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processes5. Option pricing under time-changed Levy processes; 6. Estimating Levy processes with and without time changes; 7. Concluding remarks; Acknowledgements; References; Chapter 4. Pricing with Wishart Risk Factors; 1. Introduction; 2. Wishart process; 3. Pricing; 4. Examples; 5. Concluding remarks; References; Chapter 5. Volatility; 1. Introduction; 2. A model of price formation with microstructure effects; 3. The variance of the equilibrium price; 4. Solutions to the inconsistency problem 5. Equilibrium price variance estimation: directions for future work6. The variance of microstructure noise: a consistency result; 7. The benefit of consistency: measuring market quality; 8. Volatility and asset pricing; Acknowledgements; References; Chapter 6. Spectral Methods in Derivatives Pricing; 1. Introduction; 2. Self-adjoint semigroups in Hilbert spaces; 3. One-dimensional diffusions: general results; 4. One-dimensional diffusions: a catalog of analytically tractable models; 5. Symmetric multi-dimensional diffusions; 6. Introducing jumps and stochastic volatility via time changes 7. ConclusionReferences; Chapter 7. Variational Methods in Derivatives Pricing; 1. Introduction; 2. European and barrier options in the Black-Scholes-Merton model; 3. American options in the Black-Scholes-Merton model; 4. General multi-dimensional jump-diffusion models; 5. Examples and applications; 6. Summary; References; Chapter 8. Discrete Barrier and Lookback Options; 1. Introduction; 2. A representation of barrier options via the change of numeraire argument; 3. Convolution, Broadie-Yamamoto method via the fast Gaussian transform, and Feng-Linetsky method via Hilbert transform 4. Continuity corrections

Sommario/riassunto

The remarkable growth of financial markets over the past decades has been accompanied by an equally remarkable explosion in financial engineering, the interdisciplinary field focusing on applications of mathematical and statistical modeling and computational technology to problems in the financial services industry. The goals of financial engineering research are to develop empirically realistic stochastic models describing dynamics of financial risk variables, such as asset prices, foreign exchange rates, and interest rates, and to develop analytical, computational and statistical methods and
