



Department of Economics

ECON 210: Introduction to Econometrics

Paper Outline – Semester 1, 2009

Times and Venues

Lectures: Monday: 10.00-10.50 (CO220); Tuesday: 10.00-10.50 (CO220); and
Wednesday: 10.00-10.50 (CO203)

Tutorial: Thursday: 11.00-11.50, CO220 (starting in **week 2**)

Computer labs: Monday: 9.00-9.50 (CO316) **or** Wednesday: 11.00-11.50 (CO303)
(starting in **week 4**)

Lecturers

Alfred Haug

Room: CO720

Tel: 479 5636

AHaug@business.otago.ac.nz

Office Hours: Tues 9-10am,
Thurs, 9-11am till April 28
and week before final exam

Dorian Owen (Coordinator)

Room: CO708

Tel: 479 8655

DOwen@business.otago.ac.nz

Office Hours: See whiteboard
outside room CO708

Administrative

Brenda Tustin

Enquiries, e.g.,

Room: CO706

Blackboard

Tel: 479 8725

BTustin@business.otago.ac.nz

Available 8.30am to 5pm, weekdays

Prerequisites: BSNS 102 or QUAN 101 or STAT 110; **Prerequisite or Corequisite:** One of FINQ 102, QUAN 102, MATH 160 or (MATH 102 and MATH 103); **Restriction:** FINC 203, STAT 241

We frequently use examples relating to simple economic relationships. So, although there are no specific economics prerequisites for this paper, it is helpful to have at least some basic knowledge of microeconomics and macroeconomics.

Overview and Objectives

ECON 210 is designed to introduce students to some of the statistical and econometric techniques that are widely used in empirical work in economics and other related disciplines. It covers the basics of estimation and inference in the context of the single-equation linear regression model. The main objective of the paper is to teach students how to apply relevant econometric methods to analyse data and interpret the results from such analyses. The focus is on conceptual understanding and ‘hands on’ applications using economic data drawn from real-world examples, rather than on formal theoretical proofs. By the end of the paper, students should be able to appreciate and interpret the econometric and statistical analysis reported in many studies in economics and be able to carry out and interpret their own econometric analysis.

ECON 210 is a compulsory paper for the second-year Honours programme in economics, but it is also recommended for economics majors with a good background in first-year statistics for whom an appreciation of the econometric and statistical tools in widespread use in economic analysis would be invaluable.

Lecture Notes

Copies of overhead slides and other handout material will be distributed in lectures and will be posted on *Blackboard* **after** lectures for anyone who is unable to attend. Overhead slides provide an outline of the lectures but are **not** a substitute for attending and taking your own notes.

Tutorials and computer labs

Tutorials and labs are an important part of the paper and students are strongly advised to attend all of these. A tutorial will be held weekly **beginning in week 2** of the semester. There will be fortnightly tutorial assignments. The assessed components of these will either take the form of multi-choice test questions to be completed in the tutorial (graded out of 100%) or will require solutions for a specified ‘hand-in’ question to be written up and handed in. For the hand-in questions, a mark of at least 50% will be worth 2% towards the final grade.

You will be given regular computing exercises that supplement the lectures and/or are part of the tutorial exercises. The lab times provide an opportunity to work on these problems under supervision. **Labs start in week 4** (but there will be no labs in week 13; see the timetable below). Note that you may attend either the Monday, 9am (in CO316) or the Wednesday, 11am lab (in CO303). The lab exercises will require the use of the statistical/econometric software package *Stata*. *Small Stata* version 10, a student version of *Stata*, is available in the labs for everyone enrolled for ECON 210. *Small Stata* is able to analyse datasets with a maximum of 99 variables on approximately 1,000 observations, which is sufficient for the size of problems that we will examine in ECON 210.

Workload

ECON 210 is an 18-point semester paper. Under the University's points conventions, this corresponds approximately to an average workload of 12 hours per week (including contact hours), or roughly 180 hours in total over a 15-week period (including the end-of-semester exam period).

Assessment

Assessment comprises 4 components:

- Five fortnightly tutorial multi-choice tests or exercises worth 10% where plussage **does not** apply
- a 50-minute *mid-semester test*, worth 15% where plussage applies,
- a computing assignment worth 15% where plussage **does not** apply (due at the end of week 12), and
- a two-hour *final examination* worth at least 60% depending on your *mid-semester test* result.

Calculators: mathematical calculators are allowed but neither programmable nor communicable devices are allowed to be used, in the test or examination.

Internal assessment – plussage

The aim of plussage is to enable students who perform poorly on an internal assessment covering a particular content or skill area, but who demonstrate substantial improvement in

that area during the final exam, to obtain an overall grade that reflects their capabilities at the end of the paper. It should **not** be taken as an invitation to avoid doing internal assessment.

You should also be aware that – aside from providing feedback on how you are coping with the paper and some insurance against a poor performance on the final exam – your internal assessment grade is also an important factor in determining eligibility for ‘Terms Carried Over’ (should you fail the paper) and the form of Special Consideration that might be offered (should you be ill or otherwise impaired during the final exam).

Special consideration

If you consider your performance in the end-of semester examination to be seriously impaired, or if you are too ill to sit an examination, you can apply for Special Consideration. To do this you will need to obtain an application form from the University Information Centre or Student Health. Please note that applications for Special Consideration must be made within five calendar days from the date of the last examination for which the application applies and must be accompanied by supporting documentation, such as a medical certificate.

Dishonest Practice and Plagiarism

Students should make sure that all submitted work is their own.

Any student found responsible for dishonest practice (for example, copying another student’s work, the use of unauthorised material in tests, etc.) in relation to any piece of work submitted for assessment shall be subject to the University's dishonest practice regulations which may result in various penalties, including forfeiture of marks for the piece of work submitted, a zero grade for the paper, or in extreme cases exclusion from the University.

Plagiarism is a form of dishonest practice. Plagiarism is defined as copying or paraphrasing another's work, whether intentionally or otherwise, and presenting it as one's own. In practice this means plagiarism includes any attempt in any piece of submitted work (e.g. an assignment or test) to present as one's own work the work of another (whether of another

student or a published authority). Any student found responsible for plagiarism shall be subject to the university's dishonest practice regulations as outlined above.

Class Representatives

The class representative system provides students with a vehicle for communicating their views on matters associated with the teaching and delivery of their paper or course of study. It provides staff with the opportunity to communicate information to and gain constructive feedback from students. It contributes to the development of a sense of community within a Department/School/Faculty and it adds a further dimension to the range of support services that the University of Otago offers its students. The School of Business and the Department of Economics fully supports the class representative system.

Volunteers to act as class representatives for this paper will be called early in the semester. The OUSA then invites all class representatives to a training session, conducted by OUSA, about what it means to be a class representative and some of the possible procedures for dealing with issues that arise. They also provide information on the services that OUSA offers and the role OUSA can play in solving problems that may occur. The OUSA also provides ongoing support to class representatives during the semester. The Department's Director of Undergraduate Studies and the Departmental Administrator will also meet during the semester with the class representatives for this paper to discuss general issues or matters they wish to have considered

Disclaimer

While every effort has been made to ensure that the information contained in this document is accurate, the information is subject to change. Changes will be notified in class.

Timetable of lectures, tutorials and labs for 2009

Week beginning	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Tutorial</i>	<i>Lab</i>
1 2 March	Lecture 1 ♣	Lecture 2 ♣	Lecture 3 ♦		
2 9 March	Lecture 4 ♦	Lecture 5 ♦	Lecture 6 ♦	Tutorial 1	
3 16 March	Lecture 7 ♦	Lecture 8 ♦	Lecture 9 ♦	Tutorial 2	
4 23 March	Lecture 10 ♦	Lecture 11 ♦	Lecture 12 ♦	Tutorial 3	Lab 1
5 30 March	Lecture 13 ♦	Lecture 14 ♦	Lecture 15 ♦	Tutorial 4	Lab 2
6 6 April	Lecture 16 ♣	Lecture 17 ♣	Lecture 18 ♣	Tutorial 5	Lab 3
13 April	Mid-semester break				
7 20 April	Lecture 19 ♣	Lecture 20 ♣	Lecture 21 ♣	Tutorial 6	Lab 4
8 27 April	Lecture 22 ♣	Lecture 23 ♣	Test	Tutorial 7	Lab 5
9 4 May	Lecture 24 ♣	Lecture 25 ♣	Lecture 26 ♣	Tutorial 8	Lab 6
10 11 May	Lecture 27 ♣	Lecture 28 ♣	Lecture 29 ♣	Tutorial 9	Lab 7
11 18 May	Lecture 30 ♣	Lecture 31 ♣	Lecture 32 ♣	Tutorial 10	Lab 8
12 25 May	Lecture 33 ♣	Lecture 34 ♣	Lecture 35 ♣	Tutorial 11	Lab 9
13 1 June	Queen's b'day	Lecture 36 ♣	Overflow ♣	Overflow	
8 June	Exams				

Lecturers: ♦: Alfred Haug (13 lectures) ♣: Dorian Owen (24 lectures)

Course Materials and Texts:

The essential text is Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, 4th Edition, Thomson, South-Western, 2009.

We will not cover all of the topics in Wooldridge in this paper, but later chapters will be useful for ECON 375. The 3rd Edition is just as good if you have access to it.

There are several alternative texts at a similar level that will be referred to occasionally and are also useful:

James H. Stock and Mark W. Watson, *Introduction to Econometrics*, Second Edition, Pearson Addison-Wesley, 2007.

Michael P. Murray, *Econometrics: A Modern Introduction*, Pearson Addison-Wesley, 2006.

Christopher Dougherty, *An Introduction to Econometrics*, Third Edition, Oxford University Press, 2007.

Damodar N. Gujarati, *Basic Econometrics*, Fourth Edition, McGraw-Hill, 2003.

The following is a useful complementary text, which concentrates more on an intuitive overview and less on technical detail; many students find it more accessible:

Peter Kennedy, *A Guide to Econometrics*, Sixth Edition, Blackwell, 2008.

Another easy-to-read non-technical introduction to econometrics is:

Gary Koop, *Analysis of Economic Data*, Second Edition, John Wiley & Sons, 2005.

Lecture slides, outlines, data files, computing exercises, tutorial sheets and other information relating to this course will be posted on *Blackboard* under ECON210. Login access is available at <https://blackboard.otago.ac.nz/webapps/login/>

Outline/Lecture Programme

Week 1: Introduction

The nature of econometrics and why it is useful; economic data, experimental versus non-experimental data; economic models and empirical modelling; Stata basics

Reading: Wooldridge, Chapter 1
Stock and Watson, Chapter 1
Kennedy, Chapter 1

Weeks 2-3: Review of basic statistical concepts

Random variables and distributions, characteristics of distributions (expected value, variance, conditional expectation), covariance and simple correlation, the normal distribution and related distributions (chi-squared, t - and F -distributions), central limit theorem, samples and populations, estimators as random variables, sampling distribution, properties of estimators, estimation methods

Reading: Wooldridge, Appendix B and Appendix C
Stock and Watson, Chapters 2 and 3
Kennedy, Chapter 2, Appendix A and Appendix B

Weeks 4-5: The simple regression model

Specification of the simple regression model, ordinary least squares (OLS) estimation, fitted values and residuals, goodness-of-fit, units of measurement and functional form, statistical properties of OLS estimators, regression analysis in Stata

Reading: Wooldridge, Chapter 2
Stock and Watson, Chapter 4
Kennedy, Chapter 3

Weeks 6-7: Multiple regression analysis: estimation

Motivation, mechanisms and interpretation of multiple regression models, ordinary least squares (OLS) estimation, fitted values and residuals, goodness-of-fit, units of measurement and functional form, probabilistic model assumptions and statistical properties of OLS estimators, ‘overspecifying’ and ‘underspecifying’ models, variance of OLS estimators, the Gauss-Markov theorem

Reading: Wooldridge, Chapter 3
Stock and Watson, Chapter 6
Kennedy, Chapter 3

Weeks 7-8: Multiple regression analysis: inference

Sampling distributions of the OLS estimators, testing hypotheses about a single population parameter: the t -test, economic versus statistical significance, confidence intervals, testing hypotheses about a single linear combinations of the parameters, testing multiple linear restrictions: the F -test, reporting regression results, large-sample inference

Reading: Wooldridge, Chapters 4, 5
Stock and Watson, Chapters 5 and 7
Kennedy, Chapter 4

Week 9: Multiple regression analysis: further issues

Effects of data scaling, more on functional form, more on goodness-of-fit, model selection, prediction and residual analysis

Reading: Wooldridge, Chapter 6
Stock and Watson, Chapter 8
Kennedy, Chapter 6

Week 10: Binary (or Dummy) Variables

Formulating and interpreting coefficients on dummy explanatory variables, interactions involving dummy variables, binary dependent variables: the linear probability model

Reading: Wooldridge, Chapter 7
Kennedy, Chapter 15

Week 11: Heteroskedasticity

Consequences of heteroskedasticity for OLS, testing for heteroskedasticity, heteroskedasticity-robust inference, weighted least squares estimation

Reading: Wooldridge, Chapter 8
Stock and Watson, Chapters 5 and 7

Week 12: Specification and Data Problems

Reading: Wooldridge, Chapter 9

Week 13: Overflow/Miscellaneous