ABSTRACT

The instability of the Indonesian capital market over the past year, including two trading halt events in early 2025, reflects the high levels of volatility and risk faced by investors, particularly individual investors. This study aims to develop a risk evaluation model and optimal stock portfolio formation strategy based on data from April 24, 2024, to April 25, 2025. A case study is conducted on banking sector stocks (BBCA, BBRI, BMRI, BBNI, BBTN, and BNGA), which constitute a significant portion of market capitalization within the financial sector. Risk estimation is performed using the Value at Risk (VaR) method based on Monte Carlo simulation, modeled through Geometric Brownian Motion (GBM). The portfolio construction strategy is implemented using the Mean-Variance Optimization approach. All modeling results are visualized through an interactive web application built with Streamlit to enhance accessibility and serve an educational function for individual investors. Model validation is carried out using the Mean Absolute Percentage Error (MAPE), back-testing, and bootstrapping methods. The results demonstrate that this integrated approach provides realistic risk estimations and yields quantitatively efficient portfolios. Therefore, the proposed model holds potential to support improved financial literacy and more informed investment decision-making among individual investors.

Keywords: ***Value at Risk, Mean-Variance Portfolio, risk, stock investment, investor***