Exercises

Portfolio Optimization: Theory and Application
Chapter 8 – Portfolio Backtesting

Daniel P. Palomar (2025). *Portfolio Optimization: Theory and Application.*
Cambridge University Press.

portfoliooptimizationbook.com

Exercise 8.1: Survivorship bias

Download stock price data corresponding to some index over several years and find an example where survivorship bias makes a big difference to the portfolio performance.

Exercise 8.2: Look-ahead bias

Download stock price data and find an example where look-ahead bias makes a big difference to the portfolio performance.

Exercise 8.3: Storytelling or confirmation bias

Download stock price data and find an example where storytelling or confirmation bias makes a big difference to the portfolio performance.

Exercise 8.4: Overfitting

Download stock price data and design a portfolio with overfitting in a way that makes a big difference to the portfolio performance.

Exercise 8.5: Turnover and transaction cost

Download stock price data and design a portfolio with high turnover so that the performance ignoring and including the transaction cost makes a big difference.

Exercise 8.6: Outliers

Download stock price data and find a portfolio example that accidentally benefits from some random outlier during the training phase, but with bad performance during the test phase.

Exercise 8.7: Single vs. multiple backtests

Download stock price data and choose several portfolio designs. Then evaluate them first with a single backtest and then with multiple randomized backtests. Find some example where the single backtest is totally misleading compared to the performance statistics obtained from the multiple backtests.

Exercise 8.8: Stress tests

Download stock price data and experiment with the generation of synthetic data corresponding to different market regimes of the market data. Then, repeat the experiment with multiple stocks, including the correlation among the stocks.