

27545 - Statistical Analysis for Finance

Información del Plan Docente

Academic Year	2018/19
Subject	27545 - Statistical Analysis for Finance
Faculty / School	109 - Facultad de Economía y Empresa
Degree	449 - Degree in Finance and Accounting
ECTS	6.0
Year	4
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures and computer practice sessions. In theoretical sessions the concepts and mathematical foundations of the statistical techniques will be exposed by means of slides and theoretical notes. Practice sessions will be taught with the computer in the computer classroom. In these sessions simulated and real financial time series will be analyzed by applying the statistical tools explained in the lectures. To that aim we will use some libraries of R specialized in the selection, estimation and validation of ARMA-GARCH models.

In these classes some illustrative simulated and real time series will be set-up by the teacher and will be solved by the different teams during half hour with a posterior half an hour to discuss among all the groups, the obtained results.

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Platform *Moodle 2.0* will be used to publish all the theoretical and practical materials and all the information about the development of the subject along time.

4.2.Learning tasks

The course includes the following learning tasks:

- Lectures. These sessions will be taught by means of participative master classes where a set of slides will be used in order to explain the theoretical part of the subject. The aim of these sessions will be to establish the theoretical foundations of each theme, illustrating the studied concepts and ideas by means of illustrative practical examples. The professor will use his computer to illustrate in these examples, the application of the explained statistical techniques. It is recommended to attend to these sessions because, in our experience, the theoretical part of the subject is the more difficult part to understand and study.
- Computer Practice sessions. These sessions will be carried out in the computer rooms with the students working by teams. In these classes some simulated and real series will be set-up by the teacher and will be solved by the different teams during half hour with a posterior half an hour to discuss among all the groups, the obtained results. The R statistical package will be used to solve these practical problems.

4.3.Syllabus

The course will address the following topics:

- Topic 0. Introduction. Course objectives. Evaluation. Teaching program. Bibliography
- Topic 1. Empirical characteristics of the financial time series. Assets returns. Empirical characteristics of the returns: mean, median, skewness, kurtosis, normality, autocorrelation. Introduction to R: installation, basic commands, libraries.
- Topic 2. Dynamic linear models for financial time series. Stationary series. Autocorrelation. White noise. AR, MA and ARMA models: identification, estimation, goodness of fit and prediction. Non-stationary series: unit roots tests, ARIMA models.
- Topic 3. Statistical analysis of volatility (I). Introduction. ARCH, GARCH and ARMA-GARCH models: properties, identification, estimation, goodness of fit and prediction. Applications: dynamic estimation of correlations and beta coefficients: minimum variance portfolios.
- Topic 4. Statistical analysis of volatility (II). IGARCH models. Asymmetric effect: GJRGARCH, EGARCH and APARCH models. Components GARCH. GARCH in mean. Insampling and outsampling validation of models.
- Topic 5. Value at Risk. Measuring risk. Coherence. Value at Risk. Conditional Value at Risk. Risk Metrics. Backtesting techniques.

4.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Faculty of Economics and Business website (<https://econz.unizar.es/>) and the Moodle Platform.

4.5.Bibliography and recommended resources