



## Course and Examination Fact Sheet: Spring Semester 2020

### 8,316: Econometric Methods for Financial Instruments

ECTS credits: 4

#### Overview examination/s

(binding regulations see below)

Decentral - Oral examination (individual) (70%, 15 mins.)

Decentral - Group examination paper (all given the same grades) (30%)

#### Attached courses

Timetable -- Language -- Lecturer

[8,316,1.00 Econometric Methods for Financial Instruments](#) -- Englisch -- [Fengler Matthias](#)

#### 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.

##### 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, Springer-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

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## Examination information

### Examination sub part/s

#### 1. Examination sub part (1/2)

##### Examination time and form

Decentral - Oral examination (individual) (70%, 15 mins.)

##### 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, PDAs, mobile telephones and others, are inadmissible.
- Students are themselves responsible for the procurement of examination aids.

##### 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 - Group examination paper (all given the same grades) (30%)

##### Remark

Assignments

##### 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.

- The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with the APA or MLA standards. The indications of the sources of information taken over verbatim or in paraphrase (quotations) must be integrated into the text 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. (2017), *Lern- und Arbeitsstrategien* (12th ed., Cornelsen Schweiz).
- For any work written at the HSG, the indication of the page numbers both according to the MLA and the APA standard is never optional.
- 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.
- For papers in law, the legal standard is recommended (by way of example, cf. FORSTMOSER, P., OGOREK R. et SCHINDLER B. (2018), *Juristisches Arbeiten: Eine Anleitung für Studierende* (6. Auflage), Zürich: Schulthess, or the recommendations of the Law School).

## Supplementary aids

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## Examination languages

Question language: English

Answer language: English

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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*, Springer-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.



## Please note

Please note that this fact sheet alone is binding and has priority over any other information such as StudyNet (Canvas), personal databases or faculty members' websites and information provided in their lectures, etc.

Any possible references and links within the fact sheet to information provided by third parties are merely supplementary and informative in nature and are outside the University of St.Gallen's scope of responsibility and guarantee.

Documents and materials that have been submitted no later than the end of term time (CW21) are relevant to central examinations.

Binding nature of the fact sheet:

- Information about courses and examination time (central/decentral) and examination type starting from the beginning of the bidding on 23 January 2020
- Information about examinations (examination aid regulations, examination content, examination-relevant literature) for decentral examinations after the 4th semester week on 16 March 2020
- Information about examinations (examination aid regulations, examination content, examination-relevant literature) for central examinations as from the starting date for examination registration on 6 April 2020

Please consult the fact sheet again after these deadlines have expired.