UNIVERSITY OF LONDON

Decision making | Creativity & innovation | Complex problem-solving

Course information 2025-26

FN2208 Financial Data Analysis

General information

MODULE LEVEL: 5

CREDIT: 30

NOTIONAL STUDY TIME: 300 hours

MODE: Online Taught Only

Summary

This course is an introduction to econometrics focusing on techniques applied to empirical investigations in economics and finance. The course includes a selection of the following topics: Multivariate regression analysis; hypothesis testing; omitted variables and misspecification; and time-series modelling and forecasting. Students are introduced to recent empirical findings based on finance models, such as predictability of asset returns and econometric analyses of the CAPM and multifactor models.

Conditions

Please refer to the relevant programme structure in the EMFSS Programme Regulations to check:

- where this course can be placed on your degree structure; and
- details of prerequisites and corequisites for this course.

You should also refer to the Exclusions list in the EMFSS Programme Regulations to check if any exclusions apply for this course.

Aims and objectives

- To provide an understanding of econometrics as a concept and as an important set of tools for answering questions in economics and finance.
- To explain how to use regression analysis for answering questions regarding relationship of economic and finance variables.
- To identify, explain, and apply the appropriate econometric framework for testing economic and finance theories.
- To provide an understanding of the limitations of different techniques and develop an understanding of possible solutions.

- To develop a foundation for further studies in econometrics.

Learning outcomes

At the end of this course and having completed the essential reading and activities students should be able to:

- Estimate single and multiple linear regressions models using the ordinary least squares (OLS) estimator.
- Outline and critically assess the assumptions and limitation of the OLS estimator.
- Evaluate the regression results and conduct hypothesis testing.
- Estimate panel data models and perform statistical inference on these models.
- Identify and control for omitted variable biases and endogeneity.
- Identify the need for instrumental variables (IV) estimation methods, apply the two stage least squares estimator, and test for endogeneity and valid instruments.
- Formulate and implement causal inference using experimental or quasi-experimental data.
- Apply regression techniques to time series data.
- Formulate and apply univariate and multivariate time series models to perform causal inference.
- Formulate and estimate univariate and multivariate time series models for forecasting.
- Identify and estimate stationary time series models.
- Test for unit roots.
- Test for cointegration and estimate error correction models.
- Explain, formulate, and estimate the main volatility models.

Employability skills

Below are the three most relevant employability skills that students acquire by undertaking this course which can be conveyed to future prospective employers:

1. Decision making
2. Creativity and innovation
3. Complex problem solving

Essential reading

Detailed reading lists are distributed at the start of the course.

Introduction to Econometrics by James Stock and Mark Watson, Pearson, 4th edition.

Optional reading:
Wooldridge, Introductory Econometrics: A Modern Approach, 7th edition.
Chris Brooks, Introductory Econometrics for Finance, 4th Edition.

Assessment

This course is assessed by a three-hour and fifteen-minute closed-book written examination.

Syllabus

- **Introduction to Econometrics:** Definitions, causality, prediction, datasets.
- **Single Linear Regression Model:** Assumptions, analyses of fit, sampling distribution of estimator, testing hypotheses, confidence interval.
- **Multiple Linear Regression Model:** Omitted variable bias, assumptions, control variables, analyses of fit, heteroskedasticity, finite sample properties, foundations of asymptotic theory.
- **Inference for Multiple Regression Model:** Single and multiple coefficients, joint hypotheses, confidence set.
- **Nonlinear Regression Functions:** Polynomials, logarithms, interaction (dummy and continuous variables).
- **Violations of the OLS Assumptions**: Omitted variable bias, misspecification of the functional form, measurement error bias, sample selection bias, simultaneous causality bias.
- **Panel Data:** Model and estimation, fixed effect, time fixed effects, assumptions.
- **Instrumental Variables:** Motivation, the method, estimation, sampling distribution of TSLS, the general IV model, validity of instruments (relevance, exogeneity).
- **Regression Framework for Experiments and Quasi-Experiments:** Experiments – estimation and threats; Quasi- Experiments - estimation and threats, heterogenous population.
- **Time Series Models:** Time series foundation, AR, MA, ARMA, ADL models – properties, estimation, and forecast (multi-period forecast), model specification and selection. Unit roots tests (DF and ADF), determinist and stochastic trends, spurious regression, breaks.
- **Dynamic Causal Effect:** The distributed Lag model, forms of exogeneity, exogenous regressors, strictly exogenous regressors, estimation, inference.
- **Volatility Models:** ARCH, GARCH, Realized volatility.
- **Vector Autoregressive Models:** Inference, model selection, forecast.
- **Cointegration:** The error correction model, testing for cointegration.