ABSTRACT

Investing in capital markets exposes investors to uncertain risks. To minimize risk and maximize returns, an optimal portfolio construction strategy is essential. This study aims to construct an optimal portfolio using the Mean–Semivariance model as an alternative to the Markowitz model, which assumes normally distributed returns. The data consists of daily log returns of closing stock prices from the PEFINDO25 index for the period of February 1 to July 31, 2023. Temporal similarity among stocks was identified using Partitioning Around Medoids (PAM), or K–Medoids Clustering, with Dynamic Time Warping (DTW) as the distance metric, enabling the grouping of nonlinier time series patterns. Two portfolio groups were formed with a Silhouette Coefficient of 0.6406, indicating standard cluster separation. Each group's portfolio was then constructed by calculating semivariance and semicovariance values, and optimized to minimize risk weights. Performance evaluation using the Sharpe Index shows that the clustered portfolios achieved better risk efficiency compared to the unclustered portfolio. The Sharpe Index values were 0.025827 for Portfolio 1 and -0.0099208 for Portfolio 2. These findings suggest an alternative strategy for optimal portfolio construction by incorporating downside risk and historical stock patterns.

Keywords : Optimal Portfolio, Mean–Semivariance, K–Medoids Clustering, Dynamic Time Warping (DTW), Silhouette Coefficient, Indeks Sharpe, PEFINDO25.