

Econ 606 Automatic Model Selection methods 2022-2023

COURSE AIMS & OBJECTIVES, KEY SKILLS AND LEARNING OUTCOMES

Course Aims & Objectives: The purpose of this course is to provide students with an introduction to automatic model selection and its limitations and uses in practical econometric modelling. In addition, the course introduces saturation estimation techniques, and considers other approaches.

Key Skills: By the end of this course, students should have some knowledge and understanding of:

- Theoretical properties of automatic model selection
- Using and understanding results from the Autometrics algorithm in PcGive
- Have a basic understanding of the Autometrics algorithm
- Saturation estimation, such as indicator, step, and trend indicator saturation
- Alternative Lasso based methods.

Desired Outcomes: By the end of this course, students should be able to:

- Use automatic model selection to build econometric models
- Use saturation estimation
- Present, interpret and analyse the results of automatic model selection
- Utilise effectively PcGive and the R gets package packages

Econ 606 is a 10 credits course and therefore students are expected to input approximately 100 hours of study into the course. The total number of contact hours on Econ 606 is 15 hours. This leaves 85 hours for private study. Course Delivery comes in the form of Lectures with 15 hours delivered over the first 3 weeks of the term (10 hours of lectures and 5 hours of tutorials). There will be optional clinics on the last day of the course.

During your private study you should strike a balance between reading the course material (which is the primary source of information) and the recommended textbooks, thinking critically about how these fit in to the body of knowledge on the subject and about how our level of knowledge can be improved, performing exercises, completing coursework and revising for examinations. You can expect to perform well on this course only if you work consistently through the year.

COURSE STRUCTURE

COURSE CONVENOR

Jennifer L CASTLE, Jurgen A DOORNIK, David F HENDRY

LECTURERS CONTACT INFORMATION (Including Office Hours)

Email: jurgen@doornik.com

Available by appointment (please email to arrange a convenient time)

COURSEWORK ASSESSMENT

The final mark for the course will depend on a written exam. Timetable for details of time and venues will be communicated via Moodle and by Timberlake well in advance.

The CWA mark will be calculated as 100% coursework. The coursework will be assigned at the beginning of the module.

Coursework must be submitted electronically through the Moodle site for this course: <https://mle.lancs.ac.uk/course>. Login using your regular Lancaster University access details. This opens a page headed MLE: My home.

The format of the submission is as follows.

- The submitted file must be in pdf format with the following name

stud#_studname_cw_cw#.pdf

where: **stud#** is your student number, **studname** is your name in the format *surname_name*, **cw#** is either 1 or 2 according to the piece of coursework submitted. Eg a student with student number 111 would submit a file named *111_surname_firstname_cw_1.pdf*.

- Maximum file size is 2MB: figures resolution must be adjusted accordingly.

Note that your work will be screened using software designed to detect plagiarism.

Do not rely upon someone else to submit your coursework.

*Word counts are inclusive of all material submitted apart from the Bibliography.

FEEDBACK ON COURSEWORK:

The coursework will be marked and returned to students within 4 weeks of the submission deadline. Feedback will consist of marker's notes appended to the pdf of your coursework.

MARKING CRITERIA AND PENALTIES

Marking criteria can be found in the Economics Undergraduate Handbook and the general course information paper. An electronic copy of this can be found via the Current Student page of the university website then follow the Academic Regulations link
<https://gap.lancs.ac.uk/ASQ/QAE/MARP/Documents/UG-Assess-Regs.pdf>

FINAL MARK INFORMATION

This course is assessed 100% by means of coursework. The final mark is the average of the marks obtained in the two pieces of coursework.

COURSE TEXT AND RECOMMENDED READING

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Main texts

The main recommended textbook is:

Hendry, D. F. and Doornik, J. A. (2014). *Empirical Model Discovery and Theory Evaluation*. MIT Press. Supplementary information at <http://www.doornik.com/Discovery>

Students should purchase a copy of this book. For the computer labs you will also need:

Access to XIModeler or PcGive (part of OxMetrics)

Students will also find the following texts useful as further reading.

- Hoover, K. D., and Perez, S. J. (1999). 'Data mining reconsidered: Encompassing and the general-to-specific approach to specification search'. *Econometrics Journal*, 2, 167–191.

Note Copies of the lecture slides will be made available on the course web pages. You **MUST** print off the notes for each lecture **prior to** attending. Solutions to exercises, and some additional material associated with these lectures and course announcements will also be placed on this website.

COURSE OUTLINE/LECTURE SCHEDULE

Day 1: Theory

Theory of reduction and model evaluation

Day 2: Practice and algorithms

Introduction to automatic model selection; understanding Autometrics

Day 3: Practice of automatic model selection

Empirical modelling with automatic model selection in action

Day 4: Saturation methods

Impulse indicator and other saturation methods

Day 5: Extensions and different approaches

Further uses of automatic model selection and alternative methods