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Nota di contenuto	Preface; Contents; 1. A Review of Stochastic Calculus; 1.1 Brownian Motion; 1.2 Stochastic Integration; 1.3 Quadratic Variation; 1.4 Ito's Formula; 1.5 Exercises; 2. A Review of Black-Scholes Pricing and Hedging; 2.1 Call and Put Options; 2.2 Market Model and Portfolio; 2.3 PDE Method; 2.4 The Girsanov Theorem; 2.5 Martingale Method; 2.6 Exercises; 3. Short Term Interest Rate Models; 3.1 Mean-Reverting Models; 3.2 Constant Elasticity of Variance (CEV) Models; 3.3 Time-Dependent Models; 3.4 Exercises; 4. Pricing of Zero-Coupon Bonds; 4.1 Definition and Basic Properties 4.2 Absence of Arbitrage and the Markov Property 4.3 Absence of Arbitrage and the Martingale Property; 4.4 PDE Solution: Probabilistic Method; 4.5 PDE Solution: Analytical Method; 4.6 Numerical Simulations; 4.7 Exercises; 5. Forward Rate Modeling; 5.1 Forward Contracts; 5.2 Instantaneous Forward Rate; 5.3 Short Rates; 5.4 Parametrization of Forward Rates; Nelson-Siegel parametrization; Svensson parametrization; 5.5 Curve Estimation; 5.6 Exercises; 6. The Heath-Jarrow-Morton (HJM) Model; 6.1 Restatement of Objectives; 6.2 Forward Vasicek Rates; 6.3 Spot Forward Rate Dynamics 6.4 The HJM Condition 6.5 Markov Property of Short Rates; 6.6 The

Hull-White Model; 6.7 Exercises; 7. The Forward Measure and Derivative Pricing; 7.1 Forward Measure; 7.2 Dynamics under the Forward Measure; 7.3 Derivative Pricing; 7.4 Inverse Change of Measure; 7.5 Exercises; 8. Curve Fitting and a Two-Factor Model; 8.1 Curve Fitting; 8.2 Deterministic Shifts; 8.3 The Correlation Problem; 8.4 Two-Factor Model; 8.5 Exercises; 9. A Credit Default Model; 9.1 Survival Probabilities; 9.2 Stochastic Default; 9.3 Defaultable Bonds; 9.4 Credit Default Swaps; 9.5 Exercises  
10. Pricing of Caps and Swaptions on the LIBOR  
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11. The Brace-Gatarek-Musiela (BGM) Model; 11.1 The BGM Model; 11.2 Cap Pricing; 11.3 Swaption Pricing; 11.4 Calibration of the BGM Model; 11.5 Exercises; 12. Appendix A: Mathematical Tools; Measurability; Covariance and Correlation; Gaussian Random Variables Conditional Expectation Martingales in Discrete Time; Martingales in Continuous Time; Markov Processes; 13. Appendix B: Some Recent Developments; Infinite dimensional analysis; Extended interest rate models; Exotic and path-dependent options on interest rates; Sensitivity analysis and the Malliavin calculus; Longevity and mortality risk; 14. Solutions to the Exercises; Bibliography; Index; Author Index

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## Sommario/riassunto

Interest rate modeling and the pricing of related derivatives remain subjects of increasing importance in financial mathematics and risk management. This book provides an accessible introduction to these topics by a step-by-step presentation of concepts with a focus on explicit calculations. Each chapter is accompanied with exercises and their complete solutions, making the book suitable for advanced undergraduate and graduate level students. This second edition retains the main features of the first edition while incorporating a complete revision of the text as well as additional exercises wi

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