EF5070: FINANCIAL ECONOMETRICS

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Financial Econometrics

Subject Code
EF - Economics and Finance
Course Number
5070

Academic Unit
Economics and Finance (EF)

College/School
College of Business (CB)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

This course aims to equip students with financial econometric methods to analyse time series in the respect of risk and return, and volatility modelling and risk management. Students are expected to gain practical experience in analysing financial and macroeconomic data.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Apply econometric methods to analyse financial time series.		x	x	x
2	Demonstrate econometric models to solve risk management problems.			x	x
3	Explain portfolio risk through various volatility models.			x	x

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Students will engage in lectures on instruction to the R program, with a review of probability and statistics, linear time series analysis, nonlinear models, high-frequency data analysis, and their applications.	1, 2, 3	3 hours/week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Assignments (4-5 individual problem sets)Assignments on basic statistics and R programming, and on the application of R to financial time series analysis, demonstrating students' ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, detect structural changes in the mean and variance processes, etc.	1, 2, 3	60	For Assignments, students can use Generative Artificial Intelligence Tools to help them understand the concepts/ questions/ problems, or analyze data. But the final version must be their own work, e.g., students cannot copy and paste the AI answers as their own answers.	Yes

Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

2

Additional Information for ATs

One final examination on concepts and analytics of financial time series and on R programming examples of financial time series analysis, demonstrating students' ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, detect structural changes in the mean and variance processes, etc.

Students are not allowed to use Generative Artificial Intelligence Tools in the final examination.

Assessment Rubrics (AR)

Assessment Task

Assignments (4-5 individual problem sets) (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Analytical and programming skills

Excellent

(A+, A, A-) Demonstrate very strong knowledge in the subject, and a superior grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Good

(B+, B, B-) Demonstrate good knowledge in the subject, and a good grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Fair

(C+, C, C-) Demonstrate adequate knowledge in the subject, and adequate grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Marginal

(D) Demonstrate limited knowledge in the subject, and some idea of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Failure

(F) Demonstrate very little knowledge in the subject, and no awareness of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Assessment Task

Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Analytical skills and knowledge about programming

Excellent

(A+, A, A-) Demonstrate very strong knowledge in the subject, and a superior grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Good

(B+, B, B-) Demonstrate good knowledge in the subject, and a good grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Fair

(C+, C, C-) Demonstrate adequate knowledge in the subject, and adequate grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Marginal

(D) Demonstrate limited knowledge in the subject, and some idea of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Failure

(F) Demonstrate very little knowledge in the subject, and no awareness of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Assessment Task

Assignments (4-5 individual problem sets) (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Analytical and programming skills

Excellent

(A+, A, A-) Demonstrate very strong knowledge in the subject, and a superior grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Good

(B+, B) Demonstrate good knowledge in the subject, and a good grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Marginal

(B-, C+, C) Demonstrate limited knowledge in the subject, and some idea of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Failure

(F) Demonstrate very little knowledge in the subject, and no awareness of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Assessment Task

Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Analytical skills and knowledge about programming

Excellent

(A+, A, A-) Demonstrate very strong knowledge in the subject, and a superior grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Good

(B+, B) Demonstrate good knowledge in the subject, and a good grasp of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect

structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Marginal

(B-, C+, C) Demonstrate limited knowledge in the subject, and some idea of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Failure

(F) Demonstrate very little knowledge in the subject, and no awareness of the critical issue and techniques which include the ability to model linear time series models, evaluate model adequacy, build time-varying conditional models, and detect structural changes in the mean and variance processes etc. Also, students will explore high-frequency analysis and explore the microstructure noise issue in financial analysis.

Part III Other Information

Keyword Syllabus

Financial Time Series Analysis and its Application

Volatility Models (ARCH, GARCH, EWMA, and Risk Metrics Models)

Market and Credit Risk

VaR

Reading List

Compulsory Readings

	Title
1	Ruey S. Tsay, Analysis of Financial Time Series, John Wiley & Sons, New Jersey, 2005

Additional Readings

	Title
1	Nil