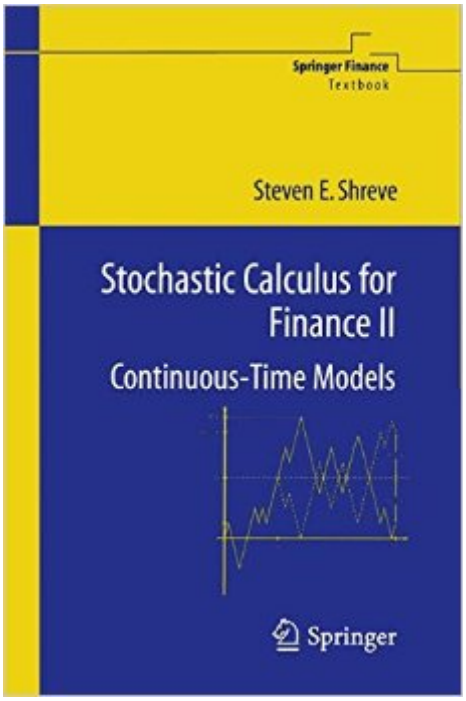
Stochastic Calculus For Finance II: Continuous-Time Models (Springer Finance)



Synopsis

"A wonderful display of the use of mathematical probability to derive a large set of results from a small set of assumptions. In summary, this is a well-written text that treats the key classical models of finance through an applied probability approach....It should serve as an excellent introduction for anyone studying the mathematics of the classical theory of finance." --SIAM

Book Information

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Customer Reviews

Think of this as a thank-you letter to Shreve for helping to teach me applied quantitative finance. This is a truly wonderful book and a great place to start learning the subject, regardless of your previous exposure to the subject or mathematical maturity, and has plentiful opportunities in the exercises to practice important results.The first three and part of the fourth chapter serve as the mathematical preparation for the book. Shreve reviews basic concepts from probability, introducing just enough measure-theoretic concepts to understand the motivation behind the concepts of a filtration and its relation to conditional expectation, martingales, and later in a brief chapter on American options, stopping times. Since the book’s main emphasis is on the application of the Ito-Doeblin calculus in solving SDE generated by Brownian motion, Chapter 2 covers the necessary elements of conditional expectation for risk-neutral pricing. Chapter 3 covers Brownian motion, although not rigorously - he gives just enough properties of the canonical continuous stochastic process to know how to identify it and to understand its crucial properties. This chapter is important for the first part of Chapter 4, which uses the properties of Brownian motion to develop the notion of

quadratic variation and its role in the calculation of the Ito Integral. After developing the Ito integral and demonstrating its key properties, such as the martingale property and the Ito isometry, Shreve has enough math to start developing the Black-Scholes-Merton framework for actual finance.

Although I work in a major global bank at a senior level I don't use stochastic calculus in my job. My maths and physics background goes back to the 1970s when stochastic calculus was not part of undergraduate studies. Indeed, one usually did stochastic theory at postgraduate level. I have memories of reading Halmos for measure theory, Feller for probability theory, Wiener and others. None of this was easy.Suffice it to say that there were a lot of abstract building blocks one had to erect first before one could actually do anything useful.Stochastic calculus is not easy. It is less intuitive than ordinary calculus. The vast majority of textbooks launch into a wall of definitions that seem divorced from the motivation for them. I am always suspicious of authors who do that. It's fine if you are writing for a very specialised audience but I am with Richard Feynman who reckoned that if you can't provide a simple explanation you don't really understand what is going on. In that context read his PhD thesis - it is most readable and understandable.What Shreve has done - and this is a significant achievement in my view - is to present something that is rigorous enough (and we all know that in this and other areas of mathematics one can go on and on with minute points of detail all in the name of rigour) yet grounds the concepts in something that is understandable.The simple pedagogical fact of life with this type of material is that there is a large overhead in getting to a particular point and Shreve had done a very good job in getting readers to a good standard without destroying their will to go on!

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