



Introduction to Econometrics

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Office hours: by appointment

This course is an introduction to master level Econometrics. It covers linear regression with single and multiple regressors, models for panel data structure and the Rubin causal model. It also introduces R, a language for statistical computing and graphics released under the terms of the GNU General Public License developed by the Free Software Foundation. R is released in source code form.

Grading and prerequisites

There will be one mid-term and one final written and closed book exam. They both contain open questions and exercises. Grades range from 0 to 20, with the mid-term exam counting for 25% of the course grade and the final for 50%. The remaining 25% of the grade comes from an homework whose deadline is mid December. Basic knowledge at the undergraduate level of Statistics and Probability is expected.

Books and readings

The book adopted is

- James H. Stock and Mark W. Watson, 2015 [SW]. *Introduction to Econometrics*, Global edition, Person Education, England.

Other books you might find useful

- Heiss Florian, 2016. *Using R for introductory Econometrics*, CreateSpace Independent Publishing Platform.
- Moffatt Peter G., 2015. *Experimetrics - Econometrics for Experimental Economics*, Palgrave MacMillan, UK.

Organization and tentative schedule

This course consists of twelve 3-hours classes. Classes start at 09h00 sharp, end at 12h00 with a 15 minutes break and they are a Mobile-free zone.

Class 1: Introduction to regression analysis.

Topics covered: Conditional expectation function and regression function.

- Instructor lecture notes.

Class 2: Linear regression with one regressor.

Topics covered: univariate linear regression, OLS assumptions, OLS estimator.

- SW chapter 4, pp. 155-174.

Class 3: Sampling distribution of the OLS estimators.

Topics covered: properties of the OLS estimator, examples for the first three classes.

- SW chapter 4, pp. 175-191.

Class 4: Inference in a linear regression model with one regressor.

Topics covered: hypothesis testing, confidence intervals, Gauss-Markov theorem.



- SW chapter 5, pp. 192-227.

Class 5: Linear regression with multiple regressors.

Topics covered: omitted variable bias, OLS in the multiple regression model, multicollinearity.

- SW chapter 6, pp. 228-262.

Class 6: Catch-up and revision for the Mid-term exam.

Topics covered: those covered in the first 5 classes.

- SW chapter 4,5,6.

Class 7: Inference in linear regression with multiple regressors

Topics covered: Hypothesis tests and confidence intervals, test of joint hypothesis, testing restrictions.

- SW chapter 7, pp. 263-301.

Class 8: Extensions and evaluation of a regression study.

Topics covered: logarithmic transformation, interaction terms, other nonlinear functional forms, nonparametric regression.

- SW chapter 8, pp. 302-360, Chapter 9, pp 361-395.

Class 9: Regression with panel data.

Topics covered: one-way fixed effects model.

- SW chapter 10, pp. 396-430.

Class 10: Regression with panel data.

Topics covered: random effects model, error clustering.

- Instructor lecture notes.

Class 11: Introduction to IV regression.

Topics covered: instrumental variables, regression with IV.

- SW chapter 12.

Class 12: Catch-up and revision for the Final exam.

Topics covered: those covered in classes from 7 to 12.

- SW chapter 7,8,9,10,12.