Università Commerciale
Luigi Bocconi

MSc. Finance/CLEFIN
2019/2020 Edition

Financial Econometrics and Empirical Finance II

Professor Massimo Guidolin

COURSE OUTLINE/OBJECTIVES

The course introduces a student to modern techniques in the area of financial econometrics; in particular, the interaction between theory and empirical analysis is emphasized.

A compulsory prerequisite is Financial Econometrics and Empirical Finance I (20191, Corielli/Fortini). I am told that class provides background. Keep in mind that a Statistics Prep course has been offered in August 2019 and that the material covered in those 24 hours represent essential background, see:

http://didattica.unibocconi.eu/mypage/map.php?IdUte=135242&idr=14063&lingua=eng
http://didattica.unibocconi.eu/mypage/doc.php?idDoc=15646&IdUte=48622&idr=7083&Tipo=m&lingua=eng

Furthermore, chapter 1 in Guidolin and Pedio's' textbook provides some introduction to regression analysis.

ASSESSMENT METHODS (THE EXAM)

The course offers a series of OPTIONAL lab sessions that will take place between mid-April and early May. Optional means that also students not attending the lab sessions may achieve the maximum grade.

Attending students will receive their grade from active participation to the lab sessions leading them to turn their computing work and a brief report at the end of each lab session. In this case, their final grade will be determined according to the formula:

$$grade = max\{0.8 \times grade\ in\ the\ final\ test + 0.2 \times lab\ session\ score;\ grade\ in\ the\ final\ test\}$$

Students not attending the labs will receive their grade entirely from the final, general exam.

There will be one general, final exam scheduled in the sessions of May, June, and October 2020. According to academic regulations, only students who have recorded a sufficient grade in 20191 before an exam session of 20192, can be enrolled in the 20192 exam. The format of the exam is closed book(s), closed notes, mixing general, open questions with data and estimation output commentaries, along the lines shown in the lectures as per posted notes and/or slides. The exam will approximately last 1 hour and 20 minutes.

A series of five lab sessions will take place at the end of the semester. The participation to the lab sessions is optional. If a student participates to the lab sessions—which will require monitored attendance—each of them may give a maximum score of 4% of the final total score in the course, up to a maximum of 20%. Once more, for attending students the formula will be $grade = max\{0.8 \times grade\ in\ the\ final\ test + 0.2 \times lab\ session\ score;\ grade\ in\ the\ final\ test\}$. The portion of the grade deriving from lab participation only applies to students who have recorded their 20191 score and expires with the June 2020 session (included). However, lab session scores will not be lost in case a student withdraws from the May general exam.

TEXTBOOKS AND OTHER SUPPORT MATERIALS

The material covered is outlined in the *lecture slides made available via the class website*:

http://didattica.unibocconi.eu/mypage/map.php?IdUte=135242&idr=14063&lingua=eng

(yes, please scroll to the middle), but a firm grasp of the course textbook,

Guidolin, M., Pedio, M., *Essentials of Time Series for Financial Applications*, 1st Edition, (eBook ISBN: 9780128134108; Paperback ISBN: 9780128134092), Academic Press, May 2018.

is necessary. The exam covers class lectures, slides and the corresponding chapters (if marked with a *) from the book. Any questions concerning whether starred portions of the book are to be covered, will be addressed by copying and pasting this portion of your syllabus.

DETAILED SYLLABUS (required readings are indicated by a *; a detailed schedule of the laboratory sessions will be published on the course web page)

1. The Econometrics of Financial Returns: an Introduction [2 hours]

*Lecture Slides.

GUIDOLIN-PEDIO, chapter 1 and Appendix.

2. Essential Concepts in Time Series Analysis: Weak and Strong Stationarity; Sample Autocorrelations and Sample Partial Autocorrelations [3 hours]

*Lecture Slides.

*GUIDOLIN-PEDIO, chapter 2.1.

3. Autoregressive Moving Average (ARMA) Models and their Applications; Selection and Estimation of AR, MA and ARMA models; Forecasting ARMA processes [6 hours]

*Lecture Slides.

*GUIDOLIN-PEDIO, chapter 2.2-2-4.

4. Multivariate Time Series: Structural vs. Reduced-Form VARs; Estimation; Specification, Hypothesis Testing, and Forecasting; Structural Analysis with VAR Models [7 hours]

*Lecture Slides.

*GUIDOLIN-PEDIO, chapter 3.1-3.3.

5. Unit Roots, Cointegration and Error Correction; Spurious Regression Problem [6 hours]

*Lecture Slides.

*GUIDOLIN-PEDIO, chapter 4.

Campbell, J. Y. and R. Shiller (1987) "Cointegration and Present Value Models", *Journal of Political Economy*, 95, 1062-1088.

6. Univariate Volatility Modeling: Introduction to ARCH and GARCH [7 hours]

*Lecture Slides.

*GUIDOLIN-PEDIO, chapter 5.1-5.2.

Engle, R. F. (2001) "GARCH 101: The Use of ARCH/GARCH Models in Applied Econometrics", *Journal of Economic Perspectives*, 15, 157-168.

7. Advanced Univariate Volatility Modeling: Non-Gaussian Marginal Innovations; Exogenous (Predetermined) Factors; Forecasting; Estimation and Inference [5 hours]

*Lecture Slides.

*GUIDOLIN-PEDIO, chapter 5.3-5.6.

Poon, S.-H., C. Granger (2005) "Practical Issues in Forecasting Volatility", *Financial Analysts Journal*, Jan./Feb. issue, 61, 45-56.

Schreder, M. (2018) "Volatility Forecasting in Practice: Exploratory Evidence from European Hedge Funds", *Journal of Asset Management*, 19, 245-258.

8. Lab Sessions in E-Views [optional, 12 hours]

Lab Slides and supporting files.