

1. Record Nr.	UNINA9911019823603321
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Titolo	Discrete-time Asset Pricing Models in Applied Stochastic Finance / / P. C. G. Vassiliou
Pubbl/distr/stampa	Hoboken : , : John Wiley, , 2013 2010
ISBN	9781118557860 1118557867 9781118618660 1118618661 9781299315365 1299315364 9781118618776 1118618777
Edizione	[First edition.]
Descrizione fisica	1 online resource (418 pages)
Collana	ISTE
Classificazione	MAT 600f MAT 606f WIR 160f
Disciplina	332.0151 332.63/22201 332.6322201
Soggetti	Securities - Mathematical models - Prices Capital assets pricing model - Mathematical models Stochastic analysis Finance
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di contenuto	CHAPTER 1. Probability and Random Variables -- CHAPTER 2. An Introduction to Financial Instruments and Derivatives -- CHAPTER 3. Conditional Expectation and Markov Chains -- CHAPTER 4. The No-Arbitrage Binomial Pricing Model -- CHAPTER 5. Martingales -- CHAPTER 6. Equivalent Martingale Measures, No-Arbitrage and Complete Markets -- CHAPTER 7. American Derivative Securities --

Sommario/riassunto

Stochastic finance and financial engineering have been rapidly expanding fields of science over the past four decades, mainly due to the success of sophisticated quantitative methodologies in helping professionals manage financial risks. In recent years, we have witnessed a tremendous acceleration in research efforts aimed at better comprehending, modeling and hedging this kind of risk. These two volumes aim to provide a foundation course on applied stochastic finance. They are designed for three groups of readers: firstly, students of various backgrounds seeking a core knowledge on the subject of stochastic finance; secondly financial analysts and practitioners in the investment, banking and insurance industries; and finally other professionals who are interested in learning advanced mathematical and stochastic methods, which are basic knowledge in many areas, through finance. Volume 1 starts with the introduction of the basic financial instruments and the fundamental principles of financial modeling and arbitrage valuation of derivatives. Next, we use the discrete-time binomial model to introduce all relevant concepts. The mathematical simplicity of the binomial model also provides us with the opportunity to introduce and discuss in depth concepts such as conditional expectations and martingales in discrete time. However, we do not expand beyond the needs of the stochastic finance framework. Numerous examples, each highlighted and isolated from the text for easy reference and identification, are included. The book concludes with the use of the binomial model to introduce interest rate models and the use of the Markov chain model to introduce credit risk. This volume is designed in such a way that, among other uses, makes it useful as an undergraduate course.