ABSTRACT

Stock portfolio optimization is crucial for investors in achieving a balance between risk and return. Instead of selecting high-risk portfolios to maximize returns, the Kataoka Safety-First model offers a more secure stock allocation by minimizing the risk of a shortfall, the condition where portfolio returns fall below the minimum return. Adding non-short selling constraints is necessary to mitigate the potential for larger losses. Optimizing the Kataoka Safety-First model portfolio, which aims at maximizing the minimum return while ensuring positive stock weights, can be accomplished using the Constrained Newton-Raphson method. This study applies the Constrained Newton-Raphson method to optimize the Kataoka Safety-First model without short selling, using weekly stock data consistently listed in the LQ45 index from February 1, 2021, to January 1, 2024. The study results indicate an optimal portfolio with the best performance based on the Sharpe Ratio, with stock weight compositions of ITMG (33,43%), TLKM (32,12%), and ICBP (34,45%). Additionally, the safest optimal portfolio, based on the highest minimum return, comprises ITMG (31,30%), TLKM (41,66%), and KLBF (27,04%). The strength of this study lies in generating optimal portfolios that not only avoid short selling but also offer good performance and enhanced safety, aligning with investors' risk preferences.

Keywords: *Stock Portfolio Optimization, Non Short Selling, Kataoka Safety-First, Constrained Newton-Raphson, Sharpe Ratio*