

FINANCIAL ECONOMETRICS

Course code	<i>GRAE018</i>
Course title	<i>Financial Econometrics</i>
Type of course	<i>Compulsory</i>
Level of course	<i>Graduate</i>
Year of study	<i>1st</i>
Number of credits	<i>6 ECTS (36 contact hours + 2 consultation hours, 124 individual work hours)</i>
Lecturer	<i>Dr. Aleksandr Christenko</i>
Prerequisites	<i>Econometrics, Probability theory, Mathematical statistics</i>
Teaching language	<i>English</i>

THE AIM OF THE COURSE

The goal of the course is to provide students with basic econometric tools for the analysis of financial data, including cross-sectional, time-series (stationary and non-stationary), and panel data. The course aims to improve students' understanding of the main principles and concepts of applied econometric analysis, improve their ability to select the adequate modelling approach for a problem at hand, estimate its parameters, validate the outcome, and interpret the results. This includes, but is not limited to: predicting returns on risky assets, forecasting volatility of bond returns, modelling exchange rates and commodity prices, testing the models in real-time, and many other tasks.

MAPPING OF COURSE LEVEL LEARNING OUTCOMES (OBJECTIVES) WITH DEGREE LEVEL LEARNING OBJECTIVES (See Annex), ASSESMENT AND TEACHING METHODS

Course level learning outcomes (objectives)	Degree level learning objectives (Number of LO)	Assessment methods	Teaching methods
CLO1. Understand the key concepts and instruments of regression analysis and its role in financial econometrics.	LO3.1, LO4.1	Assignments, Final exam	Lectures, seminars, self-study
CLO2. Demonstrate the ability to carry out the econometric project, including, but not limited to: data preparation and diagnostics, specification of the econometric model, and selection of the appropriate techniques.	LO2.1, LO3.1, LO4.1, LO6.2	Assignments, Final exam	Lectures, seminars, self-study
CLO3. Present the model outcomes both at advanced and intuitive levels; interpret the estimation output from an economic and statistical point of view.	LO2.1, LO3.1, LO6.2	Assignments, Final exam	Lectures, seminars, self-study
CLO4. Apply estimated econometric models for analytics and forecasting.	LO3.1, LO4.1	Assignments, Final exam	Lectures, seminars, self-study

ACADEMIC HONESTY AND INTEGRITY

The ISM University of Management and Economics Code of Ethics, including cheating and plagiarism are fully applicable and will be strictly enforced in the course. Academic dishonesty, and cheating can and will lead to a report to the ISM Committee of Ethics. With regard to remote learning, ISM remind students that they are expected to adhere and maintain the same academic honesty and integrity that they would in a classroom setting.

AI USE POLICY

All course participants must comply with the ISM University of Management and Economics Artificial Intelligence Policy

published on the e-learning platform. Additional requirements for each output that students need to produce during the course apply and are discussed below in the assignment description.

Course Content

DATES	TOPIC	IN-CLASS HOURS	SUGGESTED READINGS
2026 09 22	1. Introduction to research: short overview of research design, data, and hypothesis testing.	4	Ch. 1
2026 10 08	2. Introduction to regression analysis: estimation, properties of estimators, goodness of fit.	4	Chs. 2-3
2026 10 13	3. Variables: irrelevant and omitted variables, missing observations, overview of how to use different types of independent variables.	4	Ch. 4
2026 11 19	4. Classical regression model assumptions: violation, diagnostics, and fixes.	4	Ch. 4
2027 01 05/07	5. Simple time-series models: non-stationarity testing and fixing, cointegration, autocorrelation of residuals.	6	Chs. 6-7
2027 01 07/12	6. Pseudo-causality: Granger causality, Toda-Yamamoto/Dolado-Lutkepohl causality.	4	Ch. 7
2027 01 12/14	7. Simultaneous equations models.	4	Ch. 6
2027 01 14/19	8. Panel regressions: diagnostics, review of pooled OLS, fixed effects, random effects, mixed effects models.	4	Ch. 10
2027 01 19	9. Course wrap-up	2	
		Total: 36 hours	
	CONSULTATIONS	2	
	FINAL EXAM	2	

FINAL GRADE COMPOSITION

Type of assignment	%
<i>Individual Components 100%</i>	
Two assignments	40%
Final exam	60%
Total:	100

DESCRIPTION AND GRADING CRITERIA OF EACH ASSIGNMENT

(Provide short descriptions and grading criteria of each assignment)

Assignments (40%):

Students will be expected to complete two computer-based assignments that will be uploaded to the <http://elearning.ism.it> system. The two assignments have equal weights (20%) in the final grade. The assignment will require students, based on what will be presented during the seminars, to carry out research using data that they found or compiled themselves. The results of these assignments should be provided in an HTML format created using the R programming language. In addition to the main outputs of the research, the HTML files will include an interpretation of the results. A detailed schedule and assessment criteria shall be communicated by the lecturers during the course. Assignment deadlines are largely set in stone and can only be postponed if some extraordinary circumstances arise.

Regarding the usage of AI, students may use it to improve their efficiency, including getting recommendations on

possible code, drafting comments explaining what different script elements do, or improving the quality of their written English, but not to do research for them. Students are also responsible for all work they submit for grading and must ensure it follows the assignment expectations. They must also have a thorough understanding of the script, including what it does and how it works, as well as of the outputs they produced, including what the results mean. In cases where the integrity of the work might be questioned, the course instructor reserves the right to ask the student to explain their outputs and the code face-to-face sometime after the submission deadline. If the student cannot answer the questions sufficiently well, the course instructor reserves the right to give a non-passing grade for the assignment.

Final exam (60%):

The final exam will test the understanding of the techniques presented throughout the course and the ability to apply them. All necessary formulas will be given by the course lecturers. The exam will be closed book.

RETAKE POLICY

After receiving a failing final cumulative grade, a student can make one attempt to retake the exam. A retake exam shall consist of all course material and will equal **60 % of the final cumulative grade**. Provided a retake exam is taken by a student, the acquired grades for homework assignments **shall be calculated and weighted into the final cumulative grade for the course**. A student cannot retake the final exam after receiving a passing final cumulative grade. The retake exam for students who did not meet the passing score is normally scheduled 1-2 weeks after the announcement of the final grades for the final exam.

REQUIRED READINGS

Core:

1. Brooks, C. Introductory econometrics for finance. 2nd ed. Cambridge University Press, 2008.

Introductory text on econometrics (for revision):

2. Wooldridge, J.M. Introductory Econometrics. 3rd ed. Thomson South-Western, 2006

Advanced:

3. Tsay, R.S. Analysis of Financial Time Series. Wiley, 2002.
4. Hamilton, J.D. Time Series Analysis. Princeton University Press, 1994.

ADDITIONAL READINGS

None.

DEGREE LEVEL LEARNING OBJECTIVES

Competency goals and learning objectives for the Master of Social Science

Programmes:

Financial Economics

Competency Goal	Learning Objective
Students will demonstrate advanced disciplinary knowledge.	LO1.1. Students will demonstrate advanced discipline knowledge through the independent development of a Master's thesis, showing a deep understanding and appropriate application of theories, concepts, and methods relevant to their field of study.
Students will be digitally competent.	LO 2.1. Students will demonstrate digital agility competencies by selecting and applying appropriate tools, platforms or technologies, integrating digital insights into business decision-making, and adapting digital approaches in response to evolving project requirements and contextual changes.
Students will be critical thinkers	LO3.1. Students will be able to identify underlying assumptions, limitations of previous research; evaluate managerial solution alternatives.
Students will be independent learners	LO4.1. Students will become independent learners and develop their own comprehension of scientific theories, models, and concepts
Students will be socially responsible leaders	LO5.1. Students will be able to evaluate past and current practices in their discipline from an ethical perspective .
Students will be effective communicators	LO6.1. Students will develop and deliver a coherent oral presentation
	LO6.2. Students will develop and deliver a coherent written research paper