
Description: The modern financial industry has been required to deal with large and diverse portfolios in a variety of asset classes often with limited market data available. Financial Signal Processing and Machine Learning unifies a number of recent advances made in signal processing and machine learning for the design and management of investment portfolios and financial engineering. This book bridges the gap between these disciplines, offering the latest information on key topics including characterizing statistical dependence and correlation in high dimensions, constructing effective and robust risk measures, and their use in portfolio optimization and rebalancing. The book focuses on signal processing approaches to model return, momentum, and mean reversion, addressing theoretical and implementation aspects. It highlights the connections between portfolio theory, sparse learning and compressed sensing, sparse eigen-portfolios, robust optimization, non-Gaussian data-driven risk measures, graphical models, causal analysis through temporal-causal modeling, and large-scale copula-based approaches.

Key features:
- Highlights signal processing and machine learning as key approaches to quantitative finance.
- Offers advanced mathematical tools for high-dimensional portfolio construction, monitoring, and post-trade analysis problems.
- Presents portfolio theory, sparse learning and compressed sensing, sparsity methods for investment portfolios, including eigen-portfolios, model return, momentum, mean reversion and non-Gaussian data-driven risk measures with real-world applications of these techniques.
- Includes contributions from leading researchers and practitioners in both the signal and information processing communities, and the quantitative finance community.

Contents:

List of Contributors xiii

Preface xv

1 Overview 1
Ali N. Akansu, Sanjeev R. Kulkarni, and Dmitry Malioutov
1.1 Introduction 1
1.2 A Bird’s-Eye View of Finance 2
1.2.1 Trading and Exchanges 4
1.2.2 Technical Themes in the Book 5
1.3 Overview of the Chapters 6
1.3.1 Chapter 2: "Sparse Markowitz Portfolios" by Christine De Mol 6
1.3.2 Chapter 3: "Mean-Reverting Portfolios: Tradeoffs between Sparsity and Volatility" by Marco Cuturi and Alexandre d'Aspremont 7
1.3.3 Chapter 4: "Temporal Causal Modeling" by Prabhanjan Kambadur, Aurelie C. Lozano, and Ronny Luss 7
1.3.4 Chapter 5: "Explicit Kernel and Sparsity of Eigen Subspace for the AR(1) Process" by Mustafa U. Torun, Onur Yilmaz and Ali N. Akansu 7
1.3.5 Chapter 6: "Approaches to High-Dimensional Covariance and Precision Matrix Estimation" by Jianqing Fan, Yuan Liao, and Han Liu 7
1.3.6 Chapter 7: "Stochastic Volatility: Modeling and Asymptotic Approaches to Option Pricing and Portfolio Selection" by Matthew Lorig and Ronnie Sircar 7

1.3.7 Chapter 8: "Statistical Measures of Dependence for Financial Data" by David S. Matteson, Nicholas A. James, and William B. Nicholson 8

1.3.8 Chapter 9: "Correlated Poisson Processes and Their Applications in Financial Modeling" by Alexander Kreinin 8

1.3.9 Chapter 10: "CVaR Minimizations in Support Vector Machines" by Junya Gotoh and Akiko Takeda 8

1.3.10 Chapter 11: "Regression Models in Risk Management" by Stan Uryasev 8

1.4 Other Topics in Financial Signal Processing and Machine Learning 9

References 9

2 Sparse Markowitz Portfolios 11
Christine De Mol

2.1 Markowitz Portfolios 11

2.2 Portfolio Optimization as an Inverse Problem: The Need for Regularization 13

2.3 Sparse Portfolios 15

2.4 Empirical Validation 17

2.5 Variations on the Theme 18

2.5.1 Portfolio Rebalancing 18

2.5.2 Portfolio Replication or Index Tracking 19

2.5.3 Other Penalties and Portfolio Norms 19

2.6 Optimal Forecast Combination 20

Acknowledgments 21

References 21

3 Mean–Reverting Portfolios 23
Marco Cuturi and Alexandre d'Aspremont

3.1 Introduction 23

3.1.1 Synthetic Mean–Reverting Baskets 24

3.1.2 Mean–Reverting Baskets with Sufficient Volatility and Sparsity 24

3.2 Proxies for Mean Reversion 25

3.2.1 Related Work and Problem Setting 25

3.2.2 Predictability 26

3.2.3 Portmanteau Criterion 27

3.2.4 Crossing Statistics 28

3.3 Optimal Baskets 28
7.3.2 Asymptotic Approximation 157
7.3.3 Power Utility 159
7.4 Conclusions 160
Acknowledgements 160
References 160

8 Statistical Measures of Dependence for Financial Data 162
David S. Matteson, Nicholas A. James, and William B. Nicholson
8.1 Introduction 162
8.2 Robust Measures of Correlation and Autocorrelation 164
8.2.1 Transformations and Rank-Based Methods 166
8.2.2 Inference 169
8.2.3 Misspecification Testing 171
8.3 Multivariate Extensions 174
8.3.1 Multivariate Volatility 175
8.3.2 Multivariate Misspecification Testing 176
8.3.3 Granger Causality 176
8.3.4 Nonlinear Granger Causality 177
8.4 Copulas 179
8.4.1 Fitting Copula Models 180
8.4.2 Parametric Copulas 181
8.4.3 Extending beyond Two Random Variables 183
8.4.4 Software 185
8.5 Types of Dependence 185
8.5.1 Positive and Negative Dependence 185
8.5.2 Tail Dependence 187
References 188

9 Correlated Poisson Processes and Their Applications in Financial Modeling 191
Alexander Kreinin
9.1 Introduction 191
9.2 Poisson Processes and Financial Scenarios 193
9.2.1 Integrated Market-Credit Risk Modeling 193
9.2.2 Market Risk and Derivatives Pricing 194
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