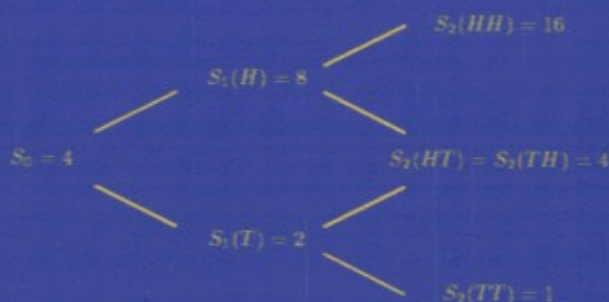


Steven E. Shreve

Stochastic Calculus for Finance I

The Binomial Asset Pricing Model



Springer

Contents

1	The Binomial No-Arbitrage Pricing Model	1
1.1	One-Period Binomial Model	1
1.2	Multiperiod Binomial Model	8
1.3	Computational Considerations	15
1.4	Summary	18
1.5	Notes	20
1.6	Exercises	20
2	Probability Theory on Coin Toss Space	25
2.1	Finite Probability Spaces	25
2.2	Random Variables, Distributions, and Expectations	27
2.3	Conditional Expectations	31
2.4	Martingales	36
2.5	Markov Processes	44
2.6	Summary	52
2.7	Notes	54
2.8	Exercises	54
3	State Prices	61
3.1	Change of Measure	61
3.2	Radon-Nikodým Derivative Process	65
3.3	Capital Asset Pricing Model	70
3.4	Summary	80
3.5	Notes	83
3.6	Exercises	83
4	American Derivative Securities	89
4.1	Introduction	89
4.2	Non-Path-Dependent American Derivatives	90
4.3	Stopping Times	96
4.4	General American Derivatives	101

4.5	American Call Options	111
4.6	Summary	113
4.7	Notes	115
4.8	Exercises	115
5	Random Walk	119
5.1	Introduction	119
5.2	First Passage Times	120
5.3	Reflection Principle	127
5.4	Perpetual American Put: An Example	129
5.5	Summary	136
5.6	Notes	138
5.7	Exercises	138
6	Interest-Rate-Dependent Assets	143
6.1	Introduction	143
6.2	Binomial Model for Interest Rates	144
6.3	Fixed-Income Derivatives	154
6.4	Forward Measures	160
6.5	Futures	168
6.6	Summary	173
6.7	Notes	174
6.8	Exercises	174
Proof of Fundamental Properties of		
	Conditional Expectations	177
References		181
Index		185