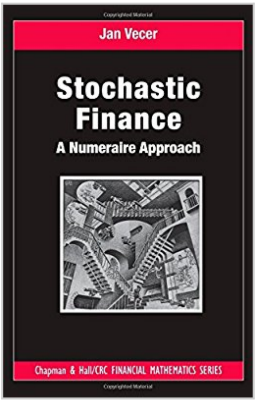

Stochastic Finance: A Numeraire Approach (Chapman and Hall/CRC Financial Mathematics Series)

By Jan Vecer

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Unlike much of the existing literature, **Stochastic Finance: A Numeraire Approach** treats price as a number of units of one asset needed for an acquisition of a unit of another asset instead of expressing prices in dollar terms exclusively. This numeraire approach leads to simpler pricing options for complex products, such as barrier, lookback, quanto, and Asian options. Most of the ideas presented rely on intuition and basic principles, rather than technical computations.

The first chapter of the book introduces basic concepts of finance, including price, no arbitrage, portfolio, financial contracts, the First Fundamental Theorem of Asset Pricing, and the change of numeraire formula. Subsequent chapters apply these general principles to three kinds of models: binomial, diffusion, and jump models. The author uses the binomial model to illustrate the relativity of the reference asset. In continuous time, he covers both diffusion and jump models in the evolution of price processes. The book also describes term structure models and numerous options, including European, barrier, lookback, quanto, American, and Asian.

Classroom-tested at Columbia University to graduate students, Wall Street professionals, and aspiring quants, this text provides a deep understanding of derivative contracts. It will help a variety of readers from the dynamic world of finance, from practitioners who want to expand their knowledge of stochastic finance, to students who want to succeed as professionals in the field, to academics who want to explore relatively advanced techniques of the numeraire change.

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Editorial Review

Review

… a nice book for researchers and practitioners. … this book can be regarded as a wonderful application of stochastic analysis, as it includes not only detailed theoretical proofs but also practical illustrative examples. With the systematic and feasible numeraire techniques, the book can serve as an everyday reference book for practitioners, but also as a powerful tool to deal with pricing and hedging for complicated financial assets. Most importantly, the representation of prices as a pairwise relationship of two assets is the most novel characteristic of this book, which could lead to deeper understanding of derivative contracts.
?Jian Ping Wan, *Mathematical Reviews*, 2012f

Although the importance of the choice of numeraire has been recognized for quite some time, this is the first book to stress the fundamental role that numeraires play in modern asset pricing theory. The author is the leading expert on the subject so it is a pleasure to highly recommend this book.
?Peter Carr, Ph.D., Managing Director of Morgan Stanley and Executive Director of NYU's Master of Science Program in Mathematics in Finance

Finally, we have a full volume with a systematic treatment of the change of numeraire techniques. Jan Vecer has taken years of teaching experience and practitioners' feedback to unify a previously complicated topic into the most elegant and easily accessible numeraire textbook to come down the pike. Now it has become fun to learn about parity and duality relationships among exotic options in a whole variety of models. The practitioners will be happy about the dimension reduction methods. There should be more such books.
?Uwe Wystup, Ph.D., Managing Director of MathFinance AG

About the Author

Jan Vecer is a professor of finance and has taught courses on stochastic finance at Columbia University, the University of Michigan, Kyoto University, and the Frankfurt School of Finance and Management. His research interests encompass areas within financial statistics, financial engineering, and applied probability, including option pricing, optimal trading strategies, stochastic optimal control, and stochastic processes. He earned a Ph.D. in mathematical finance from Carnegie Mellon University.

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