ISM UNIVERSITY OF MANAGEMENT AND ECONOMICS

FINANCIAL ECONOMETRICS

Course code	*GRAE018*
Compulsory in the programmes	*Financial Econometrics*
Level of studies	*Graduate*
Number of credits	*6 ECTS (36 contact hours + 2 consultation hours, 124 individual work hours)*
Course coordinator (title and name)	*Dr. Aleksandr Christenko (alechr@faculty.ism.lt)*
Prerequisites	*Econometrics, Probability theory, Mathematical statistics*
Language of instruction	*English*

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), ASSESSMENT 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.	LO1.1. LO1.2.	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.	LO1.1. LO1.2. LO3.2.	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.	LO1.1. LO3.2.	Assignments, Final exam	Lectures, seminars, self-study
CLO4. Apply estimated econometric models for analytics and forecasting.	LO1.1. LO1.2.	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. Concerning remote learning, ISM remind students that they are expected to adhere to and maintain the same academic honesty and integrity that they would in a classroom setting.

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COURSE OUTLINE

Topic	In-class hours	Readings
1. Introduction and main concepts: data, its main characteristics, normality, population and sample, descriptive statistics, hypothesis testing.	4	Ch. 1
2. Linear regression: estimation, properties of estimators, goodness of fit, diagnostics.	4	Chs. 2-3
3. Classical regression model assumptions, their violation, and diagnostics	4	Ch. 4
4. Functional form, omitted variables, missing observations, efficient estimates.	4	Ch. 4
5. Simple time-series models: testing for stationarity, fixing non-stationarity, cointegration, autocorrelation of residuals	4	Chs. 6-7
6. Granger-causality, Tada-Yamamoto causality 1st assignment	4	Ch. 7
7. Panel regressions: stationarity testing of panel data, panel diagnostics, pooled OLS, fixed and random effects models, mixed effects models. 2nd assignment	6	Ch. 10
8. Other models: simultaneous equations, VAR models incl. impulse response function, variance decomposition, survival analysis.	4	Ch. 6
9. Course wrap-up	2	
	Total: 36 hours	
CONSULTATIONS	2	
FINAL EXAM	2	

FINAL GRADE COMPOSITION

Type of assignment	%
Individual Components 100%	
• Two assignments	40%
• Final exam	60%
Total:	**100%**

DESCRIPTION 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.lt 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

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the main outputs of the research, the HTML files will include an interpretation of the results. 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.

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

The retake exam for the 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.

ADDITIONAL REMARKS

After receiving a failing final cumulative grade, a student can make one attempt to retake the exam. A re-take 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 he/she has received a passing final cumulative grade.

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

During the course, a variety of additional readings will be posted on the eLearning system by the lecturer. The additional readings will not be mandatory, but they will help students to better understand more complex concepts or go beyond what was covered during the lectures.

ANNEX

DEGREE LEVEL LEARNING OBJECTIVES

Learning objectives for <u>Master of Social Science</u>
Programme:
Financial Economics

Learning Goals	Learning Objectives
Students will be critical thinkers	LO1.1. Students will be able to identify underlying assumptions, limitations of previous research; evaluate managerial solution alternatives.
	LO1.2. Students will become **independent learners** and develop their own comprehension of scientific theories, models, and concepts.
Students will be socially responsible leaders	LO2.1. Students will be able to evaluate past and current practices in their discipline from an **ethical perspective**.
Students will be effective communicators	LO3.1. Students will develop and deliver a **coherent oral presentation**.
	LO3.2. Students will develop and deliver a **coherent written research paper**.