MODULE SPECIFICATION · ELECTIVE

Estimation Techniques for Linear and Nonlinear Models

This course builds on the previous module on Foundations of Econometrics, which is essentially an OLS-based course. OLS is an excellent estimator under specific circumstances and assumptions, but when these are not met other estimation techniques are preferable. This course offers an in-depth study of the theoretical and practical applications of several estimation techniques, such as Generalised and Weighted LS, MLE, IV, GMM, LAD and Robust/Quantile Regression. The module is mainly focused on using EViews for applications. The prerequisite module required before taking this course is ECON7901: Foundations of Econometrics.

10	15h	85h	100h
CREDITS	CONTACT HOURS	PRIVATE STUDY	TOTAL STUDY

COURSE CONVENOR

NAME Professor Lorenzo Trapani

OFFICE By appointment — please email to arrange a convenient time

COURSE STRUCTURE

Econ 7932 is a 10-credit course and students are expected to input approximately 100 hours of study. The total number of contact hours is 15 hours, leaving 85 hours for private study. Delivery is by lectures — 15 hours across the first five weeks of term, comprising 10 hours of lectures and 5 hours of tutorials. Optional clinics run on the last day of the course.

During private study, balance the course material (the primary source) against the recommended textbooks, working through the exercises and completing the coursework. Think critically about how the material fits into the wider body of knowledge and how that knowledge might be extended. Working consistently throughout the course is the best way to perform well.

MODULE PROGRAMME

LECT.	TOPIC	SESSION CONTENT
01	The failure of OLS	— Pseudo random number generation, some experiments using PcNaive
02	Heteroskedasticity targeting estimation: GLS and WLS	— Theory and properties of the GLS and WLS estimators; GLS and WLS estimation in EViews
03	Maximum Likelihood Estimation	— Theory and properties of the MLE estimator; MLE estimation in EViews
04	Instruments and moments	— Theory and properties of the IV and GMM estimators; IV and GMM estimation in EViews

LECT.	TOPIC	SESSION CONTENT
05	Outlier robustness	— Theory and properties of the LAD and Robust/Quantile regression estimators; robust estimation in EViews

KEY SKILLS

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

- Generalised, heteroskedasticity-targeting least squares estimation
- Maximum likelihood estimation
- Instruments and moments; Instrumental Variable and the Generalised Method of Moments estimators
- Outliers, heavy tails and Least absolute deviations
- Robust regression in the presence of outliers and heavy tails
- Using EViews to implement the estimators above
- Understand the output, and the software options, from EViews

DESIRED OUTCOMES

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

- Understand the limitations of OLS, and when not to use it
- Understand the theory of GLS/WLS, MLE, IV, GMM, LAD and Robust/Quantile Regression
- Understand when to use the estimators above
- Implement the estimators in EViews
- Present, interpret and analyse information in numerical form

ASSESSMENT

WEIGHTING	100% coursework
ISSUED	At the end of the course
DUE	Dates to be confirmed — four weeks for completion
SUBMISSION	Electronically via the Moodle site for this course
FEEDBACK	Returned within 4 weeks of the deadline, as marker's notes appended to the PDF of your coursework

Marking criteria and penalties are set out in the Economics Undergraduate Handbook and the general course information paper, available via the Current Student page of the university website under Academic Regulations.

COURSE TEXT & RECOMMENDED READING

Book chapters and online material. For the tutorials you will also need access to EViews. Copies of the lecture slides are made available on the course web pages, together with additional material and course announcements.

- Greene, W. H. (2018). Econometric Analysis, 8th edition. International edition, New Jersey: Prentice Hall