

Faculty of Economic, Social and Political Sciences



ECGE1218 Financial analysis and Mathematics

[50h] 5 credits

Language: French
Level: First cycle

Main themes

In the first part of the course, students will be introduced to the major aspects of the financial environment; market actors, negotiated financial assets and market organisation, the role of public investment funds and asset management companies. The second part is focused on the modern theory of portfolio management:

- modelling investors' attitude in the face of risk and optimum allocation of wealth between the various financial assets, primarily the CAPM
- practical aspects of the use of the CAPM using the market model (or Sharpe one-factor model) and multi-factorial models (only those based on macroeconomic data),
- the determination of the risk premium required by investors in a balanced market is analysed in the third part. The Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) are also introduced,
- discussion of market efficiency and investor behaviour. New developments in the theory incorporating the dimension of investor behaviour are presented.

The fourth part focuses on the evaluation of basic financial assets in company financing; shares and bonds. The maximization principle (the value of a financial asset is equal to the hope of future cash flows set against the return expected by the investor) is applied to bonds and ordinary shares.

The fifth part is devoted to active portfolio management and the evaluation of portfolio performance. A distinction is made between the performance measure leading to a portfolio classification and the performance attribution which involves management control and which aims to identify the operating decisions which make it possible to carry out an excess return in relation to a benchmark.

The sixth and last part of this course introduces derivative financial instruments and their use in the management of investor-incurred risk. The organisation of these markets, the valuation of these instruments and the development of complex strategy are dealt with in advanced courses given in the third and fourth year.

Content and teaching methods

Below is a list of topics covered in the course:

- The investor environment (BKM ch1)
- Markets and instruments (BKM ch2)
- Investment funds and asset trust companies (BKM ch4)
- Historical interest rates and risk premium (BKM ch5)
- Modelling risk and risk aversion (BKM ch6)
- Risk and no-risk asset allocation (BKM ch7)
- Diversification and portfolio risk (BLM ch8)
- The one-factor model (BKM ch10)
- Multi-factorial model (BKM ch10)
- The Capital Asset Pricing Model (BKM CH 9)
- Arbitration Pricing Theory (BKM CH 11)
- Market efficiency (BKM ch12)
- Fixed-interest bonds (BKM ch14)
- Bonds and interest-rate risks; duration and convexity (BKM ch16)
- Shares and their development (BKM ch18)
- Active portfolio management (BKM CH 26 and 27)
- Portfolio performance measures (BKM CH 24)
- Performance measure (BKM ch24)
- Performance attribution (BKM ch24)
- The options market, introduction (BKM CH 20)
- Options development (BKM CH 21)

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Course materials: Reference work used to help students gain a better understanding of the course contents: (BKM): Bodie, Kane and Marcus, Investments, 5th ed, McGraw-Hill, 2002 (ISBN 0-07-112305-9)