



BUSINESS SCHOOL
Te Kura Pakihi

Department of Economics

ECON 375: Econometrics

Course Outline – Semester 2, 2024

Course Description

Econometric theory and application of estimation and testing techniques in the context of multiple regression and simultaneous equation models. Interpreted literally, 'econometrics' means 'economic measurement'. Although measurement is an important part of econometrics, the scope of econometrics (and this paper) is much broader. Econometrics develops and applies statistical methods for estimating economic relationships, testing economic theories, selecting economic models and evaluating government and business policies. This paper examines the theory and application of estimation and testing techniques. The emphasis is on understanding and interpreting results. A good part of the time will be devoted to using real data for hands-on, computer-based exercises in the lab, producing estimates and forecasts and presenting these in tables and graphs along with explanations.

Graduate Attributes Emphasised

Interdisciplinary perspective, Scholarship, Communication, Critical thinking, Information literacy, Research, Self-motivation.

Learning Outcomes

The goal of this paper is to develop a good understanding of the main techniques used in econometrics, reviewing and building on the skills and knowledge obtained in 200-level introductory econometrics. Practical computing exercises and assignments will provide experience in applying these techniques. At the end of the paper, the student will be able to critically assess empirical work produced by researchers, and to apply the methods, using appropriate computer software, to relevant data in practice and interpret the results obtained.

Please note that ECON 375 is one of the required papers that students intending to proceed to postgraduate programmes (MEcon, MSc, MCom, Honours, PGDip) in economics must include in their Bachelor's degree programme. It is a prerequisite for the ECON 400 level econometrics papers and also for ECON 402, ECON 403, ECON 404, ECON 405 ECON 406 and ECON 407. The applied practical skills taught aim to provide valuable preparation for everybody intending to undertake an empirical Master's or Honours dissertation at the 400 or 500 level.

Prerequisites

(FINC 102 or FINQ 102 or MATH 140) and (ECON 210 or FINC 203 or STAT 210 or STAT 241) (or equivalent Mathematics and Statistics papers approved by the Head of Department).

Lecture Times

Mondays, 9.00-9.50 am
Tuesdays, 12.00-1.50 pm

Computing Labs

Tuesdays, as assigned, either 9.00-9.50 am or 10.00-10.50 am (**starting in week 2**)

Lecturers

Assoc. Prof. Dennis Wesselbaum (Rm OBS622, 03-479-8643)
Email: dennis.wesselbaum@otago.ac.nz

Prof. Alfred Haug (Rm OBS615, 03-479-5636; course coordinator)
Email: alfred.haug@otago.ac.nz

Office Hours: tba

Assessment

In-class assessment consists of **one in-class tests**, 50 minutes long, towards the end of Dennis's teaching period, during regular class time, worth a total of 30%, and eight hand-in tutorial questions worth each 2.5% for a total of 20%.

The final exam counts 50% and will be held during the usual University's examination period and the exact date and time will be announced by the University in due time. It will be two hours long and cover the whole course, i.e., it is comprehensive.

Full plussage will be applied to the test. The test and exam will **not** be "open book" assessments.

Workload

Note that this is an 18-point semester paper. Under the University's points conventions, an 18-point paper corresponds approximately to an average workload of 14 hours per week (including contact hours), or roughly 180 hours in total.

Academic Integrity and Academic Misconduct

Academic integrity means being honest in your studying and assessments. It is the basis for ethical decision-making and behaviour in an academic context. Academic integrity is informed by the values of honesty, trust, responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the University's Academic Integrity Policy.

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously by the University. Types of misconduct include plagiarism, copying, unauthorised collaboration, submitting work written by someone else (**including from a file sharing website, text generation software, or purchased work**) taking unauthorised material into a test or exam,

impersonation, and assisting someone else's misconduct. A more extensive list of the types of academic misconduct and associated processes and penalties is available in the University's Student Academic Misconduct Procedures.

It is your responsibility to be aware of and use acceptable academic practices when completing your assessments. To access the information in the Academic Integrity Policy and learn more, please visit the University's Academic Integrity website at www.otago.ac.nz/study/academicintegrity, or ask at the Student Learning Centre (HEDC) or the Library, or seek advice from your paper co-ordinator.

For further information:

Academic Integrity Policy

<http://www.otago.ac.nz/administration/policies/otago116838.html>

Student Academic Misconduct Procedures

<http://www.otago.ac.nz/administration/policies/otago116850.html>

Generative Artificial Intelligence and Autonomous Content Creation Policies

<https://www.otago.ac.nz/administration/policies/policy-collection/use-of-generative-artificial-intelligences-and-autonomous-content-generation-in-learning-and-teaching-policy>

Turnitin on Blackboard

Turnitin is a text-matching software tool which reports matches between sections of student work submitted to it, and other material to which Turnitin has access (i.e. material available via the internet, and content of other student assignments which have previously been submitted to Turnitin). Turnitin is also often referred to as a plagiarism detection tool. All assignments submitted electronically through Blackboard are uploaded via Turnitin, and the report is available to the marker. You are able to check your draft assignment via Turnitin before you submit your final assignment. Full instructions and guidance for the use of Turnitin can be found at: <https://help.otago.ac.nz/blackboard/assessing-your-students/turnitin/turnitin-for-students/>

Untimely Submission of Assessment Items

Late assignments will be accepted for evaluation for university-approved reasons only (in the event of illness, family emergency, or conflict with a university-sponsored event). Supporting documentation must be provided.

Textbooks

The prescribed textbooks are Wooldridge's *Introductory Econometrics* and Stock and Watson's *Introduction to Econometrics*. ECON 210 worked through the first eight chapters of Wooldridge. This course essentially works through the remainder of the topics usually covered in a full-year econometrics course. There is no one perfect textbook, and we will combine material from different sources. In addition, Kennedy's *A Guide to Econometrics* is a useful supplement that concentrates on an intuitive understanding and less on technical detail. For those students interested in the technical details, a textbook one step up is that by Johnston and DiNardo.

Wooldridge, Jeffrey M., *Introductory Econometrics: A Modern Approach*, 7th Edition, Cengage, 2020; 4th, 5th or 6th edition is also acceptable **(W)** (HB139.WW634 2020).

Stock, James H., and Mark W. Watson, *Introduction to Econometrics*, Fourth (Global) Edition, Pearson, 2020 (**SW**) (Third or second edition is fine: HB139.SV16 2007).

Kennedy, Peter, *A Guide to Econometrics*, 6th edition, Blackwell, 2008 (**K**) (HB139.KB7 2008).

A more advanced treatment is provided by:

Johnston, Jack, and John DiNardo, *Econometric Methods*, 4th Edition, McGraw-Hill, 1997.

The texts are available in the Central Library. The first part of this course will *review and enhance understanding* of concepts introduced in ECON210. ECON 375 is intended as a progression from ECON 210 (or FINC 203), and therefore students are expected to have at least some familiarity with introductory/intermediate econometrics. The intention is to develop and enhance an understanding of key statistical concepts and the fundamental assumptions (and violations) of the classical linear regression model. Most of your learning will take place by taking notes in lectures, reading appropriate material in the textbooks, attending computer labs as well as preparing for, and participating in occasional tutorials built into the lectures.

Course Outline

Topic 1

Review of basic concepts

A review of some of the key topics from ECON210, i.e., of the material in chapters 1 – 4 and 6 – 8 of Wooldridge's 6th edition. There will be some additional bits and pieces along the way, including some material on asymptotics in Wooldridge's Ch. 5, the matrix form of regression analysis in Appendices D and E, and misspecification testing.

Reading: **W:** Ch. 1 - 8, appendices D and E.
 SW: Ch. 2 - 7 (not all parts), 9.2, appendix 18.1.
 K: Ch. 1, 2, 3, 5, 12, 15.
 Review your notes from ECON 210 or equivalent.

Topic 2

Introduction to maximum likelihood estimation

The idea of maximum likelihood. MLE versus OLS in simple linear regression. Deriving maximum likelihood estimators. Wald, LR and LM tests.

Reading: **K:** Ch. 2.9.
 SW: Ch. 11.3 (pp. 398-399)

Topic 3

Categorical dependent variables

Logit and probit estimation.

Reading: **W:** Ch. 17.
 SW: Ch. 11.

K: Ch. 16.

Topic 4

Instrumental variables (IV)

Exogeneity vs endogeneity. How IV estimation works. Requirements for a good instrument. Two Stage Least Squares (2SLS). Testing whether a variable is endogenous.

Reading: **SW:** Ch. 9.2, 12.1.
W: Ch 15.

Topic 5

Simultaneous equation models

The nature of the simultaneity problem (as a violation of the classical assumptions). Identification and two stage least squares (TLS).

Reading: **SW:** Ch. 12.1, 12.2.
W: Ch. 16.
K: Ch. 11.

Topic 6

Estimation with panel data (*if time permits, otherwise this topic will be covered at the very end of the course by Alfred*)

Nature of panel data. Fixed versus random effects.

Reading: **W:** Ch. 13, 14.
SW: Ch. 10.
K: Ch. 18.

Week of 26 August 2024:

Review and Test 1 on Dennis's part

Topic 7

Autocorrelation

Causes and implications for OLS estimation. Tests for autocorrelation. Generalised Least Squares (GLS) estimation of models with auto-correlated errors. Heteroscedasticity and autocorrelation (HAC) consistent estimation.

Reading: **W:** Ch. 12.1 to 12.5.
K: Ch. 8.

Topic 8

Autoregressive and moving average models (AR&MA), vector ARs (VARs) and forecasting

Definitions and estimation problems. Introduction to time-series analysis (in the narrow sense), spurious regressions, non-stationarity, vector auto-regressions and cointegration.

Reading: SW: Ch. 14, 16.1-16.4; not all parts.
W: Ch 18.2 to 18.5.
K: Ch. 19.

Topic 9

Autoregressive conditional heteroscedasticity (ARCH)

Definitions and estimation problems. Testing for ARCH and estimation under ARCH. Extension: GARCH.

Reading: SW: Ch. 16.5.
W: Ch 12.6

Week of 9 October 2023:

Panel methods, unless covered earlier; Review

END OF CLASSES

Student Learning Support and Information

Student Charter

<http://www.otago.ac.nz/about/otago005275.html>

Guidelines for Learning at Otago

<https://www.otago.ac.nz/hedc/otago616123.pdf>

<http://hedc.otago.ac.nz/hedc/learning/>

Student Learning Centre

The Student Learning Centre, which is part of the Higher Education Development Centre, provides learning support, free of charge, to ALL enrolled students. Their services include:

- a workshop programme designed to help students to improve their learning strategies and their generic skills;
- individual assistance with learning issues;
- on-line study skills advice
- a student leadership programme
- a student-led peer support programme for students of all ages and backgrounds.
- conversational English groups for students from a non-English speaking background

The Centre also provides two very helpful study guides, "Guidelines for Writing and Editing" and "Writing University Assignments" and these are available on the SLC website. <http://slc.otago.ac.nz/>

Library Support

The Library website <http://www.otago.ac.nz/library> provides access to resources and services, including group room bookings, library hours and locations, past exam papers, subject guides, article databases and more.

If you need assistance either check out the self-help guides <http://otago.libguides.com/selfhelp>, or ask Library staff at the ground floor service desks, or email ask.library@otago.ac.nz

Pacific Student Support Facilitators

Malo e lelei

Falaviena Faiva works part-time in the Dean's Office at the Otago Business School, Division of Commerce. Falaviena is of Tongan descent and one of our two Pacific Student Support Facilitators. She is responsible for all second-year Pacific students within the division.

Falaviena is a University of Otago, Humanities and Commerce graduate and is currently completing a Postgraduate Commerce degree in International Business.

Deans Office, Otago Business School

Division of Commerce

Email: viena.faiva@otago.ac.nz

Cell Phone: 021 279 0914

Bula Vinaka

Jekope Ramala Maiono also works part time in the Dean's Office at the Otago Business School, Division of Commerce.

Maiono is of Fijian descent and our other Pacific Student Support Facilitator. He is responsible for all first-year Pacific students in the division.

Maiono is a University of Otago Commerce graduate, also studying a PHD degree in the Division of Humanities.

Deans Office, Otago Business School

Division of Commerce

Email: jekope.maiono@otago.ac.nz

Cell Phone: 021 279 0871

Kaiāwhina Māori | Māori student support

Ben is the Kaiāwhina Māori (Māori student support) for Te Kura Pākihi | Otago Business School. He is able to answer any questions you may have about studying here at the University of Otago. He can provide information about scholarships, campus services, pastoral and financial care. Ben is also here to support those students who are studying away from their whānau, hapū and iwi, to ensure they feel safe and supported. He has a passion for the development of Rangatahi and understands the struggles that can come with academic life.



Tel +64 27 513 6991

Email ben.sommerville@otago.ac.nz

Disability Information and Support

Students are encouraged to seek support if they are having difficulty with their studies due to disability, temporary or permanent impairment, injury or chronic illness. It is important to seek help early, through one of the contacts below:

Website: <http://www.otago.ac.nz/disabilities>

65 Albany St, West Lane, ISB, Student Services

Tel: +64 3 479 8235 Email: disabilities@otago.ac.nz

Student Feedback

We encourage your feedback. This can be in the form of contacting staff, participating in course evaluation surveys, and communicating with class representatives. Continual improvements will be made to this course based in part on student feedback.

Class Representatives

The class (or student) representative system is an avenue for encouraging communication and consultation between staff and students. It provides you with a vehicle for communicating your views on the teaching and delivery of the paper and provides staff with an opportunity to communicate information and gain constructive feedback from students. It contributes to the development of a sense of community within a department and it adds a further dimension to the range of support services offered to students.

Volunteers for the role of class representatives will be called early in the semester. The OUSA 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 provides support to class representatives during the semester. Departmental staff will also meet with class representatives during the semester to discuss general issues or matters they wish to have considered.

Your class representative's name and contact details will be posted on Blackboard early in the semester.

Concerns about the Course

We hope you will feel comfortable coming to talk to us if you have a concern about the course. The Course Co-ordinator will be happy to discuss any concerns you may have. Alternatively, you can report your concerns to the Class Representative who will follow up with departmental staff. If, after making approaches via these channels, you do not feel that your concerns have been addressed, there are University channels that may aid resolution. For further advice or more information on these, contact the departmental administrator or head of department.

Disclaimer

While every effort is made to ensure that the information contained in this document is accurate, it is subject to change. Changes will be notified in class and via Blackboard. Students are encouraged to check Blackboard regularly. It is the student's responsibility to be informed.