Econometrics M1 – Course Syllabus

2026–2027

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Office hours: by appointment

Overview

This course provides an introduction to econometric methods with a focus on the linear regression model. We begin by developing the simple and multiple linear regression models, discussing estimation, interpretation, and inference. The course emphasizes the understanding of the assumptions required for valid econometric reasoning. Toward the end of the course, we introduce more advanced topics, including instrumental variables (IV) estimation and an overview of linear panel data models. Throughout, the course combines theoretical derivations with applications using R.

The main reference for the course is *"Introduction to Econometrics"* (4th Global Edition) by James H. Stock and Mark W. Watson, hereafter referred to as [SW].

Prerequisites and Grading

Prerequisites

- A solid background in basic statistics and probability (Stock & Watson, Chapters 2 and 3).
- Familiarity with basic matrix algebra.
- Basic knowledge of R and of the Rstudio environment.

Grading:

- Midterm Exam: 50%
- Final Exam: 50%

Organization and Tentative Schedule

The course consists of 12 sessions of 3 hours each.

Class 1: Introduction to Econometrics

- Topics: Causality and prediction. The simple linear regression model.
- Reading: [SW] Chapters 1, 2.

Class 2: Simple Linear Regression and OLS Estimation

- Topics: Estimation of the simple regression model by Ordinary Least Squares (OLS). Interpretation.

- Reading: [SW] Chapter 4.

Class 3: Statistical Properties of OLS

- Topics: Unbiasedness, consistency, sampling distribution of OLS.
- Reading: SW Chapter 4.

Class 4: Hypothesis Testing and Confidence Intervals

- Topics: Hypothesis testing and confidence intervals in the simple regression model.
- Reading: SW Chapter 5.

Class 5: Multiple Regression Model

- Topics: Motivation and omitted variable bias.
- Reading: SW Chapter 6.

Class 6: OLS Estimation in Multiple Regression

- Topics: Estimation, interpretation, controlling for confounders.
- Reading: SW Chapter 6.

Class 7: Statistical Properties and Multicollinearity

- Topics: Properties of OLS in multiple regression. Multicollinearity.
- Reading: SW Chapters 6, 7.

Class 8: Hypothesis Testing in Multiple Regression

- Topics: Joint hypothesis tests (F-tests). Model specification.
- Reading: SW Chapter 7.

Class 9: Nonlinear Regression Functions

- Topics: Introduction to interaction terms and quadratic terms.
- Reading: SW Chapter 8.

Class 10: Instrumental Variables (IV) Estimation

- Topics: Introduction to endogeneity and IV. Concept and basic examples.
- Reading: SW Chapter 12.

Class 11: Introduction to Panel Data Models

- Topics: Fixed effects and random effects models.
- Reading: SW Chapter 10.

Class 12: Review Session

- Topics: Course review and preparation for the final exam.
- Reading: Review of previous chapters.

Note: Minor adjustments to the schedule may occur depending on course progress.