<<随机波动金融市场衍生品>>

图书基本信息

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作者：伏格

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内容概要

This book addresses problems in financial mathematics of pricing and hedging derivative securities in an environment of uncertain and changing market volatility. These problems are important to investors ranging from large trading institutions to pension funds. The authors present mathematical and statistical tools that exploit the "bursty" nature of market volatility. The mathematics is introduced through examples and illustrated with simulations, and the approach described is validated and tested on market data.　The material is suitable for a one-semester course for graduate students who have been exposed to methods of stochastic modeling and arbitrage pricing theory in finance. It is easily accessible to derivatives practitioners in the inancial engineering industry.

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书籍目录

章节摘录

The Black-Scholes model rests upon a number of assumptions that are, to some extent.“ counterfactual. ”Among these are continuity ofthe stock. price process it does not iump）， the ability to hedge continuously without transaction costs, inde-pendent Gaussian returns. and constant volatility.We shall focus here on relaxing the last assumption by allowing volatility to vary randomly, for the following rea-son：a well. known discrepancy between Black-Scholes-predicted European op-tion prices and market-traded options prices, the smile curve ，can be accounted for by stochastic volatility models. That iS.this modification of the Black-Scholes theory has a posteriori success in one area where the classical model fails.In fact.modeling volatility as a stochastic process iS motivated a priori by em-pirical studies of stock.price returns in which estimated volatility iS observed to exhibit “ random ”characteristics.Additionally, the effects of transaction costs show up. under many models, as uncertainty in the volatility；fat-tailed returns distributions can be simulated by stochastic volatility；and market ‘ jump ”phe-nomena are often best modeled as volatility iump processes.Stochastic volatility modeling therefore iS not iust a simple fix to one particular Biacl（Scholes as-sumption but rather a powerful modification that describes a much more complex market.We cite literature that explores possible causes of stochastic volatility in the notes at the end Of this chapter. In Chapter 1, we introduced the notation and tools for pricing and hedging deriv-ative securities ander a constant volatility lognormal model（1.2）.This iS the sim-plest example of pricing in a complete market.However, pricing in a market with stochastic volatility is an incomplete markets problem.a distinction that（as we shall explain）has far-reaching consequences-particularly for the hedging prob-lem and the problem of parameter estimation. It iS the latter inverse problem that iS the biggest mathematical and practical challenge introduced by such models, and also perhaps the one that benefits most from the asymptotic methods of Chapter 5.

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