



PERFORMANCE ANALYSIS OF STOCK MUTUAL FUNDS USING SHARPE, TREYNOR, AND JENSEN METHODS (STUDY ON MUTUALLISTED ON THE INDONESIA STOCK EXCHANGE FOR 2016-2020 PERIOD)

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Abstract

This study aims to analyze and find out the significant differences in the performance of Equity Mutual Funds between the Sharpe, Treynor, and Jensen methods on Mutual Fund issuers listed on the Indonesia Stock Exchange for the 2016 – 2020 period. This research was conducted on the Indonesia Stock Exchange, as for the analytical method used. is secondary data that describes the performance of stock mutual funds listed on the Indonesia Stock Exchange using the Sharpe method, Treynor method and Jensen method. Based on the results of the analysis of stock mutual fund performance data in the five-year period, 2016 – 2020 using the average and maximum value assessments, it was found that the Sharpe method had a higher average value than the Treynor and Jensen methods. while based on the minimum value assessment, the Treynor method has a higher value than the Sharpe and Jensen method. There is no significant difference between the performance of stock mutual funds based on the Sharpe method with the Treynor method and the Jensen method. However, the test results between the Treynor and Jensen methods found different results, namely there was a significant difference between the performance of the mutual funds evaluated based on the Treynor and Jensen method.

Keywords: *Stock Mutual Fund Performance, Sharpe Method, Treynor Method, Jensen Method.*

INTRODUCTION

According to the Capital Market Law no. 8 of 1995, Article 1 paragraph (27) defines that Mutual Fund is a forum used to collect funds from the investor community to be further invested in securities portfolios by investment managers. Mutual funds are places that are used to collect funds from the investor community to be further invested in securities portfolios by investment managers (Tubeti 2021). Mutual funds make it easier to invest in the capital market because they are managed by professional investment managers (companies). Mutual Fund investment has played a very important role in world financial markets, especially in developing countries where the capital market is not yet mature and tolerant of small-scale investors (Song et al.2017).

Mutual funds provide retail investors the opportunity to benefit from professional financial controls. Mutual funds are a mechanism to attract savings from the retail sector. Their money is directly handled by professional fund managers or indirectly pursued by the index or industry. The funds are distributed to various sectors to avoid potential losses. Streamlining the efforts of individual investors, they offer a smart way to manage their savings without paying high fees or requiring constant attention. Mutual funds facilitate and make traditional and complex investment decisions on behalf of investors who lack the time and knowledge. Investors trust investment managers to make these important investment choices by investing in mutual

funds, Investment Corporation of Bangladesh (ICB) which was launched by the government in 1980 was the first Mutual fund for the benefit of investors and capital markets. The ICB then offers a range of closed-end mutual funds. The first private sector to take the initiative to organize a mutual fund was Asset & Investment Management Services of Bangladesh Limited (AIMS) in 1999. Although the mutual fund industry grew over time, there have only been closed-end mutual funds since the beginning of mutual funds. The country's first open-ended mutual fund hit the market in the first quarter of 2010, expanding the orbit of the stock market and providing shareholders with a very useful and convenient investment vehicle. Prime Finance Asset Management Company Limited (PFAMCL) is developing a mutual fund with an initial value of 500 million. Mutual fund performance evaluation is also important for investors and investment managers. Historical performance evaluation provides an opportunity for investors to assess the performance of investment managers regarding how much return has been generated and what level of risk has been assumed in generating these returns.

Potential investors can choose the type of Mutual Fund that suits their individual preferences. Investors who are *risky averse* can choose protected mutual funds because the investment value is protected so that at least it does not fall below the initial investment value. Investors *risk averse* can also choose fixed-income mutual funds as mutual funds allocate some more of its assets in the form of debt securities, in order to obtain *return* a more stable and optimal. Equity funds are suitable for investors who are *risk taker*, Stock mutual funds offer *return* a fairly high with a high risk as well.

Sharpe, in Gurwitz and Venter (2021) suggests that one of the managers' active strategies to conquer the market is by making index comparisons between annual portfolios, so that managers are able to make small portfolio adjustments that have differences. The Sharpe method was developed by William F. Sharpe in 1966. Hartono (2014) states that the portfolio performance as measured by the Sharpe method is done by dividing the *return* more by the variability of the *return* portfolio, therefore this measure is also called the *Reward to Variability* (RVAR) method. . The variability in this method is measured by the standard deviation of the *return* portfolio in a certain period. *Reward to Market Risk* is basically a modification of the Treynor method. This modification is intended so that the results can be compared with the Sharpe method by converting the systematic risk in a decimal scale to a percentage scale.

One of the goals of investing is to prepare for something that will happen in the future through planning needs that are in accordance with current financial capabilities. Sulistyorini (2009) showed that there was no significant difference between the tests using the Sharpe, Treynor, and Jensen methods. Danuarta's research (2015) shows that in 2012 there were 13 equity mutual funds that performed above the market (*outperforming*) and 38 mutual funds market (*underperforming the underperforming*). In 2013 there were 14 mutual funds *outperforming* and 37 mutual funds *underperforming*. In 2014 there were 36 mutual funds *outperforming* and 15 mutual funds *underperforming*. Based on this explanation, the authors are interested in researching "Analysis of Stock Mutual Fund Performance Using the Sharpe, Treynor, and Jensen Method (Study on Mutual Fund Issuers Listed on the Indonesia Stock Exchange 2016 - 2020 Period)".

Conceptual Model

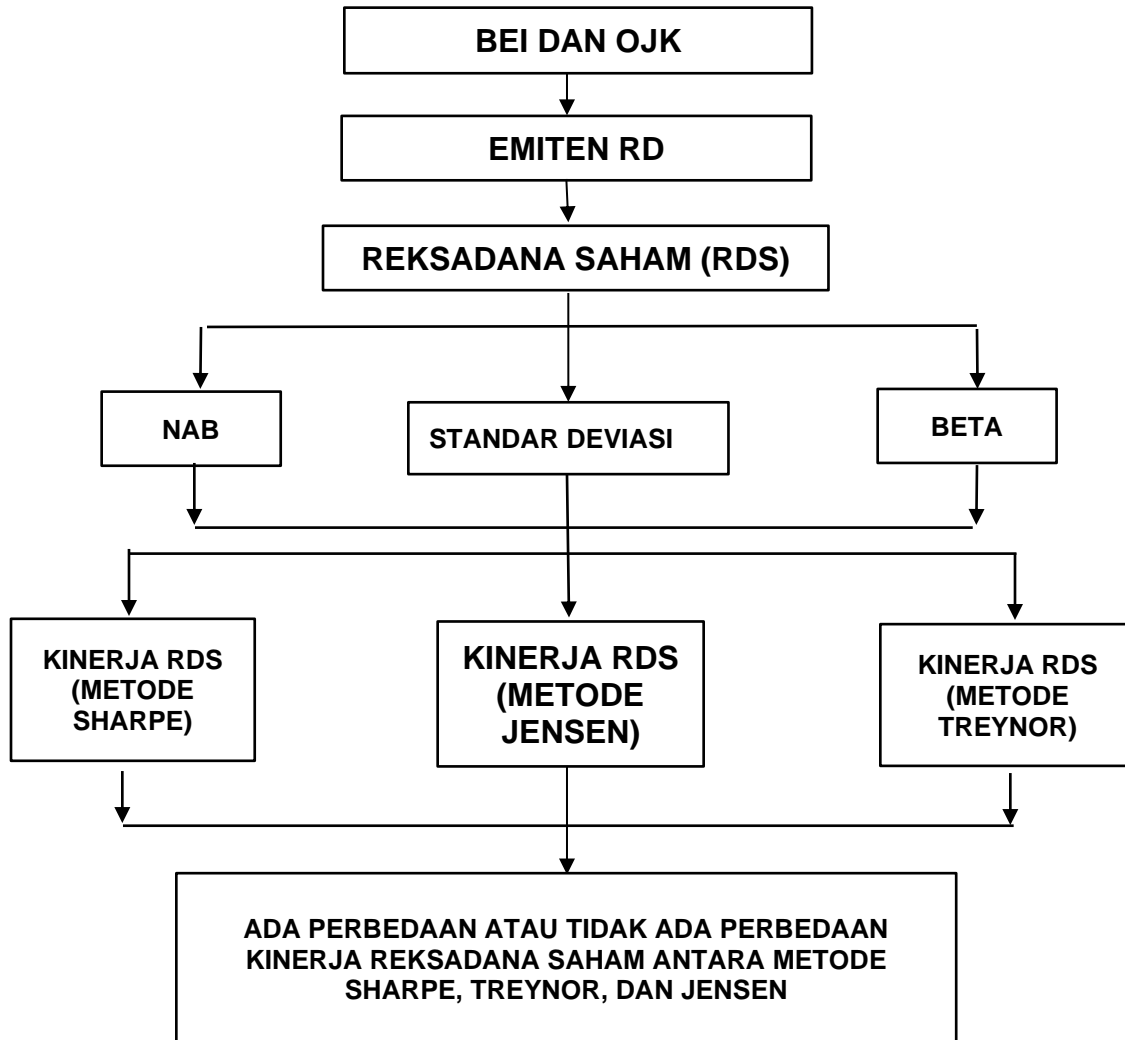


Figure 1 : Conceptual Model

1. There is a significant difference in the performance of Equity Mutual Funds with the paired method between the Sharpe and Treynor methods on mutual fund issuers listed on the Indonesia Stock Exchange.
2. There is a significant difference in the performance of Equity Mutual Funds with the paired method between the Sharpe and Jensen methods on mutual fund issuers listed on the Indonesia Stock Exchange.
3. There is a significant difference in the performance of Equity Mutual Funds with the paired method between the Treynor and Jensen methods on mutual fund issuers listed on the Indonesia Stock Exchange.

RESEARCH METHOD Research

Location and Research Design

This research will be conducted on equity mutual funds listed on the Indonesia Stock Exchange and operating from July to September. Data retrieval is downloaded using the internet on the site for daily data on stock mutual funds, for BI rate data. The implementation of data collection will begin in July 2021.

Population or Sample

Population is a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions. The sample is part of the number and characteristics possessed by the population (Sugiyono, 2014). The population of this study are all active and registered Equity Mutual Funds at the OJK, that is, there are 259 Equity Mutual Funds.

No	Equity Mutual	Investment Manager	FundManaged Fund
1	Schroder Achievement Fund Plus	Schroder Investment Management Indonesia, PT	9.69 T
2	Batavia Stock Fund	Batavia Prosperindo Asset Management, PT	6.19 T
3	Schroder Achievement Fund	Schroder Investment Management Indonesia, PT	4.57 T
4	Manulife Mainstay Shares of	Manulife Asset Management Indonesia, PT	3.11 T
5	Manulife Funds Class A Shares of	Manulife Asset Management Indonesia, PT	2.06 T
6	Simas Featured Shares of	Sinarmas Asset Management Indonesia, PT	1.77 T
7	Sucorinvest Equity Fund	Sucorinvest Asset Management, PT	1.66 T
8	Schroder Special Fund	Schroder Investment Management Indonesia , PT	1.5 T
9	BNP Paribas Pesona	BNP Paribas Asset Management, PT	1.46 T
10	Schroder 90 Plus Equity Fund	Schroder Investment Management Indonesia, PT	1, 36 T

The sample in this study was selected by *purposive sampling method*, which is adjusted to certain criteria. The criteria for selecting the sample in this study are as follows:

1. Equity mutual funds managed by investment managers registered with the Financial Services Authority (OJK).
2. Stock mutual funds that are actively operating from 2016 -2020.
3. Stock mutual funds managed by MI with the largest amount of AUM (Asset Under Management).

Research on Variables

1. Stock Mutual Fund Performance

Shows a measure of the performance or return that has been achieved by the company which is calculated from the NAV data per daily unit end of the month of Stock Mutual Funds during the 2016-2020 period.

2. JCI *Benchmark*

Performance This is a market performance as a comparison measure of the ability to show a stock mutual fund performance that has been achieved in a certain period which is calculated from the daily JCI value at the end of the 2016-2020 period. The benchmark performance results will result in categories *underperforming* (bad) and *overperforming* (good) mutual funds.

3. Standard Deviation This

is the total fluctuation risk (*unsystematic risk and systematic risk*) of mutual funds generated due to fluctuations in profits generated from other sub-periods that describe the storage that occurs from the average return of stock mutual funds and *benchmarks for* the 2016-2020 period.

4. Beta

is a systematic risk or market risk that shows the sensitivity of the profit of a stock mutual fund to changes in the average profit of shares in the market (JCI) for the 2016-2020 period.

5. Performance This *Risk Free*

is an assumed risk-free investment with an average interest rate for Indonesian Bank Certificates (SBI) in the 2016-2020 period.

6. Sharpe

method Is a method used to measure performance based on a *risk premium* (difference in the average performance of stock mutual funds with an average risk-free investment) of stock mutual funds for the 2016-2020 period obtained for each unit of risk (standard deviation) of investment

7. Treynor

Method Treynor method similar to the Sharpe method which uses the Risk Premium, but the difference is that the Treynor method uses beta (β) which is the risk of fluctuation relative to market risk for the 2016-2020 period.

8. Jensen method

The method is the same as the Treynor method, Jensen uses the beta factor in measuring the investment performance of a portfolio based on the development of CAMP.

Methods of Analysis

In this study using quantitative analysis of available data, this research on mutual fund performance uses the Sharpe Method, Treynor Method, and Jensen Method. The following are performance measurement steps which include the following:

a. Determining the Measurement Sub-Period

The measurement period in this study is carried out on a monthly basis.

b. Calculating Mutual Fund Sub-period Performance

Based on the data that can be obtained the sub-period performance in this study is calculated by excluding the element of profit sharing.

$$\text{Sub period performance} = \frac{\text{NAB} - \text{NAW}}{\text{NAW}}$$

Information :

NAV = Net Asset Value/Unit at the end of this month

NAW = Net Asset Value/Unit at the end of previous month

c. Calculating Sub Period *Benchmark Performance* (JCI)

$$\text{Sub period performance} = \frac{\text{IHSK} - \text{IHSW}}{\text{IHSW}}$$

Description:

IHSK = JCI end of this month

IHSW = JCI end of the previous month

d. Calculating average Mutual Fund Performance for Period Based on *Arithmetic Mean*
sub-performance - periode1 + 2 + ... + Performance sub - period n

$$\text{KRD} = \frac{\text{sub-performance - periode1} + 2 + \dots + \text{Performance sub - period n}}{\text{Number of sub-periods}}$$

Remarks :

K_{RD} = Average mutual fund performance for a certain period

Sub-period 1,2..n = performance Performance obtained from previous mutual fund

calculations This calculation can also be done easily through the function *average* in *Microsoft Excel*.

e. Calculating the Average Performance of the Benchmark for a Period Based on the *Arithmetic Mean*

To calculate the average performance of the *JCI/Benchmark*, we will use the same method as the average performance of mutual funds.

f. Calculating Fluctuation Risk (Standard Deviation) and Fluctuation Risk Relative to the Market (Beta)

To calculate the standard deviation of changes in mutual fund performance and *benchmark* period to period, you can use the formula:

$$= \frac{(\sum)(RD - \overline{RD})^2}{n - 1}$$

Description:

σ = Standard Deviation

RD = Performance of Mutual Funds to - i

\overline{RD} = Mean arithmetic performance of mutual funds

n = Number

To calculate the factor beta (β) or *slope* (tilt) of the performance of mutual funds with the performance of the market, it can be done using the formula:

$$= \frac{[(RD - \overline{RD})(RM - \overline{RM})]}{\Sigma(RM - \overline{RM})^2}$$

Description:

β = Beta

\overline{RD} = Performance RD i

\overline{RD} = Average performance RD

\overline{RM} = Performance *Benchmark* i

\overline{RM} = Average calculated performance *Benchmark It*

can also be obtained using the STDV function

for standard deviation and SLOPE for beta in Microsoft Excel.

g. Calculating average Risk-Free Investment Performance(*RiskFree*)

is a risk-free investment that is assumed by an average rate of interest rate of Bank Indonesia Certificates (SBI) in a given period. *Risk Free* can be determined by the following formula:

$$KFR = \frac{SBI}{\text{Period of}}$$

h. RD Performance Calculation Based on Sharpe, Treynor and Jensen Method.

Sharpe method:

$$SRD = \frac{KRD - KRF}{\sigma}$$

Description:

SRD = value of the Sharpe ratio

KRD = average performance of mutual funds sub-certain period

KRF = average risk-free investment performance of certain sub-period

σ = Mutual fund standard deviation for a certain sub-period

Treynor Method :

$$TRT = \frac{KRD - KRF}{\beta}$$

Description:

TRT = value Treynor ratio

KRD = average performance of mutual funds sub-certain period

KRF = average risk-free investment performance of certain sub-period

β = *slope* of mutual fund performance with market performance

Jensen's method:

$$(RD \text{ Performance} - RF \text{ Performance}) = \text{Alpha} + x (P \text{ Performance} - RF \text{ Performance})$$

Description:

Alfa = Jensen's intersection value

RD Performance = Mutual fund

performance RF Performance = Risk-free investment

performance P Performance = market performance

β = slope performance of mutual funds with market performance

- i. BM performance Calculation method Based Sharpe, Treynor, and Jensen.

After the performance of the mutual fund is calculated based on the Sharpe, Treynor and Jensen method, then the *benchmark/* benchmark will also use the same formula by entering the average performance, standard deviation and beta from the benchmark (JCI)

EMPIRICAL RESULTS

Descriptive Statistics (Cumulative Assessment)

Descriptive statistics aims to describe the performance of mutual funds for the 2016-2020 period of observation using the Sharpe method, Treynor method and the Jensen method. The research data amounted to 600 obtained from the multiplication of 5 years of observation with 10 mutual fund companies that were used as research samples. As can be described in the table as follows.

Description Statistics Sharpe, Treynor and JensenStatistic

		Sharpe	Treynor	Jensen
N	Valid	600 600		600
	Missing	0	0	0
Mean		0.00009 - 0.01252		0.00452
Std.Deviation		0.02390 0.12643		0.68848
Minimum		-0.39103 - 1.22431		-6.91472
Maximum		0.17226 0.30125		6.20955

Source: SPSS output

cumulative assessment is based on the mean value, max and min with the method of Sharpe, Treynor and jensen

Year	Rate			
	Mean	Max	Min	Cumulative
2016	Sharpe	Sharpe	Treynor	Sharpe
2017	Sharpe	Sharpe	Treynor	Sharpe
2018	Sharpe	Sharpe	Treynor	Sharpe

2019	Treynor	Sharpe	Treynor	Treynor
2020	Treynor	Sharpe	Jensen	Sharpe, Treynor, Jensen
Cumulative	Sharpe	Sharpe	Treynor	

Source: Processed results of Exel data

Shows that based on the cumulative average and cumulative maximum value of the 2016 to 2020 observation years, the Sharpe method is more dominate compared to the Treynor method and the Jensen method. Meanwhile, based on the assessment of the cumulative minimum value for the 2016 to 2020 observation year, the Treynor method dominates over the Treynor method and the Jensen method.

Cumulative assessment of monthly work observations based on the Sharpe,

Year	methodsMethod			Total
	Sharpe	Treynor and Treynor	JensenJens	
2016	59	20	41	120
2017	48	17	55	120
2018	53	33	34	120
2019	51	24	45	120
2020	48	28	44	120
Total	259	122	219	600

Source: Exel data processing results

show that based on the cumulative assessment of monthly performance observations for the 2016 to 2020 observation year, the Sharpe method is 259, the Treynor method is 122 and the Jensen method is 219. Thus, it can be said that cumulatively the Sharpe method is higher than the Treynor method. and the Jensen method.

Cumulative valuation based on number of companies

Year	Method			Total
	Sharpe	Treynor	Jensen	
2016	6	2	2	10
2017	4	1	5	10
2018	5	4	1	10
2019	6	3	4	13
2020	5	3	3	11
Total	26	13	15	54

Source: Processed results of Exel data

Shows that based on cumulative assessment for the observation year 2016 to 2020, the Sharpe method as many as 26 times, the Treynor method 13 times and the Jensen method 15 times. Thus, it can be said that cumulatively the Sharpe method is higher than the Treynor method and the Jensen method.

Evaluation Prerequisite

Difference Test

Results The test results using the paired-sample t-test program SPSS are shown in the following table

	Paired Differences				T	Df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Pair 1 Sharpe - Treynor	680972.59848 27800.58992 - 50164.58508 59032.36508.873					.159	599	4433.89000
Sharpe - Jensen	699159.76757 28543.07799 - 39008.79801 73104.54468 .597.551						599	17047.87333
Treynor - Jensen	128645.38744 5251.92595 2299.55659 22928.41008				12613.98333	2,402	599	.017

Source: SPSS Outputs

DISCUSSION

Based on the results of the analysis of stock mutual fund performance data in the five-year observation period, 2016 – 2020 using the average and maximum value assessment, it was found that the Sharpe method had a higher mean value than the Treynor and Jensen methods. while based on the minimum value assessment, the Treynor method has a higher value than the Sharpe and Jensen method.

Meanwhile, cumulatively for monthly observations from 2016 to 2020, it was found that the Sharpe method amounted to 259, more than the Treynor method which only amounted to 122 and the Jensen method amounted to 219. This means that the cumulative monthly performance of stock mutual funds is more dominant. using the sharpe method compared with the treynor method and the jensen method.

These results are in line with the findings of a cumulative valuation based on the number of equity mutual fund companies, it was found that in the 2016 to 2020 observation year, the Sharpe method was recorded to outperform the Treynor and Jensen methods. Sharpe method 26 times, Treynor method 13 times and Jensen method 15 times. In 2016, the Sharpe method

excelled in 6 companies, namely Schroder Dana Prestasi Plus, Batavia Dana Saham, Manulife Saham Andalan, Manulife Dana Sahama Class A, Sucorinvest Equity Fund and Schroder Dana Istimewa. Meanwhile, the Treynor method excels in 2 companies, namely Schroder Dana Prestasi and Simas Saham Leading. Meanwhile, Jensen's method excels at 2 companies, namely BNP Paribas Pesona and Schroder 90 Plus Equity Fund.

In 2017, the Sharpe method excelled in 4 companies, namely Schroder Dana Prestasi Plus, Batavia Dana Saham, Simas Saham Unggul and Sucorinvest Equity Fund. While the Treynor method excels in 1 company, namely Manulife Dana Saham Class A. Meanwhile, the Jensen method excels in 5 companies, namely Manulife Saham Andalan, Schroder Dana Prestasi, Schroder Dana Istimewa, BNP Paribas Pesona and Schroder 90 Plus Equity Fund.

In 2018, the Sharpe method excelled in 5 companies, namely Batavia Dana Saham, Manulife Saham Andalan, Schroder Dana Istimewa, BNP Paribas Pesona and Schroder 90 Plus Equity Fund. and in 2019 the Sharpe method excels at 6 companies, namely Schroder Dana Prestasi Plus, Batavia Dana Saham, Schroder Dana Prestasi, Manulife Saham Andalan, Sucorinvest Equity Fund, and Schroder Dana Istimewa. While in 2020, the Sharpe method excels in 5 companies, namely Batavia Dana Saham, Manulife Saham Andalan, Sucorinvest Equity Fund, BNP Paribas Pesona and Schroder 90 Plus Equity Fund. While the Treynor method excels in 3 companies, namely, Schroder Dana Prestasi Plus, Manulife Dana Saham Class A and Simas Saham Unggul. Meanwhile, Jensen's method excels at 3 companies, namely Schroder Dana Prestasi, Schroder Dana Istimewa and BNP Paribas Pesona.

The result contains the first two meanings. The Sharpe method is more dominantly superior than the Treynor method and the Jensen method in the observation period from 2016 to 2020. Second, the three methods above have their respective advantages, meaning that the Sharpe method dominates most companies, but in the period of observation it only covers six out of ten companies that are the subject of observation. Which means that the Treynor method and the Jensen method can outperform the Sharpe method in certain companies.

Based on the results of data analysis using the difference test, it is known that there is no significant difference between the performance of mutual funds using the Sharpe method with the Treynor method and the Jensen method. These results are because the mean value of the Sharpe method does not have a significant difference with the Treynor method and the Jensen method. Likewise, the minimum value of the Sharpe method does not have a significant difference with the Treynor method and the Jensen method as shown in table 5.6 above.

The findings of this study are in line with the research findings proposed by Sulistiyorini et al (2009) and Darmayanti et al (2018) which found that there was no significant difference in the performance of stock mutual funds using the Sharpe, Treynor and Jensen methods. The results of this study are also in line with the research findings of Rofiq and Susanto (2015) who found that there was no significant difference in the results of measuring the performance of stock mutual funds using the Sharpe, Treynor and Jensen methods.

This finding is different from the findings presented by Citrayani Tuera (2013) which found that there were significant differences in the performance of stock mutual funds using the Sharpe, Treynor and Jensen methods.

However, the test results between the Treynor and Jensen methods found different results, namely that there was a significant difference between the performance of mutual funds that were evaluated based on the Treynor and Jensen methods. These results are because the mean value of the Treynor method has a significant difference with the Jensen method as shown in table 5.6 above.

CONCLUSION The

performance of stock mutual funds based on the Sharpe, Treynor, and Jensen methods on mutual fund issuers listed on the Indonesia Stock Exchange for the 2016-2020 period, among others, the performance appraisal of stock mutual funds based on stock mutual fund the average value and the maximum value, it was found that the Sharpe method had a higher average value than the method. Treynor and Jensen. Meanwhile, based on the minimum value assessment, the Treynor method has a higher value than the Sharpe and Jensen method. In addition, based on the cumulative monthly stock mutual fund performance in 2016-2020, the Sharpe method is more dominant than the Treynor method and the Jensen method.

There is no significant difference between the performance of stock mutual funds based on the Sharpe method with the Treynor method and the Jensen method. However, the test results between the Treynor and Jensen methods found different results, namely there was a significant difference between the performance of the mutual funds evaluated based on the Treynor and Jensen method.

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