demonstrate the ability to identify key unit concepts and to integrate them to solve, create and analyse novel problems.

Assessment tasks

- Class Test
- Assignment
- Final Examination

Changes from Previous Offering

There have been minor changes to the lecture and tutorial materials. The assessment changes each year.

Research and Practice

This unit uses research by Macquarie University researchers, as well as from other Australian and international researchers (references are given in the unit notes).

You are also required to source and use Australian and international research as part of the assignment in this unit.