ACST840

Quantitative Research Methods II

S2 Day 2015

Dept of Applied Finance and Actuarial Studies

Contents

General Information

Unit convenor and teaching staff Lecturer Glen Barnett glen.barnett@mq.edu.au Contact via glen.barnett@mq.edu.au for private administrative matters (use the iLearn forum for public admin & subject content) E4A619 (Thursday lunchtime and Friday afternoons only x9987) Thursday 1:30-2:30 or as otherwise indicated on iLearn
Credit points 4
Prerequisites (Admission to MActPrac or (admission to MCom in Actuarial Studies and 16cp)) and (STAT810 or STAT806)
Corequisites
Co-badged status
Unit description This unit focuses on statistical approaches used in Business and Economics and related disciplines. Topics include statistical modelling, time series analysis, ARCH, GARCH model, longitudinal and panel data models, generalized linear models and limited dependent variables. The unit will also consider applications of the above models and techniques to the actuarial practice discipline.

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 the theoretical basis of a range of statistical models used in actuarial research and the practice of modelling and inference using statistical models.

Critique, replicate and extend basic actuarial research using statistical models.

Ask questions and communicate problems relating to statistical models, and to explain and discuss ideas relating to implementation of statistical models.

Understand how a variety of statistical models are used in actuarial research and how empirical results are communicated in practice.

General Assessment Information

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 tasks (not including the final exam mark) will not be addressed.

Student Research Projects and writeup of Research Presentation

As with most published research you will need to be quite economical with your use of words in these projects; expect them to require substantial editing to meet the length requirements, so you should budget your time as if writing a longer piece of work than it might seem from what will be submitted. These may be related to the same piece of research each time, but are not required to be. Projects should be submitted in hard copy as well as a copy uploaded to "Turnitin" (via iLearn).

Assessment Tasks

Name	Weighting	Due
Project 1	20%	Week 6
Project 2	20%	Week 9
Research Presentation	20%	Week 10-12
Final Exam	40%	Exam period

Project 1

Due: **Week 6**
Weighting: **20%**

Summarize, describe and critique a published research paper in a reputable actuarial or closely related journal (demography, finance, statistics, etc). You should explain what was done, how it was done, what its contributions were and how it might have been done better or differently. It should be expected that it will be necessary to read more widely than the specific paper you discuss. Length: Approximately 5 pages / 2000 words. Submission should be via Turnitin at 2pm on the day of the class for that week, and also on paper at the start of the class.

No extensions will be granted. Late tasks will be accepted up to 72* hours after the submission deadline. There will be a deduction of 20%* 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 – 40% penalty). This penalty does not apply for cases in which an application for special consideration is made and approved. Late submissions should be made via Turnitin, and subsequently by emailing a copy of the document to your Lecturer, and a paper copy should also be provided at the next class time.

On successful completion you will be able to:

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Project 2

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

Perform a similar analysis to an existing piece of research, on similar data. Finding some suitable data will be important -- if you can't get any for the research you have in mind you must choose a different piece of research. Note that there are a number of useful data sets available in a package associated with the textbook, some of which will be used for this purpose. Length: Approximately 5 pages / 2000 words, but a few pages of additional supplementary material may be included in a short appendix. You should hand in no more than 10 pages total, and fewer than 8 if there are few displays. Since ability to ask and/or answer questions on research is an important aspect of research, participation in relevant discussion in workshops and on the iLearn forum during weeks 2-8 will form one tenth of the mark for this project.

Submission should be via Turnitin at 2pm on the day of the class for that week, and also on paper at the start of the class.

No extensions will be granted. Late tasks will be accepted up to 72* hours after the submission deadline. There will be a deduction of 20%* 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 – 40% penalty). This penalty does not apply for cases in which an application for special consideration is made and approved. Late submissions should be made via Turnitin, and subsequently by emailing a copy of the document to your Lecturer, and a paper copy should also be provided at the next class time.

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Research Presentation

Due: **Week 10-12**
Weighting: **20%**

Extend an analysis, or perform an alternative form of analysis to that in an existing piece of research, using some methodology covered in class (or some other analysis by agreement with the lecturer), and both submit a written report and present/summarize this work in class (up to 10 minutes will be allocated to presentation; if you use slides, you should not expect to present more than a handful of slides). The presentation will be 30% of the mark and will be in the workshop time in weeks 10, 11 and 12; if you present in an earlier week, you would expect to discuss planned work rather than completed work. The report itself will be submitted in week 12 and will form 60% of the marks for the project. Length: Approximately 5 pages / 2000 words (with similar caveats to Project 2). Participation in relevant discussion in workshops and on the iLearn forum in weeks 9-12 will form one tenth of the mark for this project.

Submission of the report should be via Turnitin at 2pm on the day of the class for that week, and also on paper at the start of the class.

No extensions will be granted. Late tasks will be accepted up to 72* hours after the submission deadline. There will be a deduction of 20%* 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 – 40% penalty). This penalty does not apply for cases in which an application for special consideration is made and approved. Late submissions should be made via Turnitin, and subsequently by emailing a copy of the document to your Lecturer, and a paper copy should also be provided at the next class time.

On successful completion you will be able to:

- Critique, replicate and extend basic actuarial research using statistical models.
- Ask questions and communicate problems relating to statistical models, and to explain and discuss ideas relating to implementation of statistical models.
- Understand how a variety of statistical models are used in actuarial research and how

empirical results are communicated in practice.

Final Exam

Due: **Exam period**
Weighting: **40%**

Three hour written exam held during the university exam period.

On successful completion you will be able to:

- Understand the theoretical basis of a range of statistical models used in actuarial research and the practice of modelling and inference using statistical models.
- Understand how a variety of statistical models are used in actuarial research and how empirical results are communicated in practice.

Delivery and Resources

Lecture and Workshop times Classes for ACST840 are scheduled as per the class timetable available at http://www.timetables.mq.edu.au/. There will be 3 hours face-to-face teaching per week typically consisting of two hours of lecture and one hour of workshop, where students will be expected to both ask and answer questions (of each other as well as the lecturer).

Technology used and required If you are enrolled in this unit, you will be listed in the ACST840 online unit (iLearn). Login at http://ilearn.mq.edu.au/ The site will be used to post any additional lecture slides, handouts, and assigned work. The site contains a forum to which you will be expected to contribute (you'll be expected to contribute to discussion relating to your research - and others' research, for example). Please log in to the site on a regular basis. This course requires access to the R statistical package.

Required and Recommended Texts and/or Materials The set textbook for ACST840 is:

• Arthur Charpentier (2014), Computational Actuarial Science with R. CRC Press.

Both paper and electronic versions of the book can be obtained online. You are expected to buy or have daily access to this text. Reading will be assigned and problems will be taken from this text and this text defines the “notes” for this course.

Workshop exercises and discussion - Some weeks there will be exercises based on the previous week's material; attempting and discussing them will be an important part of the learning process for research. The performance on the exercises will not be assessed but some projects have a small discussion component, and discussion of relevant topics in class and on iLearn will contribute to those. Students will be expected to attempt any exercises during the week prior to the workshop they're to be discussed in, in order to be able to discuss them in iLearn beforehand, and in the face-to-face time. Most exercises require access to and some familiarity with the R statistical package. They will generally be covered in the last lecture hour

and will usually be on material in the previous week, but broader questions relating to research - including issues relating to student projects - during workshop time are also encouraged.

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/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

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

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 - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- Understand the theoretical basis of a range of statistical models used in actuarial research and the practice of modelling and inference using statistical models.
- Understand how a variety of statistical models are used in actuarial research and how empirical results are communicated in practice.

Assessment tasks

- Project 1
- Project 2
- Research Presentation
- Final Exam

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 the theoretical basis of a range of statistical models used in actuarial research and the practice of modelling and inference using statistical models.
- Critique, replicate and extend basic actuarial research using statistical models.
- Understand how a variety of statistical models are used in actuarial research and how empirical results are communicated in practice.

Assessment tasks

- Project 1
- Project 2
- Research Presentation
- Final Exam

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

- Critique, replicate and extend basic actuarial research using statistical models.
- Ask questions and communicate problems relating to statistical models, and to explain and discuss ideas relating to implementation of statistical models.
- Understand how a variety of statistical models are used in actuarial research and how empirical results are communicated in practice.

Assessment tasks

- Project 1
- Project 2
- Research Presentation

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 outcome

- Ask questions and communicate problems relating to statistical models, and to explain and discuss ideas relating to implementation of statistical models.

Assessment tasks

- Project 1
- Project 2
- Research Presentation