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Portfolio Design Beta, Alpha, Variance on Inconsistent Stocks in Indonesia LQ45 Index

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Abstract

Optimal portfolios have become a major concern in finance, especially in the investment context. This research aims to explore the concept of an optimal portfolio by applying beta, alpha, and variance methods, as well as considering active and passive strategies. The background of this research involves the ever-evolving complexity of financial markets, where investors are challenged to create portfolios that can provide optimal returns with acceptable levels of risk. This research aims to identify and analyze the factors that influence the formation of an optimal portfolio. The methods used include beta measurement as a measure of systematic risk, alpha calculation as an additional performance measure, and using variance to measure portfolio volatility. Active and passive strategies are then applied to understand the impact of strategy choices on portfolio performance. The findings of this research highlight the importance of understanding market dynamics and effective strategies to achieve investment goals. This research provides in-depth insight into how to use beta, alpha, and variance methods in an integrated manner to design optimal portfolios with strategies that suit investor preferences and goals. The contribution of this research lies in presenting a comprehensive framework for developing optimal portfolios, combining elements of active and passive strategies. The results of this research can provide practical guidance for investors in making more informed investment decisions and can improve their portfolio performance.

Keywords: *Stock; Portfolio; Beta, Alpha; Variance.*

Introduction

Investment activities are activities carried out to manage company funds at a certain time, whether in the short term, medium term, or long term. Investment is any activity carried out by a person or group of people to obtain increased added value that can increase the utility value of life. Every business actor or investor who will carry out investment activities should have the ability to carry out assessments and maximize existing calculations to get maximum results from investment activities to prevent any risks caused by the investment activities carried out. To determine long-term finances, stock instruments can be an option (Liu et al., 2021).

Every investment business actor in his investment activities will make decisions regarding his investment, namely the decision to make purchases, the decision to carry out sales activities, and the decision to survive. Every decision taken by investors should be based on rationality, either through calculation analysis using scientific statistics or mathematical calculations. Changes in returns and any investment risks experienced by each investor are selected through the investor's active or passive strategy in choosing a portfolio (Hendrawan & Salim, 2017). The psychological factors of investors will greatly influence every decision taken which will be irrational, this can be called herding behavior which will be used by other investors as a reference for investing in the market which results in ignoring real information.

Every investment made by each investor not only pays attention to the value of the return obtained but must also pay attention to the various risks that will be faced by each investor, namely risk taker and risk averse so that both risks can be mitigated by each investor who will carry out any investment activities. One form of anticipating risk is by diversifying the investments made by each investor. This diversification means using various investment instruments that aim to share the risks of the investments made, including,

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among other things, a portfolio. In forming this portfolio, every investor can see a picture of the level of return and the level of risk that will be faced from investment activities in that instrument.

Every time you decide on an investment instrument, an analysis needs to be carried out so that the investment objectives can align with the objectives expected by each investor. The final results and level of risk, both high risk and low risk, are used as a reference in making decisions regarding investment returns (Logubayom & Victor, 2019)

Volatility is meant to mean the movement of a share price which experiences continuous changes over time. This movement will have an impact on returns from the company that issued the shares. So, the use of beta can be used as a tool to predict the level of return on investment from the company. As explained in previous research by (Azhari et al., 2020), positive leverage will be obtained on stock returns of companies in the hotel, restaurant, and tourism sub-sector, which can be proven by the stock beta value. In other previous research, stock beta significantly influenced the return of a stock (Mulya et al, 2021). Research on this matter was also carried out by other researchers who obtained concentrated results. Based on research (Harvey et al., 2018), it is proven that forming a portfolio with volatility will be better than a traditional portfolio in terms of the returns it produces.

Literature Review

Portfolio Concept

A portfolio is an investment approach process that considers various kinds of assumptions. Building a good portfolio uses the art and science of balancing trade-offs and goals to meet long-term financial goals (Wang & Aste, 2023). In investing, portfolios are used by forming a combination of shares or stock diversification (Kristanti et al., 2022). The concept of diversification is to differentiate the placement of funds in several different instruments to anticipate various things including risk mitigation in the investment process carried out.

Modern portfolio theory was first introduced by Harry Markowitz and his colleague William Sharpe. They explain how to minimize the risk of an investment through diversification activities. Apart from risk, they also explained that there is a connection between each asset in the portfolio through correlation and covariance in its implementation. Returning investment results while minimizing risk can simultaneously be achieved through diversification (Sun, 2022).

Portfolio Investment Strategy

A portfolio investment strategy is an approach to compiling and managing an investment portfolio to maximize the return value of investment instruments. In using this, each investor will identify various elements including the investment objective, an assessment of the risk tolerance that the investor can accept, and the profile of the investment instrument that will be selected. There are two strategies, namely active strategy and passive strategy.

An active strategy is a strategy where every investor will be very active in investment activities in various ways by searching for information, monitoring stock movements, and also selecting and buying and selling shares to make a profit. Passive strategies are strategies that tend to be used by investors who are passive in their investment activities and only follow market price index movements. Investors do not search for information on shares that will be used as investment instruments for them and do not carry out buying and selling activities shortly. It is believed that this strategy was born by assuming that the efficient market price conditions that will occur are the same as the share value so that investors will tend to wait.

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Return and Risk

In an investment activity, two sides must be considered, namely return and risk. And you also need to know that in investment law it is stated that the higher the return offered, the higher the risk that will be borne by each investor (Kuo et al., 2022; Li et al., 2022)

Returns can be divided into two, namely expected returns and actual returns. The expected return is a profit that is predicted to be obtained in the future, while the realized return is the actual profit from an investment activity that is received by each investor.

Risk is something that will occur in every investment process, so it cannot be eliminated but must be analyzed and identified so that it can be managed so that it remains well controlled. The process of reducing risk control efforts is to carry out diversification efforts (Hasan et al, 2022:18).

Beta, Alpha and Variance

Beta in the context of a stock portfolio is a measure used to measure how far a stock moves about overall market price movements. More specifically, it can be explained that beta measures the sensitivity of stock prices to changes in the price of a market index or other reference index. So beta is an important risk analysis tool in stock investment.

Alpha in the context of a stock portfolio is a stock or portfolio performance measure that measures investment results that exceed or fall short of what is expected based on the risks taken. In this case, risk refers to systematic risk as measured by beta and specific risk associated with a particular stock or portfolio. Alpha is a way to evaluate whether an investment has produced better or worse profits than expected, given the risks taken.

Variance in the context of a stock portfolio is a statistical measure that measures the spread or volatility of stock prices in a portfolio. Variance measures the extent to which stock prices in a portfolio vary or fluctuate from the portfolio's average value. The higher the variance, the greater the share price fluctuations, which will indicate higher risk. Variance is often used in analyzing stock portfolios to measure the overall risk or volatility of the portfolio. A portfolio with a lower variance depicts a portfolio that tends to be stable, while a portfolio with a higher variance has greater price fluctuations.

Research Gap

The phenomena when investors mimic the behavior of others while disregarding certain facts. The Indonesian capital market has shown signs of this behavior. LQ45 index for the previous two years in both favorable and unfavorable trading environments. The index consists of 45 companies that are seen to be indicative of the market due to their high market capitalization, high transaction value, and strong development potential. The rotation of stocks in the index's value shows that stocks with different valuations have an equal chance of being included in the LQ45 index. A comparison of the two active and passive strategies in the Beta, Alpha, and Variance models of the contemporary portfolio model can yield new information about how to optimize portfolio return and risk. Still, there aren't many studies that specifically note inconsistent corporations in the LQ45 index.

Research Hyphotesis

H01: portfolios formed with a beta model using active strategies provide higher returns and performance than passive strategies.

H02: portfolios formed with an alpha model that use active strategies provide higher returns and performance than passive strategies.

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H03: portfolios formed with variance models using active strategies provide higher returns and performance than passive strategies.

Research Methodology

This study employed a quantitative research methodology, in which a quantitative approach and This study's objective is to ascertain the value of each variable, specifically the difference in returns between the optimal portfolio using beta model, Alpha model, and variance with active and passive strategies between companies that do not regularly appear in the LQ45 index from 2018 to 2023. Based on this, the study is descriptive. The data population for this study is made up of information from businesses that were included in the LQ45 index between August 2018 and January 2019 and August 2023 and January 2024 and that are listed on the Indonesia Stock Exchange (IDX).

In order to test hypotheses, data analysis performed by calculating beta model, alpha model and variance model by using Microsoft excel and IBM SPSS statistic. The steps ini data processing are as follows:

1. determining each stock's realized return, expected return, and standard deviation in addition to the IHSG with formula:

a. Realized return formula (Salim & Rizal, 2021)

$$R = \frac{(V1-V0)}{V0}$$

b. Expected return formula (Salim & Rizal, 2021)

$$E(R) = \Sigma \frac{Ri}{n}$$

c. Standard Deviation formula (Salim & Rizal, 2021)

$$\sigma_i = \sqrt{\sum_{t-1}^{n} \frac{[Rit-E(Ri)]^2}{n}}$$

2. calculating beta, alpha, variance, and individual stock unit risk with formula:

a. calculate beta with the following formula (Sun, 2022)

$$\beta i = \frac{\sigma\, im}{\sigma\, m^2}$$

b. calculate alpha with the following formula (Sun, 2022)

$$\alpha i = E(Ri) - \beta i \,.\, E(Rm)$$

c. calculate variance with the following formula below.

$$\sigma^2 = \sum_{t-1}^{n} \frac{[Rit - E(Ri)]^2}{n}$$

d. calculate unique Risk with formula (Andreas & Basana, 2021)

$$\sigma_{ei^2} = \sigma_{i^2} - \beta i^2 \,.\, \sigma_{m^2}$$

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3. Using the LQ45 index evaluation cycle to calculate the risk-free interest rate based on the cumulative BI rate over six months. After dividing the total BI rate by 360, which is the number of days in a year, the adjusted figure is used. This adjustment is made to the daily data that is used.

4. Calculate portfolio weighting with calculations.

$$W_i = \frac{z_i}{\sum z_j}$$

5. Calculating portfolio expected return and portfolio risk (Salim et al, 2022)

a. Portfolio expected return with following formula below.

$$E(Rp) = \alpha p + \beta p \times E(Rm)$$

b. Portfolio Risk with following formula

$$\sigma p^2 = \beta p^2 \ .\sigma m^2 + \left(\sum_{i=1}^{n} w_i .\ \sigma ei\right)^2_.$$

6. Evaluating portfolio performance per period with the Sharpe, Treynor and Jensen Index

a. Calculate Sharpe Index with following formula (Riandini & Risman, 2022)

$$Sp = \frac{(Rp - Rf)}{\sigma p}$$

b. Calculate Treynor Index with following formula (Riandini & Risman, 2022)

$$Tp = \frac{(Rp - Rf)}{\beta p}$$

c. Calculate Jensen Index with following formula (Riandini & Risman, 2022)

$$Ap = [R_f + (R_m - R_f)\ \beta_p]$$

Results

The research focuses on inconsistencies in the LQ45 index. Portfolio candidates include 46 inconsistent stocks from 2018 to 2023. This study examines three portfolio models, beta Model, Alpha Model, and Variance Model. Then simulates them with active and passive strategic before comparing the two strategies.

Table 1. Portfolio Return and Risk

Period	Beta Model		Alpha Model		Variance Model		Market	
	Portfolio Return	Portfolio Risk	Portfolio Return	Portfolio Risk	Portfolio Return	Portfolio Risk	Market Return	Market Risk
(2018) Aug-Jan	23.53%	0.01%	33.45%	0.01%	13.08%	0.01%	-4,47%	20,95%
(2019) Feb-Jul	27.51%	0.03%	31.93%	0.03%	-93.89%	0.26%	-6,22%	24,22%
(2019) Aug-Jan	-16.33%	1.36%	190.54%	0.58%	92.54%	0.11%	-6,98%	0,72%
(2020) Feb-Jul	-4.71%	9.77%	33.90%	8.05%	4.56%	0.02%	-0,10%	2,09%
(2020) Aug-Jan	45.19%	3.42%	96.67%	2.27%	63.87%	2.87%	0,12%	1,26%

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(2021) Feb-Jul	5.70%	2.28%	64.80%	1.52%	17.86%	2.08%	0,03%	0,84%
(2021) Aug-Jan	7.04%	1.25%	53.16%	1.08%	10.82%	1.16%	0,07%	0,75%
(2022) Feb-Jul	5.45%	1.69%	41.24%	1.04%	10.33%	1.70%	0,05%	0,97%
(2022) Aug-Jan	-10.77%	1.12%	43.98%	0.78%	-10.15%	0.94%	-0,01%	0,68%
(2023) Feb-Jul	-2.59%	0.67%	29.66%	0.35%	-1.46%	0.59%	0,01%	0,57%
(2023) Aug-Jan	-2.03%	1.17%	0.25%	1.54%	4.45%	1.25%	0,06%	0,62%
Active Strategy Accumulation	78.00%	22.77%	619.58%	17.26%	112.01%	10.99%	-1,02%	10,20%
Passive Strategy	0.45%	0.18%	208.79%	0.26%	9.23%	0.17%		

Source: Process data

The results of return calculations using the beta model for shares that are inconsistent in the LQ45 index during the observation period based on Table 1, show that overall, the portfolio formed from the beta model can provide greater returns compared to the market. The portfolio with the largest return was the August 2019-January 2020 period (45.19%), followed by the February-July 2019 period (27.51%). The smallest return is August 2019-January 2020 (-16.33%). The risk formed from the beta model portfolio during the observation period shows that the portfolio formation has a greater risk compared to market risk in each period in the active strategy, while the passive strategy has a smaller risk. Market risk in the period February-July 2020 showed the highest risk of 9.77% in the beta Model active strategy. The different strategies show the results that in terms of accumulated returns, active strategies provide greater returns compared to passive strategies and better results compared to market returns. The active strategy provides an accumulated return of 78.00% while the passive strategy is 0.45%. The accumulated risk of active strategies is still greater than passive strategies with active strategies amounting to 22.77% and passive strategies amounting to 0.18%. For active strategies, the risk is greater than market risk, while the risk for passive strategies is much lower than market risk.

In Apha Model, the results of return calculations for shares that are inconsistent in the LQ45 index during the observation period based on Table 1, show that overall, the portfolio formed from the Alpha model can provide greater returns compared to the market. The portfolio with the largest return was the August 2018-January 2019 period (190.54%), followed by the August 2019-January 2020 period (96.67%). The smallest return is August 2023-January 2024 (0.25%). The risk formed from the alpha model portfolio during the observation period shows that the portfolio formation has a greater risk compared to market risk in each period in the active strategy, while the passive strategy has a smaller risk. Market risk in the period February-July 2020 showed the highest risk of 8.05% in the alpha Model active strategy. The different strategies show the results that in terms of accumulated returns, active strategies provide greater returns compared to passive strategies and better results compared to market returns. The active strategy provides an accumulated return of 619.54% while the passive strategy is 208.79%. The accumulated risk of active strategies is still greater than passive strategies with active strategies amounting to 17.26% and passive strategies amounting to 0.26%. For active strategies, the risk is greater than market risk, while the risk for passive strategies is much lower than market risk.

In Variance Model, the results of return calculations for shares that are inconsistent in the LQ45 index during the observation period based on Table 1, show that overall, the portfolio formed from the Variance model can provide greater returns compared to the market. The portfolio with the largest return was the August 2018-January 2019 period (92.54%), followed by the August 2019-January 2020 period (63.87%). The smallest return is August 2018-January 2019 (0.01%). The risk formed from the Variance model portfolio during the observation period shows that the portfolio formation has a greater risk compared to market risk in each period in the active strategy, while the passive strategy has a smaller risk. Market risk in the period August 2019-January 2020 showed the highest risk of 2.87% in the Variance Model active strategy. The different strategies show the results that in terms of accumulated returns, active strategies provide greater returns compared to passive strategies and better results compared to market returns. The active strategy provides an accumulated return of 112.01% while the passive strategy is 9.23%. The

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accumulated risk of active strategies is still greater than passive strategies with active strategies amounting to 10.99% and passive strategies amounting to 0.17%. For active strategies, the risk is greater than market risk, while the risk for passive strategies is much lower than market risk.

Table 2. Portfolio Performance

Period	Beta			Alpha			Variance		
	Sharpe	Treynor	Jensen	Sharpe	Treynor	Jensen	Sharpe	Treynor	Jensen
(2018) Aug-Jan	5.74%	39.74%	0.18%	8.22%	52.66%	0.26%	2.55%	27.51%	0.10%
(2019) Feb-Jul	7.96%	71.33%	0.21%	10.10%	77.36%	0.25%	-8.28%	87.34%	-0.80%
(2019) Aug-Jan	4.78%	0.15%	0.19%	6.12%	0.24%	0.21%	-1.42%	-0.04%	0.03%
(2020) Feb-Jul	-1.09%	-0.04%	0.10%	4.98%	0.22%	0.40%	0.46%	0.02%	0.16%
(2020) Aug-Jan	10.37%	0.27%	0.23%	18.90%	0.73%	0.68%	13.23%	0.42%	0.39%
(2021) Feb-Jul	1.17%	0.02%	0.00%	14.46%	0.39%	0.50%	4.07%	0.09%	0.10%
(2021) Aug-Jan	1.69%	0.03%	-0.04%	11.82%	0.33%	0.33%	2.48%	0.06%	0.00%
(2022) Feb-Jul	1.19%	0.03%	-0.01%	10.44%	0.35%	0.31%	2.35%	0.06%	0.05%
(2022) Aug-Jan	-3.53%	-0.07%	-0.06%	11.08%	0.28%	0.35%	-3.16%	-0.07%	-0.02%
(2023) Feb-Jul	-1.45%	-0.03%	-0.04%	9.54%	0.25%	0.25%	-0.99%	-0.02%	0.01%
(2023) Aug-Jan	-1.16%	-0.02%	-0.10%	-0.42%	-0.01%	-0.09%	0.71%	0.01%	0.08%
Active Strategy Accumulation	25.66%	111.43%	0.66%	105.24%	132.81%	3.45%	12.00%	115.39%	0.12%
Passive Strategy	-0.35%	-1.16%	0.00%	3.65%	13.45%	0.15%	-0.16%	-0.61%	0.00%

Source: Process data

Table 2 shows how the portfolio's performance was evaluated using multiple models. The beta Model suggests that the portfolio's performance with the highest in Sharpe index was observed from August 2020 to January 2021, while the portfolio with the lowest in Sharpe index was observed from August 2022 to January 2023. The Treynor index shows that the portfolio with the best performance was observed from February to July 2019, while the portfolio with the worst performance was observed from August 2022 to January 2023. According to the Jensen index, the highest performing portfolio occurred between August 2020 and January 2021, while the lowest performing portfolio occurred between August 2023 and January 2024.

According to the Alpha Model in Table 2, the portfolio's performance with the highest in Sharpe index was seen from August 2020 to January 2021, while the portfolio's performance with the lowest in Sharpe index was observed between August 2023 to January 2024. The Treynor index shows that the portfolio's performance with the highest was seen between February and July 2019, whereas the portfolio's performance with the lowest in Treynor index was observed between August 2023 and January 2024. The Jensen index indicates that the portfolio's performance with the highest was observed from August 2020 to January 2021, whereas the portfolio's performance with the lowest Jensen index was observed from August 2023 to January 2024.

Table 2 also shows how the portfolio's performance in Variance models. The Variance Model suggests that the portfolio's performance with the highest in Sharpe index was observed from August 2020 to January 2021, while the portfolio with the lowest in Sharpe index was observed from February to July 2019. The Treynor index shows that the portfolio with the best performance was observed from February to July

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2019, while the portfolio with the worst performance was observed from August 2022 to January 2023. According to the Jensen index, the highest performing portfolio occurred between August 2020 and January 2021, while the lowest performing portfolio occurred between February and July 2019.

Table 3. Statistical Test Comparing Active and Passive Strategy with Beta Model

One-Sample Test							
	Test Value = -5.4747						
			Significance			95% Confidence Interval of the Difference	
	t	Df	One-Sided p	Two-Sided p	Mean Difference	Lower	Upper
beta	10.205	91	4.766E-17	9.533E-17	0.498068	0.40112	0.59501660

Source: Process data

Table 3 describes the statistical analysis used to evaluate the performance measures produced from the comparing active and passive strategy with Beta Model. Normality testing began with the Shapiro-Wilk test, because the sample size was less than 50. The results showed normality for both models (beta active strategy: 0.130; beta passive strategy: 0.565), with p-values greater than 0.05. An ANOVA test was then used to determine the homogeneity of variance between the two datasets. The test statistic (0.430, p-value > 0.05) proved homogeneity, but another test statistic (0.863, p-value < 0.05) revealed no difference in variance. Finally, a one-sample t-test was used to detect any significant differences between beta active and beta passive strategy. The t-test findings (t-statistic: 10.205, t-table: 1.661) revealed that the calculated t-value is greater than the crucial t-table, indicating that there is statistically significant difference between the two models. As a result, the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted, implying that there significantly different return using active strategy compared to passive strategy, with provide higher returns and performance than passive strategies.

Table 4. Statistical Test Comparing Active and Passive Strategy with Alpha Model

One-Sample Test							
	Test Value = -4.51						
			Significance			95% Confidence Interval of the Difference	
	t	df	One-Sided p	Two-Sided p	Mean Difference	Lower	Upper
alpha	7.189	75	2.048E-10	4.097E-10	0.372081	0.26897824	0.47518375

Source: Process data

Table 4 describes the statistical analysis used to evaluate the performance measures produced from the comparing active and passive strategy with Alpha Model. Normality testing began with the Shapiro-Wilk test, because the sample size was less than 50. The results showed normality for both models (Alpha active strategy: 0.153; Alpha passive strategy: 0.518), with p-values greater than 0.05. An ANOVA test was then used to determine the homogeneity of variance between the two datasets. The test statistic (0.335, p-value > 0.05) proved homogeneity, but another test statistic (0.099, p-value < 0.05) revealed no difference in variance. Finally, a one-sample t-test was used to detect any significant differences between Alpha active and Alpha passive strategy. The t-test findings (t-statistic: 7.189, t-table: 1.665) revealed that the calculated t-value is greater than the crucial t-table, indicating that there is statistically significant difference between the two models. As a result, the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is

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accepted, implying that there significantly different return using active strategy compared to passive strategy, with provide higher returns and performance than passive strategies.

Table 5. Statistical Test Comparing Active and Passive Strategy with Variance Model

One-Sample Test

	Test Value = -4.16						
			Significance			95% Confidence Interval of the Difference	
	t	df	One-Sided p	Two-Sided p	Mean Difference	Lower	Upper
variance	-1.764	91	0.041	0.081	-0.13281	-0.28232	0.01670

Source: Process data

Table 5 describes the statistical analysis used to evaluate the performance measures produced from the comparing active and passive strategy with Variance Model. Normality testing began with the Shapiro-Wilk test, because the sample size was less than 50. The results showed normality for both models (Variance active strategy: 0.138; Variance passive strategy: 0.112), with p-values greater than 0.05. An ANOVA test was then used to determine the homogeneity of variance between the two datasets. The test statistic (0.180, p-value > 0.05) proved homogeneity, but another test statistic (0.00001, p-value < 0.05) revealed difference in variance. Finally, a one-sample t-test was used to detect any significant differences between variance active and variance passive strategy. The t-test findings (t-statistic: -1.764, t-table: 1.661) revealed that the calculated t-value is less than the crucial t-table, indicating that there is no statistically significant difference between the two models. As a result, the null hypothesis (H0) is accepted and the alternative hypothesis (H1) is rejected, implying that there is insufficient data to infer that Variance active and Variance passive differ significantly in terms of performance measurement.

Discussion

Two distinct approaches for every model portfolio. Various approaches are employed to determine which approach yields the best returns on stocks that fluctuate in the LQ45 index. Two types of strategies are employed: active and passive. Every six months, the components of the portfolio are recomposed by the active strategy. There are 11 periods in total for active strategies, ranging from the August 2018–January 2019 period to the August 2023–January 2024 era. For the duration of the purchase and hold simulation study period, the passive strategy did not recompose.

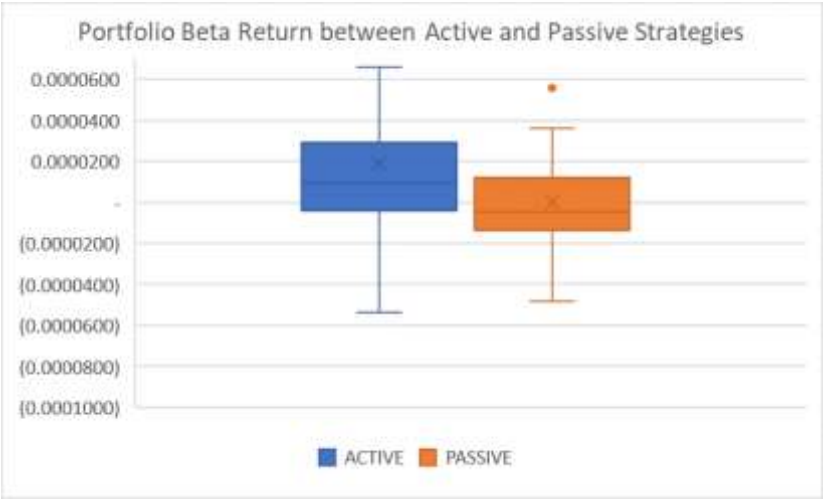

Figure 1. Portfolio Beta Return between Active and Passive Strategies

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Figure 1 shows that the beta portfolio return using an active strategy has a greater return value and based on statistical tests, a significant difference can be seen as indicated by different data labels between active and passive strategies because the standard deviation between the two data groups has very different values. The results of this research support previous research by, Fahling et al., (2019), Kristanti et al., (2022), and Gopane et al., (2023) which showed that active strategies provide better results than passive and unidirectional strategies with research by Anadu et al., (2020) which shows active strategies provide more significant returns than passive strategies and does not agree with research by Alford et al., (2017) which shows passive strategies are better than active strategies.

In this research, the recomposition of shares included in the portfolio provides an advantage in utilizing momentum and market conditions so that returns can be more optimal, which can be observed from the results of the portfolio performance evaluation using the Sharpe, Treynor, and Jensen indices, which can be observed in Figure 2 below.

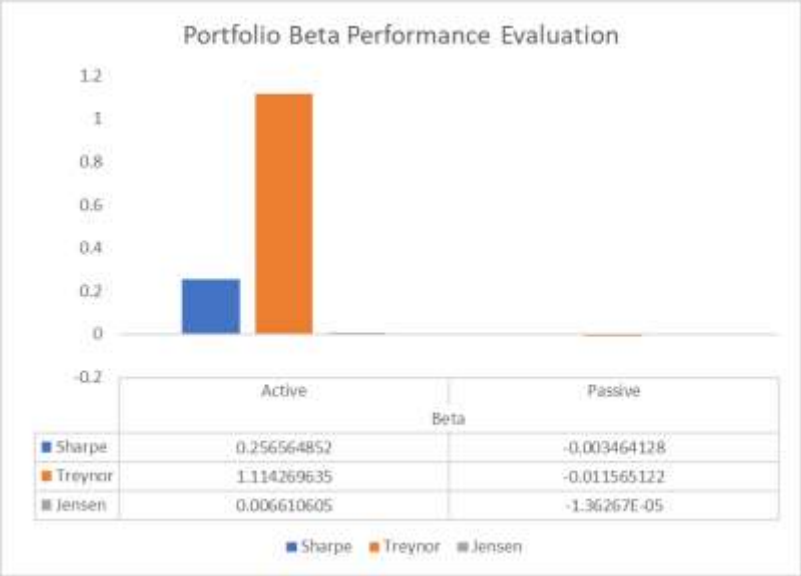

Figure 2. Portfolio Beta Performance Evaluation

The cumulative performance of the beta portfolio with an active strategy shows better results than a passive strategy. The overall performance of the beta portfolio with an active strategy shows positive values with both the Sharpe, Treynor, and Jensen indices. This shows that the beta portfolio is well-diversified and able to provide better returns than market returns. Meanwhile, the beta portfolio with a passive strategy shows the lowest performance among the whole which can be seen from the performance measurement results which show negative values both with the Sharpe, Treynor, and Jensen indices. This shows that the portfolio has not been properly diversified so it is unable to compensate for the risk of returns, sensitivity to the market, and less-than-optimal returns.

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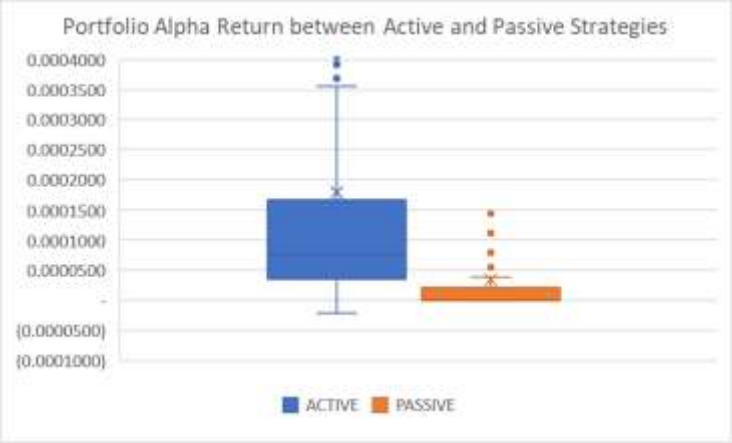

Figure 3. Portfolio Alpha Return between Active and Passive Strategies

According in Figure 3 shows that the Alpha portfolio return using an active strategy has a greater return value and based on statistical tests, a significant difference can be seen as indicated by different data labels between active and passive strategies because the standard deviation between the two data groups has very different values. The results of this research support previous research by, Fahling et al., (2019), Kristanti et al., (2022), and Gopane et al., (2023) which showed that active strategies provide better results than passive and unidirectional strategies with research by Anadu et al., (2020) which shows active strategies provide more significant returns than passive strategies and does not agree with research by Alford et al., (2017) which shows passive strategies are better than active strategies.

In this research, the recomposition of shares included in the portfolio provides an advantage in utilizing momentum and market conditions so that returns can be more optimal, which can be observed from the results of the portfolio performance evaluation using the Sharpe, Treynor, and Jensen indices, which can be observed in Figure 4 below.

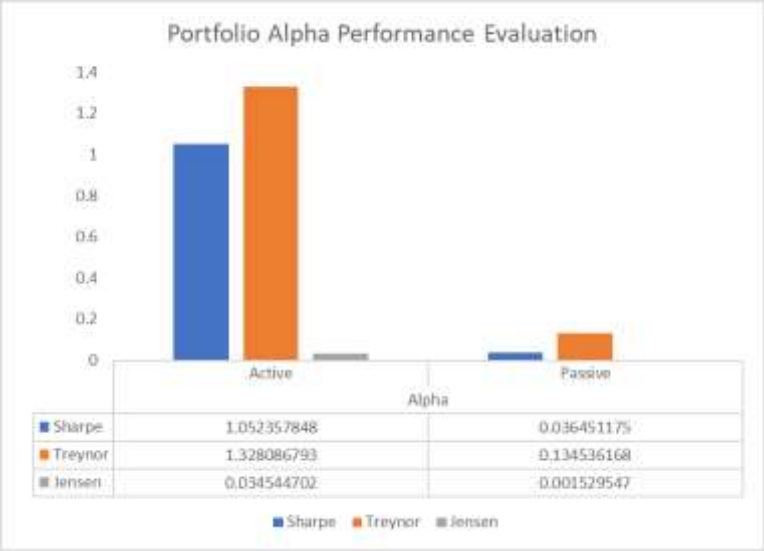

Figure 4. Portfolio Alpha Performance Evaluation

The cumulative performance of the Alpha portfolio with an active strategy shows better results than a passive strategy. The overall performance of the Alpha portfolio with an active strategy shows positive values with both the Sharpe, Treynor, and Jensen indices. This shows that the Alpha portfolio is well-diversified and able to provide better returns than market returns. Meanwhile, the Alpha portfolio with a passive strategy shows the lowest performance among the whole which can be seen from the performance

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measurement results which show negative values both with the Sharpe, Treynor, and Jensen indices. This shows that the portfolio has not been properly diversified so it is unable to compensate for the risk of returns, sensitivity to the market, and less-than-optimal returns.

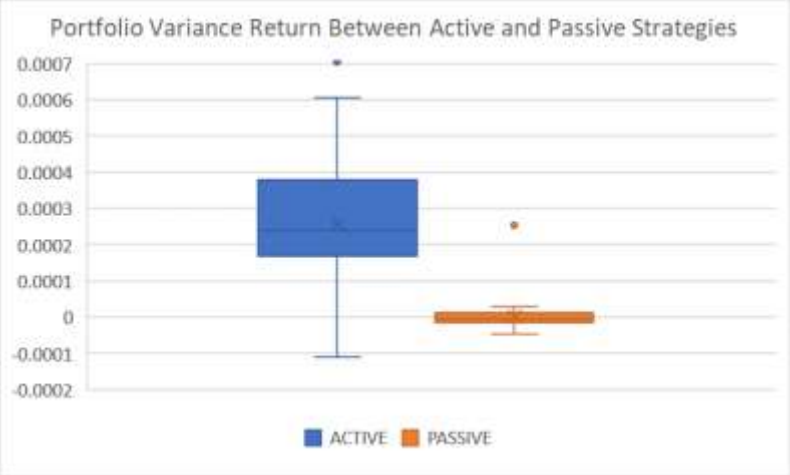

Figure 5. Portfolio Variance Return Between Active and Passive Strategies

Figure 5 shows that the variance portfolio return using an active strategy has a greater return value, but based on statistical tests there is no significant difference indicated by the same data labels between active and passive strategies because the standard deviation between the two data groups has different values. far different. The results of this research support previous research by, Fahling et al., (2019), Kristanti et al., (2022), and Gopane et al., (2023) which showed that active strategies provide better results than passive and unidirectional strategies with research by Anadu et al., (2020) which shows active strategies provide more significant returns than passive strategies and does not agree with research by Alford et al., (2017) which shows passive strategies are better than active strategies.

In this research, the recomposition of shares included in the portfolio provides advantages in utilizing market momentum and conditions so that returns can be more optimal, which can be observed from the results of evaluating portfolio performance using the Sharpe, Treynor, and Jensen indexes which can be observed in Figure 6 below.

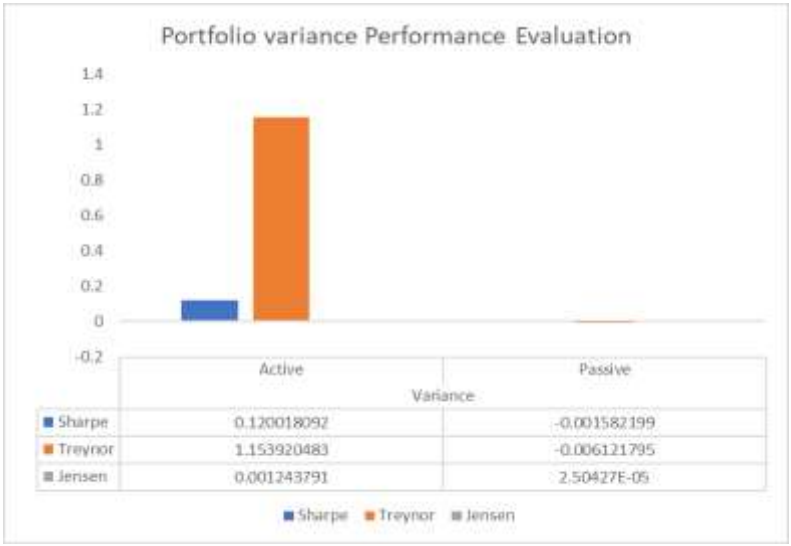

Figure 6. Portfolio Variance Performance Evaluation

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The cumulative performance of the variance portfolio with an active strategy shows better results than a passive strategy. The performance of the variance portfolio with an active strategy as a whole shows' positive values with both the Sharpe, Treynor, and Jensen indices. This shows that the variance portfolio is well-diversified and able to provide better returns than market returns. Meanwhile, the variance portfolio with a passive strategy shows the lowest performance among the whole, which can be seen from the performance measurement results which show negative values with both the Sharpe, Treynor, and Jensen indices. This shows that the portfolio has not been properly diversified so it is unable to compensate for the risk of returns, sensitivity to the market, and less-than-optimal returns.

Conclusion

Based on the research that has been conducted, it can be concluded that the portfolio of shares of inconsistent companies in the LQ45 index with active strategies in the Beta Model, Alpha Model, and Variance Model shows better performance and returns than the portfolio's performance using passive strategies, and there is a significant difference in two portfolio models, namely Beta Model and Alpha Model, but there is no significant difference in variance model. The active strategy has a recomposition that can take advantage of momentum and conditions at any time compared to passive strategies that do not change the composition of shares included in the portfolio.

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