



APPLIES TO ACADEMIC YEAR 2013/2014

## EXC 3610 Empirical Methods in Finance

### Programme

Bachelor of Business Administration (3. year), Exchange Program

### Responsible for the course

Benjamin Holcblat

### Department

Department of Financial Economics

### Term

According to study plan

### ECTS Credits

7,5

### Language of instruction

English

### Introduction

Welcome to Empirical Methods in Finance. Empirical methods aim at taking advantage of the information contained in data for decision-making. We are all prone to different kind of biases such as "overconfidence" or "recency." Quantitative empirical methods help us to discipline decision making process. More specifically, they allow to test the existence of a relation between variables (e.g., does inflation affect nominal interest rates?), quantify this relation (e.g., a one percent increase in inflation should lead to how much increase in nominal interest rate?) and forecast the evolution of variables (e.g, which interest rate should we expect in six month from now?).

### Learning outcome

The aims of this course are to introduce students to important econometric techniques that are used in empirical finance and to create awareness with students of how these techniques can be applied. More specifically, on completion of the course the students' acquired knowledge and skills should be as follows:

#### Acquired knowledge

On completion of the course students should:

- Understand the importance of basic data handling involving different graphical representations, descriptive statistics such as the mean, median, variance, standard deviation, skewness, kurtosis.
- Be able to interpret the above mentioned numerical measures.
- Understand what is meant by correlation and regression analysis - and the difference between them.
- Understand that correlation is not causation.
- Understand some of the peculiarities of financial data.
- Understand the difference between an econometric model and a financial model.
- Understand what is meant by Ordinary Least Squares (OLS) - the estimation technique used in order to estimate our econometric model.
- Understand how to interpret the estimated model.
- Understand the statistical assumptions that OLS rests upon.
- Understand the concept of Autoregressive (AR) modelling.
- Understand, at a basic level, important time series issues such as Stationarity, Cointegration and Error Correction (ECM) modelling.
- Understand the difference between the unconditional and conditional variance and how the latter can be modelled with an ARCH-type model.

#### Acquired skills

On completion of the course students should be able to use software like Eviews in order to:

- Perform basic data handling
- Estimate financial models formulated as linear regression models (Econometric models).
- Test the statistical assumptions underlying OLS.
- Take corrective action if some of these assumptions are violated.
- Estimate AR models.
- Test for Stationarity and Cointegration.
- Estimate Error Correction Models (ECMs).

- Test for ARCH effects.
- Estimate basic ARCH models and GARCH(1,1) models

### Prerequisites

Basic statistics course  
Basic calculus course

### Compulsory reading

#### Books:

DeFusco, Richard A. ... [et al.]. 2007. Quantitative investment analysis : Workbook. 2nd ed. Wiley

### Recommended reading

#### Course outline

This course introduces students to empirical techniques that are relevant for finance, and business in general. More specifically, the outline of the course is as follows:

1. Foundations for empirical methods in finance.
  - Basics of probability
  - Basics of inference
  - Introduction to implementation with R
1. Linear regression analysis.
  - Simple regression analysis
  - Regression analysis with multiple explanatory variables
  - Limits and assumptions of regression analysis
1. Introduction to time series.
  - Second-order stationarity
  - ARMA modelling
  - Limits of ARMA models: time varying volatility and unit roots

Depending on the pace of course, more advanced topics can be introduced.

### Computer-based tools

The software package R will be available on BI's computers. Other tools include Google, Yahoo finance and It's Learning.

### 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 on the white board by students.

Each topic will be accompanied by a hands-on practical application of an empirical finance topic.

The software package R will be an integral part of the coursework. R is a software that has become a standard for data analysis inside academia and corporations, especially in the finance industry. It is an open source software available free of charge on internet. The use of R will introduce students to some of the basics of programming. Programming is a skill typically required in the financial industry.

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/It's learning or in the text book.

A course of 7,5 ECTS credits corresponds to a workload of 200 hours. The following is an indication of the time required for different activities:

Activity	Hours
Lectures	45
Preparation for lectures and plenary tutorials	110
Preparation for the final	45

examination	
<b>Total recommended use of time</b>	<b>200</b>

**Use of hours**

45 hours total

**Examination**

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

50% - class work (in the form of a mix of some/ all of the following: hand in of case write ups, projects, and homeworks; case presentations and class participation; in class midterm and quizzes).

50% - 3 hour individual written examination.

Specific information regarding student evaluation beyond the information given in the course description will be provided in class. This information may be relevant for requirements for term papers or other hand-ins, and/or where class participation can be one for several elements of the overall evaluation.

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 detailed information about the grading system on the course site in It's Learning.

**Examination code(s)**

EXC 36101 - Process evaluation, counts 100% towards final grade in EXC 3610 Empirical Methods in Finance, 7,5 credits.

**Examination support materials**

A BI-approved examination calculator, TEXAS INSTRUMENTS BA II Plus™

One bilingual dictionary may also be used at written examinations. Support materials permitted at written examinations are explained under exam information in our web-based Student handbook. Please note use of calculator and dictionary.<http://www.bi.edu/studenthandbook/examaids>

**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**