Financial Derivatives

This book offers a succinct account of the principles of financial deriva-
tives pricing. The first chapter provides readers with an intuitive expo-
sition of basic random calculus. Concepts such as volatility and time,
random walks, geometric Brownian motion, and Itô's lemma are dis-
cussed heuristically. The second chapter develops generic pricing tech-
niques for assets and derivatives, determining the notion of a stochastic
discount factor or pricing kernel, and then uses this concept to price
conventional and exotic derivatives. The third chapter applies the pric-
ing concepts to the special case of interest rate markets, namely, bonds
and swaps, and discusses factor models and term-structure-consistent
models. The fourth chapter deals with a variety of mathematical topics
that underlie derivatives pricing and portfolio allocation decisions, such
as mean-reverting processes and jump processes, and discusses related
tools of stochastic calculus, such as Kolmogorov equations, martingales
techniques, stochastic control, and partial differential equations.

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Financial Derivatives

Pricing, Applications, and Mathematics

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To Maurice and Elena   J.B.

  To my parents   G.C.

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