Advanced Econometrics Part 1 — Syllabus

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Course description (Part 1):

In the first 5 classes of this Advanced Econometrics course we will revisit key econometric concepts and introduce tools commonly used in empirical research to deal with endogeneity. We will ask at each point of the class the question: ***"Are we able to estimate the causal effect of our variable of interest on the dependent variable?***

Learning objectives (Part 1)

- Understanding which econometric models are appropriate for which kind of data.
- Knowing when we are able to speak of causality.
- Gain practical experience in applying econometric methods on data with R.
- Understanding the limits of econometric models and data creation.

Prerequisites: Basic knowledge of linear regression, familiarity with R.

Course structure and schedule

Lecture	Topics
Lecture 1	Welcome and revisting of OLS • *Econometrics as a tool, not an end* • *Data in social sciences* • *Revision OLS -* ***What is endogeneity?*** • *Practical applications*

Lecture 2	Partial eliminating the omitted variable bias
	• *Revision: How to deal with binary variables? - Logit & Probit models* • *Practical applications* • *Coming closer to causality. Fixed and Random effect models*
Lecture 3	Searching for the Gold Standard
	• *Practical Applications FE/RE models* • *Quick discussion of Quantile Regression Models* • *Searching for the Gold Standard: Randomized Control Trials (RCTs)*
Lecture 4	Maybe the closest we can get with observational data to causality
	• *Two-stage-least square models (IVs)* • *Practical Application* • *Difference-in-Differences (DID)* • *Practical Application*
Lecture 5	**Group presentations of selected empirical articles**
Lecture 6-10	**Hugo Harari-Kermadec (`hugo.harari@univ-orleans.fr`)**

Assessment (for all the course)

- **10min presentation in groups of 3-4 (20% of the grade)** of selected articles. **Presentation on 11/17/2025**
- **Short single paper (80% of the grade)** to answer and discuss a research question (5 pages max., without tables, figures and references) Papers will include:
  - *An abstract*
  - *An introduction*: Motivate the readers and pose the research question.
  - *Short literature review*: What is the research gap you will address?
  - *Methodology*: What is your empirical strategy and why? (clearly explained)
  - *Database description*: Basic statistics and possibly figures.
  - *Results*: Most relevant presentation of your estimations (tables and graphs)
  - *Conclusion and Limitations*: Internal/external validity, limits of the database/ empirical strategy
  - Possibly an Appendix (results that support your findings)

  Deadline: 01/17/2025 (8pm). Send your paper to me or Hugo Harari-Kermadec (Part 2) depending on the methods you use.

Readings and resources

- Cunningham, S. (2021). Causal Inference. The Mixtape - (link to pdf)
- Hanck et al. (2025). Introduction to Econometrics with R - (link to pdf)
- Stock & Watson (2020). Introduction to Econometrics - (link to pdf)
- Wooldridge, J. M. (2013). *Introductory Econometrics: A Modern Approach* - (link to pdf)
- Selected papers provided on EPOG Nextcloud

Software and data

- We will work in R (primary). Stata can be used as well.
- Bring your laptops with R / RStudio installed.