PSTAT 234 Final Project Outline

Portfolio Optimization

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2 Proposed Data Set

- Time horizon of data: From 05/21/2013 to 05/18/2018, 5 years of data in total.
- Data: Daily closing prices of S&P 500 Index component stocks that have a full samples over the above time horizon.
- Data source: https://iextrading.com/

3 Project Outline

We conduct the back-testing for the minimal variance portfolio optimization over the time horizon from 05/21/2013 to 05/18/2018 for different choices of sample size $n \in \{21, 63, 126, 252\}$ in each re-balancing period over 3 different estimation methods for the covariance matrix Σ or its inverse – the precision matrix $\Omega = \Sigma^{-1}$:

- Sample covariance matrix
- Graphical lasso estimation
- Ledoit - Wolf estimation

In the meantime, we will compare the following measurement in portfolio performance:

- Realized return
- Realized risk
- Realized Sharpe ratio
- Turnover
- Size of short side
- Wealth growth