

**TECHNICAL SHEET OF THE SUBJECT**

Data of the subject	
Subject name	Financial Econometrics
Subject code	E000012135
Main program	Bachelor's Degree in Business Analytics
Involved programs	Grado en Administración y Dirección de Empresas y Grado en Análisis de Negocios/Business Analytics [Fifth year]
Level	Reglada Grado Europeo
Quarter	Semestral
Credits	6,0 ECTS
Type	Optativa (Grado)
Department	Departamento de Gestión Financiera
Coordinator	Elena María Díaz Aguiluz
Schedule	available in the intranet
Office hours	available in the intranet

Teacher Information	
Teacher	
Name	Elena María Díaz Aguiluz
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SPECIFIC DATA OF THE SUBJECT

Contextualization of the subject
Contribution to the professional profile of the degree
Financial econometrics is the branch of econometrics concerned with the quantitative analysis and modelling of financial markets. Through the development and estimation of econometric models, it is possible to analyse the behaviour of financial assets, value financial instruments, measure risk, and support decision-making in the financial sector. In addition, the course introduces modern time series and latent variable models that are widely used in economic and financial institutions for the dynamic analysis of markets. Over the past decades, the increasing complexity of financial markets, driven by technological advances, digitalisation, and regulatory changes, has increased both the availability of data and the need to develop quantitative tools capable of transforming that information into useful knowledge for decision-making. Financial econometrics provides the methodological framework required to model these relationships and to understand the dynamics of financial markets. To this end, the discipline combines econometric models with financial time series, making it possible to study the evolution of asset prices, analyse the propagation of shocks, generate forecasts, and quantify risk under different scenarios. Knowledge of these tools is essential for interpreting market behaviour and assessing the consequences of changes in economic and financial variables.



Prerequisites

This is a final-year undergraduate course that should be taken after completing an introductory course in Econometrics and Forecasting Techniques, as well as Financial Theory I or an equivalent course. It assumes a basic understanding of the different financial assets available in financial markets. The Financial Markets course is also useful and complementary, although not essential.

A solid background in statistics and financial mathematics is important for successfully following the course. Students are expected to be proficient in Microsoft Excel and its functions, and it is highly recommended that they have prior knowledge of a programming language, preferably Python (the primary programming language used throughout the course), although R or MATLAB may also be useful.

Competencies - Objectives

Competences

GENERALES

CG01	Capacidad de organización y planificación en la identificación de problemas en el contexto de datos masivos	
	RA1	Describe, relaciona e interpreta situaciones y planteamientos de nivel medio
	RA2	Selecciona los elementos más significativos y sus relaciones en las situaciones planteadas
	RA3	Es capaz de enfrentarse con el estudio analítico de casos y escenarios, así como de llevar a efecto síntesis de información y de datos, empleando los conceptos adecuados.
CG03	Resolución de problemas y toma de decisiones en un entorno de datos masivos tanto cuantitativos como cualitativos	
	RA1	Saber seleccionar para cada problema la técnica o técnicas de análisis de datos más adecuada para poder convertir los datos ¿en bruto¿ en información y ésta en conocimiento que ayude a la toma de decisiones y a mejorar la gestión.
CG08	Capacidad crítica y autocrítica en la sociedad de la información	
	RA1	Identifica los supuestos y las limitaciones de métodos y teorías
	RA2	Identifica, establece y contrasta hipótesis, variables y resultados de manera lógica y crítica
	RA3	Es capaz de construir un discurso propio, en un contexto de intercambio de opiniones.

ESPECÍFICAS

CEO31	Conocer los fundamentos y las principales técnicas econométricas y saber aplicarlas al campo de las finanzas
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Syllabus
2026 - 2027

	RA01	Saber especificar un modelo econométrico apropiado para dar respuesta a un problema de carácter económico-financiero
	RA02	Saber estimar y validar un modelo econométrico empleando algún software adecuado para al fin
	RA03	Saber interpretar los resultados obtenidos en los modelos econométricos y emplearlos como herramienta de ayuda a decisión y gestión empresarial en el ámbito financiero

THEMATIC BLOCKS AND CONTENTS

Contents - Thematic Blocks
Introduction to Financial Econometrics
Financial Data and Sources
Simple regression model
Multiple regression model
Univariate Analysis
Stationarity and Unit Root Tests
ARMA processes
Mean Reversion
Impulse Response Functions
Financial Forecasting
GARCH Models
Multivariate Analysis
The Vector Autoregressive Model (VAR)
Shock Identification and Visualisation and Analysis Tools
Cointegration and Vector Error Correction Models
Introduction to State-Space Models
Principal Component Analysis
Kalman Filter
Time-Varying Parameter Models

TEACHING METHODOLOGY

General methodological aspects of the subject
The course is held in the classroom and imparted through lectures, exercise solving, and classes in the computer lab or through personal laptops.



The students have to prepare the material before each class.

In-class Methodology: Activities

The number of lectures is approximately half of the hours of class devoted to the course, where the professor will define and explain the concepts and technical terminology, illustrate the theory and analytical frames with examples, and will identify the topics for debate in the discipline.

The role of the student will be active listening, trying to understand the arguments and theories, relating the class content with his/her existing knowledge, and taking structured notes of the most important contents.

The second half of the classes will consist of programming practices on the studied models. Previous preparation of the student is a necessary condition for making maximum profit from the lecture. The student will be able to follow the lectures by bringing a personal laptop to the classroom.

Generative artificial intelligence tools will be incorporated as a support for learning, particularly to facilitate the understanding, documentation, and debugging of code, as well as the interpretation of econometric results, always in accordance with the University's guidelines for the responsible use of artificial intelligence.

CG01, CG03, CG08,
CEO31

Non-Presential Methodology: Activities

Students will have to complete the programming practices for the estimation of models, which will then be discussed in class and graded by the professor.

CG01, CG03, CG08,
CEO31

SUMMARY STUDENT WORKING HOURS

CLASSROOM HOURS		
Lecciones de Carácter expositivo	Ejercicios y resolución de casos y de problemas	
30.00	30.00	
NON-PRESENTIAL HOURS		
Ejercicios y resolución de casos y de problemas	Estudios individual y/o en grupo, y lectura organizada	Trabajos monográficos y de investigación, individuales o colectivos
30.00	60.00	30.00
ECTS CREDITS: 6,0 (180,00 hours)		

EVALUATION AND CRITERIA

The use of AI to produce full assignments or substantial parts thereof, without proper citation of the source or tool used, or without explicit permission in the assignment instructions, will be considered plagiarism and therefore subject to the University's General Regulations.

Evaluation activities	Evaluation criteria	Weight
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Final Exam	Resolution of a case in the computer and interpretation of results (60% programming and 40% questions)	50 %
Programming practices and model estimation	The ability to collect data from the web, estimate models, and interpret results will be graded	30 %
Mid-Term Exam	Multiple-choice questions and programming practice	20 %

Ratings

In order to add the grade obtained in continuous evaluation, it is necessary to obtain a minimum of 5 in the final exam.

For students with a school waiver, the final exam will constitute 100% of the grade. This will also be the case for all students on the second call and up, as well as for exchange and extraordinary students that need to take this course in ICADE.

According to the General Regulations of the University, art. 168.2.e: "carrying out actions tending to falsify or defraud the academic performance evaluation systems", the improper use of ChatGPT or another IAG will be considered a serious offense. The consequences of this will include "temporary expulsion of up to three months or the prohibition to take the exam in the next call to the imposition of the sanction, in one or several subjects in which the student is enrolled, [...] apart from assuming the grade of fail (0) in the respective subject, [...] [and] the prohibition to take the exam in that subject in the next call." Specifically, in this subject, the teacher may allow the use of IAG for specific activities of the subject; where the student is obliged to do the following:

- That the student clearly indicates why he has used IAG (ChatGPT). All content created with generative AI must be labelled as such. All content that uses generative AI and is adapted, must be labelled in the same way as authors are cited.
- It includes as additional material (annexes) the complete prompt (questions and answers) of your conversation with IAG (ChatGPT) to generate the task.

In case of not complying with the above obligations, the use of IAG by the student will be considered improper use for the purposes mentioned above.

BIBLIOGRAPHY AND RESOURCES

Basic Bibliography

Brooks, C. (2019). *Introductory Econometrics for Finance* (4th ed.). Cambridge: Cambridge University Press. doi:10.1017/9781108524872

Tsay, R. S. (2010). *Analysis of Financial Time Series*. Wiley. doi:10.1002/9780470644560

Complementary Bibliography

Campbell, John; Lo, Andrew; MacKinlay, Andrew (1997). *The Econometrics of Financial Markets*. Princeton: Princeton University Press. ISBN 9780691043012.

Gujarati Damodar N. (2004). *BASIC ECONOMETRICS, FOURTH EDITION*. McGraw-Hill

Hill, Griffiths, Lim (2011) *Principles of Econometrics 4a Edición (International Student Version)*, Wiley



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Syllabus 2026 - 2027

Greene, William H. (2018). Econometric Analysis, 8th Edition, Pearson

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