The Hashemite University	
Faculty of Economics and Business Administrative	
Offering Department	Banking and Financial Sciences
Module title / number	Quantitative Methods in Finance and Insurance, 110204470
Teaching staff	Samer AL-Rjoub , PhD
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Office hours	Sunday, Tuesday and Thursday: 12 – 1
Pre-requisite	110108102 & 110201313
Course description	This is a one-semester course taught to the fourth year bachelor students of both Finance & Banking Sciences and Risk management & Insurance programs at Hashemite University. It is designed to cover essential tools for working with financial data, including the return forecasting, volatility and econometrics of asset pricing, such as testing the market models. We focus on the empirical techniques which are mostly used in the analysis of financial markets and how they are applied to actual data. The course starts with the overview of financial data, then we talk about simple linear regression models, multiple linear regression model, time series models and panel data techniques. All the models are accompanied with real-data examples in standard computer packages.
Intended learning outcomes (ILOs) Upon the completion of this module , students should be able to achieve the following:	
1- knowledge and understanding	
	1) A broad knowledge of regression analysis relevant for analyzing financial data. 2) interpretation and critical evaluation of the outcomes of empirical analysis 3) Elementary procedures for model validation in the single equation context. 4) Theoretical background for the standard methods used in empirical analyses, like properties of least squares estimators and the statistical testing of hypothesis.
2- Analytical and thinking skills	
	Students should have the ability to 1) Use E-views and/or SPSS the computer based program packages for financial econometric analyses. 2) Model financial relationship. 3) Perform a scientific financial research. 4) Perform statistical tests to investigate whether the classical assumptions in regression analysis are satisfied. 5) Be a critical reader of the literature concerning empirical analyses.
Teaching and learning methods	
	There will be 3-hour lectures per week. Although the lectures cover the vast majority of the module material, students must use of the textbooks extensively especially the empirical cases presented in the book.
Software	

Stata and E-views are the software that we are going to use for this course .These two are of the most powerful and simple to use software packages. You need to install them as soon as you can in order to be able to work with us and apply the topics week by week.

Course Requirements

Attendance is required and is assumed and expected. Students missing classes should seriously reflect on their commitment to this course as missing classes are highly correlated with poor performance on the exams.
There will be a comprehensive final exam, mid-term exam, and a set of homework. Your final course grade will base on your weighted average performance of the overall class work, as shown below:

	Weight	**Date**
Mid-Term Exam	**30%**	**26/3/2017**
Assignments	**30%**	**Every week or class**
Final Exam	**40%**	**TBA**
Total	**100%**	

Assignments

You will be assigned a set of empirical homeworks that you will need to apply using either Stata or E-views. Each one of you must submit his/her own work. Your solutions will be discussed with you in class room on the due day. At no circumstances, late submission is not accepted.

Academic Honesty

All the assignments and work submitted by the student should be his/her own. All actions of academic dishonesty including cheating, plagiarism or helping other students in such actions will be dealt with strictly according to the university regulations.

Main textbook(s) and additional readings

Main textbook:

- Brooks, Chris, Introductory Econometrics for Finance, 3rd edition, Cambridge University Press, New York, 2015.

Additional supporting textbook:

- Frank J. Fabozzi, Sergio M. Focardi, Svetlozar T. Rachev, Bala G. Arshanapalli with Markus Hoechstoetter, The Basics of Financial Econometrics: Tools, Concepts, and Asset Management Applications, 1st edition, Wiley, April 2014.
- Gujarati, Damodar N. and Dawn C. Porter, Essentials of Econometrics, 4th edition, Mc-Graw Hill, New York, 2010.

Detailed lecture schedule

Week:	**Material:**
Week 1	**Chapter 1: Introduction** 1.1 What is econometrics? 1.2 Is financial econometrics different from 'economic econometrics? 1.3 Types of data 1.4 Returns in financial modelling 1.5 Steps involved in formulating an econometric model 1.6 Points to consider when reading articles in empirical finance 1.7 A note on Bayesian versus classical statistics 1.8 An introduction to E-Views

	Week 2	**Chapter 2: Mathematical and statistical foundations** 2.1 Functions 2.5 Descriptive statistics
	Week 3 – 4	**Chapter 3: A brief overview of the classical linear regression model** 3.1 What is a regression model? 3.2 Regression versus correlation 3.3 Simple regression 3.4 Some further terminology 3.5 Simple linear regression in EViews – estimation of an optimal hedge ratio 3.6 The assumptions underlying the classical linear regression model 3.7 Properties of the OLS estimator 3.8 Precision and standard errors 3.9 An introduction to statistical inference 3.10 A special type of hypothesis test: the t-ratio 3.11 An example of a simple t-test of a theory in finance: can US mutual funds beat the market? 3.14 The exact significance level 3.15 Hypothesis testing in EViews – example 1: hedging revisited 3.16 Hypothesis testing in EViews – example 2: the CAPM
	Week 5 – 6	**Chapter 4: Further development and analysis of the classical linear regression model** 4.1 Generalising the simple model to multiple linear regression 4.2 The constant term 4.3 How are the parameters (the elements of the β vector) calculated in the generalised case? 4.4 Testing multiple hypotheses: the F-test 4.5 Sample EViews output for multiple hypothesis tests 4.6 Multiple regression in EViews using an APT-style model 4.7 Data mining and the true size of the test 4.8 Goodness of fit statistics 4.9 Hedonic pricing models
	Week 7 – 8	**Chapter 5: Classical linear regression model assumptions and diagnostic tests** 5.1 Introduction 5.2 Statistical distributions for diagnostic tests 5.3 Assumption 1: $E(u_t) = 0$ 5.4 Assumption 2: $var(u_t) = \sigma^2 < \infty$ 5.5 Assumption 3: $cov(u_i, u_j) = 0$ for $i \neq j$ 5.6 Assumption 4: the x_t are non-stochastic 5.7 Assumption 5: the disturbances are normally distributed 5.8 Multicollinearity 5.9 Adopting the wrong functional form 5.10 Omission of an important variable 5.11 Inclusion of an irrelevant variable 5.12 Parameter stability tests 5.13 Measurement errors 5.14 A strategy for constructing econometric models and a discussion of model-building philosophies 5.15 Determinants of sovereign credit ratings
	Week 9	**MIDTERM EXAM**

	Week 10 – 11	**Chapter 6: Univariate time series modelling and forecasting** 6.1 Introduction 6.2 Some notation and concepts 6.3 Moving average processes 6.4 Autoregressive processes 6.5 The partial autocorrelation function 6.6 ARMA processes 6.7 Building ARMA models: the Box–Jenkins approach 6.8 Constructing ARMA models in EViews 6.9 Examples of time series modelling in finance 6.10 Exponential smoothing 6.11 Forecasting in econometrics 6.12 Forecasting using ARMA models in EViews 6.13 Exponential smoothing models in EViews
	Week 12	**Chapter 10: Switching models** 10.1 Motivations 10.2 Seasonality in financial markets: introduction and literature review 10.3 Modelling seasonality in financial data 10.4 Estimating simple piecewise linear functions 10.5 Markov switching models 10.6 A Markov switching model for the real exchange rate 10.7 A Markov switching model for the gilt–equity yield ratio 10.8 Estimating Markov switching models in EViews
	Week 13 – 14	**Chapter 11: Panel data** 11.1 Introduction – what are panel techniques and why are they used? 11.2 What panel techniques are available? 11.3 The fixed effects model 11.4 Time-fixed effects models 11.5 Investigating banking competition using a fixed effects model 11.6 The random effects model 11.7 Panel data application to credit stability of banks in Central and Eastern Europe 11.8 Panel data with EViews
	Week 15	**Chapter 14: Conducting empirical research or doing a project or dissertation in finance** 14.1 What is an empirical research project and what is it for? 14.2 Selecting the topic 14.3 Sponsored or independent research? 14.4 The research proposal 14.5 Working papers and literature on the internet 14.6 Getting the data 14.7 Choice of computer software 14.8 Methodology 14.9 Event studies 14.10 Tests of the CAPM and the Fama–French Methodology 14.11 How might the finished project look? 14.12 Presentational issues
	Week 16	**Final Exam**