ACST819

Actuarial Modelling

S2 Day 2014

Applied Finance and Actuarial Studies

Contents

General Information

Unit convenor and teaching staff
Unit Convenor
David Pitt
david.pitt@mq.edu.au
Contact via david.pitt@mq.edu.au
E4A609
Consultation: Wednesday 3-5 during my teaching weeks, or other times by appointment

Lecturer
Bruce Edwards
bruce.edwards@mq.edu.au
Contact via bruce.edwards@mq.edu.au
-
Consultation: To be advised

Credit points
4

Prerequisites
STAT806 or STAT810

Corequisites

Co-badged status
ACST819 shares lectures with ACST359

Unit description
Survival models will be used to estimate decrement rates from actual experience, compare these with standard rates, and prepare new tables. In constructing new tables, consideration will be given to risk factors; selection; data collection; graduation; and testing the graduation. The concept of actuarial modelling will be discussed. The 'actuarial control cycle', a conceptual framework of the processes for developing and managing financial enterprises and products, will be introduced. Students gaining a grade of credit or higher in this unit and ACST818 may apply for exemption from subject CT4 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:

Describe the principles of actuarial modelling

Identify the most significant risks for various types of financial institution and compare ways of managing these risks

Discuss the concept of the Actuarial Control Cycle and apply it to a variety of straightforward practical commercial situations

Describe how to test crude estimates for consistency with a standard table or a set of graduated estimates and describe the process of graduation

Use the Binomial and Poisson models for mortality, derive the maximum likelihood estimator for the model parameter. Describe how to estimate transition intensities depending on age, exactly or using the census approximation

Apply knowledge to solve complex actuarial problems

General Assessment Information

The following apply to the class test and final examination:

- 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 not be returned to you at the end of the final examination.

- Any mortality or statistical tables that you require will be provided to you.

- Calculators (no text-retrieval capacity) are permitted.

- Dictionaries are not permitted.

- For full marks, clear and complete working must be shown.

The following applies to the class test and assignment:

- No extensions will be granted. Students who do not attend the class test or submit the assignment by the due date will be awarded a mark of 0 for the task except in cases where the formal Disruption Policy applies.

Assessment Tasks

Name	Weighting	Due
Class Test	10%	10 October 2014
Assignment	20%	Week 9
Final Exam	70%	Exam period

Class Test

Due: **10 October 2014**
Weighting: **10%**

Test covering Sections 1 to 5 inclusive. You will have 75 minutes to complete the test.

On successful completion you will be able to:

- Describe how to test crude estimates for consistency with a standard table or a set of graduated estimates and describe the process of graduation
- Use the Binomial and Poisson models for mortality, derive the maximum likelihood estimator for the model parameter. Describe how to estimate transition intensities depending on age, exactly or using the census approximation

Assignment

Due: **Week 9**
Weighting: **20%**

An assignment requiring data analysis and investigation along with a written report and presentation will be required. You will work in groups for the written component of the assignment. More detail on this task will be provided later in the session.

On successful completion you will be able to:

- Describe the principles of actuarial modelling
- Describe how to test crude estimates for consistency with a standard table or a set of graduated estimates and describe the process of graduation
- Use the Binomial and Poisson models for mortality, derive the maximum likelihood estimator for the model parameter. Describe how to estimate transition intensities depending on age, exactly or using the census approximation
- Apply knowledge to solve complex actuarial problems

Final Exam

Due: **Exam period**
Weighting: **70%**

A three-hour written exam will be held during the normal university examination period. Questions will cover the entire unit.

On successful completion you will be able to:

- Identify the most significant risks for various types of financial institution and compare ways of managing these risks

- Discuss the concept of the Actuarial Control Cycle and apply it to a variety of straightforward practical commercial situations
- Describe how to test crude estimates for consistency with a standard table or a set of graduated estimates and describe the process of graduation
- Use the Binomial and Poisson models for mortality, derive the maximum likelihood estimator for the model parameter. Describe how to estimate transition intensities depending on age, exactly or using the census approximation

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.

Required or recommended texts and/or materials

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

Technnology used and required

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

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.

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.html

Grading Policy http://mq.edu.au/policy/docs/grading/policy.html

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/p

olicy.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/

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://informatics.mq.edu.au/help/.

When using the University's IT, you must adhere to the Acceptable Use 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

- Describe the principles of actuarial modelling
- Identify the most significant risks for various types of financial institution and compare ways of managing these risks
- Discuss the concept of the Actuarial Control Cycle and apply it to a variety of straightforward practical commercial situations
- Describe how to test crude estimates for consistency with a standard table or a set of graduated estimates and describe the process of graduation
- Use the Binomial and Poisson models for mortality, derive the maximum likelihood estimator for the model parameter. Describe how to estimate transition intensities depending on age, exactly or using the census approximation
- Apply knowledge to solve complex actuarial problems

Assessment tasks

- Class Test
- 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

- Describe the principles of actuarial modelling
- Identify the most significant risks for various types of financial institution and compare ways of managing these risks
- Discuss the concept of the Actuarial Control Cycle and apply it to a variety of straightforward practical commercial situations
- Describe how to test crude estimates for consistency with a standard table or a set of graduated estimates and describe the process of graduation
- Use the Binomial and Poisson models for mortality, derive the maximum likelihood estimator for the model parameter. Describe how to estimate transition intensities depending on age, exactly or using the census approximation

- Apply knowledge to solve complex actuarial problems

Assessment tasks

- Class Test
- Assignment
- Final Exam

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Describe the principles of actuarial modelling
- Identify the most significant risks for various types of financial institution and compare ways of managing these risks
- Discuss the concept of the Actuarial Control Cycle and apply it to a variety of straightforward practical commercial situations

Assessment tasks

- Assignment
- Final Exam

Changes from Previous Offering

There have been changes to the lecture content, assessment structure and teaching personnel since the previous offering of this unit.

Research and practice

This unit uses research from Macquarie researchers and data sourced from Australian life insurance experience.

Supplementary Examinations

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

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

Changes since First Published

Date	Description
29/07/2014	Assignment description updated.