

***EVALUATING PORTFOLIO PERFORMANCE OF COMPANIES' STOCK LISTED IN LQ45
BASED ON SHARPE, TREYNOR AND JENSEN METHOD***

***EVALUASI KINERJA PORTOFOLIO SAHAM PERUSAHAAN PADA LQ45
BERDASARKAN METODE SHARPE, TREYNOR DAN JENSEN***

by:

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Abstract: *Capital market activity has an important role in developing the national economy, in order to enter the financial market, the investor needs to know about the risk in the capital market itself and determine the best stock to be taken. There are three common methods of analysis such as Sharpe ratio, Treynor ratio and Jensen's alpha which are sometimes confuse the investor in order to take which one of these three is the better method. This research objective is to identify whether there is a difference of portfolio performance among these three methods on LQ 45 by analyzing the performance of each sampling stock from LQ 45. This research was using Z-score standardized to standardized these three method and after that used one-way ANOVA to find whether there is any difference among these three methods or not. Conclusion this research showed no difference between any of these three methods. Any of this method can be used by the investor to analyze the ratio of portfolio performance. As a recommendation, using these three methods simultaneously can provide better information for manager as part of investment management process.*

Keywords: *portfolio performance, z-score, sharpe ratio, treynor ratio, jensen's alpha*

Abstrak: *Aktivitas pasar modal memiliki peran penting dalam membangun ekonomi nasional, untuk memasuki pasar modal, investor harus mengetahui risiko dan kemudian menentukan saham-saham terbaik untuk dipilih. Ada tiga metode umum yang digunakan yaitu, metode Sharpe, metode Treynor dan metode Jensen yang seringkali membingungkan para investor dalam menentukan metode mana yang terbaik. Tujuan penelitian ini untuk mengidentifikasi apakah ada perbedaan antara tiga metode ini pada LQ45 dengan menganalisa kinerja dari saham sample LQ45. Penelitian ini menggunakan Z-score untuk standarisasi ketiga metode ini, kemudian menggunakan ANOVA untuk menentukan apakah ada perbedaan antara tiga metode ini atau tidak. Kesimpulan penelitian ini bahwa tidak ada perbedaan antara ketiga metode ini. Semua metode dapat digunakan investor untuk menganalisis rasio dari kinerja portofolio. Sebagai saran untuk para investor, penggunaan ketiga metode ini secara bersama dapat memberikan informasi yang lebih baik kepada para manajer sebagai bagian dari proses manajemen investasi.*

Kata Kunci: *kinerja portofolio, z-score, sharpe ratio, treynor ratio, jensen's alpha*

INTRODUCTION

Research Background

In 2008, there was a fact like a problem about Global Economy. The fact was about global crisis and was followed by company went to bankruptcy. Nearly the end of the third quarter of 2008, the world economy faced a new round; the collapse of the new global economic stability, as the financial crisis spread to various countries. The global financial crisis has affected the Indonesian economy as reflected the turmoil in the capital markets and the market money. Composite Stock Price Index (IHSG) on In December 2008 closed at 1355,4, trimmed almost half of the level in the early in 2008 amounted to 2627,3, together with the fall of market capitalization and sharp decreased of stock trading volume. Until the end of December 2008, foreign positions in SUN recorded Rp.87,4 trillion, lower than September 2008, which had reached Rp104, 3 trillion. While foreign positions in SBI recorded Rp.8, 4 trillion, sharply decreased compared to the position in August 2008 amounted to Rp.68, 4 trillion. Simultaneously, the Rupiah also corrected sharply to the level Rp10.900/USD in late December 2008. This condition was in line with the balance of payments which showed the declining pattern since the third quarter of 2008. Meanwhile, difficulties of global financial liquidity and the increased risk aversion of foreign investors triggered the reallocation into safer assets (flight to quality) also resulted to decreasing performance of the capital and financial account (Tjahjono, et.al, 2009).

There is no exception for capital markets especially capital market in Indonesia. This problem affects most of the public companies listed in Indonesian Stock Exchange; including LQ 45 which is a forum which contains the company that have shares with high levels of liquidity and high market capitalization. Just being a member of LQ 45 does not make the shares off the risk, every share has its own risk including shares in LQ 45. Every year there are several companies out from the member of LQ 45 as the other shares replace their place. The companies inside of it have to maintain their performance which is not easy to do. When the share does not met the criteria of Indonesian Stock Exchanges, it have to be replaced by other companies which is met the criteria.

In the era of globalization, capital markets or exchanges are important to support economic condition in a country. Capital market activity has an important role in developing the national economy. In order to grow the capital market required the investors to invest their money into particular stock in the market. The lack of investors leads to an obstructed process of economic process in the country, especially for development country like Indonesia. The country needs to attract the investors to come and invest their money into the market. This is the obstacles which attract the interest of the investors is not easy. The problem is not just from the return but also from the risk, because the problem like economic crisis explained above can occur any time. The uncertainty of the capital market is the risk which leads to risk averse of the investors. Many investors draw their money to avoid the uncertainty of financial condition.

The investors sometimes confuse to determine which stock should be taken. To determine they need to analyze and design the portfolio. Evaluating portfolio performance is needed in order to know the circumstances of the stocks or shares in the capital market. The information needed to analyze and evaluate the stock before the investors decide to invest into certain shares or stocks. To determine the best stock to be taken, there are commonly several methods of analysis such as Sharpe method, Jensen method and Treynor method. Sometimes the individual investor confuses to determine which method they should take to analyze the portfolio. This problem makes the writer wants to know if there any difference among these three methods, and curious to do a research about these three portfolio analysis.

Research Objective

The objective of this research is to identify whether there is a difference of portfolio performance among Sharpe, Treynor and Jensen Method on LQ 45 by analyzing the performance of each sampling stock from LQ 45. This research used one-way analysis variance as the method to find whether there is any difference among these three methods or not.

THEORETICAL FRAMEWORK

Financial Management

Financial management is a concerned with the maintenance and creation of economic value or wealth. Consequently, this course focuses on decision making with an eye toward creating wealth. As such will deal with financial decision such as when to introduce a new product, when to invest a new asset, when to replace existing asset, when to borrow from banks, when to issue stocks or bonds, when to extend credit to a customer, and how much cash to maintain (Keown et.al, 2005:4).

Capital Market

Drake and Fabozzi (2010:28) define capital market as the sector of the financial market where long-term financial instruments issued by corporations and governments trade. The “long-term” refers to a financial instrument with an original maturity greater than one year and perpetual securities (those with no maturity). There are two types of capital market securities: those that represent shares of ownership interest, also called equity, issued by corporations and those that represent indebtedness, issued by corporations and by the state and local governments.

Investment

Kaptan (2001:1) stated that investment is the employment of funds with the aim of achieving additional income growth in value. The essential of investment is that it involves waiting for a reward. While Fabozzi and Drake (2010:390) stated that investment management is the process of managing a portfolio. Accordingly to the individual who manages a portfolio of investment as a manager. Fabozzi and Drake also illustrate the investment management process as a cyclical process where performance evaluation may result in feedback and affecting changes to the objectives, policies, strategies and composition of the portfolio.

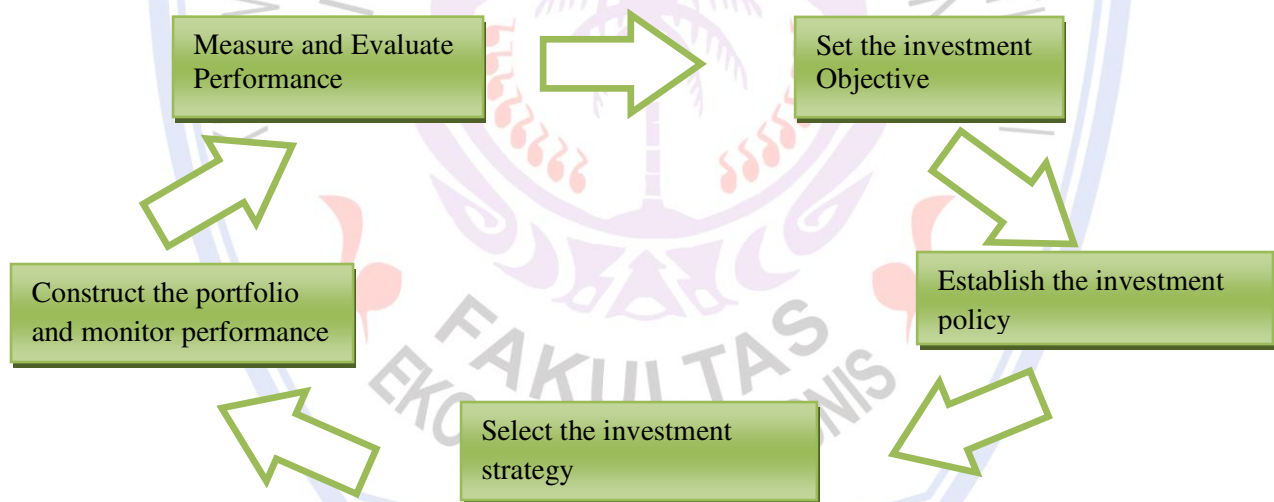


Figure 1. Investment Management Process

Source: Fabozzi and Drake (2010:390)

Risk-adjusted Performance (Portfolio Performance)

Shahid (2007) stated there are three indices available for measuring the risk-adjusted performance. There are:

1. The Sharpe Index
2. The Treynor Index
3. The Jensen Alpha

The Sharpe Index

The Sharpe index is computed by dividing the risk premium of the portfolio by its standard deviation or total risk. Symbolically, the Sharpe index presented as:

$$S_p = \frac{r_p - r_f}{\sigma_p}$$

Where:

r_p = portfolio rate of return

r_f = risk free rate of return

σ_p = standard deviation or total risk (systematic risk plus unsystematic risk)

S_p = Sharpe Index, measure of the performance of the portfolio

(the lower the value of Sharpe index, the lower the performance)

The Treynor Index

In 1965, Treynor's was the first researcher who computed measure of the portfolio performance. A measure of a portfolio excess return per unit of risk is equal to the portfolio rate of return minus the risk free rate of return, dividing by the portfolio beta. This is useful for assessing the excess return, evaluating investors to evaluate how the structure of the portfolio to different levels of systematic risk will affect the return. Symbolically, the Treynor Index (T_p) is presented as:

$$T_p = \frac{r_p - r_f}{\beta_p}$$

Where:

r_p = portfolio rate of return

r_f = risk free rate of return

β_p = portfolio beta

T_p = Treynor Index, measure of the performance of the portfolio

(the lower the value of Treynor Index, the lower the performance)

The Jensen's Alpha

Jensen alpha is an index that uses the capital asset pricing model (CAPM) to determine whether a money manager outperformed a market index. In finance, Jensen's alpha is used to determine the required (excess) return of a stock, security or portfolio by the capital asset pricing model. Jensen index utilizes the security market line as a benchmark. In 1970's, this measure was first used in the evaluation of mutual fund managers. The formula of Jensen Alpha is:

$$\alpha_p = r_p - (r_f + (r_m - r_f) \beta_p)$$

Where:

r_p = Return on the portfolio

r_f = risk free rate of return

α_p = Jensen Alpha measure of the performance of the portfolio

β_p = beta or systematic risk of the portfolio

r_m = return of the market portfolio

(the lower the value of Jensen's Alpha, the lower the performance)

Previous Research

Kolbadi and Ahmadinia (2011) Sharpe ratio has no difference in downside and upside risk when considering the risk of investment. Scholz and Wilkens (2005) in their research about "interpreting Sharpe ratios – The market climate bias" aims to deal with the influence of market climate on Sharpe ratios. The Market climate impact on Sharpe Ratios is eminently relevant in abnormal market climates, such as during exceptional bear and bull markets. Lin (2012) found that risk adjusted performance measurements has different correlation with Lipper consistent rating for the three asset classes. Treynor ratio compared with other risk adjusted performance measurements is almost always rank last based on the correlation with Lipper consistent rating.

Research Hypothesis

The detail of H_0 and H_1 as the two main possible hypotheses describe below:

H_0 : $\mu_1 = \mu_2 = \mu_3$ There is no difference among Sharpe, Treynor and Jensen method.

H_1 : $\mu_1 \neq \mu_2 \neq \mu_3$ There is a difference among Sharpe, Treynor and Jensen method.

RESEARCH METHOD

Types of Research

The type of this research is comparative research, because this research aims to find the comparison between Sharpe, Treynor and Jensen method, whether there is a significant difference between these three methods or not.

Place and Time of the Research

The place of the research is in Manado, while the time of the research is from June till July 2014.

Research Procedure

This research has the procedure in doing the research. And this is procedure can be seen in the conceptual framework of this research as follow:

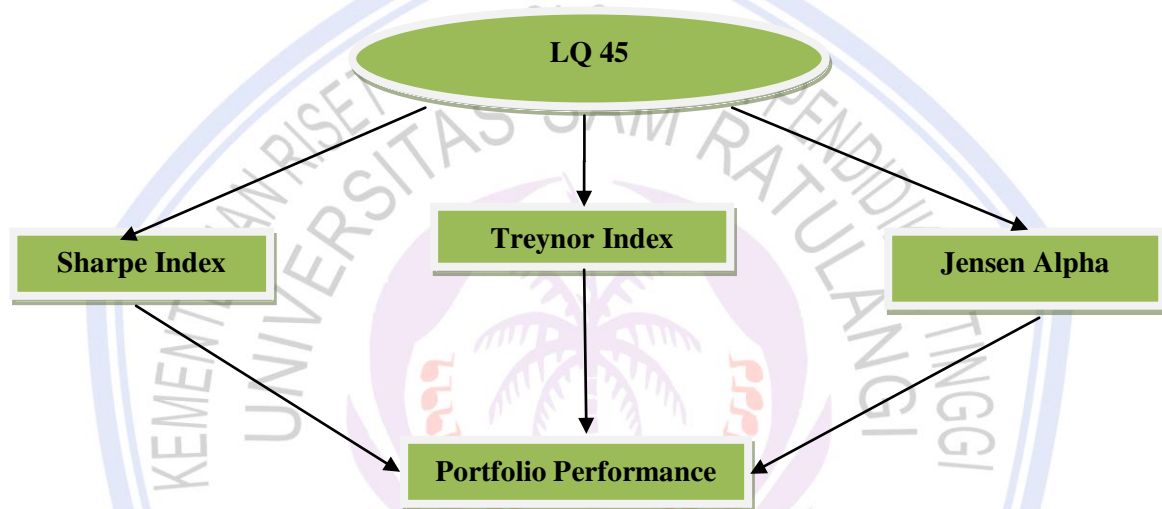


Figure 2. Conceptual Framework

Source: Data Processed

Population and Sample

Population can be interpreted as an overall element in a research. The population in this study is all go-public companies listed on the Indonesia Stock Exchange in the period 2008 until 2012. The sample of this population is determined by using purposive sampling. According to Teddlie (2009:186) purposive sampling is a sampling technique that the researcher first identifies the subgroups of the population of interest and then selects cases from each subgroup in a purposive manner. This allows the researcher to discover and describe in detail characteristics that are similar or different across the strata or subgroups. Refers to this point the researcher create a specific criteria such as:

1. The samples only the stocks included in LQ 45 in 2008 until 2012.
2. The stocks did not do a stock split, because it will cause refraction in calculation of stock returns.

Data Collection Method

The type of data collected in this research is secondary data. The secondary data were gathered from books, literature, articles, journals, an all relevant literature from the library and internet. The term of this research is in the financial sector so the main data that is used in this research is the financial data from IDX which is described and reported from the company listed in LQ 45 that reflects the condition to analyze the portfolio performance. Source of the data in this research based on the financial data from closing price of stock in IDX and also level of interest rate from SBI Bank Indonesia.

Operational Definitions of Research Variable

Operational definition of the research variable consists of Sharpe Index, Treynor Index, and Jensen Alpha.

1. Sharpe Index
Sharpe index is the average comparison between the difference in average portfolio return and risk free rate of return with total risk of portfolio.
2. Treynor Index
Treynor index is the average between the difference in average return of the portfolio and risk free rate of return with portfolio beta.
3. Jensen Alpha
Jensen alpha is the difference between portfolio rates of return with risk free rate of return plus portfolio excess return that has been multiplied with beta portfolio.

Data Analysis Method

1. Z-Score Standardized

z-score which is often called the standardized value can be interpreted as a measure of the relative location of the observation in a data set. This conversion process is called standardizing or normalizing (Anderson, Sweeney and Williams, 2008:94).

The formula:

$$Z_x = \frac{X - \bar{X}}{S_x}$$

Where:

Z_x = standardized score for a value of X

X = an interval/index variable

\bar{X} = the mean of X

S_x = the standard deviation of X

2. One Way Analysis of Variance

Anderson, Sweeney and Williams (2008:491) explained that the one way analysis of variance tests the null hypothesis that samples in two or more groups are drawn from populations with the same mean values. To do this, two estimates are made of the population variance. These estimates rely on various assumptions. The one way analysis of variance produces an F-statistic, the index of the variance calculated among the means to the variance within the samples. If the group means are drawn from populations with the same mean values, the variance between the group means should be lower than the variance of the samples, following the central limit theorem. A higher index therefore implies that the samples were drawn from populations with different mean values.

And this is the assumptions:

- a. Response variable are normally distributed (or approximately normally distributed).
- b. Variances of populations are homogen.
- c. Samples are independent.

In order to test the hypothesis using one-way analysis of variance, the writer uses the program SPSS to process the data.

RESULT AND DISCUSSION

Result

General Description of Research Object

Based on that method of purposive sampling, there are 11 company's stocks that meet the criteria of this research. The samples are:

Table 1. List of Samples Stocks

No	Code	Name
1.	AALI	Astra Agro Lestari Tbk.
2.	ANTM	Aneka Tambang (Persero) Tbk.
3.	BBNI	Bank Negara Indonesia (Persero) Tbk.
4.	BDMN	Bank Danamon Indonesia Tbk.
5.	BMRI	Bank Mandiri (Persero) Tbk.
6.	INDF	Indofood Sukses Makmur Tbk.
7.	ISAT	Indosat Tbk.
8.	MEDC	Medco Energi Internasional Tbk.
9.	PTBA	Tambang Batu Bara Bukit Asam (Persero) Tbk.
10.	TLKM	Telekomunikasi Indonesia (Persero) Tbk.
11.	UNTR	United Tractors Tbk.

Source: Data Processed

Portfolio Performance Analysis Based on Sharpe Method

The positive index showed good performance of the portfolio, the bigger the value, the better the performance of the portfolio. Overall, The poorest performance is the performance of BBNI in 2008 which have Sharpe index -0.001852 and the best performance is TLKM in 2009 which have Sharpe index 0.003895. The index showed negative value in 2008 which showed poor performance of the portfolio in that year. In 2009 the sharpe index showed that the companies made better performance of portfolio rather than the last year in 2008, just one of the companies has a negative value of Sharpe index. The index indicated good performance of the portfolio in 2009 with ISAT was the only stock with negative value -0.000433 and in 2010, similar with 2009 the companies also maintain their positive performance, with just one company that has negative value of Sharpe index . In 2011 almost every companies have negative value of Sharpe index, the companies perform poor portfolio performance in this year. However the negative Sharpe index in 2011 was not as significant as in 2008. In 2012 the pattern of the Sharpe index is varied between negative and positive value, 6 stocks have negative index while 5 of it have positive index. The positive performance performed by BDMN, BMRI, INDF, ISAT and TLKM. BDMN performed highest performance with value 0.000476. The negative performance performed by AALI, ANTM, BBNI, MEDC, PTBA and UNTR. And MEDC performed lowest performance with value -0.001487.

Portfolio Performance Analysis Based on Treynor Method

Similar with Sharpe result, the results showed in 2008 almost every company's stock has negative value except BMRI. The result showed negative value except BMRI with value 10.210098. In 2009 the higher value showed by AALI with 5.417384 and two stock went to negative value such as TLKM and INDF at value -1.102052 and -0.157718. The result showed that in 2010 almost every stock or emitten has positive value except TLKM with value -0.336534 and the highest value from BBNI with 0.912097. 2011 8 stocks have an negative value such as AALI, ANTM, BBNI, BDMN, INDF, ISAT, MEDC and PTBA, while the positive value owned by three other stocks such as BMRI, TLKM and UNTR. The highest value in 2011 is TLKM with value 5.986960 and the lowest is MEDC with value -0.578178. In 2012 the result showed almost equal between negative and positive performance. The highest performance performed by INDF with value 0.362717 and the lowest performance performed by MEDC with value -0.549484.

Portfolio Performance Analysis Based on Jensen Method

After analyzing the portfolio performance using Jensen Method, the result showed varied result of Jensen's Alpha from negative to positive value. The Jensen Method has an index between -1.790843 and 2.729995. Similar with Treynor and Sharpe, in 2008 Jensen's Alpha of all the portfolio showed negative value. And the best performance based on Jensen method is 2009 and 2010 when all of the portfolio performance has the positive value. When higher and significant alpha is shown it means that the performance is higher than the market index, and the opposite when lower alpha is shown it means that the performance is lower than the market index. The result of Jensen's alpha showed similar result with the other two methods. In 2008 it showed poor performance of the company's portfolio. All of the value showed negative result. The impact of financial

crisis can be seen with the negative value. The lowest performance performed by AALI with value -1.790843 and the highest performance performed by ISAT with value -0.300459. 2009 showed good result, all of the companies have positive index, the highest performance in this year performed by BBNI with value 2.729995 and the lowest performance performed by ISAT with value 0.659191. Similar with 2009, in 2010 all the result showed positive value of Jensen's alpha, the highest performance performed by BBNI with value 1.067203 and the lowest performance performed by AALI with value 0.404142. In 2011, 5 companies have positive value while the other 6 have negative value. And the lowest performance in this year performed by ANTM with value -0.313539, and the highest performance in this year performed by UNTR with value 0.195207. In 2012, the result showed two stocks performed negative performance included MEDC and UNTR with lowest performance was MEDC with value -0.256819 and the highest performance performed by BDMN with value 0.503140.

Z-Score on Sharpe, Treynor and Jensen Method

After all the result has been standardized, the result showed in Sharpe method the poorest performance performed by BBNI with value -2.02393 in 2008 and the best performance performed by TLKM in 2009 with value 4.19913. In Treynor method the poorest performance performed by INDF in 2008 with value -1.26001 and the best performance performed by BMRI in 2008 with value 5.46469. In Jensen method the poorest performance performed by AALI in 2008 with value -2.03323 and the best performance performed by BBNI in 2009 with value 2.41670. The result can showed the value of the index, so the maximum and the minimum result can be seen in each method. The result of these three methods can be compared each method and each year. In 2008 all of the companies perform poor performance of portfolio, which can be seen in the result above. INDF showed negatively constant among these three methods with value -1.32225 -1.26001, -1.16626. Even though BBNI has the poorest result in Sharpe method, when analyzed with systematic risk which is included the market risk using Jensen and Treynor method, BBNI performed not as poor as in Sharpe method. That is happen also with AALI, in Jensen method, the Jensen's alpha of the portfolio is the poorest performance in 2008 with Jensen method with value -2.03323, but in the other method, AALI not as poor as in Jensen method. In 2009 the result showed best performance among these three methods. In 2010 the difference can be seen after standardizing the value, before standardizing the Treynor method is positive after it standardized, it showed negative value. It showed that even though the portfolio has positive performance, when compared to the other method, it is not perform as well as the others. In 2010 the Treynor method showed positive trends, but even though it is positive some of them are still below the means of the group (Treynor group). So that is why after it standardized the value changes from positive to negative.

One-way Anova Analysis

As the research objective to find is there any differences among these three methods, one-way anova analysis is performed. The data is analyzed using SPSS and standardized score entered as the main data in order to find is there any differences among these three methods. After analyzing the standardized data from Sharpe, Treynor and Jensen result with SPSS, the result can be seen as followed:

Table 2. Descriptives Portfolio Performance

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Sharpe	55	.0181525	1.02197444	.13780301	-.2581258	.2944309	-2.02393	4.19913
Treynor	55	-2E-7	1.00955234	.13612801	-.2729204	.2729200	-1.26001	5.46469
Jensen	55	0E-7	1.00921658	.13608274	-.2728295	.2728295	-2.03323	2.41670
Total	165	.0060508	1.00743563	.07842876	-.1488095	.1609111	-2.03323	5.46469

Source: Data Processed (SPSS).

The descriptive showed the minimum value of standardized Sharpe is -2.0293 and the maximum value is 4.19913. The Treynor minimum value is -1.26001 and the maximum is 5.46469. The Jensen minimum value is -2.03323 and the maximum value is 2.41670. The mean of Sharpe method is .0181525, Treynor with -2E-7 and Jensen is 0E-7. The total mean of the data is .0060508. With total standard deviation 1.00743563.

Table 3. Test of Homogeneity of Variances

Portfolio	Levene Statistic	df1	df2	Sig.
	1,791	2	162	,170

Source: Data Processed (SPSS)

The homogeneity of variance showed result value of Sig is .170, it means that the variance of the group is homogeny, and the data is valid to analyze using one-way anova.

Table 4. ANOVA

Portfolio	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	,012	2	,006	,006	,994
Within Groups	166,436	162	1,027		
Total	166,448	164			

Source: Data Processed (SPSS)

One-way Anova analysis showed that there is no differences among these three methods. The result showed the score of F is .006 with means square .006, and sum of squares .012. The result showed the Significant is .994 which is above 0.05 and it means that H_0 is accepted, also confirmed with value of F which is smaller than the F-table.

Discussion

One-way anova is analyzed using SPSS software and showed the score of F smaller than the F-table. Also confirmed with Significant that showed in the anova table which is more than 0.05, it means that H_0 is accepted. After analyzed the result showed that there is no difference among these three methods. With this result it means that any methods can be used by the investor to analyze the ratio of portfolio performance. The investors or the company no need to doubt about the difference among these three portfolio performance analysis tool in order to find the ratio of portfolio performance.

When these three portofolio performance analysis tools comes up with the result that showed no difference among these three methods by using one way anova, the investors confuse to choose which one among these three methods is the best method. The result showed that any methods can be used by the investor to analyze the ratio of portfolio performance. It is true that any of these three methods can be used in order to analyze and evaluating the performance of a portfolio. However, after evaluating using these three methods on the data observed, this research found that this method cannot be used separately as a management process. In order to get a good feedback to make better strategy and better investment policy. This method cannot stand alone in order to set an investment strategy, because when setting an investment strategy need more feedback than just evaluating performance with one tools. For instance when the manager take Sharpe method in order to analyze the performance of a portfolio the evaluated data just based on total risk of the investment, Treynor method cannot be used alone because it can make the manager confuse when the beta portfolio is negative as the portfolio tend to moved the opposite of the market. Almost the same in Lin (2012) previous research which found that Treynor ratio always rank last based on Lipper consistent rating. When analyzing these three method separately, these three method cannot give sufficient information of the portfolio.

But when manager or individual investor these three methods as complement to support each other and give feedback, the result is better than just using a single method. Each method has its own characteristic, Sharpe method based on total risk of the investment, Treynor method involve market risk and the Jensen's Alpha using market return and systematic risk. Using this method simultaneously can provide better understandings for manager or individual investor in order to set the investment strategy and evaluating the portfolio as a part of investment management process. It is all because a good portfolio is more than a long list of goods stocks and bonds. It is a balanced whole, providing the investor with protections and opportunities

with respect to a wide range of contingencies (Markowitz, 1959, cites by Drake and Fabozzi, 2010:394). This research support the Markowitz theory, that investement is a balanced whole and every information can give the managers protection and opportunities in wide range. These three methods can be used simulataneously in order to give wide range perspective for the managers and investors.

CONCLUSION AND RECOMMENDATION

Conclusion

The conclusion of this research, that this three methods showed no difference among other. By using one-way anova to the data processed with z-score, the result showed no difference. And any methods can be used by the investor to analyze the portfolio performance. The investors or the company no need to doubt about the difference among these three portfolio performance analysis tool in order to find the ratio of portfolio performance.

Recommendation

The result showed that there is no differences among these three methods, so the managers can use any of these methods without confusing which one of it showed better result. However, the managers is recommended to use these three methods simultaneously so it can give better information about the condition of the portfolio in order to set better strategy. To face the volatility of the market nowadays the better understandings about portfolio is needed to get better profit. By evaluating portolio performance using these three methods can be a reference for the manager and the individual investor in order to choose the better portfolio to be invested.

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