APPLIES TO ACADEMIC YEAR 2016/2017

FIN 3618 Financial Econometrics

Programme
Bachelor of Finance (3. year)

Responsible for the course
Kjell Jørgensen

Department
Department of Finance

Term
According to study plan

ECTS Credits
7,5

Language of instruction
English

Introduction
Financial Econometrics can be understood as the application of statistical techniques to answer questions in finance. Financial Econometrics can therefore be used to test theories in finance. As such, it is supports financial decision-making.

Learning outcome
Acquired knowledge
During the course students should develop knowledge of:
- The role of Financial Econometrics in financial research.
- The steps involved in formulating, estimating and evaluating an econometric model.
- The role of descriptive statistics.
- The difference between correlation and regression.
- The concept of regression analysis using Ordinary Least Squares (OLS).
- Statistical inference within the regression model.
- How violations of the classical assumptions under lying OLS affect the regression model.
- Different model mis-specifications and biases.
- The concept of parameter stability/structural breaks.
- Univariate time series models (ARMA models).
- Forecasting financial variables.
- The concept of simultaneity bias.
- The concept of exogeneity.
- The estimation procedures for simultaneous equations systems.
- Vector autoregressive (VAR) models.
- Impulse responses and variance decompositions.
- The concept of stationarity.
- The concept of cointegration.
- Equilibrium or error correction models.

Acquired skills
Upon completion of the course the students should be able to:
- Estimate and interpret descriptive statistics for the variables used in the model of interest.
- Estimate regression models using OLS.
- Make statistical inference (Hypothesis testing and/or Confidence Intervals) on the parameter estimates of the model.
- Perform the various tests of the classical assumptions underlying OLS.
- Identify potential mis-specifications and biases.
- Perform parameter stability tests (test for structural breaks).
- Use Information Criterias in order to select the appropriate Univariate time series model (ARMA model).
- Estimate and interpret Univariate time series models (ARMA models).
- Use forecasting techniques in order to forecast different financial variables.
- Use different evaluation criteria for forecast precision.
- Perform tests for exogeneity.
- Apply appropriate estimation techniques for simultaneous equation systems (ILS, 2SLS).
- Estimate vector autoregressive (VAR) models.
- Estimate impulse responses and variance decompositions.
- Perform tests for stationarity (Unit root tests).
- Perform tests for cointegration.
- Estimate equilibrium or error correction models.

Reflection
In the course there will be focus on the assumptions underlying the different theories and methods covered. Hence, it is expected that students will have a critical attitude towards the realism of these. The students should upon completion of the course have a good understanding of the practical applicability of the theories and methods covered.

Prerequisites
MET 2910 Mathematics and MET 2920 Statistics or equivalent.

Compulsory reading
Books:
Chris Brooks. 2014. Introductory Econometrics for Finance. 3rd Edition. Cambridge University Press

Recommended reading

Course outline
Introduction.
- What is Financial Econometrics about
- Types of financial data
- Returns in financial modelling
- Steps involved in formulating an econometric model

Mathematical and statistical foundations
- Functions
- Matrices
- Probability and probability distributions
- Descriptive statistics

The classical linear regression model
- Regression versus correlation
- Simple regression
- The assumptions underlying the classical linear regression model
- Properties of the OLS etsimator
- Precision and standard errors
- Statistical inference

Further development and analysis of the classical linear regression model
- Multiple regression
- Testing multiple hypothesis: the F-test
- Goodness of fit statistics

Classical linear regression model assumptions and the diagnostic tests
- Heteroscedasticity
- Autocorrelation
- Non-stochastic explanatory variables
- Multicolinearity
- Specification mistakes and biases
- Parameter stability tests

Univariate time series modelling and forcasting
- Moving average (MA) processes
- Autoregressive (AR) processes
- The Box-Jenkins methodology (Information criteria)
- Forecasting financial variables

Multivariate models
- Simultaneous equations bias
- Exogeneity
- Estimation procedures for simultaneous equations systems
- Vector autoregressive (VAR) models
- Impulse responses and variance decompositions

Modellling long-run relationships in finance
- Stationarity and unit root testing
- Cointegration
- Equilibrium correction or error correction models
- Methods of parameter estimation in cointegrated systems

Computer-based tools
The software package EViews will be available on BI's computers.

Learning process and workload
A class will typically consist of a review of the last class, a lecture introducing new material and exercises that are solved by the lecturer or students. Each main topic will be accompanied by a hands-on practical application of an empirical finance topic. The software package EViews will be an integral part of the coursework.

If a student misses a class, it is her/his responsibility to obtain any information provided in class that is not included on the course homepage/itslearning or in the text book.

The following is an indication of the time required:

Aktivitet	Timebruk
Lectures and other plenary sessions	42
Reviewing lectures and preparing for lectures	110
Assignments	30
Preparation for the final exam	18
Total recommended use of time	**200**

Use of hours
42 hours - lectures
3 hours - Coordinating learning activities

45 hours total

Examination
The final grade in the course will typically be based on the following activities and weightings:

- Two assignments, count 40% of final grade. Can be solved individually or in groups of up to five students. (Each assignment count 20%)
- An individual three hours written exam, counts 60% of final grade

This is a course with continuous assessment (several exam elements) and one final exam code. Each exam element will be graded using points on a scale (e.g. 0-100). The elements will be weighted together according to the information in the course description in order to calculate the final letter grade for the course. You will find more detailed information about the grading system on the course site in itslearning.

Examination code(s)
FIN 36181 – Process evaluation, counts 100% towards final grade in FIN 3618 Financial Econometrics, 7,5 credits.

Examination support materials
A BI-approved examination calculator.

Re-sit examination
A re-sit is held in connection with the next scheduled examination in the course. Students who are retaking examination are subject to the same rules as the other students.

Additional information