Number of ECTS credits : 3 Course language : English Course leader : CHARLES AMELIE Speakers : RONCHETTI Diego

ECOURSE DESCRIPTION

This course allows discovering new concepts and approaches in finance from a mathematical and statistical angle, showing how most financial products originate from or rely on a quantitative basis.

The course is the natural continuation of Financial Markets, and Financial management taught in semester 1 and 2.

\equiv course objectives

Quantitative finance offers a conceptual framework and mathematical tools to understand a complex and changing financial world.

The concepts and mathematical tools will be illustrated with examples and applications. A practical presentation of the main statistical and mathematical tools in Excel will also be discussed and practiced.

≡ LEARNING OBJECTIVES

C4B learning goal	LG1 - Analysis
C4B learning objective	LO2 - Analyse complex situations
Outcomes	Lev. 1 - Identify and examine the various components of a complex situation

≡ TACKLED CONCEPTS

Stock market indexes Price adjustments Portfolio returns, their population, and sample moments (mean, variance, skewness, kurtosis, correlation) Semi-variance Vale At Risk

≡ LEARNING METHODS

Exercises

≡ EXPECTED WORK AND EVALUATION

Understanding the mathematical tools

Using the appropriated tools in a specific context

∃ BIBLIOGRAPHY

Williams (2010), Introduction à la Finance Quantitative, Vuibert. Campbell, Lo et MacKinlay (1997), The Econometrics of Financial Markets, Princeton University Press. Anderson et al. (2016), Statistiques pour l'économie et la gestion, De Boeck.

\equiv EVALUATION METHODS

70 % : Examen **30 % :** Continus Assessment

≡ SESSIONS

1

2

3

4

Stock market indexes (1)

LECTURE: 02h00

- Definition of a stock market index
- Types of stock market indices
- Examples of stock market indices
- Construction of a stock market index by the most common weighting schemes

Stock market indexes (2)

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Construction of a stock market index by the most common weighting schemes
- Practical examples in MS Excel

Adjustments of market prices

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Corporate actions and adjustments of market prices
- Adjustments of market prices for stock splits and dividend payments
- Practical examples in MS Excel

Financial returns (1) and mid-term

LECTURE: 02h00

Yield and return

- Simple and logarithmic financial returns
- Mean of returns
- Mid-term (stock market indexes and adjustment of market prices)

5 Financial returns (2)

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Annualization of financial returns
- Risk of returns
- Graphical representation of the financial returns by a histogram
- Practical examples in MS Excel

Financial returns (3)

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Skewness and kurtosis of returns
- Correlation between asset returns
- Interpretation of portfolio

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Portfolio returns and semi-variance

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Portfolio's optimization
- Practical examples in MS Excel
- Further portfolio risk measures
- Population and sample semi-variance of returns
- Practical examples in MS Excel

Value-at-Risk

LECTURE & CASE STUDIES & EXERCISES : 02h00

- Value At Risk (VaR) of a portfolio
- VaR estimation through non-parametric and parametric methods
- Practical examples in MS Excel

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