esade

TEACHING GUIDE - 2024-2025

Financial Econometrics

UGRA_015703

Departments	Department of Economics, Finance & Accounting
Teaching Languages	English and Spanish
ECTS	4
Teacher responsible	Manaev Vladimir - vladimir.manaev@esade.edu

Course Goals

Course Objectives:

1. Equip students with the essential econometrics toolbox, including an introduction to Python, data cleaning, and leveraging libraries like Pandas, sympy, numpy, and scipy for mathematical computations and descriptive statistics.
2. Develop a deep understanding of time series analysis, focusing on concepts such as stationarity, white noise processes, autoregressive and moving average models, as well as advanced models like ARMA, ARCH, and GARCH for stock returns modeling.

Previous knowledge

Basic knowledge of Math and Statistics is required.

Prerequisits

General familiarity with stock markets would be beneficial, but not necessary.

Recomended courses

No previous courses are required, but Introduction to Statistics and Probability would be helpful.

Description

Course contribution to program

This course in financial econometrics will enhance the program by equipping students with advanced analytical skills necessary for understanding and predicting financial data trends. It bridges theoretical knowledge with practical applications, preparing students to analyze and model complex financial time series data using Python. The course will be especially useful for those who aimed to go into areas like Quant Finance, Market Risk Management, and Asset Management.

Short description

This course provides a comprehensive introduction to financial econometrics, focusing on practical applications using Python. Topics include basic data types, data cleaning with Pandas, mathematical computations with sympy, numpy, and scipy, and descriptive statistics. It covers time series analysis fundamentals such as stationarity, white noise processes, autoregressive (AR) and moving average (MA) models, and extends to advanced models like ARMA, ARCH, and GARCH for modeling stock returns. Emphasis is placed on understanding autocorrelation, heteroscedasticity, and their implications in financial time series analysis.

Bibliography

J.M. Wooldridge, Introductory Econometrics: A Modern Approach, 7/e, Cengage, 2020 (Book)

Brooks, C., Introductory Econometrics for Finance, 4th ed. Cambridge University Press. (Book)

Activities

Group presentations
Practical group project: Individual Stock Return Analysis in Python.

Readings
Lectures.

Case study analyses
Python Labs

Content

#	Topic
1	Econometrics Toolbox: Intro to Python. Basic data types. Intro to Pandas. Basics of data cleaning in Python. Leveraging Math: use of sympy, numpy, and scipy for the math computations. Descriptive statistics in Python.
2	Basics of time series analysis. Stationarity. White noise process.
3	Time series analysis: autoregressive models (AR) , moving average processes (MA).
4	Time series analysis for stock returns modeling: ARMA, ARCH, GARCH models.
5	Topics in time series analysis: fixed and random effects, more on autocorrelation and heteroscedasticity in time series.

Assessment

Tool	Assessment tool	Category	Weight %
Written and/or oral exams	Final Written Exam (50%)	Retake and ordinary round	50.00%
Group project	Group Project: Individual Stock Returns Analysis in Python	Retake and ordinary round	40.00%
Participation in program activities	Participation in class	Retake and ordinary round	10.00%

PROGRAMS

BBA20-Bachelor of Business Administration (BBA) (Undergraduates: Business)
- BBA20 Year 2 (Optative)

BBA23-Bachelor of Business Administration (BBA) (Undergraduates: Business)
- BBA23 Year 2 (Optative)

BBE20-Bachelor of Business Administration (BBA) (Undergraduates: Business)
- BBE20 Year 2 (Optative)

DBAI21-Double Degree in Business Administration and Artificial Intelligence for Business (Undergraduates: Business)
- DBAI21 Year 3 (Optative)

GBD20-Double Degree in Business Administration and Law (Undergraduates: Law)
- GBD20 Year 5 (Optative)
- GBD20 Year 3 (Optative)
- GBD20 Year 4 (Optative)
- GBD20 Year 1 (Optative)