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An overview of applied financial mathematics

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This talk will cover a selection of topics in financial mathematics, with applicability to the areas of banking and insurance. The focus will be on practical applications and how to apply mathematics to meet the real needs of banks and insurers, rather than a detailed discussion of the underlying theory. In particular, the following topics will be discussed:

- Solvency II & Basel III: impact of regulation on client requirements in the banking and insurance sectors.
- Insurance
 - Modelling an insurer: reserving risk, underwriting risk and asset risk.
 - Economic Scenario Generation (ESG): calibrating and projecting economic models.
 - Capital: determination & allocation.
 - Reinsurance optimisation.
 - Portfolio optimisation.
- Banking
 - Valuation: valuing a portfolio of assets using real-world and risk-neutral measures.
 - Determining PFE (Potential Future Exposure).
 - Determining CVA (Credit Value Adjustment).
 - Collateral optimisation.

Many of the topics discussed have equal applicability to both banking and insurance. For instance, the calibration and projection of interest-rate models, such as Hull-White or the Libor Market Model, is very much used in both areas.