Continuous Stochastic Calculus with Applications to Finance (Applied Mathematics)

Michael Meyer
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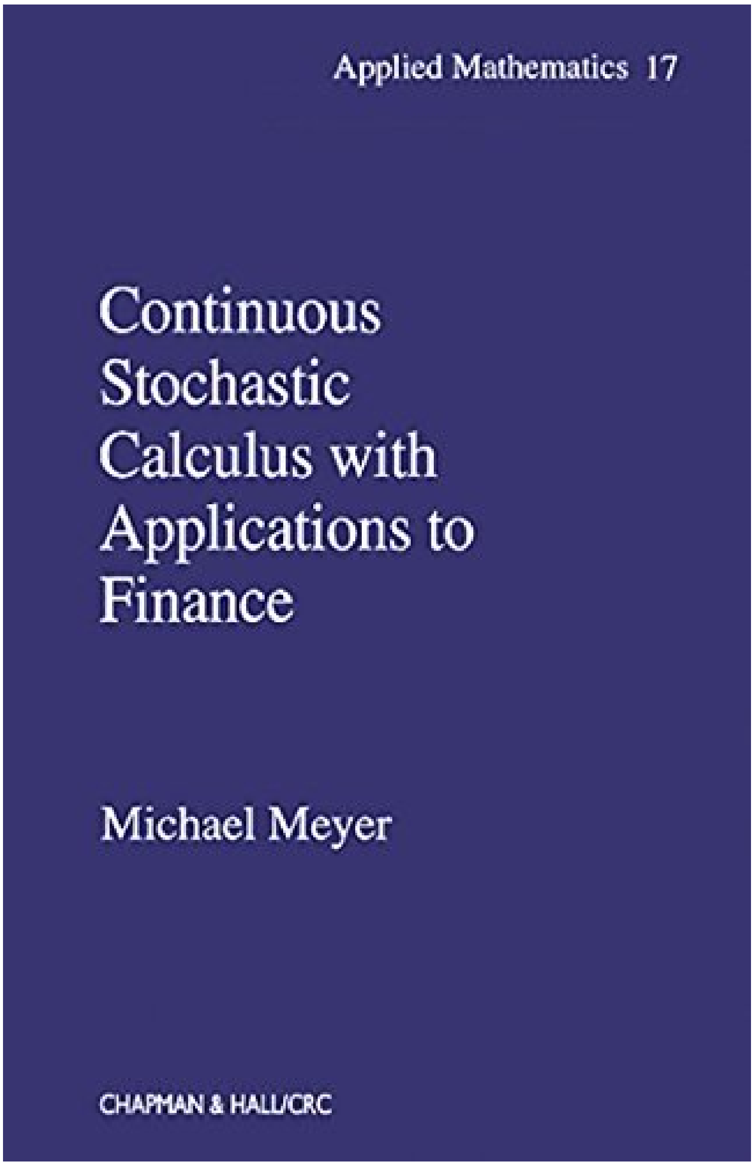

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Michael Meyer : Continuous Stochastic Calculus with Applications to Finance (Applied Mathematics) before purchasing it in order to gage whether or not it would be worth my time, and all praised Continuous Stochastic Calculus with Applications to Finance (Applied Mathematics):

4 of 4 people found the following review helpful. Good Treatment of Continuous Time MartingalesBy Jennifer M. MainwaringChapter 1: This is a summary of what every probabilist should know about Continuous Time Martingales.

Essentially it does, although in a rather terse fashion, and with no examples, for Continuous Time Martingales, what David Williams book, "Probability and Martingales", does for the discreet time case. By restricting himself to the continuous case, as opposed to the more general cadlag processes, the author is able to provide a simple proof of the Doob Meyer Decomposition. The coverage in this chapter is more extensive than that of Chapter 1 in Karatzas and Shreeve and perhaps closer to ChapterII in Rogers and Williams.Chapter 2: Essentially a brief introduction to Brownian Motion. I would advize the reader to skip this Chapter and replace it with chapter 2 of Karatzas and Shreves "Stochastic Calculus and Brownian Motion". The coverage there is more rigorous.Chapter 3:This chapter covers Stochatic Integration with respect to a Continous Time Local Martingales. The coverage here mirrors that of chapter three in Karatazs and Shreve though the notation is perhaps closer in spirit to Chapter 4 of Rogers and Williams, Diffusions, Markhov Processes and Martingales. The construction of the Stochastic Integral is then followed by the usual suspects: Ito's Lemma which says that the SemiMartingale property is preserved under smooth transformations. The Martingale Representation Theorem this says that in the case where the integral is with respect to Brownian Motion, then the integral viewed as a mapping from the space of measurable adapted processes that are square integrable with respect to the product measure onto the space of continuous square integrable martingales is surjective. And last but not least Girsanovs theorem which allows one, modulu the satisfaction of the Novikov Condition, to alter the "drift term" in semi martingales through changing to an equivalent measure.Chapter 4: I would advice the reader to replace this with chapters 4 and 5 in Nielsen's "Pricing and Hedging of Derivative Securities" for the general theory and chapter 6 for the Black and Scholes Economy. The coverage there is the best I have seen.5 of 7 people found the following review helpful. Material every quantitative financial analyst should know.By Abdullah AlothmanTime spent to read the book in detail: Four weeksThe book, 295 pages, is ordered as follows:Chapter 1 (First 50 pages):These cover discreet time martingale theory.Expectation/Conditional expectation: The coverage here is unusual and I found it irritating. The author defines conditional expectation of variables in e(P) - the space of extended random variables for which the expectation is defined - i.e. either E(X+) or E(X-) is defined - rather than the more traditional space L^1(R) - the space of integrable random variables. The source of irritation is that the former is not a vector space. Thus given a variable X in e(P) and another variable Y, in general X+Y will not be defined, for example if EX+ = infinity, EY= - infinity. As a result, one is constantly having to worry about whether one can add variables or not, a real pain. Perhaps an example might help:Suppose I have two variables X1 AND X2. If I am in the space L^1 then I know both are finite almost everywhere (a.e) and so I can create a third variable Y through addition by setting say Y = X1+X2. In the treatment here however, I have to be careful since it is not a priori clear that X1+X2 is defined a.e. What I need is - one of the proofs in the book - that E(X1)+E(X2) be defined (i.e. it is not the case that one is + infinity the other - infinity). If both E(X1)and E(X2) are finite this reduces to the L^1 case. However, because the Author chooses to work in e(P), we still have, in order to show even this basic result, quite a bit of boring work to do. Specifically: if E(X1) = +infinity then we must have, recall the definition of e(P), that E(X1^+)= +infinity AND E(X1-) -infinity and also, because E(X1)+E(X2) is defined E(X2) -infinity and so , since X2 is in e(P), that E(X2^-) -infinity. Now since,(X1+X2)^-

The prolonged boom in the US and European stock markets has led to increased interest in the mathematics of security markets, most notably in the theory of stochastic integration. This text gives a rigorous development of the theory of stochastic integration as it applies to the valuation of derivative securities. It includes all the tools necessary for readers to understand how the stochastic integral is constructed with respect to a general continuous martingale.The author develops the stochastic calculus from first principles, but at a relaxed pace that includes proofs that are detailed, but streamlined to applications to finance. The treatment requires minimal prerequisites-a basic knowledge of measure theoretic probability and Hilbert space theory-and devotes an entire chapter to application in finances, including the Black Scholes market, pricing contingent claims, the general market model, pricing of random payoffs, and interest rate derivatives.Continuous Stochastic Calculus with Application to Finance is your first opportunity to explore stochastic integration at a reasonable and practical mathematical level. It offers a treatment well balanced between aesthetic appeal, degree of generality, depth, and ease of reading.

"As a reference or a second book on stochastic calculus, Meyer is outstanding. In a formal, highly rigorous manner, he develops stochastic calculus, all the while focusing on topics of primary interest to financial engineers. I highly recommend Meyer. It is an excellent introduction and reference on stochastic calculus." - Glyn A. Holton of Contingency Analysis