

Risk management and reinsurance

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Course : 12 hours - TP : 6 hours

Objectives

Risk being its raw material, insurance has developed original techniques for modelling, valuing and transferring risks. Today, these techniques - and first and foremost reinsurance, the preferred risk transfer tool - have undergone a remarkable evolution, driven by the evolution of the insurance regulatory framework (Solvency 2) but also by academic thinking on risk valuation.

This course takes note of this evolution. Thus, the effectiveness of reinsurance will not only be studied from the angle of risk transfer but also as a powerful tool in the face of information asymmetry. The course will present the different forms of reinsurance and their relevance, cover modelling aspects and in particular the developments of Extreme Value Theory. It will take up the conclusions of the risk measurement course and apply them in an operational way for the optimization of reinsurance. The course will also cover the more directly operational aspects: Enterprise Risk Management and its application to catastrophe and life reinsurance.

In this sense, this course is positioned as a synthesis and opening course for students, allowing them to apply their knowledge to insurance risks and reinsurance, while introducing them to important aspects such as the problems of behavioural bias in the face of risks.

Outline

Part 1 - Economic and mathematical foundation of risk management and reinsurance

1. Value of Insurance Risk and Risk-Management
2. Introduction to Extreme Value Theory
3. Introduction to Extreme Dependency
4. Reminder on Risk Measures and Specific Reinsurance Measures

Part 2 - Risk Management in Insurance

5. Business Principle Risk Management in Insurance
6. Regulation - Solvency 2
7. Behavioural approach to risk and consequences in Risk Management

Part 3 - Reinsurance

8. the ILS reinsurance market and economic role
9. Nature and function of reinsurance
10. Legal aspects of reinsurance and applications
11. Non-proportional pricing
12. Optimization of reinsurance

Part 4 - Practical Application to Risk Management and Reinsurance

13. Disaster risk
- 14 Life Risk

Bibliography

- ALBERTINI L., BARRIEU P. (2010). *The Handbook of Insurance-Linked Securities*. WILEY FINANCE.
- BLONDEAU A. et PARTRAT C. (eds.) (2004). *La réassurance: approche technique*. Economica. [36 BLO 00 A]
- BEIRLANT J. , GOEGEBEUR Y., SEGERS J. et TEUGELS J. (2005). *Statistics of extremes, theory and applications*. Wiley. [16 BEI 00 B]
- EMBRECHTS P., KLUPPELBERG C. et MIKOSH T. (1997). *Modelling Extremal Events for Insurance and Finance*. Springer [16 EMB 00 A]
- SLOVIC P., *The Perception of Risk*, Earthscan Publications Ltd. (October 1, 2000)
- TIROLE J., *The Theory of Corporate Finance*, Princeton University Press, New-Jersey, 2005