Collegio Carlo Alberto

UNIVERSITÀ DEGLI STUDI DI TORINO

ECONOMETRICS & PROGRAMMING
Raffaele Corvino (Università di Torino)

Course objectives

This course provides the students with a general background on methods, issues, and advances in Econometrics. Students will learn about standard and simple techniques of estimation and inference, further than more general and complex methodologies recently applied in Economics and Finance. Throughout the entire program, students will apply their new knowledge on a computational software (Matlab) and will learn how to conduct econometric analysis on both simulated and real data.

Topics

Ordinary Least Squares: what is the relationship between economic variables? The method of Ordinary Least Squares (OLS). Model fit and model errors. Prediction. Estimation of the Market Model in Matlab.

Statistical Inference: confidence intervals and hypothesis test. Probability distribution of the estimators and t-test. Testing normality. Generating (normal) random numbers in Matlab. Stock prices simulation.

Generalized Regression Model: the main issues with OLS. Endogeneity. Measurement error and reverse causality. Instrumental Variables (IV) approach and application in corporate finance. Autocorrelation and heteroskedasticity. The method of Generalized Least Squares (GLS) and the feasible GLS (FGLS). Application in asset pricing. Reduced-form estimation in asset pricing and corporate finance. Propensity score matching. Diff-in-Diff.

Structural Estimation: Identification. Statistical and economic models. Maximum Likelihood (ML) estimation. Properties and advantages of ML. Equivalence between ML and OLS. Using ML for estimating Capital Asset Pricing Model (CAPM). The method of moments and the Generalized Method of Moments (GMM). Application in asset pricing. Estimating CAPM using GMM.

Readings

Econometric Analysis, William Green
Asset Pricing, John H. Cochrane

Prerequisites
Basic knowledge of mathematics and linear algebra
Basic knowledge of Matlab

Software needed
Matlab

Exam type
In a final test, the students will be required to conduct an econometric analysis on real data using the software and provide economic interpretation to their results