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## Abstract

A portfolio is a collection of assets owned by an individual or group for a specific economic purpose. To build a good portfolio, two key factors must be considered: return and risk. Portfolio optimization aims to produce a portfolio with high returns and low risk. There are many methods for building a portfolio; for instance, the simplest is the equal-weight method, while other methods utilize mean-variance analysis. However, these methods often yield results that are considered unsatisfactory, as there can be discrepancies between theoretical outcomes based on historical data and actual results. An alternative for constructing a new portfolio is by using Stock Network Portfolio Allocation based on Return History (SNPAr). This approach uses an algorithm that calculates transition probabilities based on accumulated wealth over the last period, allocating stock portfolios within a network using the linkages between shares. Therefore, in this final project, a stock portfolio was constructed using the Stock Network Portfolio Allocation method based on Return History (SNPAr) with the LQ45 dataset over a time span of 16 years, from October 2008 to August 2023. Based on the results of the tests conducted, it can be concluded that by applying the SNPAr method and conducting experiments on threshold values of 0.3 to 0.4, the threshold value of 0.4 demonstrated better performance compared to other thresholds. This conclusion is drawn from analyzing the parameter value of the increase in portfolio value over time, where the average growth value of the portfolio at the 0.4 threshold is 0.017, and the standard deviation of portfolio growth at this threshold is 0.062. Moreover, when comparing the performance of the Stock Network Portfolio Allocation based on Return History (SNPAr) portfolio with a threshold of 0.4 against the equal-weight portfolio, the SNPAr portfolio proved to be superior. This is evident from the average return value of the SNPAr portfolio, which is 0.017, compared to 0.012 for the equal-weight portfolio. Additionally, the standard deviation of the SNPAr portfolio's return value is 0.062, slightly lower than 0.063 for the equal-weight portfolio. In conclusion, the SNPAr method not only achieves higher returns but also establishes itself as a better choice for long-term portfolio optimization.

**Keywords:** Potofolio, *Mean-Variance*, *SNPAr*, *Return History*, *Treshold*, *Equal Weight*.