

Contents

1 Portfolio Optimization	1
1.1 Introduction	1
1.2 Market and Diversification	1
1.3 The Optimization Framework	3
1.4 Portfolio Performance	5
1.5 Basic Concepts and Notation	7
1.6 Markowitz Model	9
1.7 Risk and Safety Measures	12
1.8 Handling Bi-Criteria Optimization Problems	14
1.9 Notes and References	17
2 Linear Models for Portfolio Optimization	19
2.1 Introduction	19
2.2 Scenarios and LP Computability	19
2.3 Basic LP Computable Risk Measures	21
2.4 Basic LP Computable Safety Measures	27
2.5 The Complete Set of Basic Linear Models	32
2.5.1 Risk Measures from Safety Measures	33
2.5.2 Safety Measures from Risk Measures	35
2.5.3 Ratio Measures from Risk Measures	36
2.6 Advanced LP Computable Measures	38
2.7 Notes and References	44
3 Portfolio Optimization with Transaction Costs	47
3.1 Introduction	47
3.2 The Structure of Transaction Costs	48
3.3 Accounting for Transaction Costs in Portfolio Optimization	53
3.4 Optimization with Transaction Costs	59
3.5 A Complete Model with Transaction Costs	60
3.6 Notes and References	61

4 Portfolio Optimization with Other Real Features	63
4.1 Introduction	63
4.2 Transaction Lots.....	64
4.3 Thresholds on Investment.....	67
4.4 Cardinality Constraints	70
4.5 Logical or Decision Dependency Constraints	71
4.6 Notes and References	71
5 Rebalancing and Index Tracking	73
5.1 Introduction	73
5.2 Portfolio Rebalancing.....	74
5.3 Index Tracking	78
5.3.1 Market Index	79
5.3.2 An Index Tracking Model.....	80
5.4 Enhanced Index Tracking.....	83
5.5 Long/Short Portfolios	85
5.6 Notes and References	86
6 Theoretical Framework	87
6.1 Introduction	87
6.2 Risk Averse Preferences and Stochastic Dominance	88
6.3 Stochastic Dominance Consistency	91
6.4 Coherent Measures.....	93
6.5 Notes and References	95
7 Computational Issues	97
7.1 Introduction	97
7.2 Solving Linear and Mixed Integer Linear Programming Problems....	99
7.3 A General Heuristic: The Kernel Search.....	101
7.4 Issues on Data	103
7.5 Large Scale LP Models	108
7.6 Testing and Comparison of Models	111
7.7 Notes and References	113
References	115



<http://www.springer.com/978-3-319-18481-4>

Linear and Mixed Integer Programming for Portfolio
Optimization

Mansini, R.; Ogryczak, W.; Speranza, M.G.

2015, XII, 119 p. 25 illus., 12 illus. in color., Hardcover

ISBN: 978-3-319-18481-4