FINANCIAL ECONOMETRICS

Course code	*GRAE018*
Course title	*Financial Econometrics*
Type of course	*Compulsory*
Year of study	*MSc 1st year*
Semester	*Autumn 2018 (intensive, October-November)*
Number of credits / ECTS	*6 ECTS* *36 academic hours of lectures, 124 hours of self-study, 2 hours of consultations*
Lecturer	*dcelov@gmail.com*
Study form	*Full-time (consecutive / evening)*
Course prerequisites	*Econometrics, Calculus, Probability theory, Mathematical statistics*

Course description:

The goal of the course is to provide students with basic econometric tools for the analysis of time series data for Finance, including models for stationary and non-stationary data, univariate and multivariate analysis. The course aims to improve students understanding of the main principles and concepts of applied time series analysis, selection of adequate modelling technique for a problem at hand, estimation of the model and its application for the problems in Finance: 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 problems.

Course objectives:

Upon successful completion of this course, students will be able to:

Course learning outcomes (CLO)	Study methods	Assessment methods
CLO1. Understand the key concepts and instruments of time series analysis, the role of time series models in financial econometrics.	Lectures, classes, self study	Assignments, Final exam
CLO2. Demonstrate the ability to carry out the econometric project including: data preparation and diagnostics, specification of econometric model, selection of the appropriate time series technique.	Lectures, classes, self study	Assignments, Final exam
CLO3. Present the model outcomes both at advanced and intuitive levels; interpret the estimation output from economic and statistical point of view.	Lectures, classes, self study	Assignments, Final exam
CLO4. Apply estimated econometric time series models for forecasting and policy analysis.	Lectures, classes, self study	Final exam

Quality Assurance Measures

The lecturer will apply multiple teaching methods to keep the students engaged in the topic (case studies, practical work and computer exercises). Continuous student feedback will be encouraged and accommodated to continuously improve class experience.

Cheating Prevention

Course will apply zero tolerance policy towards plagiarism, following the rules of the University.

Course schedule (subject to change):

Topic	Dates	Topic	Readings
		Revision material	4, 1 [App. 1]
1	**Oct. 25 (2 hours)**	Introduction and main concepts: time series data, its main characteristics, lags and leads, stationarity, random walk, general steps of building the model, econometric software.	1 [Ch. 1]
2	**Oct. 25 (2 hours), Oct. 26 (4 hours)**	Linear regression: estimation, properties of estimators, hypothesis testing, goodness of fit, diagnostics, quantile regressions and principal components analysis.	1 [Ch. 2, 3]

3	**Oct. 30 (4 hours)**	Classical regression model assumptions, their violation and diagnostics: efficient estimates, multicolinearity, omitted variables, parameter stability, modelling strategies. 1st in-class assignment.	1 [Ch. 4]
4	**Nov. 5 (4 hours)**	Univariate time series models for stationary data: ARMA models, properties and identification of ARMA models, estimation and diagnostics, model selection criteria, forecasting with ARMA.	1 [Ch.5]
6	**Nov. 8 (4 hours), Nov. 13 (2 hours)**	Univariate models for non-stationary data: deterministic and stochastic trends, unit-roots, testing for unit roots, removing the trend, spurious regression, cointegration, exogeneity, Granger-causality, error-correction models, Engle-Granger procedure. 2nd in-class assignment.	1 [Ch.7]
5	**Nov. 13 (2 hours), Nov. 15 (4 hours)**	Multivariate models for stationary data: VAR models, estimation and identification, impulse response function, testing hypotheses, variance decomposition. 3rd in-class assignment.	1 [Ch.6]
	Nov. 22 (4 hours)	Modelling volatility and correlation: volatility, APARCH family of models, GJR model, EGARCH model, strategy for model selection and inference. In-class practice.	1 [Ch. 8]
7	**Nov. 29 (4 hours)**	Course wrap-up. Defence of in-class assignments.	
–	**Dec. 4**	**FINAL EXAM**	
	TBA	**Re-take exam**	

Assessment methods:

Students will be evaluated on the basis of in-class solved assignments and their performance in final exam.

Task	Weight
In-class assignments	30%
Final exam	70%
Total	**100%**

In-class assignments (30%):

Students will be expected to complete 3 computer-based assignments and send them to the course lecturer by e-mail (dcelov@gmail.com) and upload to http://elearning.ism.lt

All assignments have equal weights (10%) in the final grade. Detailed schedule and assessment criteria shall be communicated by the lecturer during the course.

The results of these assignments should be provided in the form of GRETL output and supplemented with written explanation of the results. No postponement and/or retake of the assignments shall be allowed.

Final exam (70%):
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 lecturer.

Additional notes:

1. A student must score on all the assigned tasks by the lecturer (see Assessment Methods). No postponement and/or retake of the assigned tasks shall be allowed.
2. After receiving a failing final cumulative grade, a student can make one attempt to retake an exam. A re-take exam shall consist of all course material and will equal **70 % 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 in to the final cumulative grade for the course.**
3. A student has no right to retake a final exam after he/she has received a passing final cumulative grade.

Teaching methods:

The course will involve lectures over relevant material, and will also involve in-class discussion of related material and computer applications.
Computer assignments will be carried out in a computer class during the lectures, it is also recommended to practice with simple GRETL examples at home.

Reading list:

Core:

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

Advanced:

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

Introductory (for revision):

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

Software: GRETL (GNU Regression, Econometrics and Time-Series Library). Multi-platform, open source software. Can be downloaded from http://gretl.sourceforge.net/.