



IB/ST 350 ECONOMETRICS FOR BUSINESS
IES Abroad Nice

DESCRIPTION:

Econometrics is the application of statistics and mathematics to economic and financial data. In today's world data are largely available and econometric techniques are crucially important to conducting reliable data analyses in private and public institutions. This course introduces students to regression methods for analyzing data in business and economics. After presenting the basic theoretical features of each method, it will familiarize students with how to practically implement estimation and hypothesis testing techniques in various empirical contexts. The main goal of the course is to provide students with a solid theoretical background in introductory level econometrics, to stimulate their abilities to apply such techniques on diverse datasets, and to enable them to critically analyze empirical studies in economics, business, and finance.

CREDITS: 3

CONTACT HOURS: 45

LANGUAGE OF INSTRUCTION: English

PREREQUISITES: One undergraduate-level course in Statistics.

METHOD OF PRESENTATION:

- Lectures, seminars to discuss assignments, data analysis sessions.
- Slides for each lecture will be made available to students before each lecture. References to the textbook will be provided as well in order to facilitate and clarify the content of the slides.

REQUIRED WORK AND FORM OF ASSESSMENT:

Course Participation – 10%

Assignments – 10%

Midterm – 25%

Final Exam – 30%

Final Project – 25%

Course Participation

In addition to actively participating in class, students are required to perform weekly readings and complete practical problem sets. Some of these practice problems will be based on students' datasets and will be carried out using the popular and freely available statistical software Gretl. Students will be expected to complete and submit these exercises. The solutions to these assignments will be discussed during class and are meant to enable students to gain some self-awareness on their level of understanding of the topic and to practice new concepts as they are introduced.

Assignments

Students will be given weekly problem sets composed of practice questions addressing the material covered in the classes before each assignment is due. When appropriate, some of the questions may involve the use of statistical software. Students may work in groups, but each must submit his or her solutions individually. Two of the weekly assignments (in Week 4 and Week 8) will be given a letter grade and each will count for 10% of the final grade. These graded problem sets are intended to give students concrete feedback on their work. The solutions to the problems will be discussed extensively in class.

Midterm

The midterm will take place at the beginning of Week 7. This will consist of a series of practical questions on the material covered from Week 1 to Week 6.

Final Exam

The final exam will be held in-class and will be composed of practical questions on all the material covered in the course. Questions in the final exam will not involve the use of a statistical software. Students will be allowed to use a formulae sheet and statistical tables.

Final Project

Students will be asked to conduct a comprehensive analysis of an empirical dataset that requires them to evaluate data, perform advanced calculations, and make recommendations with regard to the data. Student will work in groups on this project over the last week of the semester. Each group will be assigned a different dataset and will be asked to explain and support their results. Results will be presented as a group during the last class of the semester.

LEARNING OUTCOMES:

By the end of the course, students will be able to:

- Know the fundamental econometric models for cross-sections, time series and panel data, their statistical properties, and how to apply them to real data.
- Estimate and critically interpret parameter estimates in simple empirical settings.
- Conduct a comprehensive analysis of an empirical dataset and explain and support their results.
- Evaluate a dataset to extract policy and/or business recommendations.

ATTENDANCE POLICY:

Students are expected to be responsible for their own class attendance and to give academic responsibilities priority over other activities. Regular class attendance is mandatory. For physical and mental health reasons, IES Abroad Nice allows a maximum of THREE (3) absences in each Italian language course, TWO (2) absences in each Area Studies course, and ONE (1) absence in each Seminar course. Every absence beyond this allowance will automatically result in a penalty of 2 percentage points off the final grade. SEVEN (7) absences will result in a failing grade in Italian language and Area Studies courses. FOUR (4) absences will result in a failing grade in Seminar courses. Failure to attend a scheduled exam, test, quiz, or presentation will automatically result in an F grade on that assessment.

CONTENT:

Session	Content	Assignments
Session 1 <i>Thurs. 9/02/24</i>	Statistical Review • Probability distributions, expected value, estimator of the sample mean and its sampling distribution, hypothesis testing.	• Textbook: Appendix B (pages 714-744).
Session 2	Simple linear regression model • Model assumptions. • Ordinary least squares (OLS) and its statistical properties.	• Textbook: Chapter 2 (pages 22-59)

<i>Session 3</i>	Multiple regression model Model assumptions, interpretation of estimates, multicollinearity, t-test and F-test.	Textbook: Chapters 3 and 4, Sections 3.1, 3.2 (pages 68-83), 3.5 (pages 102-104), 4.1, 4.2 (pages 117-138), 4.4, 4.5 (140-154)
<i>Session 4</i>	Dummy variables. - Definition of dummy variables and interpretation of coefficients. - Selection of relevant questions on Sessions 1,2 and 3	- Textbook: Chapter 7, Sections 7.1, 7.2, 7.3 (pages 225-238) - Assignment 1
<i>Session 5</i>	Heteroskedasticity Consequence of heteroscedasticity, robust standard errors, weighted least squares.	Textbook: Chapters 8, Sections 8.1, 8.2, 8.3,8.4 (pages 264-290)
<i>Session 6</i>	Model misspecification Omitted variable bias, inclusion of irrelevant variables, proxy variables	Textbook: Chapters 3 and 6, Sections 3.3, 3.4 (pages 84-102), 6.3 (199-206)
<i>Session 7</i>	Discussion of practical questions on topics covered in Sections 5 and 6	Assignment 2 (graded)
<i>Session 8</i>	Endogeneity and instrumental variables Random regressors, definition of endogeneity, instrumental variable estimator (IV), two stages least squares	Textbook: Chapter 15, Sections 15.1, 15.2, 15.3 (506-525) and Appendix C.3 (pages 755- 760).
<i>Session 9</i>	Endogeneity and instrumental variables Measurement error, omitted variables and their IV solution. Testing for endogeneity.	Textbook: Chapter 15, Sections 15.4, 15.5, 15.6 (pages 525- 531)
<i>Session 10</i>	Simultaneous equations Identification problem, IV solution to simultaneity.	Textbook: Chapter 16, Sections 16.1, 16.2, 16.3, 16.4 (pages 546-560)

Session 11	Discussion of practical questions on topics covered in Sessions 8, 9 and 10.	Assignment 3
Session 12	Midterm take-home exam to be held in Week 7 Review of models for cross sectional data Review of key concepts covered in Weeks 1-6 by means of comprehensive examples.	
Session 13	Linear probability model. Model specification, interpretation of coefficients and limitation of this approach	Textbook: Chapter 7, Sections 7.5, 7.6 (246- 254)
Session 14	Time series models Model assumptions, static models, distributed lag models	Textbook: Chapters 10 and 11, Sections 10.1, 10.2, 10.3 (340-352), 11.1, 11.2 (377-388), 11.5 (399)
Session 15	Serial correlation Definition of serial correlation, consequences, robust standard errors, testing for serial correlation.	Textbook: Chapter 12 (408-436)
Session 16	Discussion of practical questions on topics covered in Sessions 12, 13 and 14.	Assignment 4 (graded)
Session 17	Panel data analysis Definition of panel dataset, pooled OLS, analysis via differencing.	Textbook: Chapter 13 (444-470)
Session 18	Panel data analysis Fixed effects and random effects models	Textbook: Chapter 14, Section 14.1, 14.2 (481-493)

Session 19	Discussion of practical questions on topics covered in Sessions 17 and 18	Assignment 5
Session 20	Review of models for time series and panel data Review of key concepts covered in Weeks 7- 10 by means of comprehensive examples.	
Session 21	Empirical project We will review the main topics on cross sectional data in view of the empirical analysis students have to carry out independently.	
Session 22	Empirical project Each group will present the results of their analysis to the rest of the class.	Empirical project to be presented and handed in by each group (graded).
	FINAL EXAM	

REQUIRED READINGS:

- Wooldridge, J., *Introductory Econometrics – A Modern Approach*, South-Western Cengage Learning, 4e International Edition, 2008.

RECOMMENDED READINGS:

- Additional readings will be provided, if necessary, on a case-by-case base.

INSTRUCTOR BIOGRAPHY:

Mohamed Arouri is currently a full Professor of Finance and Sustainability at Université Côte d'Azur, France. His research interests involve several aspects in management, finance, and economics: corporate finance, financial markets, international finance, inequalities, behavioral economics, corporate social responsibility, social inclusion, sustainability and economic development. His most recent articles are published in leading refereed journals such as *Journal of Economic Dynamic & Control*, *Journal of Empirical Finance*, *Journal of Corporate Finance*, *Journal of International Money & Finance*, *World Development*, *Journal of Macroeconomics*, *Journal of Banking & Finance*, *The World Economy*, *Ecological Economics*, *Journal of Business Ethics*, *Macroeconomic Dynamics*, *European Business Review*, *Journal of International Financial Markets, Institutions & Money*, *Oxford Development Studies*, *Revue Finance*, and *Annals of Economics & Statistics*. With a citation count of +10,000, and an H-index of 46, he has been featured among the world's top 2% scientists by Stanford University in 2021 and 2022.