

Marida Bertocchi • Giorgio Consigli
Michael A.H. Dempster
Editors

Stochastic Optimization Methods in Finance and Energy

New Financial Products and Energy
Market Strategies

4y Springer

Contents

Part I Financial Applications

- 1 Using the Kelly Criterion for Investing 3**
William T. Ziemba and Leonard C. MacLean
- 2 Designing Minimum Guaranteed Return Funds 21**
Michael A.H. Dempster, Matteo Germano, Elena A. Medova,
Muriel I. Rietbergen, Francesco Sandrini, and Mike Scrowston
- 3 Performance Enhancements for Defined Benefit Pension Plans. 43**
John M. Mulvey, Thomas Bauerfeind, Koray D. Simsek,
and Mehmet T. Vural
- 4 Hedging Market and Credit Risk in Corporate Bond Portfolios. 73**
Patrizia Beraldi, Giorgio Consigli, Francesco De Simone,
Gaetano Iaquinta, and Antonio Violi
- 5 Dynamic Portfolio Management for Property and Casualty
Insurance. 99**
Giorgio Consigli, Massimo di Tria, Michele Gaffo, Gaetano Iaquinta,
Vittorio Moriggia, and Angelo Uristani
- 6 Pricing Reinsurance Contracts 125**
Andrea Consiglio and Domenico De Giovanni

Part II Energy Applications

- 7 **A Decision Support Model for Weekly Operation of Hydrothermal Systems by Stochastic Nonlinear Optimization** 143
Andres Ramos, Santiago Cerisola, Jesus M. Latorre, Rafael Bellido, Alejandro Perea, and Elena Lopez
- 8 **Hedging Electricity Portfolio for a Hydro-energy Producer via Stochastic Programming** 163
Rosella Giacometti, Maria Teresa Vespucci, Marida Bertocchi, and Giovanni Barone Adesi
- 9 **Short-Term Trading for Electricity Producers** 181
Chefi Triki, Antonio J. Conejo, and Lina P. Garces
- 10 **Structuring Bilateral Energy Contract Portfolios in Competitive Markets** 203
Antonio Alonso-Ayuso, Nico di Domenica, Laureano F. Escudero, and Celeste Pizarro
- 11 **Tactical Portfolio Planning in the Natural Gas Supply Chain** 227
Marte Fodstad, Kjetil T. Midthun, Frode RØmo, and Asgeir Tomasgard
- 12 **Risk Management with Stochastic Dominance Models in Energy Systems with Dispersed Generation** 253
Dimitri Drapkin, Ralf Gollmer, Uwe Gotzes, Frederike Neise, and Rüdiger Schultz
- 13 **Stochastic Equilibrium Models for Generation Capacity Expansion** 273
Andreas Ehrenmann and Yves Smeers

Part III Theory and Computation

- 14 **Scenario Tree Generation for Multi-stage Stochastic Programs** 313
Holger Heitsch and Werner Romisch
- 15 **Approximations for Probability Distributions and Stochastic Optimization Problems** 343
Georg Ch. Pflug and Alois Pichler

16 Comparison of Sampling Methods for Dynamic Stochastic Programming 389
Michael A.H. Dempster, Elena A. Medova, and Yee Sook Yong

17 Convexity of Chance Constraints with Dependent Random Variables: The Use of Copulae 427
Rene Henrion and Cyrille Strugarek

18 Portfolio Choice Models Based on Second-Order Stochastic Dominance Measures: An Overview and a Computational Study ... 441
Csaba I. Fabian, Gautam Mitra, Diana Roman, Victor Zverovich, Tibor Vajnai, Edit Csizmas, and Olga Papp

Index 471