

## THE STOCK ANALYSIS DURING COVID-19 PANDEMIC: ACTIVE AND PASSIVE STRATEGIES IN FORMING A STOCK PORTFOLIO ON THE INDONESIA STOCK EXCHANGE

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### Abstract

The purpose of this research was to determine the differences in portfolio performance based on active and passive strategies during COVID-19 pandemic. The performance measurement methods used are the Sharpe, Treynor, and Jensen Index. This research was conducted on 41 company stocks that are included in the LQ 45 Index on the Indonesia Stock Exchange during the period March 2020-July 2021. The method used in compiling an active portfolio was the stock selection method with the Single Index Model approach, while the passive portfolio is formed using the Index Fund. Portfolio performance was measured monthly using the Risk Adjusted Return which consists of the Sharpe Ratio, Treynor Ratio, Jensen Alpha methods. Statistical analysis used was Independent Sample T-test to analyze whether there is a difference between portfolio performance based on active strategy and passive strategy. Based on research conducted on the three methods (Sharpe, Treynor, Jensen Alpha) the results show that the performance of a stock portfolio based on an active strategy is better than a passive strategy on LQ-45 stocks on the Indonesia Stock Exchange during the COVID-19 pandemic for the period March 2020-July 2021.

**Keywords:** Portfolio Strategy, Active Portfolio, Passive Portfolio, Portfolio Performance, COVID-19 Pandemic.

### Introduction

COVID-19 has been spreading for more than a year all over the world. At the first this pandemic has no influence on the stock market, however with more confirmed victims the stock market reacted negatively (Khan et al., 2020). This also caused prices in the stock market to decline, especially after WHO announced that COVID-19 was a pandemic (Alali, 2020) and caused negative abnormal returns (Liu et al., 2020).

The COVID-19 pandemic has also influenced the investment world in Indonesia. The largest decline in the KCI value occurred in February and March 2020 where COVID-19 began to take positive victims in Indonesia and the number was increasing from time to time (Saraswati, 2020). All sectors experienced a decline coupled with the implementation of work from home and lock down to reduce the escalation of COVID-19 (Lathifah et al., 2021).

The negative impact in capital market occurred because of the pandemic and investors decision are affected by this situation (Pitaloka et al., 2020). Fluctuations in the capital market affect people's behavior in investing because analyzing the capital market is not just looking at numbers, but also looking at the behavioral financial or economic aspects of investment actors or investors (Heminta and Rahayu, 2021). Securities analysis is becoming increasing needed by investors because investors need information about the risks and returns of their securities (Utami and Susanti, 2013).

Risk can be minimized by diversifying through portfolio formation. In stock portfolio investment, investors will use various strategies to obtain performance that is comparable to or exceeds market performance. Active and passive portfolio strategies are two basic strategies that investors can choose and decide. When making a decision between the two strategies, there are several questions investors should consider. The most important question is whether the capital market is efficient or not. Efficient capital market can happen in the United States, but not in emerging countries (Cox, 2017).

(Dyck et al., 2015) show that active management in the US, provides no greater returns. However, it provides benefit in Europe, Australia, and the Far East (EAFE) and emerging countries. Market efficiency influences the rate of return and gives varying results. In EAFE and emerging countries markets that less efficient, active management outperforms their benchmarks, on average 49-246 basis points after costs and expenses. Thus, market efficiency and investor skills affect the result of active management.

Since this COVID-19 case was announced on March 2, 2020 by the President of the Republic of Indonesia, the ICI trend has shown a downward movement. Seeing this condition, there will be a possibility of changing strategies from investors to change their investment strategy from passive portfolio management to active portfolio management. This is because the purpose of an active portfolio strategy is to achieve stock portfolio performance that exceeds the stock portfolio performance obtained through a passive portfolio strategy. Investors will proactively seek additional information, increasing their ability to analyze information that affects stock portfolio performance. Stock can be selected from the LQ 45 index which is a bluechip index and most often used as a reference by investors or researchers (Utami and Susanti, 2020). The components of transaction costs and inflation are not taken into account in measuring portfolio performance.

Several researchers have researched portfolio strategies, but it is still very rare to find research on comparative analysis of portfolio strategies during the COVID-19 pandemic, so this research can be a differentiator and has the potential to be studied in depth.

## Theoretical Background

### Portfolio Strategy

There are generally two types of portfolio investment strategies, namely active strategies and passive strategies. As explained by Tandililin (2010: 329) there are two strategies that investors can use in portfolio formation, namely active and passive strategies.

### Active Investment Strategy

An active portfolio strategy will basically include the actions of investors actively in selecting and stocks transaction, finding information, following the time and movement of stock prices and various other efforts to get abnormal returns. The objective of an active portfolio strategy is to achieve a stock portfolio performance that exceeds the performance of a stock portfolio obtained through a passive portfolio strategy.

The active strategy used in this research is stock selection strategy using the Single Index Model (SIM) method. SIM is one of the potential solutions to simplify the calculation of the optimal portfolio and assess its effectiveness under different setting models. This model aims to achieve high profits or maximize the total profit to be obtained and is limited to the maximum level of risk.

### Passive Investment Strategy

A passive portfolio strategy is an inactive action of investors in finding information and only basing the movement of their shares on the market index movement.

Formation of a portfolio based on a passive strategy will use a strategy following the index (indexing). The formation of a portfolio with a strategy to follow the index can be done by forming a portfolio that is identical to the market index, in this study the LQ 45 index is used.

### Hypothesis

Take a look the current issue of the COVID-19 pandemic, there is a possibility that investors will change their strategy to change their investment strategy from passive portfolio management to active portfolio management. This is because the purpose of an active portfolio strategy is to archive stock portfolio performance that exceeds the stock portfolio performance obtained through a passive portfolio strategy. Investors will proactively seek additional information, improve their ability to analyze information that affects the performance of stock portfolios so that their performance exceeds the market index which is currently less than encouraging in the midst of the COVID-19 pandemic.

The result of the comparison of portfolio strategies used in Hidayat and Hendrawan's research (2017) which are based on return, risk, and excess return, show that the best performance sequentially is to use an active semiannual portfolio strategy, a passive portfolio strategy, and the followed by an annual active portfolio strategy. The result of Sulistyorini's research (2019) show that the performance of the active strategy stock group is higher than the passive strategy group performance in terms of the return and risk values. Utami and Susanti (2013) show the portfolio performance based on the active strategy is better than the passive strategy. So there are hypothesis proposed in this study as follows:

*"Portfolio performance based on an active strategy is better than portfolio performance based on a passive strategy on LQ 45 shares on the Indonesia Stock Exchange during the COVID-19 pandemic for the March 2020-July 2021 Period"*

## Research Methods

### Research Design

The objects in this research are companies that have gone public, and are listed on Indonesia Stock Exchange. The data taken are daily stock data for all stock belonging to the LQ-45 stock group, the Interest

Rate (BI rate) and the Indonesia Composite Index (ICI) during the COVID-19 pandemic for the March 2020-July 2021 period.

#### Population and Research Sample

The sample in this study is the shares of companies that always listed at LQ-45 during March 2020-July 2021, which are 41 companies.

#### Analysis Method

Analysis method to test the difference is Independent Sample t-Test. In addition, this study uses variables that must be analyzed first using quantitative analysis techniques. Quantitative data processing is assisted by the Microsoft Excel program. Data analysis was carried out using the following steps and methods:

##### 1. Formation of a Portfolio with an Active Strategy using the Single Index Model

Stock from the LQ-45 index will be selected and an optimal portfolio formed through the Single Index Model (SIM) method. The steps are as follow :

- 1) Calculating stock returns ( $R_t$ ) during the observation period using the following formulation :

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Information :

$R_t$  : stock returns  
 $P_t$  : stock price at time t  
 $P_{t-1}$  : stock price at time t-1

- 2) Calculating the Indonesia Composites Index (ICI) market return index ( $R_{m,t}$ ) during the observation period with the following formulation :

$$R_{m,t} = \frac{I_t - I_{t-1}}{I_{t-1}}$$

Information :

$R_{m,t}$  : market returns  
 $I_t$  : ICI index period t  
 $I_{t-1}$  : ICI index period t-1

- 3) Calculating the expected return (mean return) of the stock during the observation period with the following formulation :

$$E(R_i) = \frac{\sum_{i=1}^n R_i}{n}$$

Information :

$E(R_i)$  : mean stock return i  
 $R_i$  : individual stock returns each period  
 $n$  : amount of data

- 4) Calculating stock risk during the observation period with the following formulation:

$$\sigma_i^2 = \frac{\sum_{i=1}^n (R_i - \bar{R}_i)^2}{n-1}$$

$\sigma_i^2$  : stock variance or risk i  
 $R_i$  : stock return i  
 $\bar{R}_i$  : mean stock return i  
 $n$  : amount of data

- 5) Calculating stock beta with the formulation:

$$\beta_i = \frac{\sigma_{i,m}}{\sigma_m^2}$$

- 6) Calculating the risk-free return symbolized by the 5BR interest rate with a calculation per semester or six month
- 7) Develop optimal portfolio based on Single Index Model.

Ranking stocks by Excess Return to Beta (ERB)

$$ERB = \frac{R_i - R_f}{\beta_i}$$

where:

ERB = excess return to beta

$R_i$  = expected stock return

$R_f$  = risk free return

$\beta_i$  = security beta i

Stocks with a low excess return to beta ratio will not be included in the optimal portfolio. Thus, it takes a cut off limiting point that determines the limit of the excess return to beta value which is said to be high. The magnitude of this point can be determined by the following steps:

- Sort the stocks based on the largest excess return to beta value to the smallest excess return to beta value. Stocks with the largest excess return to beta are candidates for inclusion in the optimal portfolio.
- Calculate the value of Bi for each of the i shares with the formula below:

$$B_i = \frac{ERB_i}{\sigma_i^2}$$

- Calculate the value of Ci with the formula:

$$C_i = \frac{ERB_i - \beta_i R_f}{1 + \beta_i \left( \frac{\sigma_i^2}{\sigma_m^2} \right)}$$

- Determine the cutoff point value, which is the largest Ci value.
- Stocks that make up the optimal portfolio are stocks that have a greater excess return to beta or stocks with a value of excess return to beta at point  $C^*$ . While stocks that have a value of excess return to beta that is smaller than the excess return to beta at point  $C^*$  are not included in the formation of an optimal portfolio (Elton & Gruber, 2007).
- Determining Optimal Proportions

Determining the optimal proportion can be done by first finding the Zi of each asset that is included in the optimal portfolio combination. The Zi value is found by the following formula:

$$Z_i = \frac{\beta_i}{\sigma_i^2} (ERB_i - C^*)$$

After that, the optimal weight of each asset included in the optimal portfolio combination can be calculated using the following equation:

$$X_i = \frac{Z_i}{\sum_{i=1}^n Z_i}$$

where:

Zi = security proportion scale i

$\beta_i$  = Beta security i

$\sigma_i^2$  = the variance of the i-th securities residual error which is also an unsystematic risk

ERB = Excess Return to Beta securities

$X_i$  = Proportion of the i-th security

- Calculating the expected return and portfolio risk:

$$R_p = \sum X_i R_i$$

$$\sigma_p^2 = \beta_p^2 \sigma_m^2 + (\sum_{i=1}^n W_i \sigma_{e_i})^2$$

## 2. Formation of a Portfolio with a Passive Strategy using Indexing

The analytical steps for calculating the passive portfolio strategy method are as follows:

- Calculating stock returns ( $R_{i,t}$ ) during the observation period using the following formulation:

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$$

information:

$R_{i,t}$  = return index i

$P_{i,t}$  = stock price/index period t

$P_{i,t-1}$  = stock price/index period t-1.

- 2) Calculating the LQ45 index market return ( $R_{m,t}$ ) during the observation period with the following formulation:

$$R_{m,t} = \frac{R_{m,t} - R_{m,t-1}}{R_{m,t-1}}$$

information:

- $R_{m,t}$  = Market returns  
 $t$  = LQ45 index period t  
 $t-1$  = LQ45 index period t-1

- 3) Calculating the expected return (mean return) of the stock during the observation period with the following formulation:

$$E(R_i) = \frac{\sum R_i}{n}$$

information:

- $E(R_i)$  = Mean stock return i  
 $R_i$  = individual stock returns each period  
 $n$  = amount of data

- 4) Calculate the variance during the observation period with the formulation:

$$\sigma^2 = \frac{\sum (R_i - E(R_i))^2}{t}$$

where:

- $\sigma^2$  = index variance  
 $R_i$  = index return  
 $E(R_i)$  = Expected Return Index  
 $t$  = number of periods

- 5) Formation of a portfolio by indexing can be done to form a portfolio whose composition is similar to the LQ 45 index. This method is called an index fund. Where the proportion of each share is based on the Equally Weighted method. Then calculate the expected return and portfolio risk with the following formulation:

$$R_p = \sum X_i R_i$$

$$\sigma_p^2 = \beta^2 \sigma_m^2 + (\sum w_i \sigma_{e_i})^2$$

### 3. Portfolio Performance Evaluation

The optimal portfolio formed will be measured its performance through the risk adjusted return method as a benchmark in the comparison of portfolio performance between before and during the COVID-19 pandemic, namely by:

#### a. Sharpe Index

$$S_p = \frac{R_p - R_f}{\sigma_p}$$

where:

- $S_p$  = Sharpe Index  
 $R_p$  = Portfolio average return  
 $R_f$  = Average return on risk-free assets  
 $\sigma_p$  = Portfolio standard deviation

#### b. Treynor Index

$$T_p = \frac{R_p - R_f}{\beta_p}$$

where:

- $T_p$  = Treynor Index  
 $R_p$  = Portfolio average return  
 $R_f$  = Average return on risk-free assets  
 $\beta_p$  = Portfolio systematic risk

#### c. Jensen Index

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

information:

- $J_p$  = Jensen Portfolio Index  
 $R_f$  = Average risk-free rate of return during the observation period

$R_m$  = Average market rate of return during the observation period  
 $\beta_p$  = Beta portfolio p

#### 4. Normality Test

This research uses the Kolmogorov-Smirnov test technique because this method is designed to test the alignment of continuous data.

#### 5. Independent Sample t-test

In analyzing the differences in portfolio performance, it can be done by using two different average tests, namely the Independent Sample T-test.

### Results and Discussion

#### The Comparison of Active and Passive Performance

After the expected rate of return and risk for the portfolio are calculated, then the performance assessment of the two portfolio strategies is carried out using the Risk Adjusted Return method which consists of three methods, namely: Sharpe, Treynor, and Jensen's Alpha. The results of the calculation of stock portfolio performance are as follows:

Table 1. The Comparison of Active and Passive Performance

Periode	Sharpe Ratio		Treynor Ratio		Jensen Ratio			
	Active	Passive	Active	Passive	Active	Passive		
2020	March	0,0304	-0,1633	0,0020	-0,0093	0,0065	-0,0023	
	April	0,2444	0,0921	0,0096	0,0036	0,0190	0,0012	
	May	0,3935	0,1278	0,0152	0,0035	0,0002	0,0018	
	June	0,1864	0,0750	0,0052	0,0017	0,0145	0,0017	
	July	0,3737	0,1384	0,0109	0,0022	0,0287	0,0001	
	August	0,3929	0,1981	0,0130	0,0042	0,0074	0,0019	
	September	0,0355	-0,1840	0,0011	-0,0040	0,0008	0,0001	
	October	0,3881	0,1229	0,0078	0,0020	0,0113	0,0005	
	November	0,4556	0,2530	0,0143	0,0056	0,0035	0,0012	
	December	0,3073	0,1363	0,0073	0,0028	0,0092	0,0007	
	2021	January	0,1817	-0,0331	0,0061	-0,0016	0,0294	0,0007
		February	0,4913	-0,0064	0,0078	-0,0001	0,0273	-0,0027
March		0,2236	-0,1443	0,0091	-0,0031	0,0050	-0,0004	
April		0,2487	-0,0114	0,0064	-0,0002	0,0043	0,0000	
May		0,2428	-0,0397	0,0058	-0,0007	0,0077	-0,0008	
June		0,6609	-0,1755	0,0145	-0,0038	0,0183	-0,0036	
July		0,2986	0,0035	0,0089	0,0002	0,0030	-0,0003	

The stock portfolio using the Sharpe, Treynor, and Jensen ratio methods based on an active strategy produces positive performance. This means that the portfolio has been quite good at compensating its total risk and systematic risk with a higher return, and the actual return from its investment is higher than the theoretical return of the investment and its performance is better than the market index. Meanwhile, the performance of the stock portfolio based on the passive strategy resulted in fluctuating numbers, namely there were positive and negative performances. This is because in those months some of the returns generated by each stock produce negative numbers, causing the resulting portfolio returns to also be negative. This can be caused by external factors that affect the stock returns such as changes in government policies, inflation, interest rates, deposit rates, as well as socio-political conditions and Indonesia's security stability, especially during the COVID-19 pandemic, 19 at the moment.

#### Hypothesis Testing Results

To analyze the performance of the active and passive portfolios, hypothesis testing is carried out using a two-average difference analysis, whether there is a difference between the performance of the active portfolio and the performance of the passive portfolio, but previously the data from all methods, both active strategy and passive strategy, will first be tested for normality using the Kolmogorov Smirnov test, with the following results:

Table 2. Kolmogorov Smirnov Test

	Active	Passive
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Variabel	Sig	Alpha	Information	Sig	Alpha	Information
Sharpe	0.987	0.05	passed	0.946	0.05	passed
Treynor	0.995	0.05	passed	0.929	0.05	passed
Jensen	0.618	0.05	passed	0.633	0.05	passed

From the table above, it can be seen that all methods using both active and passive strategies have passed the normality test. After the data is confirmed to pass the normality test, then a test is carried out to find whether there is a difference between an active strategy and a passive strategy. The results of these tests can be seen in the following table:

**Table 3. Independent Sample Test**

		Levene's Test for Equality of Variance		t-test for Equality of Mean	
		F	Sig.	t	Sig.
Sharpe	Equal variances assumed	0.697	0.757	5.533	0.000
	Equal variances not assumed			5.533	0.000
Treynor	Equal variances assumed	0.188	0.672	6.210	0.000
	Equal variances not assumed			6.210	0.000
Jensen	Equal variances assumed	28.647	0.000	4.832	0.000
	Equal variances not assumed			4.832	0.000

Based on the result of the above calculations, it can be taken a decision to reject  $H_0$  and accept  $H_1$ . So the conclusion in this test is that there is a significant difference between the performance of an active portfolio and the performance of a passive portfolio using the Sharpe ratio, Jensen ratio, and Treynor ratio on the LQ-45 stock on IDX during the COVID-19 pandemic for the March 2020-July 2021 period. In other word, a portfolio based on an active strategy is better than a passive strategy in terms of compensating the return of the portfolio against its total risk (systematic risk and unsystematic risk), also against its systematic risk as measured by portfolio beta, and in terms of providing a return that is greater than the expected return or beating market index. The selection of stocks that have a positive ERB (Excess Return to Beta) makes the active strategy generate a greater  $E(R_p)$  than the passive  $E(R_p)$ , so that the active strategy has a higher divisor than the passive strategy which automatically makes the ratio become bigger. In addition, the active portfolio risk which is smaller than the passive strategy portfolio risk also gives a higher value to the active portfolio ratio. This is in accordance with the objective of an active strategy that seeks information actively in order to exceed market performance, especially in the midst of the COVID-19 pandemic.

From the three methods of calculating portfolio performance assessment above, the results of the Independent Sample T-Test show that all calculation methods provide an assessment that portfolio performance based on an active strategy is better than a passive strategy. This is because in the active strategy, investors act actively in making decisions to buy and sell shares with various public and private information and follow the time and movement of stock prices to get the best stock combination that will produce optimal returns and abnormal returns. Whereas in the passive strategy, investors only base their stock movements on the movement of the market index so that they will only get a return equal to the return of the market index. The activity of these investors encourages high return and reduces risk in order to obtain optimal results and can exceed market performance.

This is in line with studies conducted in Indonesia, namely research by Utami and Susanti (2013) which tested the differences based on an active strategy using the Single Index Model and a passive strategy using an index fund, namely the LQ-45 index for the 2009-2010 period which showed significant differences. There is significant difference between the performance of the stock portfolio based on the active strategy and the performance of the stock portfolio based on the passive strategy, where the performance of the portfolio based on active strategy is better than the passive strategy. Likewise, with the results of Sulistivormi's research (2019) on the JII Index for the 2015-2017 period which shows the performance of the active strategy stock group is higher than the performance of the passive strategy stock group in terms of the return and risk values.

In contrast to the results of Cox's research (2017) which provides an analysis that active strategies show results that are not statistically significant, which means that no significant benefits for active management were found in the U.S. market. Based on this, the use of passive investment vehicles in the US market is recommended. Investors interested in maximizing the return on their long-term investment in the US market should pursue a passive investment strategy, while other seeking other benefits may consider pursuing an active investment strategy.

### Conclusions

Based on the results of statistical analysis using the Sharpe, Treynor, and Jensen Alpha methods on LQ 45 shares on the Indonesia Stock Exchange during the COVID-19 pandemic for the March 2020-July 2021 period, the results show that there is a significant difference between stock portfolio performance based on active strategies and portfolio performance stocks based on passive strategies, where portfolio performance based on active strategies is better than passive strategies. This is commensurate with the sacrifice of an active strategy of seeking information compared to a passive strategy that only follows the index in the midst of the COVID-19 pandemic. However, wise investors and investment managers must still take into account the costs of this strategy, because active portfolio strategies require higher costs than passive portfolio strategies.

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