ECON333

Econometric Methods

S1 Day 2014

Economics

Contents

Disclaimer

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General Information

Unit convenor and teaching staff
Unit Convenor
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E4A 417
Available on iLearn

Credit points
3

Prerequisites
6cp at 200 level including (ECON232 or ECON233 or ECON334)

Corequisites

Co-badged status

Unit description
The purpose of this unit is to extend econometric techniques and theory beyond the ideal world of the classical linear regression model. It introduces various econometric methods and their properties to analyse more realistic economic phenomena where some of the classical assumptions are most likely to be violated. The topics include: binary-choice models; multi-response models; maximum likelihood estimation; matrix algebra; GLS estimation; instrumental-variable and GMM estimation; unit-root and co integration tests; VECM; and models for panel data.

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:

    To clearly understand key concepts and results for each topic covered in the unit.

    To be able to specify an econometric model that is appropriate for the problem at hand, estimate it using a relevant method, and interpret the estimation results.

    To understand statistical properties of the estimator used and to draw correct inferences from them (including hypothesis tests).

To appreciate the advantages and limitations of an econometric method in various situations.

To understand matrix algebra

Assessment Tasks

Name	Weighting	Due
Class Test	25%	Week 5
Assignment	25%	Week 11
Final Examination	50%	University Examination Period

Class Test

Due: **Week 5**
Weighting: **25%**

Topics: matrix algebra and the topics covered in Weeks 1−4.

Date and time: during lecture time **- 9:00 am**, **2 April** (Week 5)

Duration: 50 minutes

You will need a calculator. This is a closed-book test. There will be no supplementary test even if you miss this test. If you cannot sit the test due to illness or unavoidable disruption, you will have to apply for special consideration with supporting documentations attached. If approved, this component will not be counted in calculating your final grade.

On successful completion you will be able to:
- To clearly understand key concepts and results for each topic covered in the unit.
- To understand statistical properties of the estimator used and to draw correct inferences from them (including hypothesis tests).
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Assignment

Due: **Week 11**
Weighting: **25%**

·　　　The questions will be made available about 3-4 weeks before the due date, **28 May** (Week 11). It must be submitted to the lecturer at the beginning of the lecture (i.e. 9 am) in Week 11. No extension will be granted. Late submissions will be accepted up to three days after the submission deadline. There will be a deduction of 20% of the total available marks made from the total awarded marks 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.

Always keep a photocopy of the document you submit for assessment, including assignment, to insure yourself against loss.

On successful completion you will be able to:

- To be able to specify an econometric model that is appropriate for the problem at hand, estimate it using a relevant method, and interpret the estimation results.
- To understand statistical properties of the estimator used and to draw correct inferences from them (including hypothesis tests).
- To appreciate the advantages and limitations of an econometric method in various situations.

Final Examination

Due: **University Examination Period**
Weighting: **50%**

The examination will be closed-book and of two hours' duration. It will cover all the topics that have been discussed in class during the semester. You will need a calculator.

The University Examination period in Semester 1, 2013 is from 11 June to 28 June. You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in draft form approximately eight weeks before the commencement of the examinations and in final form approximately four weeks before the commencement of the examinations: http://www.timetables.mq.edu.au/exam.

Students who do not sit for the final exam will be awarded a grade of FA (failed absent). The only exception to this rule will occur in cases where the student has been granted special consideration on the grounds of unavoidable disruption. Students who are prevented from sitting the final exam due to illness or unavoidable disruption may wish to consider applying for special consideration; see below for the related information. If a supplementary examination is granted as a result of the special consideration process the examination will be scheduled after the conclusion of the official examination period. If the student does not attend the supplementary examination at the scheduled time, a grade of FA will be awarded. **Note that special consideration may be approved only if the coursework during semester is satisfactory.**

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is the final day of the official examination period.

On successful completion you will be able to:

- To clearly understand key concepts and results for each topic covered in the unit.
- To be able to specify an econometric model that is appropriate for the problem at hand, estimate it using a relevant method, and interpret the estimation results.

- To understand statistical properties of the estimator used and to draw correct inferences from them (including hypothesis tests).
- To appreciate the advantages and limitations of an econometric method in various situations.
- To understand matrix algebra

Delivery and Resources

CLASSES

Classes: Wednesday 9 am - 12:00 pm (E5A 110)

There is a single three-hour lecture/tutorial each week of semester. Attendance to lectures is strongly recommended. Selected questions from tutorials will be discussed during lectures.

It should be noted that class attendance is only one part of university study. In addition to class attendance, students will need to spend around six to nine hours per week in private study in order to perform well in the unit.

The timetable for classes can be found on the University website at: http://www.timetables.mq.edu.au/

REFERENCES

There is no set textbook, but students may find the following texts useful:

[1] Verbeek, Marno, A Guide to Modern Econometrics (latest 4th edition, 2012);

[2] Greene, William H., Econometric Analysis (latest 7th edition, 2011); and

[3] Enders, Walter, Applied Econometric Time Series (latest 3rd edition, 2010).

Verbeek [1] is compact and relatively easy to read, while Greene [2] is more complete in details but a bit complex. As such, the former is useful to those who want to learn key concepts quickly and to get the big picture, while the latter is useful to those who want to have a reference they can consult to find answers to various "why" and "how" types of questions.Unfortunately, Greene [2] does not have much on time-series models. Enders [3] could be a good supplement to Greene [2] on time series models.

For all topics, supplementary notes will be provided (on the unit homepage). Students are expected to download the notes for the next lecture topic and bring them to the lecture.

TECHNOLOGY USED AND REQUIRED

(1)   Students will require a **non-programmable calculator** for tutorials, tests and the final examination.

Students will also require access to a **computer**, on which the following programs are installed or accessible.

(2)   *Shazam*: A code-based econometric software program, which can be accessed through *iLab*: ***http://students.mq.edu.au/information_technology/.*** The user has to write his/her own

codes using the commands and language of the program. It is very flexible in the sense that users can write their own codes to suit their needs instead of being limited by the available menu items of a menu-based program. A document on how to use the program will be provided on the unit homepage.

(3)   *Gretl*: It is free, open-source software. Visit the *Gretl* website: http://gretl.courceforge.net/, and choose the operating system of your computer from the menu on the left-hand side. Download and install the program onto the computer. Download also the manual and all the data for practice.

      The program has code facilities, but it is basically menu-based. Its functions cover most of the topics, but not all of them. This program may be used in combination with *Shazam* to verify results and to better understand the estimation methods.

(4)   An internet browser, such as **Firefox** and Internet **Explorer**, to access *iLearn*.

(5)   **Adobe Acrobat Reader**: to read course material downloaded from iLearn. This program can be downloaded from http://www.adobe.com/downloads/.

UNIT WEB PAGE

Useful information and some course material will be made available on the learning management system (*iLearn*): ilearn.mq.edu.au. Visit the homepage regularly for new information, course material and announcements.

TEACHING AND LEARNING STRATEGY

Lecture notes will be made available before each corresponding lecture throughout the semester. The notes will include key concepts and points that are to be explained and discussed in the lecture. It is essential to get a good grasp of the contents of the lecture notes. Student may consult the references for better understanding of the material.

Useful examples are provided in the tutorials. Going through those questions will help better understand the topics discussed in lectures. Solutions to the tutorial questions will be provided on the unit homepage. However, students are recommended to attempt the questions without looking at the provided solutions first and then refer to them for the expected answers.

Attendance to the lectures is not compulsory. However, students may be seriously disadvantaged by missing a lecture. If you missed a class for an unavoidable reason, it would be a good idea to borrow notes from a friend and see what was discussed in your absence.

The references listed above may be consulted for more detailed explanations and examples. For some topics, journal articles may be prescribed for further reading.

Unit Schedule

TOPICS

Part 1:

· Models with Discrete Dependent Variables (Verbeek 7.1, 7.2, 6.1, and 6.2; Greene Chs. 18 and 14)

 - Binary-choice models

- Ordered-choice models

- Multinomial-choice models

- Maximum likelihood (ML) estimation

· Matrix Algebra (Verbeek Appendix A, 2.1, 2.2, and 2.3; Greene Appendix A)

A supplementary note will be made available in Week 1.

Part 2:

· Nonspherical Disturbances and the Generalised Least Squares (GLS) estimation

   (Verbeek Ch. 4; Greene Chs. 9 & 20)

· Stochastic Regressors and Consistent Estimation (Verbeek Ch. 5; Greene Chs. 8 & 13.4)

- Instrumental variables estimation

- Method of moments estimation

- Generalised method of moments

· Models for Panel Data (Verbeek Ch. 10; Greene Ch. 11)

- Fixed-effects model

- Random-effects model

Part 3:

· Time Series Models (Verbeek Chs. 8 and 9; Enders Chs 5 and 6; Greene Chs. 20 & 21)

 - Nonstationarity and unit root test

- Cointegration (single-equation approach)

- Cointegration (multi-equation approach)

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Learning and Teaching Activities

Lectures

Two to three hour lecture in each week, where the topics are introduced, key concepts and ideas are explained, and some application examples are discussed.

Tutorials

Eight sets of practical questions. Solutions provided. Some selected questions are discussed in class.

Private study

Six to nine hours' private study in each week, reviewing course material, reading texts and recommended journal articles, and practicing software programs.

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/

Academic Honesty

The nature of scholarly endeavour, dependent as it is on the work of others, binds all members of the University community to abide by the principles of academic honesty. Its fundamental principle is that all staff and students act with integrity in the creation, development, application and use of ideas and information. This means that:

- all academic work claimed as original is the work of the author making the claim
- all academic collaborations are acknowledged
- academic work is not falsified in any way
- when the ideas of others are used, these ideas are acknowledged appropriately.

Further information on the academic honesty can be found in the Macquarie University Academic Honesty Policy at http://www.mq.edu.au/policy/docs/academic_honesty/policy.html

Grades

Macquarie University uses the following grades in coursework units of study:

- HD - High Distinction
- D - Distinction
- CR - Credit
- P - Pass
- F - Fail

Grade descriptors and other information concerning grading are contained in the Macquarie University Grading Policy which is available at:

http://www.mq.edu.au/policy/docs/grading/policy.html

Grading Appeals and Final Examination Script Viewing

If, at the conclusion of the unit, you have performed below expectations, and are considering lodging an appeal of grade and/or viewing your final exam script please refer to the following website which provides information about these processes and the cut off dates in the first instance. Please read the instructions provided concerning what constitutes a valid grounds for appeal before appealing your grade.

http://www.businessandeconomics.mq.edu.au/new_and_current_students/undergraduate_current_students/how_do_i/grade_appeals/

Special Consideration Policy

The University is committed to equity and fairness in all aspects of its learning and teaching. In stating this commitment, the University recognises that there may be circumstances where a student is prevented by unavoidable disruption from performing in accordance with their ability. A special consideration policy exists to support students who experience serious and unavoidable disruption such that they do not reach their usual demonstrated performance level. The policy is available at:

http://www.mq.edu.au/policy/docs/special_consideration/policy.html

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

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- To clearly understand key concepts and results for each topic covered in the unit.
- To be able to specify an econometric model that is appropriate for the problem at hand, estimate it using a relevant method, and interpret the estimation results.
- To understand statistical properties of the estimator used and to draw correct inferences from them (including hypothesis tests).
- To appreciate the advantages and limitations of an econometric method in various situations.
- To understand matrix algebra

Assessment tasks

- Class Test

- Assignment
- Final Examination

Learning and teaching activities

- Two to three hour lecture in each week, where the topics are introduced, key concepts and ideas are explained, and some application examples are discussed.
- Eight sets of practical questions. Solutions provided. Some selected questions are discussed in class.
- Six to nine hours' private study in each week, reviewing course material, reading texts and recommended journal articles, and practicing software programs.

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- To clearly understand key concepts and results for each topic covered in the unit.
- To be able to specify an econometric model that is appropriate for the problem at hand, estimate it using a relevant method, and interpret the estimation results.
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Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- To clearly understand key concepts and results for each topic covered in the unit.
- To be able to specify an econometric model that is appropriate for the problem at hand, estimate it using a relevant method, and interpret the estimation results.
- To understand statistical properties of the estimator used and to draw correct inferences from them (including hypothesis tests).
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Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- To be able to specify an econometric model that is appropriate for the problem at hand, estimate it using a relevant method, and interpret the estimation results.
- To understand matrix algebra

Assessment task

- Assignment