

Holger Kraft

Optimal Portfolios with Stochastic Interest Rates and Defaultable Assets



Springer

Contents

1	Preliminaries from Stochastics	1
1.1	Stochastic Differential Equations.	2
1.2	Stochastic Optimal Control.	6
2	Optimal Portfolios with Stochastic Interest Rates	21
2.1	Introduction	21
2.2	Ho-Lee and Vasicek Model	22
2.2.1	Bond Portfolio Problem	24
2.2.2	Mixed Stock and Bond Portfolio Problem	34
2.3	Dothan and Black-Karasinski Model.	39
2.4	Cox-Ingersoll-Ross Model.	44
2.5	Widening the Investment Universe.	65
2.6	Conclusion.	68
3	Elasticity Approach to Portfolio Optimization	71
3.1	Introduction.	71
3.2	Elasticity in Portfolio Optimization.	72
3.3	Duration in Portfolio Optimization.	82
3.4	Conclusion.	92
3.5	Appendix.	93

4	Barrier Derivatives with Curved Boundaries	99
4.1	Introduction	99
4.2	Bjork's Result	100
4.3	Deterministic Exponential Boundaries	102
4.4	Discounted Barrier and Gaussian Interest Rates	104
4.5	Application: Pricing of Defaultable Bonds	110
4.6	Conclusion	112
5	Optimal Portfolios with Defaultable Assets - A Firm Value Approach	115
5.1	Introduction	115
5.2	The Unconstrained Case	117
5.2.1	Merton Model	117
5.2.2	On the Assumption that Firm Value is Tradable	122
5.2.3	Black-Cox Model	125
5.3	From the Unconstrained to the Constrained Case	138
5.4	The Constrained Case	143
5.4.1	Merton Model	144
5.4.2	Black-Cox Model	148
5.4.3	Generalized Briys-de Varenne Model	150
5.5	Conclusion	162
	References	165
	Abbreviations	171
	Notations	173