

# LITERATURE REVIEW ON ASSET ALLOCATION METHODS IN OPTIMISING PORTFOLIOS

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## ABSTRACT

Investment selection and asset allocation are fundamental components of financial management that have a significant impact on portfolio performance and risk management. The main objective of this article is to find out the methods used to perform asset allocation strategies to optimize portfolios so as to improve investor's financial goals and minimize the risks that may be faced so that they can make strategic decisions to deal with market uncertainty. Based on previous research there are many methods that can be used for asset allocation to optimize portfolios. The purpose of investors investing in the capital market is to obtain returns that are expected to be greater than deposit interest with a certain period of time. Therefore, the choice of calculation method for the optimal portfolio depends on the investor's preference for risk and experience of the investor. An investor can create an optimal portfolio by balancing risk and maximum return. It all depends on the investment objective of each investor.

**Keywords :** Asset Allocation Method, Optimal Portfolio

## 1. INTRODUCTION

Investment selection and asset allocation are fundamental components of financial management that have a significant impact on portfolio performance and risk management. Asset allocation theory has been the subject of research aimed at optimizing investment strategies, because the goal of investing is to get maximum profit. As an investor, you must demand a return on the funds that have been invested.

Research has consistently highlighted the importance of diversification in asset allocation decisions. Research (Li, 2022) examines the effect of asset allocation on investment performance in the topic of retirement strategies based on asset classes. (Chen, 2022) examines the impact of asset allocation on corporate risk-taking behavior. Based on these studies, it is said that optimal asset allocation, selection of competent investment managers and detailed risk analysis are important factors in achieving portfolio performance. The importance of asset selection and allocation is the importance of strategic decision making in achieving financial goals. Consideration of important considerations such as diversification, risk management, and optimization of important considerations such as diversification, risk management, and optimization of investor and fund manager performance can improve portfolio return well. The main objective of this article is to find out the methods used to perform asset allocation strategies to optimize portfolio so as to improve investor's financial goal and minimize the risks that may be faced so as to make strategic decisions to deal with market uncertainty.

## 2. RESEARCH METHODS

The method used in this research is Systematic Literature Review (SLR) is a structured approach to analyzing existing research on a particular topic. It involves systematically searching, selecting, evaluating and synthesizing relevant empirical studies to provide a comprehensive overview of the subject matter. In the context of asset allocation for portfolio optimization purposes, a systematic literature review has been conducted to explore various knowledge related aspects. This article uses the SLR method to analyze asset allocation strategies for portfolio optimization.

Based on a search using publish or perish using the keyword asset allocation on portfolio with a maximum limit of 50 relevant articles were found from Google Scholar and Scopus. The decision to limit 50 articles because the article is the top article that is most cited. From the identified articles or journals, screening is carried out with the criteria that the journal or article must be published between 2021-2024. 12 articles/journals that are not full text and are not processed, 12 articles related to asset allocation and portfolio optimization were identified. Finally a review of 12 articles that fulfilled all inclusion criteria, namely articles/journals with quantitative data, was conducted and conclusions were drawn

### 3. RESULTS AND DISCUSSION

Asset allocation strategies in optimizing portfolios are very important, this is done to increase the effectiveness of portfolio management. These strategies include diversifying the portfolio and reducing risk and addressing market uncertainty as well as improving long term financial performance.

Review of 12 articles or journals that meet the criteria of asset allocation strategies for portfolio optimisation, the result are presented in table 1

Table 1. Articles/ Journals Asset Allocation Strategy in Optimising Portfolio

No	Researcher / Year	Title	Sample	Method	Result
1.	(Awaludin et al., 2021)	Analysis of the Effect of Asset Allocation on Portfolio Performance with Diversification as an intervening variable	136 Pension funds registered with OJK	Statistical Method using SEM	Selection ability has a positive and significant effect on diversification, indicating that the pension fund manager has a good ability to choose an asset allocation strategy to anticipate risks that may occur during this study period
2.	(Aggarwal, 2022)	Optimum investor portfolio allocation in new age digital assets	Using the closing prices of cryptocurrencies from 8 august 2015 to 18 june 2020	Applying the Multi Garch (M-Garch) Model	Litecoin is the most volatile cryptocurrency. The portfolio weights show that investors can create two optimized asset portfolios with the lowest exposure to stellar eith litecoin and ripple. Market participants with a long position in ripple can obtain the cheapest hadge by selling stellar
3	(Umar & Olson, 2022)	Strategic asset allocation and the demand for real estate: international evidence	42 this alternative real estate index covers geographical coverage Asia-Pacific, Australasia, EU Europe, Market Developed, Emerging, and World (not including the US)	Alternative methodology based on cointegration test across asset classes	Real estate can be a desirable component of of an investor's portfolio - especially for investors with a short-term investment horizon. In the long run, real estate provides littled iversification benefit against an optimal portfolio of risky Assets consisting only of a stock index and national bonds country
4	(Durall, 2022)	Asset Allocation: From Markowitz to Deep Reinforcement Learning	8 Shares of well-known companies in Spain for 7 years	Conduct benchmarks to determine the reliability of portfolio optimisation techniques based on traditional	Approach Traditional based on Markowitz portfolios this model shows stable results. However, in highly volatile markets, this traditional approach is less suitable, and the Algorithm is only

No	Researcher / Year	Title	Sample	Method	Result
				theoretical approaches (Markowitz mean variance portfolio theory) and machine learning approaches.	designed based on asset returns While the Machine Approach tends to have a process that exceeds the traditional approach, it also provides a weaker performance process. will indirectly
5	(Abdurakhman, 2022)	Asset Allocation in Indonesian Stocks Using Robust Portfolio	4 banking stocks in Indonesia AGRS, BTPN, BBNI, BBKA Closing Price shares Daily (2 January 2020- 2 January 2022)	Portfolio mean-variance-skewness strong which includes skewness in its optimisation	The role of variance is still dominant in determining the percentage weight of a portfolio. If investors take into account risk of a portfolio, the largest weighting occurs in the stock market with a high risk smallest. When investors consider the slope of returns, the portfolio allocation of weights tends to be evenly distributed between each share.
6	(Gusliana & Salih, 2022)	Mean-variance Investment Portfolio Optimisation Model Without Risk Free Assets in JII 70 Share	5 Stocks that JII 70 (May 2021- April 2022)	Mean-variance Investment Portfolio Optimisation with No Risk Free Assets	Determine the allocation of portfolio weights of optimal investment in riskless assets, can investment portfolio optimisation model is used Mean-Variance as model basic Markowitz model. Mean-Variance expansion is done by including risk-free assets in JII70 stocks. With this expansion, it can be derived formula to determine the weight allocation of the optimal portfolio. From the investment portfolio optimisation model, an optimal portfolio consisting of five stocks that are included in the list is obtained. JII70 stocks
7	(Ardi & Darwanto, 2023)	Analysis of Determining optimal portfolio	This Quantitative research uses secondary data in	Markowitz diversification method with	Result research shows that the actual portfolio of BPKH in 208 and

No	Researcher / Year	Title	Sample	Method	Result
		in BPKH'S portfolio using Tangency Portfolio Model	the form of price and coupons of each sukuk instrument, yield results equivalent of Islamic banks (BUS) and sharia Business Units (UUS), as well as BI 7-day Repo Rate as Rate interest rates. Data is taken on a quarterly basis starting 1 <sup>st</sup> quarter of the year 2018 to 4 <sup>th</sup> quarter of 2021	portfolio tangency model as a model to determine the optimal	2019 cannot be determined as an efficient potfolio and optimal portfolio. Optimal portfolio while the reliation of the BPKH portfolio in 2020 and 2021 is an efficient portfolio but not an optimal portfolio
8	(Haymans Manurung et al., 2023)	Construction Portfolio Using Elton Gruber Model: COVID-19	6 Selected stocks that are members of the sri kehati business index during January 2015- June 2015. 2022	using the model Elton gruber return calculation using equal weighted and market capitalisation weighted	Equal Weighted and Market Capitalisation portfolios are only affected by Market shock. Based on the results of this study, it implies that investors do not need fund managers to manage their portfolios if investors use equal weighted or capitalisation mode. market weighted
9	(Ling & Dasril, 2023)	Portfolio Selection Strategies in Bursa Malaysia Based on Quadratic Programming	15 potential top- performing companies on Bursa Malaysia for the period 2014-. 2020	Quadratic programming method	The quadratic programming (QP) model can solve all types of mathematical optimisation problems in research. research. Therefore, investors can optimise portfolio return of their investment with using the QP method.
10	(Herlansyah & Saepudin, 2023)	Use Of The Black- Litterman Model In Portfolio Optimisation For Active Investors On Stocks In Lq45 Index	2 companies namely BBKA. and TLKM 3 July 2018-27 June 2022	the use of Black- Litterman Model in optimising portfolios for active investors	The value of the investor view matrix also has an influence in calculating the expected return value using the Black-Litterman model. In the third test scenario, the return value of BBKA.JK shares is

No	Researcher / Year	Title	Sample	Method	Result
					smaller than the return value of BBCA.JK shares in the second test scenario, but when the investor's view is 0.1 (optimistic), the number of shares returned is 0.1 (optimistic). BBCA.JK shares are growing
11	(Riyadhi & Atok, 2023)	Impact of COVID-19 on Indonesia stock portfolio allocation based on a technical & Fundamentals approach using a machine learning algorithm [version 1; peer Review: 1 approved with reservations]	35 stocks that are members of the LQ45 Index period 1 January 2019 to	Clustering method	From the clustering results, it is known that LQ 45 stocks are grouped into 4 clusters, the results of which are as follows used as a reference in portfolio allocation
12	(Manurung, 2024)	Stock selection using semi-variance and Beta to construct portfolio and effect macro-variable on portfolio Return.	28 Share that to member portfolio	Equal Weighted, Market Capotalisation Weighted, Methods Markowitz and Elton Gruber used for build portfolio	This research found that the boundary curve efficient method similar to the Markowitz. Criteria Roy found that the level of returns portfolio varies form 2.2% tp 9.65% however criteria kataoka found the level of returns portfolio varies from 5.4% to 11.12% Reasearch. This research found that Elton Gruber has return for all four portfolios. Market return has an effect significsnt against all return portfolio but interest rate effect significant to

No	Researcher / Year	Title	Sample	Method	Result
					portfolio return for the weighted portfolio equal and Elton method Gruber.

The approaches used in all articles sampled include using SEM Statistical Methods, Multi Garch Models, Asset class Cointegration Tests, Benchmarking to determine the reliability of portfolio optimisation techniques based on traditional theoretical approaches with Markowitz mean variance portfolio theory and machine learning approaches. Other methods used in order to optimise portfolios are the Strong mean-variance skewness, investment portfolio optimisation with mean variance without asset free ratio, Markowitz diversification method with portfolio tangency model as a model to determine the optimal portfolio. Other studies use the Elton Gruber model method in calculating returns and use equal weighted and weighted market capitalisation. (Ling & Dasril, 2023) examined 15 potential companies that have the best performance on Bursa Malaysia using the Quadratic programming method. (Herlansyah & Saepudin, 2023) conducted research on BCA and Telkom using the Black-Litterman model method in optimising portfolios for active investors. Other research uses the Clustering Method.

Based on previous research, there are many methods that can be used to allocate assets to optimise portfolios. The purpose of investors investing in the capital market is to obtain returns that are expected to be greater than deposit interest with a certain period of time. Therefore, the choice of calculation method for the optimal portfolio depends on the investor's preference for risk and the experience of the investor

#### 4. CONCLUSION

Based on previous research, asset allocation strategies in optimising portfolios have many methods that can be used. Each method has its own advantages and disadvantages. The point is that investors must allocate assets properly and efficiently. The portfolio is said to be efficient if the portfolio has a minimum risk for the desired level of return and acceptable risk. Investors can try to choose a combination of assets that maximises expected return or minimises risk, depending on their investment objectives. Investors can create an optimal portfolio by balancing risk and maximum return. It all depends on each investor's experience and investment goals.

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