Advanced Econometrics

Welcome

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Econometrics and Data Science
Master Program

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The team

Etienne Wijler (e.j.j.wijler@vu.nl) is assistant professor of econometrics and data science. He is your lecturer and course coordinator. Address organizational questions to him.

Gabriele Mingoli is PhD student in econometrics and data science and your instructor for the exercise tutorials.

Noah Stegehuis is PhD student in econometrics and data science and your instructor for the coding questions for the case work.

Motivation

Introductory econometrics: you studied the properties of basic estimators (OLS, ML, GMM).

Problem: that introductory analysis...

- was only valid in simple models (linear regression, ARMA);
- did not extend to other estimators;
- required an assumption of correction specification.

Advanced Econometrics

Econometricians work everyday with complex nonlinear models, robust estimators, and recognize that their models are mis-specified!

Course structure

- Lectures: Monday at 17:30h (MF-FG2) and Wednesday at 15:30h (HG-14A00). Slides distributed prior to lecture on Canvas.
- Online Q&A sessions: Tuesday at 14:00h. Attendance is voluntary. Post questions on the Discussion Forum. Recordings will be made available.
- Tutorials: Thursday or Friday (register yourself). Discuss recommended *and* requested exercises.
- Coding office hours: Each Wednesday morning starting from week 2. Information will follow on Canvas.

For more detailed information, download the Course Manual from Canvas.

Discussion Forums

In this course, we will make us of three types of discussion forums:

1. Lecture Q&A: Post questions to receive better answers during Q&A.
2. Tutorial Exercises: Suggest exercises to solve during tutorials.
3. Coding: Post coding questions in separate Python and R forums.

Use these forums to your advantage! The best way to learn is through questioning and explaining.

Assignments

- Assignments: There will be a total of four assignments during the course.
- Individual: The first assignment is to be made fully individually and will be graded with a pass or fail.
- Group: The remaining three assignments are group assignments, to be made in teams of 3 or 4 students. We will open team allocation on Canvas.
- Coverage: The assignments are chosen to cover both predictive and causal modelling in real-world problem settings, including
  - **Finance**: return and volatility modelling,
  - **Economics**: interpreting the dynamics in unemployment rates,
  - **Marketing**: examining adstock generation and optimizing prices.

Grading

- Grading policy: The course grade consists of the assignment grade (AG) and a final exam grade (EG).
- AG: The assignment grade is calculated as

$$\mathrm{AG} = \begin{cases} 1 & \text{if IA} = \text{fail}, \\ (\mathrm{GA1} + \mathrm{GA2} + \mathrm{GA3})/3 & \text{if IA} = \text{pass}. \end{cases}$$

- FG: The final grade is calculated as:

$$\mathrm{FG} = \begin{cases} \min(\mathrm{AG}, \mathrm{EG}) & \text{if AG} < 5 \text{ or EG} < 5, \\ 0.3 \times \mathrm{AG} + 0.7 \times \mathrm{EG} & \text{if AG} \geq 5 \text{ and EG} \geq 5. \end{cases}$$

Literature

Exam material

- Lecture slides
- **Course book**: F. Blasques (2021) *Advanced Econometric Methods: A guide to estimation and inference for nonlinear dynamic models (2nd ed.)*
- Solutions manual (download from Canvas)

Background reading

- Research articles on Canvas
- Books on time series and nonlinear modelling (see Canvas)