Asset and Liability Management


- Estimate the expected return for all stocks (let be the vector $\mu$) and the index (let be $\mu_{S&P500}$).
- Estimate the covariance matrix $\Sigma$ for the stocks.
- Construct your portfolio by solving the following optimization problem

$$
\min_w w'\Sigma w \\
\text{subject to } w'e = 1 \\
w'\mu = \mu_{S&P500}.
$$

and try to find a solution for the following optimization problem

$$
\min_w w'\Sigma w \\
\text{subject to } w'e = 1 \\
w'\mu \geq \mu_{S&P500}.
$$

- By looking at the time window from January 2, 2007 to January 1, 2008, compare the performance of your portfolio with the performance of the S&P500 index.


For any problem or remark, do not hesitate to contact me, bianchi@statistik.uni-karlsruhe.de