ABSTRACT

The growth of the investment sector in Indonesia reflects increasing public awareness of the importance of future-oriented asset management. In the context of stock investment, an appropriate stock selection process and portfolio formation are required. Company efficiency can serve as a basis for stock selection, as efficient firms tend to utilize resources optimally and generate better financial performance. In this study, Data Envelopment Analysis (DEA) is employed to identify efficient stocks for portfolio construction. The portfolio is formed using the Mean-Semivariance (MSV) method as a development of the Mean-Variance (MV) approach, since MSV places greater emphasis on downside risk and does not require the assumption of multivariate normal distribution, which is often not satisfied in stock return data. Portfolio optimization is conducted using Quadratic Programming to address the possibility of negative weights. Portfolio risk is measured using Value at Risk (VaR) and Expected Shortfall (ES), where ES is used as a coherent risk measure capable of capturing extreme losses. The data consist of daily stock returns from the IDXQ30 index for the period October 1, 2024 to October 30, 2025, selected due to their strong fundamental quality and representativeness of the Indonesian stock market. The results indicate that the portfolio is composed of four efficient stocks with optimal weight allocations of LSIP (21.83%), NCKL (13.62%), TAPG (20.16%), and UNTR (44.39%), generating an expected portfolio return of 0.11%. Risk measurement at a 95% confidence level with a one-day holding period indicates that the portfolio has a maximum potential loss of 2.57% (VaR), with an average loss of 4.01% (ES) when the VaR level is exceeded.

Keywords: *Data Envelopment Analysis, Mean-Semivariance, Quadratic Programming, Value at Risk, Expected Shortfall*