TECHNICAL DATA SHEET

Information about the subject	
Name	Statistics and Econometrics for Finance
Code	E000004279
Degree	Máster Universitario en Finanzas
Course	Máster Universitario en Finanzas [First course]
Credits	2,0 ECTS
Type	Compulsory
Department / Area	Máster Universitario en Finanzas

Professors' data	
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SUBJECT SPECIFIC INFORMATION

Context
Contribution to course's the professional profile

Statistics and econometrics are tools of great importance in Finance.

At the core of multiple problems lies the description, analysis and interpretation of data. The proper use of data is intended to derive conclusions regarding empirical phenomena.

Statistics deals with methods and procedures to gather, classify, summarize, detect regularities and analyze data. Econometrics, as the science and art of building models, allows us to explore, measure and tests empirically, using real micro or macro data, the relationship between financial variables and theories about them.

Class aims

At the end of the course the student should be able to:

· Understand the **quantitative consequences of uncertainty and risk** in Finance.

· Understand, use and develop critical thinking about the application of basic concepts in:

- Descriptive statistics in Finance, specially the representation of different frequency distributions.

- Probability in Finance, specially the most frequently used probability laws with continuous and discrete data

- Statistical Inference in Finance, specially parameter estimation and hypothesis testing.

- Econometric modeling, particularly the linear regression model.

- Panel data analysis, fixed and random effects

- Time series analysis, specially the Box-Jenkins (ARIMA) methodology

- Multivariate Analysis, specially the principal component analysis

- To get familiar with scientific articles in Applied economics and Finance

- To use, at a basic level, some statistical packages useful for regression analysis, specially R Studio programming software.

Competences - Objectives

Competences

GENERAL

CG01		Capacity for analysis and synthesis
	RA1	Describe, relate and interpret situations and theoretical and practical approaches in different contexts
	RA2	Select and analyze the most significant elements and their relationships in different contexts and identify the lack of information and its relevance, establishing relationships with elements external to the situation.
	RA3	Perform analysis with the depth and coherence necessary to support business decision making with impact.
CG02		Problem solving and decision making
	RA1	Know the scope and practical utility of the theoretical notions learned. Study theoretical and practical cases and see the application to real future situations
	RA2	Resolve and make decisions in case studies based on real situations autonomously between alternatives and specific situations
CG03		Capacity for organization and planning

	RA1	Plan your personal work in a viable and systematic way, taking into account a work plan organized in time and quality
CG04	Ability to manage information from different sources	
	RA1	Know, use and discriminate the different sources of information on the subject (registered information of the markets, diffusers of information, web pages, specialized magazines, analyst reports and others) showing depth in the base of their analysis and precision in the data used
	RA2	Identify the suitability of each source and study based on the purpose of the same, giving rigor to the opinions and conclusions taken
CG05	Advanced computer skills related to field of study	
	RA1	Use computer tools to generate documents (graphs, tables, etc.) that illustrate and clarify arguments
	RA2	Use audiovisual media to support oral presentations
CG06	Interpersonal skills: listen, argue and debate	
	RA1	Know how to communicate analyzes and concussions accurately in the language and in the justification of the arguments used, adapting to the target audience.
	RA2	Able to argue, discuss and defend the conclusions and approaches with rigor
CG07	Leadership and teamwork	
	RA1	Participate actively in the classroom and in the group work assuming the responsibility of its assigned module and demonstrating its leadership capacity for its management and development
	RA2	Oriented towards the achievement of common agreements and objectives
CG08	Critical and self-criticism capacity	
	RA1	Identify, establish and contrast the hypotheses, variables and results in a logical and critical way
	RA2	Review the options and alternatives with a critical reasoning that allows you to discuss and argue contrary opinions
CG11	Ability to learn and work independently	

	RA1	Guide study and learning autonomously, developing initiative and setting priorities in their work
	RA2	Manage your time distinguishing the urgent from the important and planning a work plan.
CG13	Action and quality orientation	
	RA1	Motivated to improve the quality of work and the achievement of achievements, being the search for excellence part of his work
	RA2	Have a method of acting and systematically review it
CG14	Ability to process and transmit ideas, projects, reports, problems and solutions	
	RA1	Determine the scope and practical utility of theoretical notions, preparing documents that translate diagnosis of complex real situations, identifying and justifying the models that can propose a solution.
	RA2	Generate ideas and solutions correctly identifying the knowledge applicable to each situation
SPECIFIC		
CE03	Understand and correctly apply the principles and models of valuation of companies, assets, portfolio management, the fundamentals of the analysis of investment projects and those that support the theories of efficient portfolio construction	
	RA1	Meet the classic and modern financial models, and is able to explain the evolution of the Modern Portfolio Theory to the most current models
	RA2	Know and understand the concept of efficient portfolio and be able to obtain the efficient frontier in practice with real market data. Know how to get the Capital Market Line
	RA3	Know, understand, and apply the model and C.A.P.M. and be familiar with the limitations of its application to real life and with alternative models such as APT
	RA4	Correctly interpretsinformation on market interest rates and uses it to estimate fixed-income securities prices
	RA5	Master and apply in practice the methods of cash flow discount (DCF) and multiples.
		Know how to deal with special assessment situations in practice, such as

	RA6	valuation of investments with different types of assets, newly created companies, diversified company valuation and valuation of financial entities
	RA7	Know and apply the technical analysis as a complement to the fundamental analysis to make judgments about assets, securities and investments
CE05	Know how to integrate and apply the debt and dividend policy in a company	
	RA1	Know and apply the existing theories on how value can be created or not through debt policy, capital cost theory as well as the most current paradigms related to indebtedness and dividends
	RA2	It is able to perform an analysis of optimal capital structure from the analysis of ratios and financial statements
	RA3	It is able to perform, at each moment or specific juncture, an analysis of the remuneration of companies via dividends
	RA4	Know and understand the impact of capital operations on the share price
CE14	Know and apply mechanisms to create defined functions, statistical, econometric and mathematical analysis through computer programs	
	RA1	Know how to use statistical, mathematical and econometric tools to analyze data and prepare research and reports.
	RA2	It is capable of programming financial utility functions and knows the use of variables, matrices and sentences in Excel, Vb, Matlab, SPSS, Gretl for the implementation of solutions to the daily needs of a financial professional
	RA3	Use the Excel tool as an advanced user and macro generation.
	RA4	Master the basic statistical, mathematical and econometric concepts necessary for financial operations and financial research
	RA5	It is able to perform, in a basic way, derivative programming
CE17	Ser capaz de aplicar los principios y normas contables en un contexto globalizado así como los métodos de consolidación	
	RA1	Know how to prepare in financial statements the economic facts related to the usual business operations and complex operations, applying the PGC, IFRS, FAS, and other accounting regulations and

		its subsequent updates and recommendations.
	RA2	Know, interpret and obtain the maximum information from the different models of annual accounts for later analysis
	RA3	Know and know how to reflect in the corresponding books the events after the end of the year and the consequences of changing the accounting criteria and / or estimates
	RA4	Know and apply the financial analysis, and the different tools and indicators that serve to issue a value judgment on the financial statements of the company and especially financial entities, as well as to make decisions on how to account for certain operations, and make decisions on investment.
	RA5	Knowledge and understanding of the regulations and fundamental concepts of national and international consolidation theories and methods and their application to professional practice
CE18	Develop a broad practical vision regarding the tax implications of business decisions regarding costs, credit, sources of financing, assets, investments, equity, as well as the fiscal optimization of business resources in accordance with regulations and jurisprudence	
	RA1	Know and understand the tax and accounting regulations for accounting for the main taxes, direct and indirect, that affect business operations, acquisition and investment in different assets or contracting of products related to the company's financing operations
	RA2	Know, identify and quantify the main tax consequences of the different financial investment alternatives, both for individuals and legal entities, residents or non-residents
	RA3	Know and manage the fiscal financial planning tools that allow you to identify alternatives to optimize business decisions
	RA4	Know the scope and application of administrative doctrine and applicable jurisprudence in tax matters to optimize business decisions with the lowest risk and the greatest legal certainty

CONTENT

Content - Topics
Statistics and Econometrics for Finance

Lesson 1: Probability and Inference
1.1 Basic probability concepts
1.2 Probability distributions
1.3 Basic inference concepts
1.4 Parameter estimation: punctual snd by intervals
1.5 Hypothesis tests

Tema 2: Regression
2.1 Econometric basic concepts
2.2 Linear regression model. Assumptions
2.3 Modelling process: specification, estimation, validation and prediction

Tema 3: Panel data
3.1 Definition
3.2 Linear models for panel data
3.3 Fixed and random effects models

Tema 4: Time series
4.1 Basic concepts
4.2 ARIMA models
4.3 Cointegration. VAR models
4.4 Volatility models

Tema 5: Applications
5.1. SML and CAPM
5.2 APT
5.3 Betas stability
5.4 Interest rates structure
5.5 Value-at-Risk (VaR)

TEACHING METHODOLOGY

General methodological aspects of the subject

In-classroom Methodology: Activities

Most of the interaction between the professor and students takes place during the lectures. There are 3 types of activities:

Master classes

Sessions in which the professor introduces topics in a clear, structured and motivating manner. Students must attend to class with the required background for their better comprehension

Discussions

Students must attend to class with the required background and will participate actively. Several scientific papers and videos will be presented and analyzed in class. Complementary technical exercises will be required

Continuous evaluation

They are intended to check the student's progress in the assimilation of the contents given in the master classes and the discussions. These quizzes are part of the grading system and helps the students in the task of monitoring his/her evolution during the semester

Off-classroom Methodology: Activities

The work that students do independently is the essential complement to the process of teaching and learning. The correct orientation, follow-up and intensity of this work is fundamental for the learning process

Study and Documentation

Preparation before the lectures according to the guidelines set by the teacher. Individual reading of various texts (books, magazines, newspapers, online publications, etc.) related to the problem being studied and the techniques and tools applied to its analysis and discussion

SUMMARY OF STUDENT WORK HOURS

HORAS PRESENCIALES					
Master classes	General sessions of presentation of contents	Public presentation of topics or works	Exercises and problem solving	Organized debates	Simulations, role plays, group dynamics
5.00	5.00	2.00	5.00	1.00	2.00
HORAS NO PRESENCIALES					
Study and documentation	Theoretical or practical monographs	Tutorial Sessions	Cooperative learning		
15.00	8.00	2.50	5.00		
			ECTS CREDITS: 2,0 (50,50 hours)		

EVALUACIÓN Y CRITERIOS DE CALIFICACIÓN

Terms of evaluation	Criteria	Weight
Final exam	Adequacy of the answers to the statements of the questions Success in the answers Organization of the information Clarity in the presentation	30
Midterm exam	Success in the answers	10
Presentations in public, individually or in group	Adequacy of the instructions and test criteria Adaptation to the statements of the questions Success in the answers Organization of the information Clarity in the presentation	15
Evaluation of monographs, exercises or individual case studies.	Adequacy of the instructions and test criteria. Adaptation to the statements of the questions. Success in the answers. Organization of the information. Clarity in the presentation.	10
	Monograph assessment of collective authorship	

Monograph assessment of collective authorship	Adequacy of the instructions and test criteria.	15
	Adaptation to the statements of the questions	
	Success in the answers	
	Organization of the information	
	Clarity in the presentation	
	Synthesis	
	Presentation in term.	
	Work distribution and organization	
	Everyone must intervene	
Participation, attitude and use of classes	The participation in class of the students, the attitude, the quality and opportunity of their interventions, the quality in the preparation and presentation of the works, predisposition and commitment, initiative and assistance.	20

Grades

The details of the evaluation of each of the evaluation activities will be found in the planning provided by each teacher.

Notes to the evaluation criteria:

1. All students must meet a minimum of 75% attendance in the whole of the subject and in each of its blocks led by different teachers, to pass the subject.

2. In order for the exercises to be taken into account they must be delivered within the deadline and format provided.

3. If, by combining the criteria, the final grade is equal to or greater than 5, but had not exceeded the minimum grade of the final exams or exams, the final grade will be reduced to a maximum of 4.0 points.

4. 4. In the event that the student does not obtain a grade of 5.0 or higher in the whole of the subject or in any of its blocks or sections after the application of the evaluation system criteria, the student may take an exam extraordinary, in which case the final grade of the

subject, or the section under review, may not exceed 6.0. In these cases, for the calculation of the final grade, only the exam test will be taken into consideration without taking into account the other evaluation activities.

    5. If the student does not fulfill all the evaluation activities and fails to comply with any of the activities listed in the previous table, they cannot approve each of the blocks.

The student enrolled in the subject for the second consecutive year, provided that it is justified by attending work needs, may excuse class attendance in a maximum percentage of 50% of scheduled sessions.

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