

Derivatives in portfolio management

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I. Course description

This course focuses on topics associated with the uses and applications of derivatives. Emphasis will be on derivatives strategies, hedging derivatives and risk management with computer-based implementation in Vbasic for Excel. At the end of the class, students should be able to

understand and manage the risks of a derivatives portfolio composed of vanilla and or exotic options

assess the dynamic behaviour, performance and risks of hedging and investment strategies through simulation

II. Outline

Lecture 1: Options markets and strategies

- Types of options; positions, payoffs and P/L; underlying assets and specifications, trading
- Option strategies; basic risk management; equity-linked CDs with derivatives

Computer session 1: Empirical performance of derivatives strategies

Readings: Bernard and Boyle (2009), “Mr. Madoff’s Amazing Returns: An Analysis of the Split-Strike Conversion Strategy”, *Journal of Derivatives*, Vol. 17, No. 1, pp. 62–76.

Lecture 2: Dynamic management of vanilla derivatives portfolio

- Dynamic hedging of a derivatives position; delta hedging; Greek letters; dynamic portfolio insurance

Computer session 2: Greeks and the performance of delta hedging

Readings: Figlewski (1989), “Options Arbitrage in Imperfect Markets”, *Journal of Finance*, pp. 1289-1311.

Lecture 3: Hedging exotic options

- Types of exotic options; greek letters and dynamic hedging of exotic options; static hedging of barrier options

Computer session 3: Dynamic vs static hedging of barrier options

Readings: Engelmann, Fengler, Nalholm and Schwendner, (2006), “Static versus dynamic hedges: an empirical comparison for barrier options”, *Review of Derivatives Research*, Vol. 9, No. 3, pp. 239-264

III. Texts

Hull, J. (2006), *Options, futures and other derivatives*, 6th ed., Pearson Prentice Hall

MacDonald R. L. (2003) *Derivatives Markets*, Addison Wesley

Riva, F. (2005) *Applications financières sous Excel en Visual Basic*, 3ème éd., Economica.

IV. Grading

Professional track:

Closed-book exam (60%), Coursework (30%), Class participation (10%)

Research track:

Pricing and hedging structured products Project (written report – 40%, presentation 20%), Coursework (20%), Class participation (10%)