A balanced introduction to the theoretical foundations and real-world applications of mathematical finance

The ever-growing use of derivative products makes it essential for financial industry practitioners to have a solid understanding of derivative pricing. To cope with the growing complexity, narrowing margins, and shortening life-cycle of the individual derivative product, an efficient, yet modular, implementation of the pricing algorithms is necessary. *Mathematical Finance* is the first book to harmonize the theory, modeling, and implementation of today’s most prevalent pricing models under one convenient cover. Building a bridge from academia to practice, this self-contained text applies theoretical concepts to real-world examples and introduces state-of-the-art, object-oriented programming techniques that equip the reader with the conceptual and illustrative tools needed to understand and develop successful derivative pricing models.

Utilizing almost twenty years of academic and industry experience, the author discusses the mathematical concepts that are the foundation of commonly used derivative pricing models, and insightful Motivation and Interpretation sections for each concept are presented to further illustrate the relationship between theory and practice. In-depth coverage of the common characteristics found amongst successful pricing models are provided in addition to key techniques and tips for the construction of these models. The opportunity to interactively explore the book's principal ideas and methodologies is made possible via a related Web site that features interactive Java experiments and exercises.

While a high standard of mathematical precision is retained, *Mathematical Finance* emphasizes practical motivations, interpretations, and results and is an excellent textbook for students in mathematical finance, computational finance, and derivative pricing courses.
at the upper undergraduate or beginning graduate level. It also serves as a valuable reference for professionals in the banking, insurance, and asset management industries.

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**ABOUT THE AUTHOR**

Christian Fries, PhD, is Lecturer of Mathematical Finance at the University of Frankfurt and head of financial model development at DZ Bank AG Frankfurt, both located in Germany. With extensive knowledge in various programming languages, Dr. Fries has conducted quantitative analysis and overseen the implementation of mathematical modeling platforms at numerous financial institutions. His research interests within the field of mathematical finance include the LIBOR Market Model, Efficient Calculation of Risk Measures with Monte-Carlo Methods, Pricing of Bermudan Options with Monte-Carlo Methods, and Markov Functional Models.

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