

ABSTRACT

Investment is an activity of allocating funds at present with the aim of gaining profits in the future. In stock investment, every investor certainly desires optimal returns with minimal risk. One strategy to minimize investment risk is forming a portfolio consisting of several stocks with optimal composition. To determine the stocks that make up the portfolio, a grouping process can be performed using cluster analysis. This research aims to form an optimal portfolio through the integration of Ward Clustering and Mean-Semivariance methods. Stock grouping is conducted based on profitability ratios consisting of Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM) as they can reflect company management effectiveness. Ward Clustering method is selected due to its ability to maximize data homogeneity within each formed cluster. The results of stock grouping are then validated using Silhouette Coefficient to determine the most optimal number of clusters. The data used in this research includes LQ45 index stocks that consistently remained in the index from November 2023 to October 2024, which are subsequently used as the basis for portfolio formation using the Mean-Semivariance approach. To measure portfolio risk, the Historical Simulation method is used in calculating Value at Risk (VaR), while portfolio performance is measured using the Sharpe Index. The optimal portfolio formed has an expected return of 0.0008486, Semivariance of 0.00004211, and Sharpe Index of 0.105002. Research findings show that the longer an investor maintains stock ownership in the portfolio, with the same capital and confidence level, the greater the VaR value based on the Historical Simulation method, reflecting the maximum potential loss that may occur. The obtained Sharpe Index value indicates that the formed portfolio performs better than risk-free investments.

Keywords: LQ45 Stock Index, Ward Clustering, Mean-Semivariance Portfolio, Historical Simulation VaR, Sharpe Index