

# Advanced Risk Management

## MSc Finance, Block IV, February–March 2022

Lecturer:

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### *Intended learning outcomes*

Understand and apply modern techniques for financial risk management and measurement, with an emphasis on time-series models used to evaluate risk measures such as Value at Risk and Expected Shortfall, and on back-testing tools to validate such models. Some attention will also be given to credit risk management and systemic risk.

### *Course material*

- Christoffersen, P.F. (2012), *Elements of Financial Risk Management* (2nd ed.). Academic Press. Supplementary material at <http://booksite.elsevier.com/9780123744487/>.
- Lecture notes, exercises and assignments, to be made available via Canvas.

### *Teaching method*

Each week three hours of lectures, discussing new material, and one hour of exercises. The computer lab hour will be spent on a number of computer exercises, and two assignments.

### *Grading*

The final grade will be determined by the result of the written, closed-book exam (70%) and two assignments (in groups of three; together 30%).

### *Outline in weeks*

**Week 1:** Value at risk and expected shortfall; backtesting and stress testing

- *Read:* Christoffersen, Chapters 1, 2 and 13
- *Computer lab:* Backtesting Value at Risk and Expected Shortfall

**Week 2:** Univariate volatility models

- *Read:* Christoffersen, Chapters 4 and 5
- *Computer lab:* Assignment 1: Estimation and testing of GARCH models

**Week 3:** Non-normal distributions; extreme value theory

- *Read:* Christoffersen, Chapter 6
- *Computer lab:* Applying non-normal VaR

**Week 4:** Multivariate volatility models; dynamic simulation

- *Read:* Christoffersen, Chapter 7 and 8
- *Computer lab:* Estimating dynamic conditional correlation models

**Week 5:** Tail risk and copulas

- *Read:* Christoffersen, Chapter 9
- *Computer lab:* Assignment 2: Correlation and Value at Risk

**Week 6:** Credit risk

- *Read:* Christoffersen, Chapter 12