University of St.Gallen

Course and Examination Fact Sheet: Spring Semester 2021

8,316: Econometric Methods for Financial Instruments

ECTS credits: 4

Overview examination/s
(binding regulations see below)
Decentral - Oral examination (individual) (70%)
Examination time: term time
Decentral - Group examination paper (all given the same grades) (30%)
Examination time: term time

Attached courses
Timetable -- Language -- Lecturer
8,316,1.00 Econometric Methods for Financial Instruments -- Englisch -- Fengler Matthias Reginald

Course information

Course prerequisites
Basic knowledge in Finance. Sound stat, math, econometrics basis is mandatory.

Learning objectives
Students learn how to analyze and to appropriately model financial instruments data.

Course content

The class discusses econometric modeling and statistical inference for financial instruments data.

The course is relevant for students planning to work professionally with financial data. In part one, the class covers diffusion processes and discusses methods for approximation and estimation; the second part is devoted to miscellaneous topics such as modeling the Black-Scholes-Merton implied volatility, the estimation of option price functions and state price densities.

The class naturally complements the class time series econometrics or any other advanced econometrics class.

Course structure

1. Basic concepts of probability theory
2. Basic concepts of stochastic processes
3. Diffusions
4. Maximum likelihood estimation
5. Estimation of diffusions by means of ML
6. Method of Moments
7. Estimation of diffusions by means of GMM and simulated MM
8. Models of implied volatility
9. Estimation of option pricing functions and state price densities

Course literature

Books:

GJ: Gouriéroux, Jasiak (2001): Financial Econometrics, Princeton University Press G: Greene (2011), Econometric Analysis, 7th

edition, Prentice Hall

I: Iacus, St. (2010) Simulation and Inference for Stochastic Differential Equations, Sprginer-Verlag

L: Linton (2019), Financial Econometrics, Cambridge University Press Papers:

Cysne (2004): On the Statistical Estimation of Diffusion Processes: A Partial Survey, Brazilian Review of Econometrics, 24(2)

Hurn, Jeisman, Lindsay (2007): Seeing the Wood for the Trees: A Critical Evaluation of Methods to Estimate the Parameters of Stochastic Differential Equations, JFinEc 5(3)

Figlewsky (2008), Estimating the Implied Risk Neutral Density for the U.S. Market Portfolio, in: Volatility and Time Series Econometrics: Essays in Honor of Robert F. Engle (eds. Tim Bollerslev, Jeffrey R. Russell and Mark Watson). Oxford, UK: Oxford University Press, 2008.

Additional course information

In the case of the President''s Board having to implement new directives due to the SARS-CoV-2 pandemic in SpS2021, 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 for 30 days;
- The lecturer informs via StudyNet or e-mail on the changed implementation modalities of the course;   There are no changes necessary to the course information.
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The examination information listed below would be changed as follows:

- The oral examinations are conducted online and are not recorded.
- Otherwise there are no changes necessary to the examination information.

Examination information

Examination sub part/s

1. Examination sub part (1/2)

Examination time and form
Decentral - Oral examination (individual) (70%)
Examination time: term time

Remark
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Examination-aid rule
Extended Closed Book
The use of aids is limited; any additional aids permitted are exhaustively listed under "Supplementary aids". Basically, the following is applicable:

- At such examinations, all the pocket calculators of the Texas Instruments TI-30 series and mono- or bilingual dictionaries (no subject-specific dictionaries) without hand-written notes are admissible. Any other pocket calculator models and any electronic dictionaries are inadmissible.
- In addition, any type of communication, as well as any electronic devices that can be programmed and are capable of communication such as notebooks, tablets, mobile telephones and others, are inadmissible.
- Students are themselves responsible for the procurement of examination aids.

Supplementary aids
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2. Examination sub part (2/2)

Examination time and form
Decentral - Group examination paper (all given the same grades) (30%)
Examination time: term time

Remark
Assignments (2-3 students collaborate)

Examination-aid rule
Term papers

Term papers must be written without anyone else's help and in accordance with the known quotation standards, and they must contain a declaration of authorship which is a published template in StudentWeb.

The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with the chosen citation standard such as APA or MLA.

For papers in law, the legal standard is recommended (by way of example, cf. FORSTMOSER, P., OGOREK R. et SCHINDLER B., Juristisches Arbeiten: Eine Anleitung für Studierende, newest edition respectively, or according to the recommendations of the Law School).

The indications of the sources of information taken over verbatim or in paraphrase (quotations) must be integrated into texts in accordance with the precepts of the applicable quotation standard, while informative and bibliographical notes must be added as footnotes (recommendations and standards can be found, for example, in METZGER, C., Lern- und Arbeitsstrategien, newest edition respectively.

For any work written at the HSG, the indication of the page numbers is mandatory independent of the chosen citation standard. Where there are no page numbers in sources, precise references must be provided in a different way: titles of chapters or sections, section numbers, acts, scenes, verses, etc.

Supplementary aids
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Examination content

Please note: If an exam question requires information on slides, the lecturer will provide a copy of the respective slides. Students will not be able to use their own copy.

- Basic concepts of stochastic processes I1; GJ 11
- Diffusions I 2; GJ 11, L 12
- Maximum likelihood estimation General exposition: G 14
- Estimation of diffusions by means of ML I 3; GJ 12.1; L 12; CLM 9.3-9.3.2; Hurn, Jeisman, Lindsay; Cysne.
- Method of Moments General exposition: G 13; GJ 8.3;
- Estimation of diffusions by means of GMM and simulated MM I 3; GJ 12.2-4; L 12 Hurn, Jeisman, Lindsay; Cysne
- Models of implied volatility NLS: G 7
- Estimation of option pricing functions and state price densities Figlewski (2008); GJ 13.1.4

Examination relevant literature

Books:

GJ: Gouriéroux, Jasiak (2001): Financial Econometrics, Princeton University Press

G: Greene (2011), Econometric Analysis, 7th edition, Prentice Hall I: Iacus, St. (2010) Simulation and Inference for Stochastic Differential Equations, Sprginer-Verlag

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Cysne (2004): On the Statistical Estimation of Diffusion Processes: A Partial Survey, Brazilian Review of Econometrics, 24(2)

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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, 28 January 2021);
- Examination information (regulations on aids, examination contents, examination literature) for decentralised examinations: in CW 12 (Monday, 22 March 2021);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 12 (Monday, 22 March 2021);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised examinations: two weeks before the end of the registration period in CW 14 (Thursday, 8 April 2021).