

Contents

Preface	v
Contents	vii
List of Figures	xi
1 Introduction	1
1.1 Overview	4
1.2 Basic Definitions and Notation	5
1.2.1 Simple Returns	5
1.2.2 Risk-Free Asset	5
1.2.3 Other Conventions	5
2 Single-Period Problems	7
2.1 Basic Formulation	7
2.2 Solution	9
2.3 Risk-Free Asset, Tangency Portfolio, Separation	11
2.4 Utility Maximization	11
2.5 Risk Measures	14
2.5.1 Semivariance	14
2.5.2 Roy's Safety First	14
2.5.3 Value-at-Risk	15
2.5.4 Conditional Value-at-Risk	16
2.5.5 Other Measures	16
2.6 Additional Constraints	17
2.6.1 No Short-Sales Constraint	17
2.6.2 Turnover and Transaction Costs Constraints	18
2.6.3 Maximum Holdings Constraint	20
2.6.4 Maximum Tracking Error and Factor Exposure Constraint ..	20

2.6.5	Transaction Size, Cardinality and Round Lot Constraints . . .	21
2.7	Forecasting Models	23
2.7.1	Factor Models	23
2.7.2	Factor Models in Covariance Matrix Estimation	25
2.7.3	Factor Models in Expected Return Estimation	26
2.7.4	Other Expected Return Forecasting Models	27
2.8	Forecast Stability and Econometric Issues	29
2.8.1	Shrinkage Estimators	30
2.8.2	Bayesian Approaches	31
2.8.3	The Black-Litterman Model	32
2.8.4	Portfolio Resampling	34
2.8.5	Robust Portfolio Allocation	34
2.8.6	Portfolio Robustness: a Synthesis?	35
3	Multiperiod Problems	37
3.1	The Discrete-Time Case	38
3.1.1	Power Utility	40
3.1.2	Numerical Example	41
3.1.3	The Mean-Variance Multiperiod Criterion	42
3.2	The Continuous-Time Case	45
3.3	Structure of Optimal Solutions	48
3.3.1	Logarithmic Utility	49
3.3.2	When is the Myopic Policy Optimal?	49
3.4	The Martingale Formulation	49
3.4.1	The Growth-Optimum Portfolio	50
3.4.2	The Cox-Huang Method	51
3.4.3	Implementation	54
3.5	Investor Learning	55
3.6	Common Extensions	56
3.6.1	Intermediate Consumption and Labor Income	56
3.6.2	Non-Standard Preferences	56
3.6.3	Transaction Costs	58
3.6.4	Taxes and Other Frictions	59
4	Direct and Alternative Methods for Portfolio Choice	61
4.1	Machine Learning Approaches	62
4.2	Parametric Portfolio Policies	63
4.3	Nonparametric Portfolio Weights	64
4.4	“Non-Allocation” Approaches	65
4.5	Information-Theoretic Approaches	65
4.6	Stochastic Programming Approaches	66
A	Mathematical Complements	71
A.1	Minimization of a Quadratic Form Under Linear Equality Constraints	71

A.2	Deriving the Tangency Portfolio	72
A.2.1	Efficient Frontier	73
A.2.2	Maximization of the Sharpe Ratio	73
A.3	Itô's Lemma	74
A.3.1	Wiener Processes	74
A.3.2	One-Dimensional Case	75
A.3.3	Multi-Dimensional Case	75
Glossary	77
References	79
Author Index	89
Subject Index	93

Portfolio Choice Problems

An Introductory Survey of Single and Multiperiod Models

Chapados, N.

2011, X, 96 p. 8 illus., Softcover

ISBN: 978-1-4614-0576-4