Interest Rate Derivatives : Valuation, Calibration and Sensitivity Analysis /

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Monografía

The class of interest rate models introduced by O. Cheyette in 1994 is a subclass of the general HJM framework with a time dependent volatility parameterization. This book addresses the above mentioned class of interest rate models and concentrates on the calibration, valuation and sensitivity analysis in multifactor models. It derives analytical pricing formulas for bonds and caplets and applies several numerical valuation techniques in the class of Cheyette model, i.e. Monte Carlo simulation, characteristic functions and PDE valuation based on sparse grids. Finally it focuses on the sensitivity analysis of Cheyette models and derives Model- and Market Greeks. To the best of our knowledge, this sensitivity analysis of interest rate derivatives in the class of Cheyette models is unique in the literature. Up to now the valuation of interest rate derivatives using PDEs has been restricted to 3 dimensions only, since the computational effort was too great. The author picks up the sparse grid technique, adjusts it slightly and can solve high-dimensional PDEs (four dimensions plus time) accurately in reasonable time. Many topics investigated in this book are new areas of research and make a significant contribution to the scientific community of financial engineers. They also represent a valuable development for practitioners

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Contenido: Preface -- 1.Literature Review -- 2.The Cheyette Model Class -- 3.Analytical Pricing Formulas -- 4. Calibration -- 5.Monte Carlo Methods -- 6.Characteristic Function Method -- 7.PDE Valuation -- 8.Comparison of Valuation Techniques for Interest Rate Derivatives -- 9.Greeks -- 10.Conclusion.-Appendices: A.Additional Calculus in the Class of Cheyette Models -- B.Mathematical Tools -- C.Market Data -- References -- Index

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