School of Economics and Management

NFIN96, Finance: Financial Econometrics and Machine Learning, 7.5 credits

Finans: Finansiell ekonometri och maskininlärning, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus is an old version, approved by The Board of the Department of Economics on 2020-12-08 and was valid from 2020-12-08 , autumn semester 2021.

General Information

This is a single subject master course in finance belonging to the "Financial Economics" specialisation.

Teaching may be in Swedish if all registered students have a good knowledge of Swedish.

Main field of studies	*Depth of study relative to the degree requirements*
Finance	A1F, Second cycle, has second-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

The aim of the course is to develop students' understanding of econometric models for financial data and their ability to apply the models to real problems. Specifically, after the course the students are expected to understand:

- classical OLS regression, assumptions and diagnostic tests,
- basic panel data methods,
- ARMA time series models,
- non-stationarity and cointegration,
- machine learning methods such as linear discriminant analysis, Ridge/Lasso regression and tree based methods.

Competence and skills

Students shall have the ability to independently apply their knowledge to real world problems. In particular they shall be able to:

- implement methods for estimating the econometric models covered in the course,
- implement tests to evaluate the reliability of the estimated models,
- identify finance-related problems in the real world and apply relevant methodologies and theories to analyze these problems,
- clearly and pedagogically report the results of their own and others' empirical analyses.

Judgement and approach

Students shall have developed:

- learning skills that allow for further study in finance and economics,
- an ability to independently search for and evaluate information drawn from the econometrics literature,
- the ability to independently conduct a master thesis.

Course content

The course aims to provide students with tools and techniques to carry out and analyze empirical problems in financial economics. The course has an applied approach to financial econometrics. The course trains students in the use of econometric models and in understanding financial data. The emphasis is on learning to select and use the right method for a given problem. The course primarily focuses on three areas: methods for finding causal relationships such as instrumental variables and difference in difference studies, time-series methods such as ARIMA and error correction models and machine learning methods including the Lasso, regression trees and random forests.

Course design

1. Teaching: Tuition consists of lectures and computer labs.

Assessment

1. Examination: Examination consists of a written examination that takes place at the end of the course. There will be further opportunities for examination close to this date. In addition, there are two home aqssignments carried out in groups. Other forms of examination may be used to a limited extent.
2. Limitations on the number of examination opportunities: –

The University views plagiarism and other academic dishonesty very seriously, and will take disciplinary action against students for any kind of attempted malpractice in connection with examinations and assessments. Plagiarism is considered to be a very serious academic offence. The penalty that may be imposed for this, and other unfair practices in examinations or assessments, includes suspension from the University for a specified period.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, E, D, C, B, A.
1. Grading: The official grading scale is A, B, C, D, E and Fail.

Grade (Definition), Points or percentage out of maximum points, Characteristic
A (Excellent), 85–100, A distinguished result that is excellent with regard to theoretical depth, practical relevance, analytical ability and independent thought.
B (Very good), 75–84, A very good result with regard to theoretical depth, practical relevance, analytical ability and independent thought.
C (Good), 65–74, The result is of a good standard with regard to theoretical depth, practical relevance, analytical ability and independent thought.
D (Satisfactory), 55–64, The result is of a satisfactory standard with regard to theoretical depth, practical relevance, analytical ability and independent thought.
E (Sufficient), 50–54, The result satisfies the minimum requirements with regard to theoretical depth, practical relevance, analytical ability and independent thought, but not more.
U (Fail), 0–49, The result does not meet the minimum requirements with regard to theoretical depth, practical relevance, analytical ability and independent thought.
Students have to receive a grade of E or higher in order to pass a course.

2. Weighting grades from different parts of the course: –
3. Grading scales for different parts of the course: –

Entry requirements

Students who have studied a one-year master programme in finance and are admitted to a double degree master programme in finance between a non-Swedish university and the School of Economics and Management, Lund University are eligible for this course.

Further information

1. Transitional regulations: –
2. Limitations in the period of validity: –
3. Limitations: This course may not be part of the same degree as NEKN96 "Financial Econometrics and Machine Learning".
4. Similar courses: –
5. Limitations in renewed examination: –

Subcourses in NFIN96, Finance: Financial Econometrics and Machine Learning

Applies from H21

2101 Financial Econometrics and Machine Learning, 7,5 hp
Grading scale: Fail, E, D, C, B, A