Indonesian Development of Economics and Administration Journal

ISSN (*online*) : 2963-5896 & ISSN (*print*) : 2964-0482

Vol. 2 • No. 1 • August 2023
Pege (*Hal.*) : **107 – 123**

ISSN (*online*) : 2963-5896
ISSN (*print*) : 2964-0482

DOI No : -
Website : https://ojs.ideanusa.com/index.php/idea

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Article info : *Received:* May 2023 ; *Revised*: June 2023 ; *Accepted*: July 2023

Analysis of Stock Portfolio Performance Using Passive Strategy and Active Strategy with Single Index Model

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Abstract. This study aims to determine and analyze the differences in return and risk performance results of active portfolio strategies and passive portfolio strategies using the Single Index Model. Then measure the return performance using the Sharpe Index, Treynor, and Jensen's Alpha. This research was conducted on Sri-Kehati index stocks for the period November 2019 to November 2021. Based on passive portfolio strategy research, there are three stocks that form the optimal portfolio, namely PT Bank Central Asia Tbk (BBCA), PT Japfa Comfeed Indonesia Tbk (JPFA), and PT Industri Jamu dan Farmasi Sido Muncul Tbk (SIDO). While based on active portfolio strategy research, in the first year there were three stocks that formed the optimal portfolio, then in the second year there were four stocks forming the optimal portfolio, namely PT Dharma Satya Nusantara Tbk (DSNG), PT Vale Indonesia Tbk (INCO), PT Industri Jamu dan Farmasi Sido Muncul Tbk (SIDO), and PT Wijaya Karya (Persero) Tbk (WIKA). Based on performance measurement using Sharpe, Treynor and Jensen's Alpha indices, the Passive Portfolio Strategy is better than the Active Portfolio Strategy. Meanwhile, based on the difference test using the Mann Whitney U test method, it can be concluded that there is no significant difference in return performance between passive portfolio strategies and active portfolio strategies..

Keywords: Sri-Kehati Index, Active and Passive Portfolio Strategy, Optimal Portfolio, Single Index Model, Sharpe, Treynor, Jensen Alpha Index Performance Measurements (;).

A. INTRODUCTION

"Investment is a commitment of a number of funds for the purpose of obtaining profits in the future. The expectation of future profits is compensation for the time and risks associated with the investment made (Tandelilin, 2017)". In the context of investing, the expected return is often called return. In addition to return, there is also the concept of risk in investing in the money market and capital market. The potential difference between actual and expected returns can be interpreted as investment risk. The two concepts of risk and return are always two sides of the same coin. That is, in addition to calculating the expected return, investors must also pay attention to the risks they take. Therefore,

ISSN (online) : 2963-5896 & ISSN (print) : 2964-0482

investors should exercise caution when looking for investment alternatives that offer the highest expected return at a certain level of risk, or investments that offer a certain return at the lowest level of risk.

There are several stages in the investment decision-making process, including setting investment goals, setting investment guidelines, selecting portfolio strategies, selecting assets, and measuring and evaluating portfolio performance. The asset selection and portfolio management stage recognizes the concept of risk reduction by adding securities to the portfolio. The concept is that as you continue to add security types to your portfolio until it reaches a certain point where mitigation begins, the greater the risk mitigation is achieved. This concept corresponds to the law of large numbers in statistics, which states that the larger the sample, the more likely it is that the sample average is close to the population's expectations. Portfolio risk reduction is also almost the same as the principle of insurance, the insurer reduces risk by taking out as much insurance as possible.

Investing in shares on the Indonesia Stock Exchange offers a very high return. According to data from www.investing.com, the performance of the Composite Stock Price Index (JCI) from 2006 to 2021 averaged 13.29% or higher than the deposit rate expressed in Bank Indonesia's interest rate of 6.36%, and the yield on 10 (ten) year Government Bonds which was only 8.00 percent

Stock investment is an investment instrument that can provide high returns but is accompanied by high risk. To minimize risk, investors need to put together an optimal portfolio that can spread risk. The optimal portfolio relies heavily on the investor's in-depth analysis when observing and analyzing the market.

When investing in the stock market, investors basically have a large number of indices that can be used as a reference when building a portfolio. A stock index is a statistical measure of changes in stock price movements that is periodically evaluated from a set of stocks selected based on established criteria and methodologies. Stock indices are usually used as an investment tool. Data from the Investment Company Institute shows that the development of passive investment is on the rise worldwide. In the US, passive investment (index funds and ETFs) increased by $1.8 trillion from 2010 to 2019, while active investment (non-index funds) fell by $1.8 trillion and $1.7 trillion, respectively. In Indonesia alone, the use of the Indonesia Stock Exchange Index (IDX) as an investment product increased significantly from the total managed funds of Rp 2.72 trillion at the end of 2015 to Rp 2.7 trillion. 15.88 trillion at the end of 2020, representing a CAGR of 42 percent over the past five years.

Based on data from the Indonesia Stock Exchange, there are several Stock Indices classified based on the Headline Index, Sector Index, Thematic Index, and Factor Index. The classification of IDX Index can be explained in the following table:

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IDX Indices	Classification	Index
Headline	Composite	JCI
	Board	Main Board, Development Board
	Liquidity	IDX30, LQ45, IDX80
	Liquidity Co-Branding	Kompas100, Investor33, MNC36, Business-27
Sector	Composite Sector (IDX-IC)	IDXEnergy, IDXBasicM, IDXIndustrials, IDXConsNC, IDXConsCyc, IDXHealthCare, IDXFinance, IDXPropRE, IDXTechnology, IDXInfra, IDXTransportation&Logistic.
	Investor Sector	SMInfra18 (Infrastructure), Infobank15 (Bank)
Thematic	**ESG**	**Srikehati, IDX ESG Leaders**
	Sharia	DADDY, JII70, JII
	Others	Pefindo iGrade (Investment Ratings), IDXBUMN20
Factor	Size	SMC Composite, SMC Liquid, Pefindo25
	Growth/Value	IDX Value30, IDXGrowth30
	Dividend	IDX HighDividend20
	Quality	IDX Quality30

Source : www.idx.co.id

In a CNBC Indonesia report, Khoirul Anam (2022) shows that the Indonesian stock market is attracting more and more investors to companies that apply environmental and social governance (ESG) principles. Data from McKinsey & Company and The Boston Consulting Group shows that companies that apply ESG principles deliver better results than others.

The concept of ESG answers phenomena related to climate change and the sustainability of a company. This concept was first initiated in the Kyoto Protocol Agreement (1997) to reduce greenhouse gas emissions that contribute greatly to global warming. Followed by the Paris Agreement (2016) which was attended by 195 heads of state who formed an agreement to carry out the mission of reducing gas emissions with the aim of tackling climate change. Indonesia itself has set its commitment through the ratification of the Paris Agreement with Law No. 16 of 2016 and delivered a Nationally Determined Contribution (NDC) with a target of reducing greenhouse gas emissions by 29 percent in 2030.

ESG (Environmental, Social, and Governance) is a corporate standard for investing through three criteria, namely environmental, social, and good governance. Environmental criteria include matters related to the conservation of natural resources such as waste, toxic emission management, and environmental impact analysis (AMDAL). Social criteria ensure good interaction and rights between parties in the company, between workers, suppliers, and consumers so that there is no conflict of interest. While the criteria for governance are the application of quality, transparent, credible company management, and compliance with applicable laws and regulations.

The Indonesia Stock Exchange together with the KEHATI Foundation published a Green Index called the Sustainable and Responsible Investment (SRI)-KEHATI Stock Index which was launched on June 8, 2009, with reference to the United Nations' Principles for Responsible Investment (PRI). Selection criteria for companies that apply the principles of sustainable and responsible investment (SRI) and environmental, social

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and governance (ESG). Currently, SRI-KEHATI is the only reference for investment principles that focus on green economy issues in the Indonesian capital market. The purpose of the SRI-KEHATI Index is to create linkages between the conservation community and the corporate sector.

The SRI-KEHATI Index currently consists of 25 companies listed on the IDX, whose composition is reviewed and updated every semester every year. Since its inception, the index has historically performed superior to several other major indices such as the IDX30 and LQ45. Based on data from www.kehati.or.id, the performance of the SRI-KEHATI Index for the period June 2009 to November 2021 produced a return of 224.19 percent, outperforming the IDX30 index performance of 153.14 percent, and the LQ45 index of 137.42 percent.

The SRI-KEHATI Index allows investors to choose the right stocks based on their fundamental qualities and supports a green economy where all companies are required to apply environmental, social, and good corporate governance (ESG) principles.

Portfolio theory proposed by Markowitz in 1952, known as the Markowitz Model provides an efficient and optimal investment approach, namely forming an optimal portfolio. Markowitz's portfolio theory is based on the mean and variance approaches, where mean is a measure of return and variance is a measure of risk. Markowitz Portfolio Theory, also known as the mean-variance model, by maximizing expected returns (mean) and minimizing uncertainty / risk (variance) to select and form an optimal portfolio (Hartono, 2017).

Basically, investors always want to maximize their expected return with a certain level of risk they are willing to bear, or look for a portfolio that offers the lowest risk with a certain return (Tandelilin 2017, p.164). The portfolio formed is called an efficient portfolio. An optimal portfolio is a portfolio that is taken according to the investor's choice from a set of efficient sets of portfolios.

In forming an optimal portfolio, investors can use various portfolio formation models including the single index model. This model was introduced by William F. Sharpe in 1963 to simplify input parameters when calculating very complex Markowitz models. The single index model takes into account market aspects and the uniqueness of companies.

A research study conducted by Nanang Pratama (2019) states that the single index model is better and the risk is smaller than the Markowitz model with more stock criteria thereby reducing the greater level of risk. Another study from Oktaviani and Wijayanto (2016) states that the single index model is considered simpler than the very complex Markowitz model. Research from Septyanto and Kertopati (2014) states that the Markowitz model assumes continuous portfolio addition, where at some point, these benefits will decrease and can increase portfolio risk. The research also showed that the expected rate of return was higher for the single-index model approach than for the Markowitz approach.

On the other hand, investors are generally still concerned about the level of accuracy of the resulting portfolio model, therefore, investors need to evaluate the portfolio by measuring performance to find out and ensure that the portfolio produces optimal returns and risk levels according to investor expectations.

According to Samsul (2015), models that can measure portfolio performance are generally the Sharpe, Treynor, and Jensen's Alpha models. The Treynor model is the

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most suitable model for research because it considers market factors (beta) in its calculations. Research by Suryano and Herianti (2015) concluded that Treynor's method has the highest consistency among other methods, although there is no significant difference between the three methods.

The measurement period in this study is the period from November 2019 to November 2021. Stock data taken based on criteria for stocks that are consistently included in the SRI-KEHATI Index during the study period. This period was taken based on economic conditions that were declining due to the Covid-19 pandemic. The concept of green economy or commonly known as green economy is considered to be one of the important concepts to overcome the economic impact of the Covid-19 pandemic, in addition to government policies and stimulus packages. This is revealed in the latest report of the Climate Policy Initiative (CPI) and Vivid Economics entitled Improving the Impact of Fiscal Stimulus in Asia: An Analysis of Green Recovery Investments and Opportunities.

In forming a stock portfolio, there are several investment strategies that can be used by capital market investors, namely passive strategies and active strategies. A passive strategy is a portfolio that can generate the best returns in an efficient capital market. A portfolio is identified as an attainable market portfolio based on the level of portfolio capitalization of all risky assets. There are several strategies used in passive strategies, including indexing strategy and buy-and-hold strategy. On the other hand, active strategies have several portfolio strategies, including stock selection, sector rotation, and market momentum strategies.

In a passive portfolio strategy does not require too many positions, so it can minimize ordinary decision-making. This can happen because the analysis related to the purchase of shares has been done before. The trading intensity of a passive strategy does not require high costs because the transactions carried out are when the goals set by the investor have been achieved or when the stock price rises or falls significantly. However, passive portfolio strategies have several disadvantages where they generally have returns close to or equal to market returns, in addition to that increased market price volatility can eliminate the opportunity for investors to take advantage of momentum in search of abnormal returns.

On the other hand, investors using active strategies usually actively pick stocks based on information analyzed from stock movements. Active strategies usually make investors become more or more actively involved in stock trading. Investors with active strategies usually have skills that other investors don't have. This is because investors actively select stocks that can be included in their portfolio and provide the expected rate of return. The decisions made by investors are based on current market trends and momentum and investors can take advantage of stock price volatility to achieve maximum returns. However, active portfolio strategies also have the disadvantage of potentially generating higher transaction costs that investors can bear.

Based on differences from the results of previous studies, researchers intend to conduct research studies related to which portfolio strategies are best applied to stock portfolios using the SRI-KEHATI index for the period November 2019 to November 2021 with the following titles “analysis of stock portfolio performance using passive strategy and active strategy using single index model (case study of sri-kehati index on indonesia stock exchange)".

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B. LITERATURE REVIEW

Markowitz Portfolio Theory

In 1952, Harry Markowitz provided one of the best works to address the investor's problem of choosing investments in varying amounts according to his wealth, and investing large amounts in more conservative sectors (Elton, et al. 2014, p.499-500). The portfolio theory proposed by Markowitz, known as the Markowitz model, is an efficient and optimal way to achieve goals by forming an optimal portfolio by fulfilling the principle of investing in obtaining a level of return at the desired level with the minimum risk. To minimize risk, investors need to diversify in investing, namely forming a portfolio or investing funds not only in one asset but in several assets.

Proportion Each security in the portfolio is identical to the market capitalization of that security. The rise and fall of the portfolio value will be proportional to the rise and fall Return Market, which is to follow the ups and downs of JCI as Benchmarks or the reference stock price index in Indonesia. Investment risk in market equilibrium theory is the risk caused by price fluctuations in the capital market which is often referred to as systematic risk. Other risks that are not related to price fluctuations in the capital market will be equal to zero (unsystematic risk). This corresponds to the diversification theory of market equilibrium which includes all securities traded in the capital market. Investors who apply this theory essentially adhere to passive strategies (indexing).

Markowitz's Portfolio Theory is based on the averaging approach (Mean) and variance, where mean is a measure of the rate of return and variance is a measure of the amount of risk. Markowitz's portfolio theory is also known as the mean variable model (mean-variable model), which focuses on efforts to maximize the average expected rate of return and minimize uncertainty/risk (Variance) to select and form an optimal portfolio. The optimal portfolio calculation uses the following equation (Hartono, 2017, p.395).

Information:

E(Rp) = Expected portfolio rate of return
Wi = Proportion invested in ith stock
E(Ri) = Rate of return on securities i

Basically, an investor will always want to accept a certain amount of risk and maximize the expected rate of return, or look for a portfolio that offers the smallest risk for a certain rate of return (Tandelilin 2017, p.164). These portfolio characteristics are called efficient portfolios. An optimal portfolio is a portfolio chosen according to the investor's preferences from a set of efficient sets of portfolios. The following curves are presented that illustrate the efficient portfolio and the optimal portfolio.

Single Index Model Portfolio Theory

The Single Index Model shows that all stocks are affected by general market movements. When the market performs well, individual stock prices will also increase. This is indicated by the available market indices. Conversely, if the market situation worsens, it will also be followed by a decline in stock prices. The Single Index Model uses market indices to proxy common factors (Bodie et al 2011, p.249). This provides the reason that the return of correlated securities is due to the same response to market changes, and to measure this correlation is obtained by relating the return of a stock to the return of a stock market index. This shows that the stock rate of return is formulated as follows: (Husnan 2015, p.89).

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Ri = αi + βiRm
Information:
Ri = Return on stock i
αi = Component of stock return i that is not affected by changes in market indices
βi = Constant that measures change Ri due to change Rm
Rm = Market Return

Single Index Model allows investors to determine the optimal portfolio by comparing Excess Return to Beta (ERB) and cut-off rate (Ci). ERB is the excess rate of return of a stock over the return on a risk-free asset, known as the premium rate of return per unit of risk measured in beta. Level cut-off rate (Ci) is the result of dividing the market variance and the premium rate of return on the error variant of the stock by the market variance on the sensitivity of each stock to the error variant of the stock.
This approach is referred to as the Single Index model, as it uses stock market indices as proxies for Common Factor. To obtain an optimal portfolio using the Single Index model, the first step is the selection of stocks based on excess return to beta ratio, Furthermore, the selection results are given weight to each stock to become an optimal portfolio.

Basis of Investment Decision

According to Tandelilin (2017), investment is a commitment to a number of funds or other resources carried out now, with the aim of obtaining a number of profit benefits in the future. The term investment can relate to various activities such as real sector investment activities (land, machinery, or buildings) or financial assets (deposits, stocks or bonds). According to Jogiyanto (2020), investment can be defined as the delay of consumption now to be used in efficient production over a certain period of time.

The basis of any investment decision consists of the expected rate of return, the level of risk, and the relationship between the rate of return and that risk. In the context of investment, investment risk can be interpreted as the possibility of a difference between actual return and expected return. These two concepts, risk and return are like two sides of a coin that are always side by side, meaning that in investing in addition to calculating the expected return, investors must also pay attention to the risks they bear. Therefore, investors must be careful and careful in looking for investment alternatives that offer the highest expected return with a certain level of risk, or investments that offer a certain return with the lowest level of risk.

Return and risk have a similar relationship, technically the higher the target expected return of an investment, the higher the risk that will be faced by investors and the opposite is true. The relationship between risk and return is linear and unidirectional. The relationship between return and risk from an investment can be explained on the Security Market Line.

The Security Market Line (SML) above shows a positive relationship between risk and return, where return is indicated by E(R) or expected return of the portfolio on the Y axis and the level of risk (risk) is indicated by the β or beta of the portfolio on the X axis, while Rf is the level of return on investment in risk-free assets with near-zero risk. So it can be concluded that risk and return are linearly.

Investment Decision Process

The investment process involves understanding the basics of investment decisions and organizing activities in the investment decision process. At the core of the investment decision-making process is how to understand the relationship between the expected

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return and risk of an investment. The relationship between risk and expected return is unidirectional and linear. This relationship answers the question of why not all investors invest only in assets that generate very high returns. (Tandelilin, 2017:9).
The investment decision-making process is a continuous decision-making process consisting of five important decision stages that are carried out to achieve the best investment decision goals. The stages of investment decisions include five decision stages, namely: The first stage is to determine investment goals; The second stage is to determine investment policy; The third stage is the selection of a portfolio strategy; The fourth stage is asset selection; The fifth stage is the measurement and evaluation of portfolio performance.

Portfolio Strategy

In the investment decision process, it has been explained that there are several strategies that investors can do to achieve investment goals. There are several investment strategies that investors can use in forming a portfolio, namely active strategies and passive strategies. Investors who choose an active strategy generally actively seek information, monitor price movements, and actively buy or sell securities with the aim of obtaining returns (return) other or abnormal return. In an active strategy, the goal of the strategy is to achieve a stock portfolio return that exceeds the market portfolio return. Strategies that are usually used by investors in carrying out active stock portfolio strategies are stock selection, sector rotation, and price momentum strategies.

While investors who choose a passive strategy will tend to be passive in investing in securities or securities, because they have done analysis and portfolio formation at an early stage, only doing Buy and Hold as well as following market indices. In passive strategy, according to the concept of efficient markets which assumes that if the market is truly efficient, then no one investor will be able to obtain abnormal returns above market returns. Investors who use passive strategies believe that the market price that occurs is a price that reflects the intrinsic value of the stock. The strategy used in the passive portfolio strategy is the buy and hold strategy (Buy and Hold Strategy) and index following strategies (Indexing Strategy).

Portfolio Performance Measurement

The concept of portfolio performance measurement was developed in the late 1960s by William F. Sharpe, Jack L. Treynor, and Michael C. Jensen. This concept is based on capital market theory (Capital Market). These three performance measurements are referred to as composite measure of portfolio performance Because measurement uses a combination of risks (Risk) and rate of return (return) in his calculations.

The three portfolio performance measurements are as follows:

1. Sharpe performance measurement indicator.
   Sharpe Ratio is a performance measurement by examining investment performance by adjusting the risk. This measurement was introduced by William F. Sharpe and is closely related to the capital assets pricing model. The Sharpe index bases its calculations on the concept of the capital market line or better known as the reward to variability ratio. Sharpe stated that the portfolio performance series is the net result of the portfolio at a risk-free interest rate per unit of risk. The Sharpe index is calculated through the following equation (Bodie et al 2011, p.822)

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Sharpe ratio=(E(Rp)-Rf)/σp
Information:
E(Rp) = Expected return portfolio
Rf = Risk free of return
σ = portfolio standard deviation

2. Treynor performance measurement indicators
The Treynor Ratio is a performance measurement of returns that have no diversifiable risk per each unit of assumed market risk. This portfolio performance measurement was developed by Jack L Treynor, the first inventor to provide a composite measurement of portfolio performance that takes into account the level of risk. The purpose of the Treynor index is to determine a performance measure that all investors can apply to, regardless of individual risk preferences. Treynor also suggested that there is a risk component, resulting from fluctuations in the market and risk arising from fluctuations in individual securities.
Treynor introduced the concept of a security market line that defines the relationship between a portfolio and market returns. The slope of the line measures the relative volatility between the portfolio and the market (expressed in beta). The beta coefficient simply measures the volatility of a stock, portfolio or the market itself. The greater the slope of the line, the better the risk trade off and the rate of return. Performance measurement using the Treynor index is often referred to as the reward to volatility ratio. The Treynor index can be done using the following equation (Bodie et al, 2011, p.822).

Information:
E(Rp) = Expected return portfolio
Rf = Risk free of return
β = Beta portfolio

3. Jensen's Alpha performance measurement indicator
Jensen's Alpha Ratio is a risk-adjusted performance measurement indicator that represents the average return of a portfolio or investment above or below predicted by a capital asset pricing model (CAPM) based on portfolio beta and market return. Michael C. Jensen, invented a measurement that takes into account the excess return obtained by a portfolio beyond the expected return. As one of the indicators of portfolio performance measurement, Jensen's Alpha takes into account the CAPM component in measuring portfolio performance which is often referred to as the differential return measure. Jensen's Alpha is an absolute measure that estimates a constant rate of return over the investment period. Jensen's Alpha formula can be calculated through the following equation (Bodie et al. 2011, p.822)

Information:
E(Rp) = Expected return portofolio
Rf = Risk free rate of return
βp = Beta portfolio
Rm = Market return

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C. RESEARCH METHODOLOGY

The type of research used in this study is descriptive research with a quantitative approach. According to Sugiyono (2013: 13), quantitative research methods can be interpreted as research methods based on philosophy positivism, which is used to study a specific population or sample. Sampling is generally done randomly, data collection is carried out using research instruments, and analysis of quantitative or statistical data with the aim of testing established hypotheses.

A research variable is something determined by a researcher for an investigation so that information can be obtained about it and conclusions can be drawn. (Sugiyono, 2016: 38). Operational Variables are intended to determine the measurement scale of each variable so that the tool can be used to test hypotheses properly and precisely.

This study uses the population in the form of shares of companies on the Indonesia Stock Exchange (IDX) which are included in the SRI-KEHATI index stock group. Multiple samples were determined from such populations using the technique purposive sampling. SRI-KEHATI index stock included in the optimal active and passive portfolio use a single index model for periode November 2019 – 2021.

D. RESULTS AND DISCUSSION

Based on the calculation of Sri-Kehati Index stocks for the November 2019 period, the ERB values are as follows

Code	Exp Return $E(R_m)$	Beta (β)	Std. Deviasi	Rf rate (R_f)	ERB	Ai	Bi	C	C*	Optimal Stock	Description	
AALI	-0.0002	0.6766	0.0911	0.0044	-0.0068	-0.0138	55.2091	0.0000	0.0000	-0.0068	ERB < C*	
ADHI	-0.0165	2.4502	0.1344	0.0044	-0.0086	-2.2406	332.1310	-0.0017	0.0068	-0.0153	ERB < C*	
ASII	-0.0068	0.9803	0.0582	0.0044	-0.0115	-1.9754	284.0130	-0.0015	0.0068	-0.0182	ERB < C*	
BBCA	0.0191	0.9929	0.0422	0.0044	0.0147	10.6317	553.5686	0.0068	0.0068	0.0080	ERB > C*	*Optimal Stock*
BBNI	0.0006	2.1632	0.0902	0.0044	-0.0018	0.1694	575.7844	0.0001	0.0068	-0.0085	ERB < C*	
BBRI	0.0120	1.6039	0.0631	0.0044	0.0047	4.8444	646.7973	0.0029	0.0068	-0.0020	ERB < C*	
BBTN	-0.0105	1.7076	0.1145	0.0044	-0.0087	-1.3627	222.2475	-0.0011	0.0068	-0.0155	ERB < C*	
BMRI	-0.0015	0.9465	0.0448	0.0044	-0.0063	-0.7049	446.5252	-0.0005	0.0068	-0.0130	ERB < C*	
BSDE	-0.0081	1.3324	0.0852	0.0044	-0.0094	-1.4891	244.3954	-0.0012	0.0068	-0.0162	ERB < C*	
INDF	0.0053	0.8935	0.0631	0.0044	0.0010	1.1871	200.3286	0.0010	0.0068	-0.0058	ERB < C*	
JPFA	0.0177	1.9490	0.1340	0.0044	0.0068	1.9197	211.6200	0.0016	0.0068	0.0000	ERB > C*	*Optimal Stock*
JSMR	-0.0078	1.1963	0.0761	0.0044	-0.0102	-1.6179	247.2766	-0.0013	0.0068	-0.0170	ERB < C*	
KLBF	-0.0001	1.1045	0.0632	0.0044	-0.0041	-0.0291	305.7601	0.0000	0.0068	-0.0109	ERB < C*	
PGAS	0.0138	2.2135	0.1441	0.0044	0.0042	1.4672	235.8140	0.0012	0.0068	-0.0025	ERB < C*	
PJAA	-0.0166	0.5739	0.0654	0.0044	-0.0367	-2.2281	76.9225	-0.0020	0.0068	-0.0434	ERB < C*	
PPRO	-0.0375	2.9492	0.1369	0.0044	-0.0142	-5.8915	463.8438	-0.0040	0.0068	-0.0210	ERB < C*	
SIDO	0.0435	0.3353	0.0946	0.0044	0.1166	1.6309	12.5692	0.0016	0.0068	0.1098	ERB > C*	*Optimal Stock*
SMGR	0.0150	2.5581	0.1219	0.0044	0.0041	2.5778	440.3022	0.0018	0.0068	-0.0026	ERB < C*	
TINS	0.0072	3.4955	0.1957	0.0044	0.0008	0.6603	318.8830	0.0005	0.0068	-0.0060	ERB < C*	
TLKM	-0.0008	0.1458	0.0540	0.0044	-0.0362	-0.0426	7.3038	0.0000	0.0068	-0.0429	ERB < C*	
UNTR	-0.0161	0.6842	0.0814	0.0044	-0.0300	-1.6657	70.6505	-0.0015	0.0068	-0.0368	ERB < C*	
UNVR	-0.0050	1.0607	0.0631	0.0044	-0.0089	-1.3285	282.2085	-0.0010	0.0068	-0.0156	ERB < C*	
WIKA	0.0093	2.9777	0.1560	0.0044	0.0016	1.1338	364.4266	0.0008	0.0068	-0.0051	ERB < C*	
WSKT	-0.0149	3.1472	0.1249	0.0044	-0.0062	-3.0101	634.4237	-0.0018	0.0068	-0.0129	ERB < C*	
WTON	-0.0045	1.6130	0.1285	0.0044	-0.0055	-0.4383	157.6613	-0.0004	0.0068	-0.0123	ERB < C*	

Based on these calculations, the ERB value of each Sri Kehati index stock and the cutoff point (C*) value obtained from the highest C value result. The optimal stocks are determined based on the Excess Return to Beta (ERB) value of the stock which is greater than the cutoff point value (ERB > C*). These optimal stocks include BBCA, JPFA, SIDO with ERB values of 0.0147, 0.0068, and 0.1166.

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Based on the calculation of Zi value, the portfolio allocation can be explained as follows: 1) BBCA stock portfolio with Zi value of 5.7877 with an allocation of 31.38%, JPFA stock portfolio with Zi value of 0.1254 with allocation of 0.68%, and SIDO shares with Zi value of 12.5297 with allocation of 67.94%.

Based on the calculation above, the SIM Passive Strategy Portfolio generates a monthly Expected Return of 1.40% (18.23% on an annualized basis), with risk levels measured by beta and standard deviation of 0.5122 and 0.0488 respectively.

The formation of the Active Strategy SIM portfolio was carried out in 2 (two) stages, namely the formation of a portfolio in the first year with optimal stocks that were the same as the passive strategy because it used the November 2019 Sri-Kehati index benchmark, but in November 2020, portfolio changes were made using the November 2020 Sri-Kehati index with optimal stocks as follows

Code	Exp Return $E(R_{im})$	Beta (β)	Std. Dev (σ_{im})	Rf rate (R_f)	ERB	Ai	Bi	C	C*	Optimal Stock	Description	
ASII	-0.0137	1.3859	0.1099	0.0042	-0.0130	-2.0640	159.1582	-0.0042	0.0061	-0.0191	ERB < C*	
AUTO	-0.0039	1.5551	0.1088	0.0042	-0.0053	-1.0733	204.4261	-0.0020	0.0061	-0.0114	ERB < C*	
BBCA	0.0091	0.8445	0.0601	0.0042	0.0057	1.1361	197.7487	0.0022	0.0061	-0.0004	ERB < C*	
BBNI	-0.0039	2.0923	0.1353	0.0042	-0.0039	-0.9333	238.9847	-0.0016	0.0061	-0.0100	ERB < C*	
BBRI	0.0099	1.4551	0.0971	0.0042	0.0039	0.8782	224.7484	0.0016	0.0061	-0.0022	ERB < C*	
BBTN	0.0005	2.4188	0.2047	0.0042	-0.0015	-0.2150	139.5851	-0.0005	0.0061	-0.0077	ERB < C*	
BMRI	-0.0002	1.6130	0.1072	0.0042	-0.0028	-0.6278	226.5975	-0.0011	0.0061	-0.0089	ERB < C*	
BSDE	-0.0033	1.6690	0.1186	0.0042	-0.0045	-0.8883	198.1813	-0.0017	0.0061	-0.0106	ERB < C*	
DSNG	0.0322	1.1484	0.1096	0.0042	0.0244	2.6746	109.7013	0.0061	0.0061	0.0183	ERB > C*	*Optimal Stock*
INDF	0.0064	0.5409	0.0842	0.0042	0.0041	0.1679	41.2292	0.0005	0.0061	-0.0020	ERB < C*	
INCO	0.0264	1.8304	0.1350	0.0042	0.0121	2.2247	183.7260	0.0043	0.0061	0.0060	ERB > C*	*Optimal Stock*
INTP	-0.0078	1.1694	0.0931	0.0042	-0.0103	-1.6278	157.6424	-0.0034	0.0061	-0.0164	ERB < C*	
JSMR	0.0121	1.8934	0.1431	0.0042	0.0042	0.7286	175.0385	0.0014	0.0061	-0.0020	ERB < C*	
KLBF	0.0021	0.6306	0.0754	0.0042	-0.0033	-0.2333	69.9013	-0.0006	0.0061	-0.0095	ERB < C*	
LSIP	0.0102	1.4355	0.1292	0.0042	0.0042	0.5160	123.5067	0.0011	0.0061	-0.0019	ERB < C*	
NISP	-0.0005	0.3755	0.0467	0.0042	-0.0126	-0.8131	64.6510	-0.0021	0.0061	-0.0187	ERB < C*	
PGAS	0.0011	2.8402	0.1720	0.0042	-0.0011	-0.3022	272.6210	-0.0005	0.0061	-0.0072	ERB < C*	
PJAA	-0.0158	1.9509	0.1332	0.0042	-0.0103	-2.2010	214.4280	-0.0041	0.0061	-0.0164	ERB < C*	
PTPP	0.0105	3.4274	0.2086	0.0042	0.0018	0.4956	270.0398	0.0008	0.0061	-0.0043	ERB < C*	
SIDO	0.0279	0.1032	0.0855	0.0042	0.2295	0.3345	1.4578	0.0010	0.0061	0.2233	ERB > C*	*Optimal Stock*
SMGR	0.0059	1.6048	0.1196	0.0042	0.0010	0.1837	180.1229	0.0004	0.0061	-0.0051	ERB < C*	
TLKM	-0.0029	0.8885	0.0742	0.0042	-0.0080	-1.1512	143.4940	-0.0024	0.0061	-0.0141	ERB < C*	
UNTR	-0.0033	0.5853	0.0945	0.0042	-0.0129	-0.4940	38.3503	-0.0013	0.0061	-0.0190	ERB < C*	
UNVR	-0.0016	0.2943	0.0670	0.0042	-0.0198	-0.3820	19.2912	-0.0011	0.0061	-0.0259	ERB < C*	
WIKA	0.0204	2.6276	0.1687	0.0042	0.0062	1.4954	242.6648	0.0026	0.0061	0.0000	ERB > C*	*Optimal Stock*

Based on these calculations, the ERB value of each Sri Kehati index stock and the cutoff point (C*) value obtained from the highest C value result. The optimal stocks of SIM Strategy Active for the second year period are determined based on the Excess Return to Beta (ERB) value of the stock which is greater than the cutoff point value (ERB > C*). These optimal stocks include DSNG, INCO, SIDO, WIKA with ERB values of 0.0244, 0.0121, 0.2295, and 0.0062, respectively. The cut-off point value is 0.0061.

Based on the calculation of the Z value, the second year's Active Strategy SIM portfolio allocation can be explained as follows: 1) DSNG stock portfolio with a Z value of 1.6704 with an allocation of 5.07%, INCO stock portfolio with a Z value of 0.4262 with an allocation of 1.29%, and SIDO shares with a Z value of 30.8180 with an allocation of 93.45%, and WIKA shares with a Z value of 0.0620 with an allocation of 0.19%.

Based on the calculation above, the SIM Strategy Active portfolio generated a monthly return of 1.38% or (17.89 annualized) better than the market monthly return (JCI) of 0.51% (6.29% annualized). The risk levels measured by the standard deviation and beta of the portfolio are 0.0573 and 0.5181, respectively.

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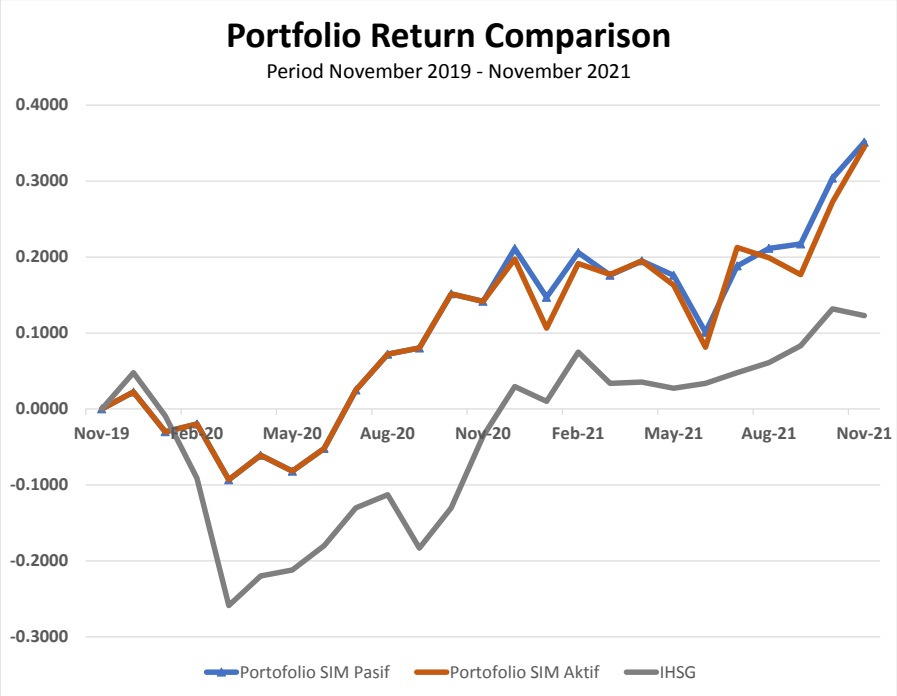
Portfolio Performance

Expected Return E (Rp) or the level of profit expected by investors from the optimal portfolio formed. Based on the calculation above, it can be concluded that the Passive SIM portfolio

strategy is better than the Active SIM Portfolio Strategy and the JCI Market Portfolio. This can be seen from the comparison of NAV value and return.



The NAV value of the Passive Strategy SIM Portfolio in the final measurement period of November 2021 was 1,378.04 (annualized return 9.74%) or better than the NAV Value of the Active Strategy SIM Portfolio of 1,355.80 (annualized return 9.71%) and better than the JCI value of 6,533.93 (annualized return 8.85%).

Portfolio Performance Measurement Using Sharpe, Treynor, and Jensen Alpha

Based on the calculation of the Sharpe index, it can be concluded that the performance of the SIM Passive Strategy Portfolio is better than the performance of the Active Strategy SIM Portfolio and JCI. The SIM Strategy Passive Portfolio yielded a Sharpe index of 0.2196 or better than the SIM Strategy Active Portfolio of 0.1829 and JCI of 0.0321.

Portfolio	Portfolio Return	Rf	Std. Dev	Indeks Sharpe
	1	2	3	4 = (1-2)/3
Passive Strategy	0.0140	0.0033	0.0488	**0.2196**
Active Strategy	0.0138	0.0033	0.0573	**0.1829**
IHSG	0.0051	0.0033	0.0562	**0.0321**

Based on Treynor's index calculations, it can be concluded that the performance of the SIM Strategy Passive Portfolio is better than the performance of the SIM Strategy Active Portfolio and JCI. The Passive Strategy SIM Portfolio yielded a Treynor index of 0.0209 or better than the Active Strategy SIM Portfolio of 0.0202 and JCI of 0.0018.

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Portfolio	Portfolio Return	Rf	Beta	Indeks Treynor
	1	2	3	4 = (1-2)/3
Passive Strategy	0.0140	0.003325	0.5122	**0.0209**
Active Strategy	0.0138	0.003325	0.5181	**0.0202**
IHSG	0.0051	0.003325	1.0000	**0.0018**

Based on the calculation of Jensen's Alpha index, it can be concluded that the performance of the Passive Strategy SIM Portfolio is better than the performance of the Active Strategy SIM Portfolio. The Passive Strategy SIM Portfolio yields a Jensen's Alpha index of 0.0098 or better than the Active Strategy SIM Portfolio of 0.0096.

Portfolio	Portfolio Return	Rf	Beta (β)	Market Return	Indeks Jensen's Alpha
	1	2	3	4	5 = (1-2) - 3(4-2)
Passive Strategy	0.0140	0.003325	0.5122	0.0051	**0.0098**
Active Strategy	0.0138	0.003325	0.5181	0.0051	**0.0096**

Hypothesis Testing Results

Mann Whitney U

To test the difference between two independent samples, researchers use the non-parametric Mann-Whitney U test. The Mann-Whitney U test is a non-parametric test used to compare the rank or median of two independent samples. The Mann-Whitney U Test hypothesis of the difference in the results of the active portfolio strategy and the passive portfolio strategy is as follows:

H0 : There is no significant difference between the investment returns of an active portfolio strategy and a passive portfolio strategy.

H1 : There is a significant difference between the investment returns of an active portfolio strategy and a passive portfolio strategy.

Based on the statistical results of the Mann-Whitney U Test can be concluded as follows:

Test Statistics

	Stock
Mann-Whitney U	80.500
Wilcoxon W	171.500
With	-.205
Asymp. Sig. (2-tailed)	.837
Exact Sig. [2*(1-tailed Sig.)]	.840b

Mann-Whitney U indicates a value of 80,500, a value of U indicates the relative position of two compared data in the ranking data. The calculated Wilcoxon W value is 171,500, the W value describes the number of higher ratings for a particular data pair.

1. The indicated Z value is -0.205, a negative value indicates that the average rating of the first group tends to be lower than that of the second group.
2. Asymp.Sig (2-tailed) shows a value of 0.837, indicating that there is not enough statistical evidence to conclude that there is a significant difference between the active portfolio strategy and the passive portfolio strategy.
3. Exact Sig.[2*(1-tailed Sig.)] shows a value of 0.840, indicating that there is insufficient statistical evidence to conclude that there is a significant difference between active portfolio strategies and passive portfolio strategies.

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E. CONCLUSIONS AND SUGGESTIONS

Overall, the results of this statistical interpretation show that based on the Mann-Whitney U test and Wilcoxon W tests, there is no significant difference between the investment returns of active portfolio strategies and passive portfolio strategies.

Based on the results, researchers concluded that there is no significant difference between the investment returns of active portfolio strategies and passive portfolio strategies due to the following:

Market Efficiency

1. If the market is efficient, meaning that asset prices can quickly reflect the available information, then an active strategy of trying to beat the market will be difficult to achieve a significant advantage.

Observation Period

2. Insignificant results may occur if the observation period used is too short or if the market environment does not experience considerable changes during the period. Over longer periods of time or in more fluctuating market conditions, the difference between active and passive strategies may be more pronounced.

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