University of St.Gallen

Course and Examination Fact Sheet: Spring Semester 2022

8,154: Financial Econometrics

ECTS credits: 4

Overview examination/s

(binding regulations see below)
Decentral - examination paper written at home (in groups - all given the same grades) (50%)
Examination time: term time
Decentral - Written examination (with defined exam duration) (50%, 90 mins.)
Examination time: term time

Attached courses

Timetable -- Language -- Lecturer
8,154,1.00 Financial Econometrics -- Englisch -- Söderlind Paul

Course information

Course prerequisites

Some basic knowledge of **statistics** (hypothesis testing, distributions and their moments), **linear algebra** (vectors and matrices) and **financial theory** (CAPM, market volatility, basic portfolio theory) is useful.

Learning objectives

Students are able to draw meaningful inference from financial data, based on a set of skills rich enough to write a successful Master thesis on a broad range of topics.

Course content

The following is covered in detail:

- descriptive statistics of asset returns;
- linear models estimation and testing;
- robust regressions;
- time-series models;
- estimating and forecasting volatility;
- panel regressions.

Lectures are accompanied by PC lab sessions using the R programming language, where students apply the gathered knowledge to real-world financial data, test dependencies between assets, come up with better forecasts, and learn how to not get fooled by financial data.

Course structure and indications of the learning and teaching design

This course will take place in hybrid form with face-to-face teaching and online. Attendance of the face-to-face teaching sessions is not mandatory.

The course covers the following topics:

1. Review of Statistics

sample mean, standard error, confidence interval, covariance, correlation

2. Least Squares

R-squared, t-statistics, outliers, hypothesis testing, autocorrelation and heteroskedasticity of residuals

3. System of OLS Regressions

System of 2 OLS Regressions, System of n OLS regressions

4. CAPM and Linear Factor Models

CAPM, alpha, joint test of significance, multifactor model, mean-variance

5. Simulating the Finite Sample Properties

Monte Carlo Simulations, Bootstrapping

6. Time Series Analysis

white noise, autoregression, moving average, forecasting

7. Maximum Likelihood

loss function, quasi-MLE

8. Models of Autoregressive Volatility

ARCH, GARCH, GARCH variants, value-at-risk, expected shortfall

9. Panel Data

fixed effects model, random effects model

Course literature

Required:

Lecture notes (distributed in class);

Optional #1 (theory of finance):

Elton, E. J., M. J. Gruber, S. J. Brown, and W. N. Goetzmann, Modern Portfolio Theory and Investment Analysis

Optional #2 (econometrics):

M. Verbeek, A Guide to Modern Econometrics; William H. Greene, Econometric Analysis;

Additional course information

Language: English

In the case of the President's Board having to implement new directives due to the SARS-CoV-2 pandemic in SpS2022, the course information listed above will be changed as follows:

- The course is conducted online via the platform Zoom.
- The recordings of the course are available until the exam;
- The lecturer informs via StudyNet and e-mail on the changed implementation modalities of the course;

  The examination information listed below would be changed as follows:

- The examination would be conducted online.

Examination information

Examination sub part/s

1. Examination sub part (1/2)

Examination time and form
Decentral - examination paper written at home (in groups - all given the same grades) (50%)
Examination time: term time

Remark
Problem sets (empirical)

Examination-aid rule
Term papers

Written work must be written without outside help according to the known citation standards, and a declaration of authorship must be attached, which is available as a template on the StudentWeb.

Documentation (quotations, bibliography, etc.) must be carried out universally and consistently according to the requirements of the chosen/specified citation standard such as e.g. APA or MLA.

The legal standard is recommended for legal work (cf. by way of example: FORSTMOSER, P., OGOREK R., SCHINDLER B., Juristisches Arbeiten: Eine Anleitung für Studierende (the latest edition in each case), or according to the recommendations of the Law School).

The reference sources of information (paraphrases, quotations, etc.) that has been taken over literally or in the sense of the original text must be integrated into the text in accordance with the requirements of the citation standard used. Informative and bibliographical notes must be included as footnotes (recommendations and standards e.g. in METZGER, C., Lern- und Arbeitsstrategien (latest edition)).

For all written work at the University of St.Gallen, the indication of page numbers is mandatory, regardless of the standard chosen. Where page numbers are missing in sources, the precise designation must be made differently: chapter or section title, section number, article, etc.

Supplementary aids
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Examination languages
Question language: English
Answer language: English

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2. Examination sub part (2/2)

Examination time and form
Decentral - Written examination (with defined exam duration) (50%, 90 mins.)
Examination time: term time

Remark
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Examination-aid rule
Open Book
Students are free to choose aids but will have to comply with the following restrictions:

- All the pocket calculators that are not of the Texas Instruments TI-30 series are explicitly inadmissible.

- In addition, any type of communication, as well as any electronic devices that can be programmed and are capable of communication such as electronic dictionaries, notebooks, tablets, mobile telephones and others, are inadmissible.
- Students are themselves responsible for the procurement of examination aids.

Supplementary aids

Lecture notes are sufficient.

Examination languages

Question language: English
Answer language: English

Examination content

All topics covered by the Lecture notes except for optional ones (marked with an asterisk) AND during the PC lab sessions.

Examination relevant literature

Lecture notes

Please note

Please note that only this fact sheet and the examination schedule published at the time of bidding are is binding and takes precedence over other information, such as information on StudyNet (Canvas), on lecturers' websites and information in lectures etc.

Any references and links to third-party content within the fact sheet are only of a supplementary, informative nature and lie outside the area of responsibility of the University of St.Gallen.

Documents and materials are only relevant for central examinations if they are available by the end of the lecture period (CW21) at the latest. In the case of centrally organised mid-term examinations, the documents and materials up to CW 12 are relevant for testing.

Binding nature of the fact sheets:

- Course information as well as examination date (organised centrally/decentrally) and form of examination: from bidding start in CW 04 (Thursday, 27 January 2022);
- Examination information (regulations on aids, examination contents, examination literature) for decentralised examinations: in CW 12 (Monday, 21 March 2022);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 12 (Monday, 21 March 2022);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised examinations: two weeks before the end of the registration period in CW 15 (Monday, 11 April 2022).