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Research Article

Share Portfolio Performance Analysis Using Sharpe, Trey nor and Jensen Methods with the Geographical Perspective of Indonesia Stock Exchange

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Abstract

This study aims to determine the performance of stock portfolios in the Property Industry, Real Estate and Building Construction sectors listed on the IDX for the period 2015 - 2019 using the Sharpe, Treynor and Jensen methods. The research method uses a comparative descriptive method. The population in this study were 91 companies. The sample selection technique used purposive sampling method and obtained a sample of 50 companies. The calculation of stock portfolio performance in this study uses a different test using One Way of Variance by Rank with Kruskal-Wallis. The results showed that there were significant differences in stock performance between the Sharpe, Treynor and Jensen methods. Another test by looking at the difference in the three mean ranks, the Treynor method is the one that shows the most consistency, because Treynor has the lowest mean rank difference compared to using the Sharpe and Jensen methods.

Keywords

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Introduction

Property, building construction, and real estate play a significant part in Indonesia's economic as well as development sectors. This sector can also be used to evaluate a country's economic development. Developments inside the property and real estate business sector are of course very attractive to investors because of the increase in land and building prices which continue to rise every year, land supply is fixed while demand will increase along with the increasing population and increasing human needs for housing. , offices, shopping centers, and others. The building construction business in building facilities and infrastructure in Indonesia is growing and will also attract investors to invest because of the large number of developments. Investment in the capital market is one of the most developed investment fields today. A part from being a forum that brings together issuers and investors, investing in the stock market provides investors with additional income in the form of capital gains as well as dividends. For the purpose of decreasing risk borne, the investors may invest into several kinds of stocks with establishing a "portfolio". A stock "portfolio" is one of the strategies that investors use to reduce risk by allocating a certain amount of funds to various types of investments that can provide optimal returns. The strategy carried out aims to spread the possibility of risk without having to sacrifice the expected return (Abulela & Davenport Jr, 2020; Anwar, Kamarudin, Noordin, Hussain, & Mihardjo, 2021; Chantika, 2015; Demir, 2020). (Husnan, 2015) A very important stage of the investment process is the portfolio performance evaluation stage. This is said to be important because it can identify whether the level of profit earned is in accordance with the risks borne, and can provide information for investors to know as a whole what are the weaknesses and strengths of the portfolios which have been designed. In evaluating the performance of our portfolio, we do not just examine on return levels, on the other hand also the level of portfolio risk that should be borne and the objectives of the investment. The research phenomenon is consist on data which is collected from the "Indonesia Stock Exchange, the property sector index, real estate and building construction" throughout 2017 fell 4.31% when the JCI actually jumped by 19.99%. The property sector did not improve even though Bank Indonesia interest rates fell and the loan to deposit ratio policy was relaxed. The performance of the property industry sector in the country which in the last 5 years has only grown at 3.5 percent. It has an inverse relationship with economic development, which hovers around 5%. The World Bank also released a report that the demand for housing in Indonesia reached 920 thousand units per year, while the availability figure only reached 400 thousand units per year. This shows the lack of development inside the Property, Real Estate as well as Building Construction Industry in Indonesia which has not been able to meet the needs of housing in Indonesia. There are several studies that have been done before, regarding the dimension of a portfolio performance by the Sharpe, Treynor as well as Jensen methods, namely research conducted by (Tuerah, 2013) by conducting a comparison test of three Sharpe Treynor models, as well as Jensen by the analysis tool pair sample test and ANOVA results. Research shows that the method; (Alexander, Sharpe, & Bailey, 2010) differ significantly between the expected returns and those resulting from the 3 methods. This is due to differences in the variables used in the calculation and the need to standardize the performance measures used. Another study was conducted by (Arisonda, 2013; Peker, 2020) spending Sharpe, Treynor, as well as Jensen approaches with the Zscore and Kruskall Wallis statistical tests.

Literature Review

Portfolio Performance Evaluation

There are the portfolio performance reviews is a crucial step in the investment process because in this stage it can identify portfolios that have been formed or provide a relatively higher return rate than other portfolio returns and to find out these returns according to the level of risk borne. In addition to the level of return being considered, it is necessary to pay attention to additional aspects for example level of portfolio risk and investment objectives.

According to (Mediana, 2018; Muhammad, Kumaidi, & Mukminan, 2020; OZKARAL & Bozyigit, 2020; Setyo, Asianto, & Kurniasih, 2020; Tandelilin, 2010) there are several factors that need to be considered in evaluating the performance of a portfolio, as follows:

1. Level of risk. In evaluating portfolio performance, it is necessary to pay attention to the level of portfolio return obtained which is sufficient to cover the risks that must be borne and is

based on risk-adjusted measures.

2. Period of time. The time period needs to be considered when evaluating portfolio performance, because it will affect the level of portfolio return.

Use of appropriate benchmarks Evaluation of investment performance should also involve comparison of portfolio performance with other relevant portfolio alternatives. The portfolio selected as the benchmark must be able to accurately reflect the goals that investors want to invest in.

3. Investment Objectives. Different investment objectives will affect the performance of the portfolio it manages. For example, if the investment objective of an investor is long-term growth, then the portfolio performance that is formed will be relatively smaller than the portfolio performance established by the aim of obtaining short-term benefits.

Portfolio Performance Measurement

According to (Setyo & Kurniasih, 2020;Suryani & Herianti, 2015; Tandelilin, 2010), there are numerous ways for assessing portfolio performance that consider risk, namely the Sharpe, Treynor, as well as Jensen indices. There are three basic methods will then be used to analyze the portfolio performance in this study.

1. 1. The Sharpe Index William Sharpe created the Sharpe index, which is also known as the "reward-to-variability ratio". The cost of capital to every unit of risk in the portfolio is evaluated using reward-to-variability. The Sharpe index is calculated using the capital market line idea, which involves distributing portfolio risk premium through the standard deviation.

2. Treynor Index is the second index. The Treynor Index, created by Jack Treynor, is a measuring of portfolio performance that is also known as the reward-to-variability ratio (the assumption that the portfolio is well diversified so that the relevant risks are in systematic risk or beta). The Treynor index relates the degree of risk in a portfolio with the level of return. Treynor makes the assumption that the portfolio is well-diversified and that the only risk that matters is risk premium (measured through beta).

3. Jensen Index is a third option. The Jensen index measures the difference among a portfolio's actual rate of return as well as the predicted rate of return unless the portfolio were already on the capital market line. The Jensen index is define as a measure of returns that are either above or below the market line for a security. The Jensen index can be considered as a measure of how well a portfolio "beats the market." A positive index indicates that the portfolio has outperformed return expectations, which is a good thing for the reason that portfolio has a high return for its systematic risk level.

Investment is a term with several meanings related to finance and economics. In making the decision to invest, an investor must consider which stocks to choose. The stocks chosen must be those that provide an extreme return by a certain risk, and a positive return by a lowest risk. To discovery which stocks are selected, it can be done by classifying the shares by forming an optimal portfolio of stocks. The term investment relates to the accumulation of a form of asset with the hope of obtaining future benefits. Islamic stocks also have the same rate of return and risk as conventional stocks. The resulting optimal portfolio is included in a measure of the performance of the stock portfolio. Portfolio performance using risk-adjusted return measures Sharpe, Treynor, as well as Jensen indexes can all be used to determine this (Tandelilin, 2010; Yangin, Turan, & BİLGİN, 2020). The criteria of stock portfolio must have information about return rate as well as resulting risk. Poor market conditions can reduce portfolio performance. The Sharpe index could be utilized to rank different portfolios constructed on performance, with a greater Sharpe index indicating superior portfolio performance when compared to other portfolios. Portfolio performance can be measured by dividing the return over the portfolio volatility (Jogiyanto, 2010).

Hypothesis

H_1: By comparing the performance of the Property Industry stock portfolio to use the Sharpe, Treynor, as well as Jensen Indices, there is no significant variation in the results.

H_2: By comparing the performance of the Property Industry stock portfolio and use the Sharpe, Treynor, as well as Jensen Indices, there's also a significant difference throughout the results.

Research Methods

This study uses a descriptive method and is a quantitative study, because the data that has been together as well as indicated is into the method of numbers. The Quantitative study is mostly used in the study which have an objective to examines a concept, present a detail or describe static, and indicated the association among variables as well as some remain developing concepts, developing understanding and describing various things(Sugiyono, 2013). Data in the form of numbers will then be analyzed using statistical methods. There are the sampling method utilized purposive sampling.

Research Sample Criteria:

1. Organizations included in the category of the Property Industry, Real Estate as well as Building Construction sectors listed on the Indonesia Stock Exchange for the period 2015-2019.
2. Organizations that own and publish share price data during the research period
3. A portfolio of stocks that are actively traded during the 2015-2019 period.

Research Results and Discussion

Comparative Analysis of Stock Portfolio Performance Using the Sharpe Index, Treynor Index and Jensen Index Method.

In this study, portfolio performance will be measured using three different methods, namely the Sharpe, Treynor, and Jensen methods. Portfolio performance measurement for the three different methods requires data in the form of portfolio return, standard deviation, market return and risk free rate. Considering that the three methods have different formulations and performance measurement characteristics, the performance index value obtained from the calculation of the index number is different.The index value using the Sharpe method is in the range of -0.2042 to the maximum range of 0.2178. For index numbers with the Treynor method in the range of -0.0213 to the maximum range of 0.2774. Meanwhile, the index number using the Jensen method is in the range of -0.0198 to the maximum range of 0.0315. Each method of stock portfolio performance has a relative numerical basis that cannot be compared directly with one another, considering that the measurement methods are different. This makes this study necessary to standardize the index value of the three measurement methods.

Transformation Result Z-score (standardized)

In this study, to conduct a standard assessment of each performance measurement using the Z-score transformation method (standardized). Z-score is a way of converting data values into standardized scores which have a means equal to zero and a standard deviation equal to one.

Table 1.
Value of Mean and Standard Deviation of Output Z-score Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Zscore	150	-.2609	.2774	-.018885	.0730046
Method	150	1	3	2.00	.819
Valid N (list wise)	150				

Source: Result of Data Processing (2020)

Table 1 shows the number of samples in this study as many as 150 with a mean value of -0.018885 and a standard deviation of 0.730046. The resulting minimum value of -0.2609 is generated from the Sharpe index measurement and the maximum value of 0.2774 is generated from the Jensen index measurement.

Kruskal-Wallis Test Results

After knowing the ranking of each portfolio performance measurement using different methods, the next step is to test whether the portfolio performance will have the same ranking when measured using three different methods. Because the data used next is in the form of ranking, then testing with non-parametric statistics will be more appropriate to use. This test is done by comparing the same sample or the same case with different conditions. Each sample is measured under all conditions, so for a design like this it is called a one way analysis of variance by rank with the method used is the Kruskal-Wallis test

Table 2.
Kruskal Wallis Test Results against the Z-score of the Sharpe, Treynor and Jensen Indices

Test Statistics[a, b]	Nilai
Kruskal-Wallis H	10.675
Df	2
Asymp. Sig.	.005

a. Kruskal Wallis Test
b. Grouping Variable: Metode
Source: Result of Data Proccesing (2020)

Testing between treatments that have the lowest mean rank difference is the most consistent form of portfolio performance measurement method. The results of the mean rank test can be seen in table 3 as follows:

Table 3.
Comparison between the Sharpe, Treynor, and Jensen Treatment Indices

Ranks	Method	N	Mean Rank
Zscore (Amount)	Sharpe	50	59.28
	Treynor	50	81.57
	Jensen	50	85.65
	Total	150	

Source: Result of Data Proccesing (2020)

Table 4.
Difference in Mean Rank Index Sharpe, Treynor dan Jensen

Method	Difference			Amount
	Sharpe	Treynor	Jensen	
Sharpe (59.29)	0	22.28	26.36	48.64
Treynor (81.57)	22.28	0	4.08	26.36
Jensen (85.65)	26.36	4.08	0	30.44

Source: Result of Data Proccesing (2020)

By looking at the difference between the three mean ranks, the Treynor method is the method that shows the most consistency, because Treynor has the lowest mean rank difference against Sharpe and Jensen. The results of this study support the research conducted by (Tuerah, 2013) which states that there is a significant difference between testing using the Sharpe, Treynor and Jensen methods. This is due to differences in the variables used in the calculation of each method. The Jensen, Sharpe and Treynor method is built with different assumptions, because:

1. The Sharpe performance measure is constructed with the assumption that it is a measure of return from the ratio of returns divided by risk. The Sharpe method states that the portfolio performance series is calculated which is the net yield of the portfolio with a risk-free interest rate per unit, and if it gets a positive and bigger result, then portfolio performance is getting better.
2. The Treynor Performance Measure is built on the assumption that stocks are highly diversified. Is a measure of return per unit risk? This excess return is defined as the difference between the return on shares and the risk-free rate of return in the same evaluation period. The Treynor method states that the Treynor index is the right measuring tool because it is a fully diversified portfolio.
3. The Jensen performance measure is built with an assumption model that investors will estimate a constant rate of return during the investment period by obtaining the Jensen ALPHA rate of return above (below). So that the predictive power of the 3 methods is different and this proves that the results are significantly different.

Conclusion

1. According to Sharpe, the measure of stock portfolio performance dominantly shows negative results, with a minimum value of -0.2042 on ACST shares, and a maximum value of 0.2178 in INPP shares. This shows that the performance of the stock portfolio during the observation period still provides returns below the risk free rate.
2. Treynor's calculation, the stock portfolio produces a minimum value of -0.0213 on ACST shares, and a maximum value of 0.2774 on JKON shares. This can be caused by the inclusion of a market risk variable (beta coefficient) which measures the level of response of stocks to market movements into the analysis of the calculation of return and portfolio risk.
3. Jensen's calculation, using the market risk variable (beta coefficient) in its calculations, yields a minimum value of -0.0198 on ACST shares and a maximum value of 0.0315 on OMRE shares. The difference in results is significant in measuring portfolio performance in the Property Industry, Real Estate and Building Construction sectors listed on the IDX

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