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Pembentukan Portfolio Optimal Saham Indeks SRI KEHATI Pada Bursa Efek Indonesia (Periode 2019-2023)

Optimal Portfolio Formation of SRIKEHATI Index Stocks on the Indonesia Stock Exchange (2019-2023 Period)

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Abstrak

Kondisi ekonomi yang stabil di Indonesia memberikan dampak positif, yang mengarah pada peningkatan jumlah investor di pasar modal Indonesia. Salah satu instrumen utama dalam pasar ini adalah saham. Tujuan dari penelitian ini adalah untuk menciptakan portofolio optimal yang dapat direkomendasikan kepada investor. Penelitian ini menggunakan model CAPM dan Markowitz serta melibatkan penggunaan data sekunder. Proses pemilihan sampel penelitian menggunakan teknik non-probabilitas, khususnya purposive sampling. Penelitian ini berfokus pada Indeks SRI KEHATI untuk periode dari Januari 2019 hingga Desember 2023. Dengan menggunakan metode CAPM, tujuh saham efisien telah diidentifikasi, yaitu BBCA, BBNI, BBRI, BMRI, JSMR, KLBF, dan UNTR. Kombinasi tujuh saham menggunakan model Markowitz membentuk dua preferensi. Preferensi pertama menghasilkan proporsi alokasi dengan rumus yang menghasilkan imbal hasil portofolio tahunan sebesar 40,55% dan risiko portofolio tahunan sebesar 30,33%. Preferensi kedua menghasilkan proporsi alokasi dengan solver yang menghasilkan imbal hasil portofolio tahunan sebesar 46,79% dan risiko portofolio tahunan sebesar 32,91%.

Abstract

The stable economic conditions in Indonesia have had a positive impact, leading to an increase in the number of investors in the Indonesian capital market. One of the key instruments in this market is stocks. The aim of this research is to create an optimal portfolio that can be recommended to investors. The study utilizes the CAPM and Markowitz models and involves the use of secondary data. The research sample selection process makes use of non-probability sampling techniques, specifically purposive sampling. This research focuses on the SRI KEHATI Index for the period from January 2019 to December 2023. Using the CAPM method, 7 efficient stocks have been identified, namely BBCA, BBNI, BBRI, BMRI, JSMR, KLBF, and UNTR. The combination of 7 stocks using the Markowitz model forms two preferences. The first preference generates an allocation proportion with a formula that results in an annual portfolio expected return of 40.55% and an annual portfolio risk of 30.33%. The second preference generates an allocation proportion with a solver that results in an annual portfolio expected return of 46.79% and an annual portfolio risk of 32.91%.

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1. Introduction

The global economic slowdown has not adversely affected Indonesia's economy. This is evidenced by the ongoing growth in production and the sustained increase in domestic demand, which remains robust in terms of both investment and household consumption. According to a report published by the Badan Pusat Statistik (BPS), in 2023, Indonesia's economic growth was 5.05%, slightly lower than the 5.31% growth in 2022. However, the rate of economic growth, measured by Gross Domestic Product (GDP), increased to Rp20,892.4 trillion in 2023 compared to Rp19,588.4 trillion in the previous period of 2022. This favorable economic condition has attracted both domestic and foreign investors (Retha & Budiarti, 2021).

According to data from the Kustodian Sentral Efek Indonesia (KSEI), the number of capital market investors increased by 11.22% (ytd) at the beginning of 2023. This increase brought the number of capital market investors from 10.31 million in 2022 to 11.58 million by August 8, 2023. In terms of demographics, investors in Indonesia are predominantly under 30 years old, making up 56.98% of the total. Additionally, 27.83% are students, indicating that students are starting to plan for their future by investing. However, many young investors experience losses when investing. These investors tend to focus more on quickly achieving high returns without considering potential future losses. This failure is attributed to novice investors relying more on internal factors or behavioral biases when making investment decisions due to their limited knowledge about investing (Puspawati & Yohanda, 2022). According to (Arifin & Mutasowifin, 2022), investors aim to achieve the highest possible returns with the lowest possible risks. This can be realized by having a strategy, skills in analysis, and good investment knowledge as a basis for making the right investment decisions to avoid risks.

Capital market investors invest in stocks, one of the traded instruments. According to (Nurhadi, 2020), stocks can provide profits in the form of dividends and capital gains. Stocks can offer high returns, but the level of risk is also high (Budiman, 2021). Therefore, as an investor, it is necessary to diversify by forming a portfolio, which is a combination of various assets to minimize risk without reducing the expected return (Mustakim, 2021). In the study conducted by (Yunita, 2018), the optimal portfolio was generated using the Markowitz model. In the research by (Natalia et al., 2014), stocks categorized as part of the optimal portfolio were also generated using the Markowitz model. (Sirait et al., 2022) studied forming an optimal portfolio using the Markowitz model. Additionally, the results of optimal portfolios were obtained through a combination of the Markowitz model and the Single Index Model in studies by (Pratiwi et al., 2014), (Simorangkir, 2021), and (Permata & Suryawati, 2020). Besides using these two models, an optimal portfolio was also formed using CAPM by (Arimarista, 2017) and a combination of CAPM and the Single Index Model by (Aunillah & Wahyudi, 2022). Therefore, the novelty of this study lies in the formation of the optimal portfolio using a combination of the Markowitz model and CAPM

The portfolio diversification used refers to the optimal portfolio method proposed by (Markowitz, 1952). An optimal portfolio is a collection of efficient portfolios chosen by investors. Efficient portfolios are those that provide high returns at a certain level of risk or minimize risk while achieving specific returns (Tandelilin, 2001). Markowitz's model forms efficient sets and optimal portfolios by connecting risk measured by standard deviation and expected returns from the average returns of a stock.

According to (Budiman, 2021), the formation of investment portfolios can be done by selecting one of the indices in the capital market. Otoritas Jasa Keuangan (OJK) states that the Indonesia Stock Exchange (IDX) currently lists 44 types of stock indices categorized based on their criteria. One of the stock indices maintained by IDX is the SRI-KEHATI Index. Researchers are interested in using this index in line with the statement by (Trisnowati, 2023) that Indonesia is a country concerned about global warming issues and environmental problems. The government's efforts to address these issues are reflected in the Mandate of the Environmental Investment Law with policies related to Green Investment. Green investment involves investing or capitalizing in companies committed to environmentally friendly practices, such as natural resource conservation, production and discovery of alternative and renewable energy sources (EBT), and implementation of clean air and water projects.

The SRI-KEHATI Index is one of the indices that consists of companies that implement green investments. The SRI-KEHATI Index reflects the stock price performance of 25 listed companies with good performance, focusing on the application of Sustainable and Responsible Investment (SRI) principles as well as Environmental, Social, and Good Governance (ESG) principles. The Indonesian Biodiversity Foundation (KEHATI Foundation) manages the SRI-KEHATI Index and pioneered the green index in the capital market. The green index mirrors stock price performance that incorporates green investments. Based on the background and considerations of the factors discussed, the author is interested in conducting research titled "Formation of Optimal Portfolio of SRI-KEHATI Index Stocks on the Indonesia Stock Exchange (2019-2023 Period)."

2. Method

This research approach is quantitative, utilizing secondary data in the form of time series from 2019 to 2023. The secondary data is obtained from historical data available on Bloomberg Data, the IDX website www.idx.co.id, the Bank Indonesia website, and yahoo.finance.com. In addition to these sources, additional sources used include company documents, company financial reports, company websites, theses, journals, books, and the Internet. The obtained data is then processed using the analysis toolpak in Microsoft Excel 2021 using the CAPM method and the Markowitz model.

The sample selection uses a non-probability sampling technique, specifically purposive sampling. The selected samples represent the entire population with specific characteristics. The criteria used are companies listed on the IDX, companies included in the SRI-KEHATI Index for at least the last 5 years during the study period, and the availability and completeness of data. Based on these criteria, out of 25 issuers included in the SRI-KEHATI Index, the population used is 14 issuers. The analysis is conducted to examine the condition and development of stocks within the index, the performance of each listed company in the index, and to form an optimal portfolio as a recommendation for investors. The conceptual framework in Figure 1.

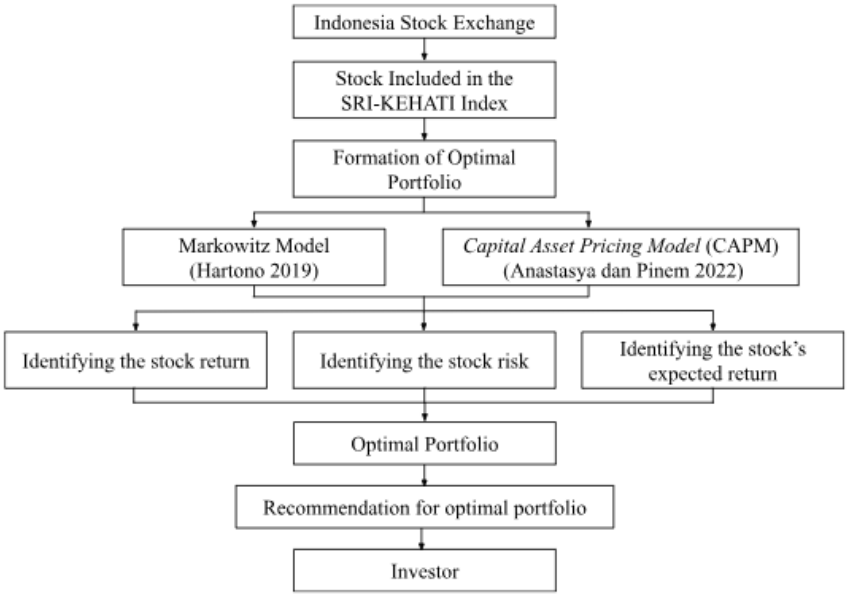

Figure 1. Conceptual Framework

3. Result and Discussion

3.1 Overview

From 2019 to 2023, the Indonesia Stock Exchange (IDX) has shown rapid development in the stock market, as seen in Figure 2. At the beginning of 2019, the condition of the IDX Composite Index (IHSG) remained steady, with an average of 6324. However, in March 2020, the stock market experienced a significant drop, plummeting to 4538, a decrease of -29.84% year-over-year (yoy). The Indonesian economy began to recover by the end of 2020. By 2022, the Indonesian economy

had stabilized, leading to a steady movement in the stock market. The IHSG reached its peak over the last five years at 7228 in April 2022.

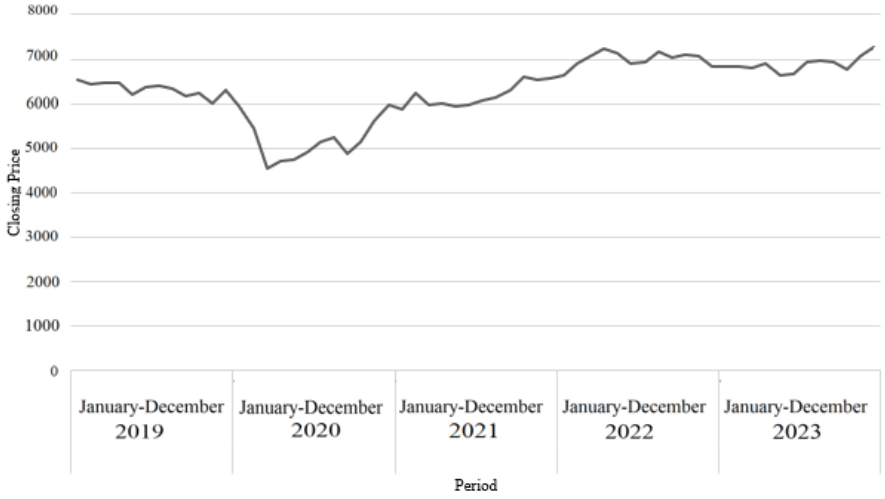

Figure 2. Indonesian capital market conditions for the period 2019-2023
Source: Yahoo Finance (2024)

The economic conditions affecting the Indonesian stock market also influence the movement of one of the indices listed on the IDX, namely the SRI-KEHATI Index. This situation illustrates whether the stock movements are in good or poor condition. The trendline of this index shows an uptrend, which is a positive signal for investors. Figure 3 reflects the movement of the SRI-KEHATI Index over the past five years.

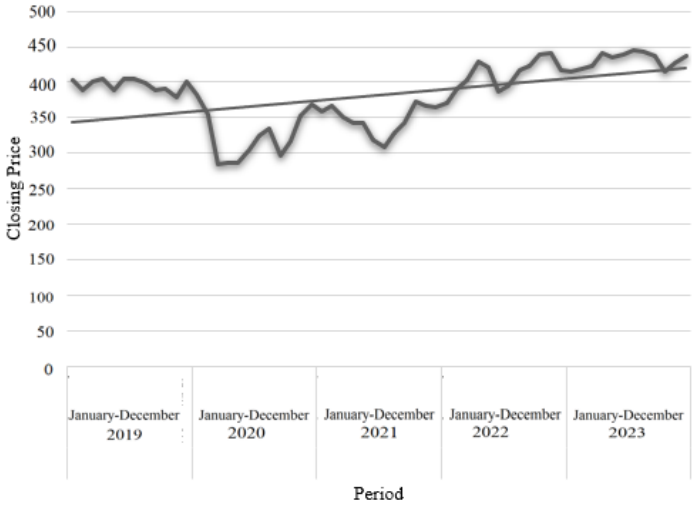

Figure 3. SRI-KEHATI Index conditions for the period 2019-2023
Source: yahoo.finance (2024)

3.2 Performance of SRI-KEHATI Stock Issuers for the Period January 2019-December 2023

Overall, the condition of SRI-KEHATI stocks has increased or shown an uptrend, as presented in Figure 3. Besides being influenced by the prevailing economic conditions, stock price movements are also affected by the performance of each company. The upward trend is due to the number of companies with good performance being more excellent than those with poor performance. Companies with good performance and an uptrend include BBCA, BBNI, BBRI, BMRI, KLBF, and UNTR. In contrast, companies with poor performance and a downtrend include JSMR, PGAS, SMGR, UNVR, and WIKA. Additionally, there are three companies with stable or sideways conditions, namely ASII, INDF, and TLKM. The stock price movements of each issuer in the index are presented in Figure 4.

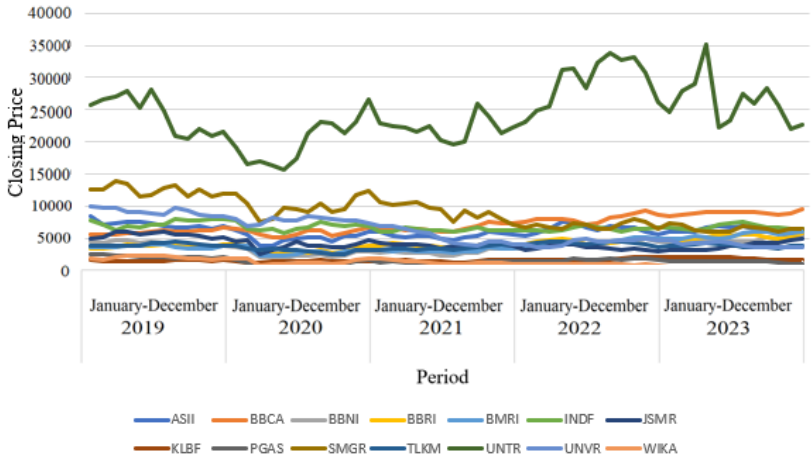

Figure 4. Performance of SRI-KEHATI stocks for the period January 2019-December 2023
Source: Bloomberg Data (2024)

3.3 Efficient Portfolio Selection

Making investment decisions on a stock requires a strong foundation and thorough analysis. Observing the favorable condition of the capital market influences one of the indices used by the researcher as a sample. Referring to the optimal portfolio theory, the researcher selected an efficient portfolio on the SRI-KEHATI index from January 2019 to December 2023 using the CAPM method.

The assessment of these stocks is based on the results of individual returns and expected returns, which indicate whether a stock is efficient or inefficient. A stock is considered efficient if its individual return is greater than the expected return (Ri > E(Ri)). Conversely, a stock is deemed inefficient if the individual return is less than the expected return (Cherie et al., 2014).

Table 1. Components to calculate *expected return*

Emiten Codes	Ri	Rm	Rf	σ_{im}	σ2m	βi
ASII	-0,0027	0,0026	0,0007	0,0021	0,0016	1,3160
BBCA	0,0101	0,0026	0,0007	0,0014	0,0016	0,8730
BBNI	0,0088	0,0026	0,0007	0,0031	0,0016	1,9566
BBRI	0,0115	0,0026	0,0007	0,0022	0,0016	1,3759
BMRI	0,0121	0,0026	0,0007	0,0023	0,0016	1,4107
INDF	-0,0012	0,0026	0,0007	0,0004	0,0016	0,2393
JSMR	0,0058	0,0026	0,0007	0,0026	0,0016	1,6079
KLBF	0,0019	0,0026	0,0007	0,0007	0,0016	0,4449
PGAS	-0,0055	0,0026	0,0007	0,0038	0,0016	2,4049
SMGR	-0,0062	0,0026	0,0007	0,0022	0,0016	1,3485
TLKM	0,0022	0,0026	0,0007	0,0015	0,0016	0,9421
UNTR	0,0043	0,0026	0,0007	0,0017	0,0016	1,0691
UNVR	-0,0150	0,0026	0,0007	0,0002	0,0016	0,1035
WIKA	-0,0199	0,0026	0,0007	0,0037	0,0016	2,3358

Sources: Data processed (2024)

The first step in the CAPM method involves calculating the average actual returns of each stock (Ri), the **actual** market returns (Rm), and the actual risk-free rate (Rf), as shown in Table 1. Before obtaining the expected return results for each stock, the next step is to determine the beta value. The beta value is obtained by dividing the covariance by the variance. The beta values are presented in Table 1.

Table 2. Efficient Portfolio Selection for the SRI-KEHATI Index

Emiten Codes	Ri	Ri (%)	E(Ri)	E(Ri)(%)	Note
ASII	-0,0027	-0,26%	0,0033	0,33%	*Non-efficient*
BBCA	0,0101	1,01%	0,0024	0,24%	*Efficient*
BBNI	0,0088	0,88%	0,0045	0,45%	*Efficient*
BBRI	0,0115	1,15%	0,0034	0,34%	*Efficient*
BMRI	0,0121	1,20%	0,0035	0,35%	*Efficient*
INDF	-0,0012	-0,11%	0,0011	0,11%	*Non-efficient*
JSMR	0,0058	0,58%	0,0038	0,38%	*Efficient*
KLBF	0,0019	0,19%	0,0016	0,16%	*Efficient*
PGAS	-0,0055	-0,55%	0,0054	0,54%	*Non-efficient*
SMGR	-0,0062	-0,61%	0,0033	0,33%	*Non-efficient*
TLKM	0,0022	0,21%	0,0025	0,25%	*Non-efficient*
UNTR	0,0043	0,43%	0,0028	0,28%	*Efficient*
UNVR	-0,0150	-1,49%	0,0009	0,09%	*Non-efficient*
WIKA	-0,0199	-1,98%	0,0053	0,53%	*Non-efficient*

Source: Data Processed (2024)

Table 2 calculates the efficient portfolio obtained as a research sample. It shows that not all research samples are included in the efficient portfolio. According to the results of Table 2, the highest realized return was produced by BMRI stock at 0.0121 or 1.20%, with an expected return of 0.0035 or 0.35%.

Conversely, the smallest realized return was produced by WIKA stock at -0.0198 or -1.98%, with an expected return of 0.0053 or 0.53%. The highest expected return was produced by PGAS stock at 0.0054 or 0.54%, with a realized return of -0.0055 or -0.55%. Meanwhile, the lowest expected return was produced by UNVR stock at 0.0009 or 0.09%, with a realized return of -0.0149 or -1.49%. The selection of stocks for the efficient portfolio includes the following issuers: BBCA, BBNI, BBRI, BMRI, JSMR, KLBF, and UNTR. The stocks classified as inefficient portfolios are ASII, INDF, PGAS, SMGR, TLKM, UNVR, and WIKA.

Based on the selection results, there are efficient and inefficient portfolios. Seven samples of stocks passed and are categorized as efficient stocks, illustrated in Figure 7 with the Security Market Line (SML) graph.

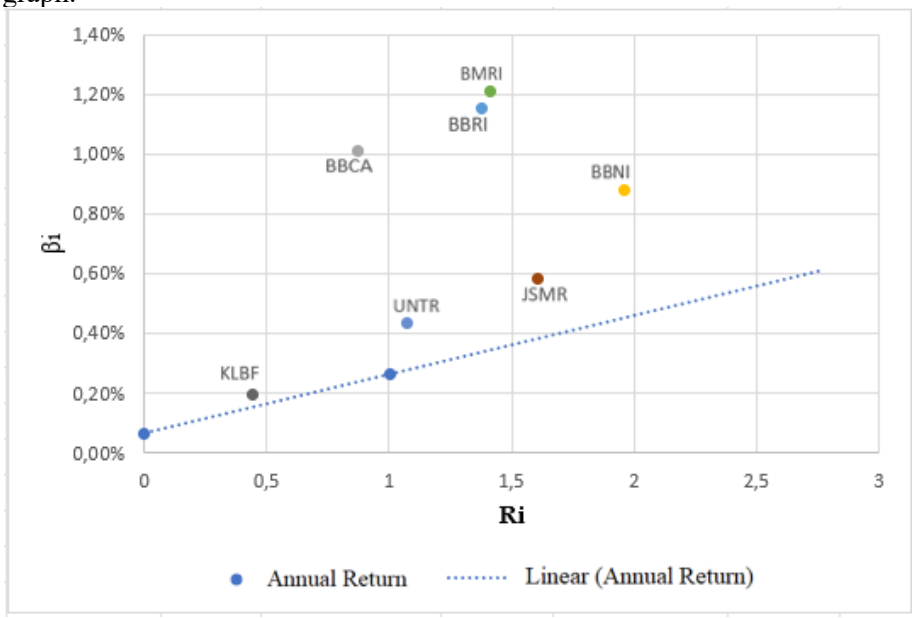

Figure 5. Security Market Line (SML)
Source: Data Processed, 2024

3.4 Formation of Optimal Portfolio using Markowitz Model *Expected Return*

In the previous method, efficient portfolio selection was conducted to form optimal portfolios. The components forming these optimal portfolios utilized the Markowitz model. Investor portfolio selection in this approach is based on preference calculations regarding expected returns and risks.

3.4.1 Expected Return

Based on the expected return data of stocks in Table 3, the expected return rates of each asset show positive outcomes, indicating that investing in these stocks would yield profits for investors. The highest expected return rate is obtained from BMRI stock at 0.0121 or 1.20%. Conversely, the lowest expected return rate is obtained from KLBF stock at 0.0019 or 0.19%.

Table 3. Expected return values for 7 efficient stock samples

Emiten Code	E(Ri)	E(Ri)(%)
BBCA	0,0101	1,01%
BBNI	0,0088	0,88%
BBRI	0,0115	1,15%
BMRI	0,0121	1,20%
JSMR	0,0058	0,58%
KLBF	0,0019	0,19%
UNTR	0,0043	0,43%

Source: Data processed (2024)

3.4.2 *Standard Deviation and Variance*

Table 4 shows the results of standard deviation and variance values, which represent the level of risk investors would incur if they invested in those stocks. After calculating the risk level for each asset, the highest standard deviation and variance are obtained from UNTR stock with a standard deviation of 0.1124 and variance of 0.0126. Conversely, the lowest risk level is observed for BBCA stock with a standard deviation of 0.0514 and a variance of 0.0026.

Table 4. Standard Deviation and Variance values for 7 efficient stock samples

Emiten Code	σi	σi2
BBCA	0,0514	0,0026
BBNI	0,1046	0,0109
BBRI	0,0770	0,0059
BMRI	0,0824	0,0068
JSMR	0,1032	0,0106
KLBF	0,0609	0,0037
UNTR	0,1124	0,0126

Source: Data processed (2024)

3.4.3 *Variance-Covariance* dan *Correlation*

Based on the data shown in Table 5, there are positive and negative covariance results. The covariance results in Table 5 identify that stocks BBCA, BBNI, BBRI, JSMR, KLBF, and UNTR have positive covariance values, indicating that the values of these two variables move in the same direction.

Table 5. Variance-Covariance Matrix of 7 efficient SRI-KEHATI stocks

	BBCA	*BBNI*	*BBRI*	*BMRI*	*JSMR*	*KLBF*	*UNTR*
BBCA	0,0026	0,0035	0,0027	0,0030	0,0018	0,0006	0,0020
BBNI	0,0035	0,0109	0,0057	0,0065	0,0068	0,0016	0,0029
BBRI	0,0027	0,0057	0,0059	0,0044	0,0038	0,0005	0,0014
BMRI	0,0030	0,0065	0,0044	0,0068	0,0043	0,0009	0,0021
JSMR	0,0018	0,0068	0,0038	0,0043	0,0106	0,0008	0,0010
KLBF	0,0006	0,0016	0,0005	0,0009	0,0008	0,0037	0,0012
UNTR	0,0020	0,0029	0,0014	0,0021	0,0010	0,0012	0,0126

Source: Data processed (2024)

The correlation results in Table 6 identify no stocks with negative correlation values, indicating that stock movements do not oppose each other. However, several stock correlation values in Table 6 approach zero. Stocks showing correlation values near zero can be diversified because their price movements are not related. Additionally, there are stocks with correlation values approaching one. Stocks with correlation values of one or close to one cannot be diversified as their price movements are aligned.

Table 6. Correlation among Individual Asset Classes

	BBCA	*BBNI*	*BBRI*	*BMRI*	*JSMR*	*KLBF*	*UNTR*
BBC	1,000						
BBNI	0,649	1,0000					
BBRI	0,674	0,7099	1,0000				
BMRI	0,700	0,7497	0,6987	1,0000			
JSMR	0,347	0,6270	0,4802	0,5040	1,0000		
KLBF	0,185	0,2458	0,0965	0,1763	0,1241	1,0000	
UNT	0,351	0,2462	0,1634	0,2268	0,0862	0,1685	1,0000

Sumber: Data diolah (2024)

3.4.4 Portfolio Optimal

The final calculation results from the Markowitz model consist of the optimal weights of each asset in the portfolio to be invested by the investor. This combination yields an optimal asset allocation that maximizes returns for a given level of risk. The efficient set depicted in Figure 8 is located at points on the line. Among the efficient sets formed, one represents the optimal portfolio. Figure 8 illustrates the efficient frontier line of the optimal portfolio SRI-KEHATI for the period from January 2019 to December 2023.

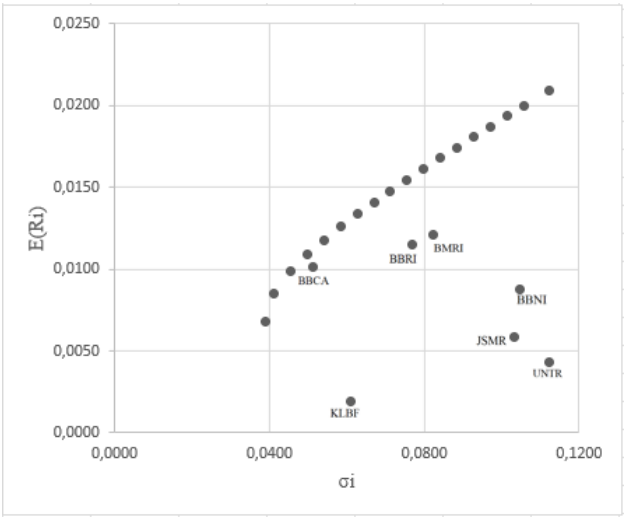

Figure 6. *Efficient Frontier Line*
Source: Data processed (2024)

3.4.5 Minimum Risk Optimal Portfolio using Formula

The next step involves calculating the optimal portfolio proportions using a formula with a preference for the smallest risk. The resulting minimum variance portfolio shows a portfolio risk of 0.0392 and an expected portfolio return of 0.0068. The proportions for each stock are presented in Table 7.

Table 7. Allocation proportions of optimal portfolio using formula

Company Name	Emitenn Code	E(Ri)	Proportion
Bank Central Asia Tbk.	BBCA	0,010	62,91%
Bank Negara Indonesia	BBNI	0,008	-24,40%
Bank Rakyat Indonesia	BBRI	0,011	11,55%
Bank Mandiri (Persero)	BMRI	0,012	-3,23%

Company Name	Emitenn Code	E(Ri)	Proportion
Jasa Marga (Persero)	JSMR	0,005	13,22%
Kalbe Farma Tbk	KLBF	0,001	37,57%
United Tractors Tbk.	UNTR	0,004	2,37%

Source: Data processed (2024)

Based on Table 7, the largest allocation of funds is allocated to BBCA stock at 62.91%, while the smallest allocation is to UNTR at 2.37%. Among the seven stocks, two stocks are allocated for short selling. These stocks are BBNI with the highest proportion of -24.40% and BMRI at -3.23%. The allocation proportions are shown in Figure 7 as the result of forming an optimal portfolio, which can serve as a strategy for individuals looking to invest.

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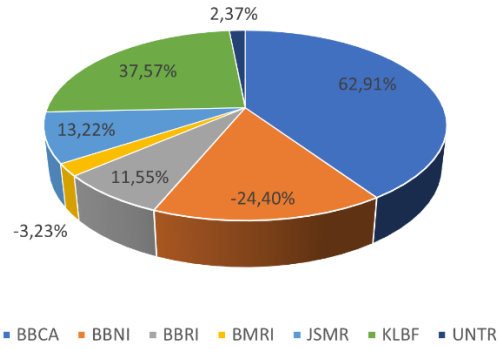

Figure 7. Proportions of optimal portfolio using formula

Source: Data Processed (2024)

Table 8. Formulation of expected return and risk levels with formula

	Monthly	Annual (%)
Expected return portofolio	0,0068	40,55%
Risiko portofolio	0,0392	30,33%

Source: Data Processed (2024)

The combination of stocks and allocation proportions using the formula yields the expected return and investment risk, as shown in Table 8. Investors following the allocation calculated in Table 7 achieve an annual expected return of 40.55% with an annual portfolio risk of 30.33%.

3.4.6 Minimum Risk Optimal Portfolio using Solver without Short Selling

Due to its optimization process of minimizing or maximizing an objective function, the solver function in Microsoft Excel can calculate the minimum risk value of the portfolio at the optimal portfolio proportions for each asset. The minimum variance portfolio result using the solver yields a portfolio risk of 0.0425 and an expected portfolio return of 0.0078, with the optimal portfolio proportions detailed in Table 9.

Table 9. Allocation proportions of optimal portfolio using solver

Company Name	Emiten Code	E(Ri)	Proportion
Bank Central Asia	BBCA	0,0101	55,62%
Bank Negara	BBNI	0,0088	-
Bank Rakyat	BBRI	0,0115	-
Bank Mandiri	BMRI	0,0121	-
Jasa Marga (Persero)	JSMR	0,0058	4,38%
Kalbe Farma Tbk	KLBF	0,0019	38,52%
United Tractors Tbk.	UNTR	0,0043	1,48%

Source: Data Processed (2024)

Table 9 illustrates the allocation of funds across four stocks, with BBCA having the highest proportion at 55.62% and UNTR the lowest at 1.48%. The remaining two stocks allocated are KLBF at 38.52% and JSMR at 4.38%. This allocation can be visualized in Figure 8.

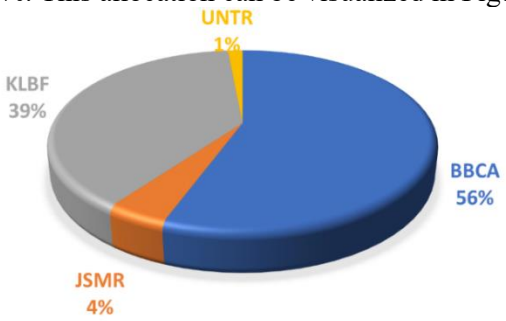

Figure 8. Proportions of minimum risk optimal portfolio using solver

Source: Data processed (2024)

Table 10. Formulation of expected return and risk levels with solver

	Monthly	Annual (%)
Expected return portofolio	0,0078	46,79%
Portfolio risk	0,0425	32,91%

Source: Data Processed, 2024

The combination of stocks and allocation proportions using the solver results in expected returns and investment risks, as shown in Table 10. If investors allocate proportions according to the solver optimization in Table 9, the annual expected return obtained is 46.79%, with an annual portfolio risk of 32.91%.

4. Conclusion

Based on the results and discussion of forming an optimal portfolio using CAPM and the Markowitz Model on the SRI-KEHATI Index from January 2019 to December 2023, it can be concluded that the overall performance of the stocks in the index during this period was in an uptrend. Six issuers showed an uptrend condition: BBCA, BBNI, BBRI, KLBF, and UNTR. Additionally, three issuers were in a sideways condition: ASII, INDF, and TLKM. Meanwhile, five other issuers were in a downtrend condition: JSMR, PGAS, SMGR, UNVR, and WIKA. Prevailing economic conditions and the performance of each company influenced these movements.

Based on the CAPM method calculations of 14 research sample stocks from the SRI-KEHATI Index from January 2019 to December 2023, seven stocks were classified as efficient: BBCA, BBNI, BBRI, BMRI, JSMR, KLBF, and UNTR. BMRI obtained the highest expected return at 0.0121 or 1.20%. On the other hand, seven samples were classified as inefficient: ASII, INDF, PGAS, SMGR, TLKM, UNVR, and WIKA.

The formation of an optimal portfolio using the Markowitz model on the SRI-KEHATI Index resulted in seven stock combinations, each with different proportions, expected returns, and risks. For the calculation with the lowest risk preference formula, the annual expected portfolio return was 40.55%, and the annual portfolio risk was 30.33%. The allocation proportions for each issuer were as follows: BBCA at 62.91%, BBNI at -24.40%, BBRI at 11.55%, BMRI at 3.23%, JSMR at 13.22%, KLBF at 37.57%, and UNTR at 2.37%. Meanwhile, the calculation using the solver method resulted in an annual expected portfolio return of 46.79% and an annual portfolio risk of 32.91%. The allocation proportions using the solver method were BBCA at 55.62%, BBNI at 0%, BBRI at 0%, BMRI at 0%, JSMR at 4.38%, KLBF at 38.52%, and UNTR at 1.48%.

This study forms an optimal portfolio using the Markowitz model, consisting of an efficient portfolio with the CAPM method applied to the performance of the SRI-KEHATI Index stock portfolio. Future research is recommended to measure the performance of the optimal portfolio based on fundamental analysis of the companies, such as profitability ratios, liquidity ratios, solvency ratios, activity ratios, and valuation ratios. Additionally, future studies are encouraged to analyze stock price movements from a technical analysis perspective, which can be further explored.

The overall positive performance of the stocks in the SRI-KEHATI Index from January 2019 to December 2023 highlights the need to focus on the six issuers showing an uptrend: BBCA, BBNI, BBRI, KLBF, and UNTR for potential investment opportunities. Investors should monitor the three issuers with a sideways trend: ASII, INDF, and TLKM, while being cautious of the five issuers in a downtrend: JSMR, PGAS, SMGR, UNVR, and WIKA, as these movements reflect current economic conditions and company-specific performance.

Based on the CAPM analysis, prioritizing the seven efficient stocks: BBCA, BBNI, BBRI, BMRI, JSMR, KLBF, and UNTR can lead to better investment choices, particularly noting that BMRI offers the highest expected return of 1.20%. Investors should also consider the optimal portfolio formed using the Markowitz model, which comprises seven stock combinations tailored for varying risk preferences.

For those with a lower risk tolerance, the portfolio with a 40.55% annual expected return and 30.33% risk is particularly relevant. The allocation within this low-risk portfolio provides valuable insights into investment strategies: BBCA (62.91%), BBNI (-24.40%), BBRI (11.55%), BMRI (3.23%), JSMR (13.22%), KLBF (37.57%), and UNTR (2.37%). For higher-return aspirations, the solver method indicates an expected annual return of 46.79% with a risk of 32.91%, suggesting a leaner allocation that emphasizes BBCA (55.62%) and KLBF (38.52%), among others.

Future research should focus on assessing the performance of the optimal portfolio by incorporating fundamental analysis metrics, such as profitability, liquidity, solvency, activity ratios, and valuation ratios of the selected companies. Additionally, conducting further technical analysis of stock price movements is essential to enhance investment decision-making and deepen understanding of stock performance dynamics.

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