

Different Stock Weighting Methods and their Influence on Portfolio Performance

Bachelor Thesis in Banking & Finance
Department of Banking and Finance
University of Zurich

Prof. Dr. Felix Kübler
Luca Mazzone

Author: Patrick Goncalves da Costa

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Executive Summary

Problem and Objective

Due to a large number of promising theoretical and practical stock investment strategies, it is necessary to analyze and understand the backgrounds and performances of certain strategies. The objective of the bachelor thesis is to figure out which stock weighting methods allow to outperform a stock index, in this case the Swiss Market Index and the Dow Jones Industrial Average from 31 March 2008 to 30 April 2015, and analyze which of them promise the highest performance.

Approach and Structure

The core of the bachelor thesis is the application of five different stock weighting methods and present as well as compare their performance. The first portfolio is a so-called market or benchmark portfolio, representing a stock index and reflecting the market performance. The stocks of the second portfolio, defined as individual portfolio, are weighted corresponding to their individual reciprocal price/earnings ratios. The stocks of the naive portfolio, the third of the five portfolios, are equally weighted. The fourth and fifth portfolio weight the stocks corresponding to the resulting optimal weights from the minimum variance and maximum sharpe ratio optimization theory. The portfolios are constructed and applied monthly, resulting in monthly performances for each stock weighting method.

The first part of the bachelor thesis consists of the description of five stock weighting methods and the motivation to analyze them as promising investment strategies, by referring to already established studies. The second part consists of three analyses. The objective of the first analysis is to understand the power of price/earnings ratios as weights and analyze the predictability of stock index returns by using price/earnings ratios weighted stock portfolio returns. The second and central analysis consists of the numerical and graphical presentation of the portfolio performances under the assumption of no transaction costs. The influence of transaction costs on the performance is analyzed and presented in the third analysis. The third part of the bachelor thesis presents an overview of the most important results and a conclusion. The fourth and last part rounds up the bachelor thesis by showing how much money an investor would own at the end of the investment period, depending on the stock weighting method, compared to an initially invested capital of one US-Dollar.

Results and Conclusion

The conclusion of the first analysis is that returns of price/earnings ratios weighted portfolios can be used as predictors for stock index returns due to a positive relationship. A price/earnings ratios weighted portfolio, compared to a stock index and independent of whether the price/earnings ratios are low or high, also led to higher returns. These results underline the potential of price/earnings ratios as weights. But the central recognition refers to the fact that the positive relationship has a value of less than one. The implication is that price/earnings ratios should be used as weights in case of a negative market development, because the performance of the correspondent portfolios is not as negative as the performance of the stock index. But in case of a positive market development it should not be possible to outperform the index. Thus, the expected market development is, or should be an important criterion for investors.

The objective of the second and third analyses is to ascertain which of the five analyzed stock weighting methods lead to higher performances by comparing three key figures, namely the return, the standard deviation and the return/risk ratio. The results show that, under the assumption of no transaction costs, there are only few weighting methods that were able to outperform a stock index. A promising portfolio is the individual portfolio, namely the use of reciprocal price/earnings ratios as weights. The problem is that the assumption of no transaction costs is not achievable in reality. The inclusion of transaction costs shows that not one of the portfolios clearly outperformed the market. The worst possible investment strategy would have been the use of optimal weights from the maximum sharpe ratio optimization theory, especially under the assumption that short selling is allowed. The most promising strategy, under this circumstances, was to invest according to a stock index or market portfolio.