

Sharia Investment Analysis: Profit and Risk Optimization of Stock Portfolios with SCAPM Models through Particle Swarm Optimization

Di Asih I Maruddani

Faculty of Science and Mathematics, Department of Statistics, Universitas Diponegoro, Tembalang, Semarang

Tarno Professor

Faculty of Science and Mathematics, Department of Statistics, Universitas Diponegoro, Tembalang, Semarang

Deby Fakhriyana

Faculty of Science and Mathematics, Department of Statistics, Universitas Diponegoro, Tembalang, Semarang

Abstract:

This research proposal aims to develop a portfolio optimization model for IDX30 stocks using a Sharia-Adjusted Capital Asset Pricing Model (SCAPM) integrated with Particle Swarm Optimization (PSO). Sharia-compliant investing has gained traction among investors who seek ethical investment portfolios that adhere to Islamic principles. The SCAPM extends the traditional CAPM by incorporating Sharia compliance factors, ensuring that the portfolio consists of only Sharia-approved assets. This research intends to optimize the portfolio by maximizing the Sharpe Ratio, a measure of risk-adjusted return, while maintaining adherence to Sharia principles.

The methodology includes filtering IDX30 stocks for Sharia compliance and calculating the expected return of each stock based on SCAPM, which adjusts for systematic risk without relying on income from interest or prohibited business activities. Particle Swarm Optimization is applied to determine the optimal weights for each Sharia-compliant stock in the portfolio, aiming to maximize the Sharpe Ratio while observing real-world constraints, such as non-negative weights and a total sum of weights equal to one.

The expected contributions of this study include demonstrating the effectiveness of SCAPM combined with PSO in constructing Sharia-compliant portfolios with enhanced risk-adjusted returns, especially in emerging markets like Indonesia. This research will offer valuable insights for investors and fund managers seeking ethical investment options with optimized performance, bridging the gap between Sharia compliance and modern portfolio optimization techniques.