Syllabus

Course Description

Course Title	Financial econometrics
Course Code	27505
Course Title Additional	
Scientific-Disciplinary Sector	SECS-P/05
Language	English
Degree Course	Master in Data Analytics for Economics and Management
Other Degree Courses (Loaned)	Loaned from course 25423 – Master in Accounting and Finance (LM-77 AF)
Lecturers	Prof. Francesco Ravazzolo, Francesco.Ravazzolo@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/36066
Teaching Assistant	
Semester	First semester
Course Year/s	1
CP	6
Teaching Hours	36
Lab Hours	-
Individual Study Hours	-
Planned Office Hours	18
Contents Summary	This work provides an introduction to the fundamentals of financial econometrics, bridging theoretical concepts with practical applications. We begin with the foundational principles of stochastic processes and the characteristics of financial assets, including an analysis of empirical "stylized" facts observed in financial data. The subsequent sections delve into various models for forecasting returns, such as Classical Linear Regression and Time-Series Analysis (e.g., ARMA models), as well as models specifically designed for volatility analysis and prediction, including ARCH and GARCH models. The text also covers macro-finance analysis, introduces Bayesian methods and Monte Carlo

	simulations, and explores special topics like cryptocurrency, energy markets, and bond markets.
Course Topics	The course covers the tools of financial econometrics and empirical finance, with the focus on correlation analysis, classical linear regression and advanced time-series analysis. It introduces econometric modelling of financial prices and volatility, and estimation of some risk measures. Then, it extends to macro-finance problems. Strong emphasis is placed on the application of the models to real financial data.
Keywords	Stochastic Processes, Financial Time-Series Analysis, Volatility Modeling (ARCH/GARCH), Forecasting, Bayesian Analysis
Recommended Prerequisites	Basic knowledge of statistics
Propaedeutic Courses	
Teaching Format	The course will combine in-class explanation of the background material, problem-solving and case discussions. Students will be expected to participate actively in class work, which will give them the opportunity to apply theoretical concepts to realistic situations.
Mandatory Attendance	Strongly recommended, but not required.
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding: The student acquires specific knowledge of the economic and business domains of his/her interest and necessary to address decision-making and management issues in public and private organisations with an interdisciplinary perspective. In the Data Analytics for Economics pathway, knowledge will be oriented towards economic theory, economic analysis and econometrics through the development of micro- and macroeconomics, decision theory under conditions of uncertainty, time series analysis and forecasting techniques, methods for causal inference from both administrative and experimental data. Knowledge will also be oriented towards data analysis. In the Business Analytics track, the knowledge acquired will concern the tools necessary for analysing and interpreting business and organisational data, as well as business economic measurements, business models and their evolution, tools and techniques to support decision-making, performance measurement systems consistent with digitisation and sustainability processes, the governance of marketing processes, with particular regard to digital and interactive marketing and the impact of digitisation on marketing activities.

	Aapplying knowledge and understanding: Ability to analyse business issues that characterise data-driven decision support through the application of statistical and computational models. Ability to use and apply models for market analysis and economic policy formulation. Making judgements: Master's graduates will have the ability to apply the acquired knowledge to interpret data in order to make directional and operational decisions in an economic-business context. Master graduates will have the ability to apply the acquired knowledge to support processes related to production, management and risk promotion activities and investment choices through the organisation, analysis and interpretation of complex databases. Communication skills: Master's graduates will be able to communicate effectively in oral and written form the specialised contents of the individual disciplines, using different registers, depending on the recipients and the communicative and didactic purposes, and to evaluate the formative effects of their communication. Learning skills: "MSc graduates should be familiar with the tools of scientific research. They will also be able to make autonomous use of information technologies to carry out bibliographic research and investigations both for their own training and for further education. In addition, through the curricular teaching and the activities related to the preparation of the final thesis, they will be able to acquire the ability - to identify thematic links and to establish relationships between methods of analysis and application contexts; - to frame a new problem in a systematic manner and to implement appropriate analysis solutions; - to formulate general statistical-econometric models from the phenomena studied.
Specific Educational	Ability to perform all the mentioned econometric techniques by

Objectives and Learning Outcomes (additional info.)	using appropriate software (MATLAB, PYTHON, R).
Assessment	Final Exam (50%): The final exam is a combination of problems, cases, and essay questions. Optional assignment (50%): Case studies will be assigned during the semester to be completed in writing and presented in class by groups of students. The questions included in the final exam are aimed at assessing the acquisition of knowledge and understanding the ability to apply them to new situations as well as to evaluate the skill of the student to analyse and report on complex business transactions. The case studies also measure the student's capability to search for the relevant regulatory and economic information that apply to a specific situation. If a student does not complete the assignment, the exam will weight 100%.
Evaluation Criteria	Final exam: 50% Assignment: 50% The student must pass the exam to have a passing grade in the course.
Required Readings	Selection of papers provided by the teacher.
Supplementary Readings	CFA Institute Curriculum 2018 edition, Level II, Readings 9-11. Koop G. (2003). Bayesian Econometrics. Wiley. Stock J.M. and Mark W. Watson, *Introduction to Econometrics*. Pearson International 3rd Edition. Diebold F. X. (2006). Elements of Forecasting. Mason 4th Edition.
Further Information	
Sustainable Development Goals (SDGs)	Quality education, Gender equality, Affordable and clean energy, Climate action, Reduced inequalities, Responsible consumption and production, Decent work and economic growth