
Robust Investment Portfolios

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Abstract

This master's thesis pursues the construction of stable, robust and growth portfolios in active portfolio management. These portfolios provide limited downside risks, short-time drawdowns and substantial growth prospects. We argue that the construction of such portfolios is based on security selection as well as on portfolio theory (the Mean-Variance Model, MVM). The equity based portfolios were constructed and tested on real market data from the 1995-2014 period. The tested portfolios outperformed the S&P 500 out of and within the risk-reward ratio domain.

Robust portfolios build on the MVM but they are less sensitive to errors of parameters estimation. We experimented with several robust approaches and the results confirmed that the robust portfolios were less sensitive to outliers, less volatile and more stable (robust).

The bottom-up process of security selection seems time consuming and labor intensive. Therefore we proposed an alternative approach to select stocks with so-called "cluster analysis". Generally, the cluster analysis classifies similar objects (companies) into similar groups. Technical and fundamental parameters of companies provided needed classification parameters. The classification was run over companies from the German DAX index. The achieved results were surprisingly supportive and valuable.

We argue that the robustness of a portfolio is primarily driven by security selection, therefore we describe what matters in our opinion. The robustness of a portfolio can be measured by many measures. The personally selected measures are size, frequency of drawdowns, drawdown period and risk-return measures (such as Sharpe ratio). The selected measures were evaluated on the historical data. The experimental verification supported our assumptions that robust portfolios provide lower drawdowns and high risk-return measures.

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