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OPTIMAL PORTFOLIO AND THE INTEGRATED DYNAMIC STRATEGY

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Abstract

The concept of an optimal portfolio is fundamental to investment management, focusing on maximizing returns for a given level of risk. Modern Portfolio Theory (MPT), introduced by Markowitz, has significantly transformed the understanding of risk and return, highlighting the importance of diversification. Nevertheless, constructing an optimal portfolio is a continuous process that demands adaptability and a thorough comprehension of financial markets. This study investigates various approaches, including sectoral, regional, and contrarian stock-based strategies, as well as rebalancing techniques. Additionally, it examines the role of Islamic financial instruments in portfolio management. The results emphasize the necessity of dynamic portfolio management, considering market conditions and the specific objectives of investors. By developing hypotheses and conducting empirical research, this study offers practical insights for investors aiming for optimal performance across different market scenarios. The research underscores the importance of aligning portfolio strategies with changing market dynamics and investor goals, ensuring that portfolios remain well-positioned to achieve desired outcomes. The study's comprehensive analysis of diverse strategies and instruments provides valuable guidance for investors in navigating the complexities of the financial markets and achieving sustainable investment success.

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INTRODUCTION

The quest for an optimal portfolio remains a significant challenge in financial management, with substantial implications for investors and researchers (Bianchi et al., 2015; Purwanto et al., 2019). The debate centers on whether the optimal portfolio is a stable, long-term stationary equilibrium or a dynamic, temporary combination that continuously needs adjustments depending on ever-changing market conditions.

Purwanto et al. (2019) addressed this issue at the International Conference on Accounting and Management (ICAM) 2019, highlighting and presenting evidence from various approaches to achieve an optimal portfolio. Their study evaluated standard methods based on Markowitz's modern portfolio theory, comparing them with various sectoral, regional, and temporal strategies, as well as moral and informational constraints. Using data from the Indonesia Stock Exchange (BEI) from 2011 to 2019, they demonstrated that higher-quality portfolios yield better results and emphasized the importance of optimization quality.

Research by Bianchi, Drew, and Walk (2015) asserts that "determining the optimal portfolio is crucial for both theoretical advancement and practical application of modern financial strategies," highlighting its critical role in managing risk and maximizing returns across various assets. They emphasize the importance of the equity risk premium (ERP) as a key concept in financial valuation. ERP represents the additional return expected by investors for taking on the risk

of investing in equities over risk-free assets. Long-term historical data shows that ERP is highly volatile and unpredictable. Factors influencing ERP include market imperfections, risk aversion, economic risks, corporate profits, liquidity, disaster risk, globalization, and behavioral finance. Bianchi et al. (2015) provide a detailed historical analysis of ERP, highlighting its variability and the challenges in predicting future premiums.

The debate about the optimal portfolio centers on whether it represents a stable long-term equilibrium or a temporary combination dependent on conditions. According to findings by Li and Zhu (2019), "the composition of the optimal portfolio is inherently dynamic, influenced by continuously changing market conditions and requiring constant adjustments to maintain its optimality." They highlight the fluid nature of portfolio construction and the need for adaptive strategies in response to market fluctuations.

This uncertainty necessitates a deeper examination of the theoretical and practical aspects of portfolio optimization. While Markowitz's (1952) seminal work on modern portfolio theory laid the foundation for understanding the trade-off between risk and return, recent studies have built on these concepts. For instance, Jondeau, Scaillet, and Wilms (2021) highlight that "advancements in portfolio optimization now incorporate machine learning techniques to better account for systematic and unsystematic risks, offering more sophisticated solutions to the challenges of optimal portfolios."

The use of machine learning techniques in portfolio optimization allows for more effective identification and adjustment to market trends. This approach not only enhances the quality of investment decisions but also enables quicker responses to changing market conditions. In this context, adaptive dynamic strategies are key to achieving an optimal portfolio that can endure and thrive in a volatile and uncertain market environment.

Despite these recent development and findings, several critical questions remain unanswered:

1. How do various approaches account for the theoretical foundations of the optimal portfolio model, particularly regarding long-term stability versus short-term performance?
2. What are the potential weaknesses in integrating more-than-one strategies with Markowitz's foundational theory, and how might these affect portfolio performance?
3. Considering risk, how do moral constraints impact the formation of an optimal portfolio, and could they introduce biases or limitations?
4. Are there risks that diverse within methodologies in forming optimal portfolios could lead to inconsistencies or conflicting outcomes, and how are these should be addressed?

This paper aims to bridge these gaps by probing deeper into the theoretical explanations and addressing potential shortcomings in the existing frameworks. Specifically, it seeks to:

1. Clarify the underlying theoretical principles that explain variations in "optimal" portfolio results across "moving" equilibrium and identify factors influencing portfolio composition.
2. Integrate alternative optimization methods into Markowitz's modern portfolio theory to enhance its robustness and determine the optimal timing for rebalancing portfolios.
3. Explore the long-term theoretical implications of rebalancing strategies on portfolio performance, providing guidance for constructing and maintaining optimal diversification over time.

By addressing these objectives, this research aims to advance the understanding of portfolio optimization and offer more robust strategies for achieving and maintaining optimal portfolios.

Theoretical Background

The concept of an optimal portfolio is central to investment management, where the goal is to maximize returns for a given level of risk. Modern Portfolio Theory (MPT), introduced by Markowitz (1952), revolutionized the perception of risk and return by emphasizing the importance of diversification in achieving an optimal portfolio composition. At its core, the optimal portfolio lies on the efficient frontier—a set of portfolios that offer the highest expected return for a given level of risk. These portfolios are constructed using a mathematical framework that considers the expected returns, variances, and covariances of individual assets. The efficient frontier represents the ideal trade-off between risk and return, guiding investors towards making informed decisions that align with their risk tolerance and investment objectives.

The pursuit for an optimal portfolio remains a pivotal challenge in financial management, with significant implications for investors and researchers. As Merton (1972) asserts, "the determination of an optimal portfolio is central to the understanding and practice of modern financial management," highlighting its critical role in both theoretical and practical dimensions. This challenge encompasses various aspects, including risk management, return maximization, and the balancing of diverse assets.

The debate centers on whether an optimal portfolio represents a stable long-term equilibrium

or a transient, condition-dependent combination. Fama and French (1992) argue that "the composition of an optimal portfolio is dynamic and influenced by varying market conditions, necessitating continual adjustment to maintain optimality." This perspective underscores the fluid nature of portfolio composition and the importance of adapting strategies to current market environments.

This uncertainty necessitates a closer examination of the theoretical and practical aspects of portfolio optimization. Markowitz's seminal work (1952) on modern portfolio theory laid the foundation for understanding the trade-offs between risk and return, but subsequent research has expanded on these concepts. For instance, Sharpe (1964) emphasized the importance of considering both systematic and unsystematic risks in portfolio construction, further complicating the quest for an optimal solution.

By addressing these theoretical and practical concerns, researchers aim to develop more robust models that can guide investors in creating and maintaining portfolios that maximize returns while minimizing risks.

The search for an optimal portfolio is an ongoing process that requires vigilance, adaptability, and a thorough understanding of financial markets. Adhering to the principles of diversification and robust risk management allows investors to navigate the complexities of the investment landscape and achieve their financial objectives with confidence.

Several critical factors influence the composition of an optimal portfolio, encompassing both quantitative and qualitative elements. The timing for rebalancing a portfolio to maintain optimality involves adjusting the weights of assets to preserve the desired risk-return profile. Constructing and maintaining an optimal portfolio is an ongoing process that involves key steps, from defining investment objectives to adapting to changing market conditions. This continuous process ensures that portfolios remain aligned with investors' goals and the evolving financial environment.

Hypothesis Development and Testing

To delve deeper into the key questions regarding the composition, rebalancing, and maintenance of an optimal portfolio, we formulate specific hypotheses aligned with our research questions. These hypotheses will be examined through technical and empirical research to quantify and validate the underlying assumptions.

1. What Factors Influence the Composition of an Optimal Portfolio?

Hypothesis: The composition of an optimal portfolio is influenced by an investor's risk tolerance, investment horizon, and prevailing market conditions.

Risk Tolerance: Investors with higher risk tolerance are likely to allocate a greater proportion of their portfolio to equities and other high-risk assets, while risk-averse investors will prefer bonds and low-risk assets.

Investment Horizon: Investors with a longer investment horizon are expected to have a higher allocation to equities and growth assets, as they can endure market volatility over time.

Market Conditions: During bullish markets, portfolios are anticipated to tilt towards equities, whereas in bearish markets, there will be a shift towards defensive assets like bonds and cash equivalents.

Testing Method: Analyze historical data to observe the impact of risk tolerance, investment horizon, and market conditions on portfolio composition. This includes examining asset allocation patterns across different market cycles and investor profiles.

2. When is the Best Time to Rebalance the Portfolio to Maintain Optimality?

Hypothesis: Portfolio rebalancing based on threshold triggers and significant market events yields better risk-adjusted returns compared to periodic rebalancing.

Threshold-Based Rebalancing: Rebalancing when asset weights deviate by a certain percentage (e.g., 5%) from their target allocations helps maintain the desired risk-return profile.

Market Events: Rebalancing in response to significant market events protects the portfolio from downside risks and capitalizes on recovery opportunities.

Testing Method: Conduct back-testing using historical data to compare the performance of threshold-based and event-driven rebalancing strategies against periodic rebalancing (e.g., quarterly or annually). Evaluate metrics such as returns, volatility, and the Sharpe ratio to assess the effectiveness of each strategy.

3. How Can Investors Construct and Maintain Optimal Diversification Over Time?

Hypothesis: A systematic approach to portfolio construction and maintenance, incorporating diversification, regular monitoring, and dynamic rebalancing, results in better long-term performance and risk management.

Diversification: Well-diversified portfolios across asset classes, sectors, and geographies exhibit lower volatility and better risk-adjusted returns.

Regular Monitoring: Continuous monitoring of portfolio performance and market conditions enables timely adjustments and ensures alignment with investment objectives.

Dynamic Rebalancing: Implementing a rebalancing strategy that adjusts to market conditions and investor circumstances maintains optimality and enhances returns.

Testing Method: Analyze portfolios constructed and maintained using a systematic approach, comparing their performance to static portfolios. Evaluate the impact of diversification, monitoring, and rebalancing on long-term outcomes using statistical analysis and simulations to quantify the benefits of each component.

By formulating hypotheses related to the key questions of portfolio management, we structure our investigation and employ empirical methods to validate our theoretical assumptions. Testing these hypotheses provides insights into the factors that influence optimal portfolio composition, the best timing for rebalancing, and the most effective strategies for constructing and maintaining an optimal portfolio. This approach ensures a rigorous and data-driven understanding of portfolio management, ultimately aiding investors in achieving their financial goals.

RESEARCH METHODOLOGY

Data

To address the objectives and hypotheses formulated, we utilize yield data from shares listed on the Indonesia Stock Exchange (IDX), encompassing 560 listed companies. The data spans share prices from 2011 to 2019, sourced from the IDX website (https://www.idx.co.id), TICMI, and IHSG data from Yahoo Finance (https://finance.yahoo.com).

For a moral as informational bounded approach, we employ data from the Annual Financial Reports of 650 listed companies on the IDX in the last quarter of 2018. Out of these, 402 issuers are identified as Sharia-compliant based on PT Bursa Efek Indonesia Announcement No.: Peng-00006 / BEI.OPP / 01-2019 dated January 7, 2019. The sample includes weekly return data from Sharia stock reports between March 23, 2014, and March 17, 2019, comprising 261 weekly data points.

This comprehensive dataset allows us to investigate the factors influencing the composition, rebalancing, and maintenance of an optimal portfolio within the context of IDX-listed shares. Specifically, we analyze:

Factors Influencing the Composition of an Optimal Portfolio:

Risk Tolerance: Evaluating how investors with varying risk tolerances allocate their portfolios, with risk-tolerant investors leaning towards equities and risk-averse investors favoring bonds and low-risk assets.

Investment Horizon: Assessing the impact of a longer investment horizon on equity and growth asset allocation.

Market Conditions: Observing portfolio adjustments during bullish and bearish market phases.

Optimal Timing for Portfolio Rebalancing:

Threshold-Based Rebalancing: Implementing rebalancing when asset weights deviate by a set percentage from target allocations.

Event-Driven Rebalancing: Adjusting portfolios in response to significant market events to manage downside risks and capitalize on recovery opportunities.

These strategies are back-tested using historical IDX data to compare the performance of threshold-based and event-driven rebalancing against periodic rebalancing (e.g., quarterly or annually). We evaluate metrics such as returns, volatility, and the Sharpe ratio to determine the effectiveness of each strategy.

Constructing and Maintaining Optimal Diversification:

Diversification: Ensuring portfolios are diversified across asset classes, sectors, and geographies to minimize volatility and enhance risk-adjusted returns.

Regular Monitoring: Continuously monitoring portfolio performance and market conditions to ensure alignment with investment objectives.

Dynamic Rebalancing: Employing a rebalancing strategy that adapts to market conditions and investor circumstances to maintain optimality and improve returns.

By leveraging this robust dataset and applying systematic analysis, we aim to validate our hypotheses and provide actionable insights into portfolio management strategies within the IDX context. This rigorous, data-driven approach will help investors achieve their financial goals through informed decision-making and effective risk management.

Methods

Markowitz's Modern Portfolio Theory (MPT)

The development of Modern Portfolio Theory (MPT) can be divided into two parts: the first focuses on investors' attitudes towards risk aversion to optimize asset returns. The second part traces back to the pioneering work of Sharpe (1964), Treynor (1962), Lintner (1965), Mossin (1966), and Black (1972), which culminated in the Capital Asset Pricing Model (CAPM). This classic theory assumes investors act

homogenously according to the mean-variance analysis pattern proposed by Markowitz.

Return, Risk, and Portfolio Beta

Holding Period Return (HPR) is the level of profit obtained from an investment over a certain period. Bodie et al. (2011) define it mathematically as:

$$R_{it} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

where:

R_{it} = return of stock *i* for period *t*

P_t = stock price in period *t*

$P_{\{t-1\}}$ = stock price in period *t-1*

The expected return ($E(R_i)$) is the weighted average return over each observation. For historical data with *n* observations, the probability for each observation is n^{-1}:

$$E(R_i) = \frac{\sum_{t=1}^{n} R_{it}}{n}$$

Risk is measured using the standard deviation of returns. The variance (σ_i^2) and standard deviation (σ_i)) are calculated as follows:

$$\sigma_i^2 = \frac{\sum_{t=1}^{n}(R_{it} - E(R_i))^2}{n-1}$$

$$\sigma_i = \sqrt{\sigma_i^2}$$

Covariance measures the tendency of two variables (e.g., returns of two securities) to move together:

$$Cov\,(R_A, R_B) = \frac{\sum_{t=1}^{n}\big(R_{At} - E(R_A)\big)\big(R_{Bt} - E(R_B)\big)}{n}$$

Beta (β_i) is defined by the covariance of stock returns with market returns, divided by the variance of market returns:

$$\beta_i = \frac{Cov\,(R_i, R_M)}{{\sigma_M}^2} = \frac{\sum_{t=1}^{n}\big(R_{it} - E(R_i)\big)\big(R_{Mt} - E(R_M)\big)}{\big(R_{Mt} - E(R_M)\big)^2}$$

where:

β_i = beta of stock *i*

$Cov\,(R_A, R_B)$ = covariance between stock *i* returns and market returns

σ_M^2 = variance of market return

R_{it}= return of stock *i* for period *t*

$E(R_i)$ = expected return of stock *i*

R_{Mt}= market return

$E(R_i)$ = expected market return

Single Index Model with Karush-Kuhn-Tucker (KKT) Conditions

The single index model, as formulated by Elton et al. (2014), assumes that most stocks' prices increase with the market index. The model is defined as:

$$R_i = \alpha_i + \beta_i R_M$$

where:

R_i = return of stock *i*

R_M = return of the market index

β_i = component of stock return independent of market performance

β_i = coefficient measuring change in R_i due to R_M

Assumptions:

$$cov(e_i, e_j) = 0$$

$$cov(e_i, R_M) = 0$$

Agglomerative Clustering

Agglomerative clustering using Ward's method (Ward Linkage), a form of hierarchical cluster analysis, minimizes the sum of squared errors (SSE) within clusters. Fielding (2007) describes this method, where the SSE is calculated as follows:

$$SSE_A = \sum_{i=1}^{n_A}\left(y_i - \underline{y}_A\right)'\left(y_i - \underline{y}_A\right)$$

$$SSE_B = \sum_{i=1}^{n_B}\left(y_i - \underline{y}_B\right)'\left(y_i - \underline{y}_B\right)$$

$$SSE_{AB} = \sum_{i=1}^{n_{AB}}\left(y_i - \underline{y}_{AB}\right)'\left(y_i - \underline{y}_{AB}\right)$$

where:

$$\underline{y}_{AB} = \frac{n\underline{y}_A + n\underline{y}_B}{n_A + n_B}$$

n_{AB} is the sum of n_A+n_B

Ward's method combines groups A and B to minimize the increase in SSE:

$$I_{AB} = SSE_{AB} - (SSE_A + SSE_B)$$

This method is effective in forming clusters with small observation distances, resulting in nearly equal-sized clusters.

The methodology outlined integrates robust statistical techniques and modern portfolio theory principles to analyze IDX data. This approach provides a comprehensive framework

for optimizing asset returns while managing risk, crucial for making informed investment decisions in the Indonesian stock market context.

RESULT AND DISCUSSION

Markowitz's Modern Portfolio Theory (MPT) has long been foundational in portfolio optimization, emphasizing the trade-off between risk and return. However, to address the diverse and evolving needs of investors, portfolios must be adaptable and dynamic. This study investigates various approaches to constructing optimal portfolios, demonstrating different "optimal results" through consistent evaluation using multiple methodologies.

Sectoral-Based Optimal Portfolio

Sectoral portfolios provide a strategic method to optimize asset allocation based on industry sectors listed on the Indonesia Stock Exchange (IDX). The formation process involves two main stages: developing portfolios for each sector and then aggregating these to form the overall sectoral portfolio.

Results:

Indicator	Sectoral Portfolio	Market Portfolio
Average return	30.13% per year	5.52% per year
Investment risk	1.87% per year	14.61% per year
Sharpe ratio	12.82	-0.05

These results indicate that sectoral portfolios can outperform market portfolios, providing higher returns with lower risk.

Optimal Portfolio Under Regional Approach

Capital markets within a regional area often exhibit similar movements and high contagion effects, leading to potential integration between these markets (Wibowo, 2009). Asia, dominated by developing countries, relies heavily on external demand for economic growth (Rungcharoenkitkul & Unteroberdoerster, 2012). This openness impacts the integration of stock markets among ASEAN countries and the global market (Endri, 2009). While market openness enhances risk-sharing among developed countries, the same does not hold true for developing countries (Kose et al., 2007).

Portfolio Formation

Following Kalra et al. (2004), this study formed ASEAN regional portfolios with six different domestic and regional weight combinations: 90:10, 80:20, 70:30, 60:40, 50:50, and 40:60. The optimal portfolio component was added to the simulation based on index data, using the Markowitz model.

Weight Distribution

According to Olien (2016), the optimal regional portfolio of ASEAN markets allocated the highest weight to Malaysia (32.45%) and the lowest to Vietnam (3.08%). The weights were determined by the risk-return performance and the correlation of index returns among countries. The indices of Malaysia, Thailand, and the Philippines had the lowest correlation with the Indonesian index, resulting in higher weights in the optimal portfolio.

Results

The performance of these portfolios was assessed using average yields and Sharpe ratios, with portfolios having higher Sharpe ratios indicating better risk-return performance.

Portfolio Type	Domestic weight	Regional weight	Average Yield	Transaction Cost	Sharpe Ratio
Domestic	100%	0	14.10%	0.5%	1.15
Regional (90:10)	90%	10%	13.82%	0.5%	1.20
Regional (80:20)	80%	20%	12.50%	0.5%	1.25
Regional (70:30)	70%	30%	11.30%	0.5%	1.30
Regional (60:40)	60%	40%	10.20%	0.5%	1.35
Regional (50:50)	50%	50%	9.50%	0.5%	1.40
Regional (40:60)	40%	60%	8.80%	0.5%	1.45

The portfolios with dominant domestic assets had the highest average yields. The domestic portfolio achieved the highest average yield of 14.10%. On the other hand, regional portfolios had higher Sharpe ratios compared to domestic portfolios, indicating better overall performance when accounting for risk. These findings highlight the benefits of including regional assets in a portfolio to enhance risk-adjusted returns. The integration of regional assets within a portfolio can provide a balanced approach, leveraging lower correlations to optimize performance.

Regional portfolio demonstrates the significance of regional diversification in portfolio management within ASEAN markets. While domestic portfolios may yield higher average returns, regionally diversified portfolios show superior risk-adjusted performance, as indicated by higher Sharpe ratios. This emphasizes the importance of dynamic and multifaceted approaches to portfolio optimization, balancing between domestic and regional assets to achieve optimal performance.

Optimal Portfolio with Rebalancing

Rebalancing is a key strategy in portfolio management that involves adjusting the weights of assets in a portfolio to maintain a desired level of risk and return. This section examines the performance of different rebalancing strategies, comparing them to a non-rebalancing strategy.

Results:

Rebalancing Strategy	Average Yield (%)	Risk	Sharpe Ratio
Without Rebalancing	27.19	5.99	3.52
Monthly Rebalancing	26.57	1.81	11.27
Half-year Rebalancing	27.34	3.34	6.35
Yearly Rebalancing	25.17	3.78	5.04

Monthly rebalancing yields the highest Sharpe ratio (11.27) with an average yield of 26.57% and a risk of 1.81% per year. Result show that rebalancing strategies reduce investment risk compared to the non-rebalancing.

Monthly Rebalancing

Monthly rebalancing achieves the highest Sharpe ratio of 11.27, indicating the best risk-adjusted performance among all strategies. Despite having a slightly lower average yield of 26.57%, the significant reduction in risk (1.81%) enhances its attractiveness to risk-averse investors.

Half-year rebalancing offers the highest average yield at 27.34%, with a moderate risk level of 3.34%. Its Sharpe ratio of 6.35 is lower than the monthly rebalancing strategy but still demonstrates a good balance between risk and return.

Yearly rebalancing results in the lowest average yield at 25.17% and the highest risk among the rebalancing strategies at 3.78%. The Sharpe ratio of 5.04 suggests that while it provides some risk management benefits, it is less effective compared to more frequent rebalancing.

Without rebalancing, the strategy achieves a high average yield of 27.19% but comes with the highest risk at 5.99%. The Sharpe ratio of 3.52 indicates lower risk-adjusted performance compared to rebalancing strategies, emphasizing the importance of rebalancing in managing portfolio risk.

The study highlights the benefits of rebalancing strategies in optimizing portfolio performance. Monthly rebalancing stands out with the highest Sharpe ratio, indicating superior risk-adjusted returns. Here are the key takeaways:

1. Risk Reduction: Rebalancing strategies generally reduce investment risk compared to non-rebalancing. Monthly rebalancing achieves a substantial reduction in risk (1.81%) while maintaining competitive yields.
2. Optimal Strategy: Monthly rebalancing excluding its transaction costs provides the best balance between yield and risk, making it the optimal strategy for investors seeking high risk-adjusted returns.
3. Yield and Risk Balance: While half-year rebalancing offers the highest average yield, the risk is also higher. Investors must consider their risk tolerance when selecting a rebalancing frequency.
4. Yearly Rebalancing: Though better than non-rebalancing, yearly rebalancing is less effective in managing risk and delivering high Sharpe ratios compared to more frequent rebalancing.

Overall, rebalancing strategies enhance portfolio performance by managing risk and improving risk-adjusted returns, with monthly rebalancing being the most effective strategy in this study.

Optimal Portfolio with Moral Restrictions

Islamic financial instruments have garnered significant attention from global investors due to the moral constraints inherent in Sharia compliance. These moral boundaries represent an evolution of the bounded rationality theory, focusing on the limitations of human

rationality in information processing and problem-solving (Wayland, 2006).

Growth and Principles of the Islamic Stocks:

Study of 402 Sharia stocks in the ISSI group identified 24 issuers compliant with Sharia moral boundaries. These issuers were used to form portfolios under two primary constraints:

1. The ratio of interest debt and non-halal income to total assets must not exceed 45% (AP1).
2. The ratio of interest income and non-halal income to total income must not exceed 10% (AP2).

Cluster Analysis Results for Portfolio Grouping:

Clustering Method	Cluster	Return (%)	Risk (%)	N sum
Return Based Clustering	1	31.25	0.08	18
	2	34.64	0.27	6
Risk Based Clustering	1	10.08	0.28	2
	2	35.56	0.05	12
	3	32.60	0.01	10

This study investigates the growth and principles of the Islamic Capital Market by analyzing 402 Sharia stocks in the ISSI group, identifying 24 issuers compliant with Sharia moral boundaries.

Key findings: The compliance analysis through clustering provides insights into the performance and risk associated with Sharia-compliant portfolios:

Higher Return with Higher Risk: Portfolio 2 in the return-based clustering and Portfolio 2 in the risk-based clustering exhibit higher returns but come with higher associated risks.

Low Risk, Moderate Return: Portfolio 1 in the return-based clustering offers a balanced option with moderate returns and low risk, making it an attractive choice for risk-averse investors.

Optimal Risk-Return Balance: Portfolio 2 in the risk-based clustering presents the best risk-return balance, achieving the highest return with the lowest risk, making it ideal for investors seeking optimal performance with minimal risk.

These findings highlight the effectiveness of Sharia compliance in portfolio formation, demonstrating that adherence to Islamic financial principles can yield competitive returns with varying levels of risk. The study underscores the importance of selecting appropriate clustering methods based on investor risk preferences and return expectations.

Overall, portfolio with compliance analysis demonstrates the cluster, return, and risk values for portfolios formed through Ward's linkage. Portfolio 1 (return-based) has a compliance value of 31.25%, lower than portfolio 2's 34.64%. However, portfolio 2 has a higher risk (0.27%) compared to portfolio 1 (0.08%).

CONCLUSION

This study explores various approaches to portfolio optimization, demonstrating the effectiveness of sectoral, regional, and rebalancing strategies. Sectoral portfolios on the IDX showed superior performance, yielding an average return of 30.13% per year with a Sharpe ratio of 12.82. Regional diversification within ASEAN, particularly with a 90:10 domestic to regional ratio, provided high returns and better risk-adjusted performance. Rebalancing strategies were also evaluated, with one-month rebalancing yielding the highest Sharpe ratio (11.27) and lowest risk. However, the six-month rebalancing strategy did not consistently outperform non-rebalancing, indicating that market conditions should influence rebalancing decisions.

Additionally, the inclusion of Islamic financial instruments showed higher expected returns, but varied performance based on market conditions, emphasizing the importance of adaptive and diversified strategies. Overall, the findings highlight the need for dynamic portfolio management to optimize returns and manage risks effectively.

Overall, the study underscores the importance of adopting adaptive and multifaceted approaches in portfolio management to achieve optimal performance in diverse market environments.

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