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PERFORMANCE OF CONSTRUCTION SERVICES SECTOR COMPANIES ON THE INDONESIA STOCK EXCHANGE IN THE PERIOD BEFORE THE COVID-19 PANDEMIC AND DURING THE COVID-19 PANDEMIC USING SHARPE, TREYNOR AND JENSEN RATIO

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Abstract:-
This study aims to compare the return and risk on shares of Construction Services Sector Companies in the period before and during the COVID-19 pandemic in Indonesia. The research method used was a quantitative method with a descriptive approach using secondary data with 15 samples of companies selected by the non-probability sampling method with the use of purposive sampling technique on the IDXINFRA stock index of the Indonesia Stock Exchange ("IDX"). The period considered in this research was before the COVID-19 pandemic from March 11, 2019 until March 1, 2020 and during the COVID-19 pandemic which was from 2 March 2020 – March 1, 2021. The measurement of investment return and risk was carried out using the Sharpe, Treynor, and Jensen Ratio methods. Then the data were tested by using T-Test (Different Test) to see if there is a significant difference between the two data. The results showed that the performance seen from the risk adjusted return of the Construction Services Sector Company during the COVID-19 Pandemic was better than the Performance of the Construction Services Sector Company before the COVID-19 pandemic. The different tests results showed a significant difference between the results of the Sharpe, Treynor, and Jensen Ratio before the COVID-19 pandemic compared to the results using the Sharpe, Treynor, and Jensen Ratio during the COVID-19 Pandemic. The best performance before the COVID-19 Pandemic were performed by; 1) PBSA (Sharpe Ratio), 2) JKON (Treynor Ratio), and 3) ACST (Jensen Ratio) while the best performance during COVID-19 was performed by; ACST (Sharpe Ratio, Treynor Ratio, and Jensen Ratio).

Keywords: - *Sharpe Ratio, Treynor Ratio, Jensen Ratio, Pandemic COVID-19, Construction Services Sector Companies.*

INTRODUCTION

The first case of the COVID-19 outbreak in Indonesia was discovered and released by the Indonesia Government on March 2, 2020 (WHO Indonesia Situation Report 1, 2020). Since the first case was appeared, the rate of spread of the COVID-19 pandemic in Indonesia continually increased, so the Indonesian Government attentively determined COVID-19 outbreak as a National Non-Natural Disaster on April 13, 2020 through Presidential Decree No. 12 of 2020 (Keppres No. 12 of 2020, 2020). One of the policies immediately decided by the Indonesian Government is to impose Large-Scale Social Restrictions ("PSBB") which aims to decrease the rate of spread of COVID-19 globally in Indonesia. This obviously affected on the closure of some central economic sectors, so that the wheels of the Indonesian economy could not significantly run. According to Nurmasari (2020) in her journal said that the rapid spread of the COVID-19 pandemic had negatively influenced in many economic sectors which led to layoffs for employees. In other words, all economy sectors are affected by this PSBB although some of them are still granted exceptions to operate on a limited basis.

The Construction Services Sector is the one that also given an exception which strives to continue operating on a limited basis (Haryanti, 2020). However, this still had a slow-down effect towards the performance of the Construction Services Sector companies. In addition, there was also an impact on the performance of the shares of the Construction Services Sector Company. Prior to the COVID-19 pandemic, the Composite Stock Price Index ("CSPI") had reached an all-time high with an outstanding performance in the whole sectors with a total transaction value of 6,686 in 2018. After the first case was announced and then continued the implementation of the PSBB due to the emergency condition of the COVID-19 pandemic, the CSPI had experienced a fairly deep decline, which was 58.49% compared to the same period in the previous year.

Mahayani (2019) said that when doing investment in the capital market, the investors will expect the highest return with a certain level of risk. Return can be in the form of yield and capital gain (loss), while yield is showed by the amount of obtained dividends. Capital gain (loss) is an incline (decline) in the price of a security letter that provides a profit (loss) to the investors (Tandelilin, 2017). Thus, following in doing the investment of the stocks, there is a certain level of risk in each generated return. Mahayani (2019) in her research found that the riskier level of the optimal portfolio composed of shares of the Infrastructure, Utilities and Transportation Sector companies on the IDX (Indonesian Stock Exchange) which resulted a risk level of 0.004 percent with an expected return of 5.085%. For some reasons, in this unstable economic condition, investors are required to be more observant in doing the investment of their capitals for the sake of avoiding any further risk factors

Based on the background that previously discussed, the questions of this research can be formulated as follows:

1. How is the comparison of the shares performance between the risk and performance of the Construction Services Sector Companies before and during the COVID-19 pandemic measured by the Sharpe Ratio?
2. How is the comparison of the shares performance of the systematic risk-adjusted of the Construction Services Sector Companies before and during the COVID-19 pandemic measured by the Treynor Ratio?
3. How is the comparison of the shares performance of the Construction Services Sector Companies before and during the COVID-19 pandemic measured by the Jensen Ratio?
4. Are there any differences among the use of the measurement methods of the Sharpe, the Treynor, and the Jensen Ratio before and during the COVID-19 pandemic?

LITERATURE REVIEW

Return

One factor which affects investors to invest capital and to earn profits or returns that may be willing to bear the risk of the investments made (Tandelilin, 2017). Return is the only one way that makes the most sense for investors to compare various investment alternatives with various returns from these investment alternatives (Jensen and Jones, 2019). The return value of each security is obviously different from each other. Not all securities will provide the same return for investors. The return of a security is determined by many things, such as the performance and the strategy of the companies in managing its profits. The expected return on the stock investment is relatively higher than the interest rate on bank deposits. Stock returns may also allow investors to compare the rate of return of one company to other companies (Jogiyanto, 2017).

According to Brigham and Houston (2010), they said that the return or rate of return is the difference between the received amount and the invested amount, divided by the invested amount. A research conducted by Darmayanti, Mildawati, & Susilowati (2020) found that there is no any significant difference in the Stock Return of PT. Indosat Tbk. before and after the first case announcement of the start of the COVID-19 outbreak in Indonesia. Based on the definition, return can be defined as: "the reward for the courage of investors to bear the risk of the investment they made". The following is the formula for calculating the individual stock and expected return that can be noted as:

$$\bar{R}_i = \frac{\bar{P}_t - \bar{P}_{t-1}}{P_{t-1}}$$

Where:

$\bar{P}_t$ = Stock price t;

$\bar{P}_{t-1}$ = Stock price t - 1;

$\bar{R}_i$ = Stock return i.

Risk is the possibility of the difference between the actual return (which has occurred) and the return expected by investors (Tandelilin, 2017). According to Zulfikar (2016), risk is an unfavorable possibility that will occur in the near future. Investment risk consists of two types, namely; systematic risk and non-systematic risk. According to Tandelilin (2017), systematic risk is a market risk that occurs as a whole or applies to all stocks in the capital markets. Thus, risk cannot be avoided or declined by investors with doing diversification. While nonsystematic risk is defined as a unique risk (corporate risk), which is not related to overall market changes or the risk of form some particular stocks which can be mitigated by diversification.

Systematic risk refers to one measure called beta (β). According to Campbell, Polk, & Vuolteenaho (2009), beta is known as a coefficient which shows the sensitivity of a stock's profit rate to changes of the stock market index's profit rate. The beta coefficient is neutral, if the value is 1 (β = 1). In the world of investment, risk has a strong relationship because it has the potential of the obtained losses from investment results when conditions are not possibly based on our plans or expectations. Many studies discussed the risks resulting from the uncertainty which often occurred, for example the COVID-19 pandemic which dominantly has an impact on various aspects of human life, including the economy and capital markets. Research conducted by Delis, Savva, & Theodossiou (2021) regarding with the market risk due to the effects of the COVID-19 outbreak, showed a negative impact on market risk which can be concluded that the crisis was very severe. Liu, Manzoor, Wang, Zhang, & Manzoor (2020) analyzed the several impacts of the outbreak of COVID-19 on financial markets with doing an exploration on the unexpected effects on financial markets (investment risk). Based on the definition from the literature, risk can be defined as "a condition where the actual rate of return obtained by an investor is not in line with the expected rate of return".

Portfolio

Portfolio is defined as a collection of investments Husnan (2004). This process means identifying which securities to choose and how much capital to invest. Markowitz (1952) said that to reduce investment risk, investors can invest in various types of stocks by forming a portfolio. Tandelilin (2017) added that to form an optimal portfolio; at first, investors need to determine an efficient portfolio, while the optimal portfolio is a portfolio chosen by an investor from various choices available in an efficient portfolio collection. A research conducted by Damayanti, Sugiharti, & Yudhawati (2021) measured the portfolio performance by comparing the best composition of the three selected stocks which showed the result that the best composition is portfolio II, namely a portfolio of 50% PTPP shares and 50% UNTR shares.

Sharpe Ratio

The Sharpe Ratio ("Sharpe") was firstly developed by William Sharpe in 1966. According to Halim (2015), the Sharpe ratio is often used for investors who use their funds only or mostly in some certain portfolios, so that portfolio risk is identified by the standard deviation. Besides, according to Pangestuti, Wahyudi, & Robiyanto (2017) the Sharpe ratio is one method used to help investors to compare each portfolio or stock with the concept of the Capital Market Line (CML) or known as the Reward to Variability Ratio (RVAR). According to Bukit, Surono, & Astriana (2019), Sharpe or RVAR emphasizes the total risk or standard deviation. The standard deviation can also help show the size of the change in the return of a stock to the average return of the stock. For the purpose of predicting future performance, past data is considerably used. The past average return is expected to be a predictive return of the future and standard deviation of past return is considered as a predictive risk in future.

The Sharpe's portfolio performance (reward to variability/RVAR) is measured by dividing the excess return by the variability of the portfolio return (Hartono, 2017). The lower the value of the Sharpe ratio, the lower the performance will be showed (Zakarias & Tumewu, 2015). Similarly, according to Happy & Robiyanto (2020), the greater the value of the Sharpe ratio, the more attractive the stock performance adjusted which the result of their research showed that Sharpe's calculations not all stocks in LQ45, promote good performance because the results of the Sharpe ratio show negative numbers. And the stock that performs the best performance in each period is namely BBCA with a value of 0.342. Furthermore, another study that also used the Sharpe ratio to measure and evaluate the portfolio performance are such as; Vernando et al (2015), Javier et al. (2016), Quranita et al. (2019), Nurhayati et al. (2021), Dikri et al. (2021), and others. Based on the definition from some literatures like; Halim (2015); Zakaria (2015); Pangestuti et al. (2017); Hartanto (2017); Pantun et al. (2019); and Robianto et al. (2020), the Sharpe ratio is often defined and considered as "a measurement instrument for the performance of an investment portfolio or stock based on a comparison of the average difference in return and risk-free return with the total risk of a portfolio or stock". According to (Sharpe, 1966), the Sharpe Ratio can be measured by using the following formula:

$$\hat{S}_P = \frac{\bar{R}_i - \bar{R}_F}{\sigma_{TR}}$$

Where:
S_P = Sharpe ratio;
R_i = Stock return i;
R_F = Risk-free rate;
σ_{TR} = Standard deviation of portfolio return

Treynor Ratio
Treynor Ratio ("Treynor") is used when evaluating the performance of the stock portfolio which considered with the past average return as the expected return and also determined by beta as a measure of risk (Samsul, 2006). According to Sulistyorini (2009), Treynor ratio determined that the portfolio is highly diversified or known as the Reward to Volatility Ratio (RVOR). Therefore, Treynor ratio stated that the portfolio performance series is calculated as the net result of the portfolio with a risk-free interest rate per unit of the portfolio's market risk. Mustopa (2016) defined Treynor ratio as one method that measures the excess return of a portfolio against beta which refers to the relationship between portfolio return and risk, and also distinguishes between total risk and systematic risk.

A research on the optimal portfolio as measured using the Treynor ratio with z-score transportation (standardized) conducted by Suryawan (2003) showed that measuring portfolio performance could significantly have different result characteristics from both the Jensen and the Sharpe ratio, which in other words they could not be compared directly to each other. Thus, it is necessary to standardize the performance measurement.

Based on the literature, Treynor ratio can be essentially defined as "an instrument for measuring the performance of an investment portfolio based on the systematic return and risk of the investment portfolio in the future".
According to Jack Treynor (1965), the formula for the Treynor Ratio is:

$$\hat{T}_P = \frac{\bar{R}_i - \bar{R}_F}{\hat{\beta}_P}$$

Where:
T_P = Treynor ratio;
R_i = Stock return; R_F = Risk-free rate;
β_P = Beta portfolio.

Jensen Ratio
According to Manurung (2019), the Jensen Ratio ("Jensen") means a ratio that shows the difference between the actual rate of gained return and the expected rate of return if the portfolio is on the capital market line. Sulistyorini (2009) stated that portfolio performance measurement assumes that there is a slightly linear relationship between portfolio returns and several market indices returns. The model bases its analysis on past returns to predict returns and risks in near future.

Purwanto & Indra (2015) said that Jensen or usually called as Jensen Alpha is a measure that estimates a constant rate of return during the investment period by gaining a Jensen Alpha rate of return above (below) from a buy-hold strategy with the same systematic risk. Meanwhile, according to Sulistyorini (2009) Jensen Ratio is actually based on the development of the Capital Asset Pricing Model (CAPM), Jensen measures the performance which is above the market performance dealing with the systematic risk. Based on the literature, then Jensen can be further defined as "one instrument to measure the performance of an investment portfolio which reflects on the return and risk of the investment portfolio in near future".
According to Jensen (1967), the Jensen Ratio formula is as follows:

$$\hat{J}_P = \bar{R}_i - [\bar{R}_F + (\bar{R}_M - \bar{R}_F) \times \hat{\beta}_P]$$

Keterangan: J_P = Jensen ratio;
R_i = Stock Return;
R_F = Risk-free Rate
R_M = Market Return
β_P = Portfolio Beta

Return Market

Market Return $(\bar{R}_M)$ in this research applies JCI data which can be formulated by the following pattern as follows:

$$R_M = (JCI_t - JCI_{t-1}) / JCIt_{-1}$$

T-Test

The T-Test is a tool to analyse data consisting of 2 populations which then the data compared to test whether there is a significant difference in the average. Based on the comparison of scores in the test, the following criteria need to be carefully considered:

If the value > 0.05, it means there is no significant difference in the average. If the value < 0.05, it means there is a significant difference in the average.

The T-Test formula is as follows:

$$t = \frac{x_1 - x_2}{\sqrt{\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}^2 - 2r\left(\frac{s_1}{\sqrt{n_1}}\right)\left(\frac{s_2}{\sqrt{n_2}}\right)}}$$

Where:

t = T-Test;
x1 = Average of sample 1;
x2 = Average of sample 2;
s1 = Standard deviation of sample 1;
s1 = Standard deviation of sample 2;
$s_1 2$ = Sample variants 1;
s22 = Sample variants 2;
r = Correlation between two samples

The theoretical framework of this research is as follows:

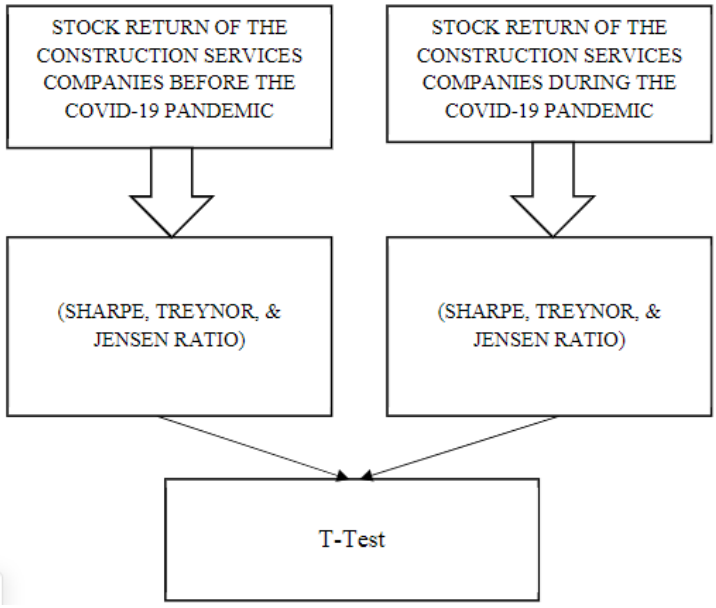

Figure 1. The Theoretical Framework of the Research

DATA & METHODOLOGY

This research was conducted using quantitative methods with a descriptive approach by applying the secondary data types. The data from this research cannot be totally affected by the writer, so the data used in this study belongs to the data that has minimal interference. The study setting used is non-contrived, which is carried out in an experienced condition where the certain events normally occur. The research period considered to get the data is before the outbreak of COVID-19 which was from March 11, 2019 – March 1, 2020 and during the outbreak of COVID-19 was from March 2, 2020 – March 1, 2021.

Choosing the data samples of this research was carried out by using a non-probability sampling method with a purposive sampling technique from one population of all company shares including the IDXINFRA index (57 shares) which was then doing a technique sampling by selecting the Heavy Constructions & Civil Engineering sub-sector and reselecting some companies with Activities Main Business in Construction Services Sector (civil/building/energy contractors). So that, the total of gained data sample were 15 companies whose main business activities are in the Construction Services Sector (civil/building/energy contractors). The 15 companies are as follows:

NO	TICKER CODE	COMPANY NAME
1	ACST	Acset Indonusa Tbk.
2	ADHI	Adhi Karya (Persero) Tbk.
3	DGIK	Nusa Konstruksi Enjiniring Tbk
4	IDPR	Indonesia Pondasi Raya Tbk.
5	JKON	Jaya Konstruksi Manggala Prata
6	NRCA	Nusa Raya Cipta Tbk.
7	PBSA	Paramita Bangun Sarana Tbk.
8	PPRE	PP Presisi Tbk.
9	PTPP	PP (Persero) Tbk.
10	SSIA	Surya Semesta Internusa Tbk.
11	TOPS	Totalindo Eka Persada Tbk.
12	TOTL	Total Bangun Persada Tbk.
13	WEGE	Wijaya Karya Bangunan Gedung Tbk.
14	WIKA	Wijaya Karya (Persero) Tbk.
15	WSKT	Waskita Karya (Persero) Tbk.

Then the research was conducted by comparing the stock price data of the 15 companies at the time of stock closing (daily closing price) in a predetermined period which was then processed to see the amount of return and risk in the form of a stock portfolio, then measured the performance of the portfolio by using the Sharpe, the Treynor, and the Jensen Ratio. Then the two data will be carried out with a T-Test (Different Test) to see a comparison between risk and stock performance before and during the situation of COVID-19 pandemic, which is calculated from the Sharpe, the Treynor, and the Jensen Ratio calculations.

FINDINGS AND DISCUSSIONS

Based on data on closing share prices that have been taken from 15 shares of Construction Services Sector Companies, there are two shares whose closing prices of stocks still had not changed or remained constant, namely DGIK and TOPS. DGIK did not perform any price changes from the beginning of data collection March 12, 2019 to March 1, 2021, while TOPS performed a price decline before the COVID-19 Pandemic in Indonesia and the price remained constant until March 1, 2021. Therefore, the two stocks were excluded from the sample of this study so that the sample of the shares used were 13 shares of the Construction Services Sector Company.

The gained data of this research before the COVID-19 Pandemic were 240 stock price closing data from the 13 Construction Services Sector Companies and during the COVID-19 Pandemic were 240 stock closing price data from the 13 Construction Services Sector Companies. The largest mean in the data before the COVID-19 pandemic was 2,107, namely WIKA shares, while the smallest one was 306, namely PPRE shares. Meanwhile, the largest mean in the data during the COVID-19 pandemic was 1,374, namely WIKA shares, while the smallest was 187, namely shares from PPRE. The distribution of research data can be seen in Table 1 of Statistical Description of Stock Closing Price before the COVID-19 Pandemic and Table 2 of Statistical Description of Stock Closing Price during the COVID19 Pandemic.

Table 1: Statistical Description of Stock Closing Price before the COVID-19 Pandemic

NO	Ticker Code	N	Mean	Std. Deviation	Std. Eror	Min	Max
1	ACST	240	1.198	280,04	18,08	243	1.700
2	ADHI	240	1.356	227,01	14,65	755	1.800
3	IDPR	240	398	93,59	6,04	300	850
4	JKON	240	466	58,62	3,78	300	550
5	NRCA	240	384	20,32	1,31	300	422
6	PBSA	240	607	161,85	10,45	288	785
7	PPRE	240	306	68,03	4,39	154	394
8	PTPP	240	1.096	431,58	27,86	486	2.230
9	SSIA	240	700	75,20	4,85	545	850
10	TOTL	240	491	73,75	4,76	372	640
11	WEGE	240	329	38,49	2,48	224	426
12	WIKA	240	2.107	186,84	12,06	1.735	2.490
13	WSKT	240	1.679	292,73	18,90	975	2.180

Table 2: Statistical Description of Stock Closing Price during the COVID-19 Pandemic

NO	Ticker Code	N	Mean	Std. Deviation	Std. Eror	Min	Max
1	ACST	240	228	116,75	7,54	66	580
2	ADHI	240	832	415,47	26,82	386	1.870
3	IDPR	240	197	55,11	3,56	93	346
4	JKON	240	364	46,77	3,02	254	476
5	NRCA	240	325	37,11	2,40	232	402
6	PBSA	240	655	94,03	6,07	428	750
7	PPRE	240	187	48,39	3,12	78	290
8	PTPP	240	1.096	290,99	18,78	486	2.230
9	SSIA	240	443	94,51	6,10	282	670
10	TOTL	240	319	40,71	2,63	260	406
11	WEGE	240	199	36,17	2,33	128	278
12	WIKA	240	1.374	379,80	24,52	725	2.360
13	WSKT	240	879	382,60	24,70	398	1.920

Table 3: Increase or decrease in stock prices compared to before the COVID-19 pandemic

NO	Ticker Code	Average Closing Price before COVID-19	Average Closing Price during COVID-19	Changing (Decreasing/Increasing)
1	ACST	1.196	228	(968)
2	ADHI	1.355	832	(524)
3	IDPR	396	197	(199)
4	JKON	466	364	(102)
5	NRCA	384	325	(58)
6	PBSA	607	655	48
7	PPRE	319	187	(132)
8	PTPP	1.829	1.096	(733)
9	SSIA	700	443	(257)
10	TOTL	490	319	(171)
11	WEGE	328	199	(129)
12	WIKA	2.108	1.374	(734)
13	WSKT	1.678	879	(800)

Based on data on closing stock prices per day from the 13 Shares of Construction Services Sector Companies, stock prices during the COVID-19 Pandemic were 11 shares or equivalent to 92.3% of the total sample performing a decrease in price, while 1 share or equivalent to 7.69% performing an increase. The decline experienced by the shares of the Construction Services Sector Company was due to the outbreak of COVID-19 situation. To see the difference or effect of the COVID-19 Pandemic, there were calculations carried out using the Sharpe Ratio, Treynor Ratio, and Jensen Ratio. Before calculating to these three methods, it should importantly need the stock return data (R_i), Risk Free (R_F), Market Return (R_M), Portfolio Beta (β_P), and Standard Deviation (σ_{TR}).

Stock Return (R_i)

From the Closing Price data, the stock of price per day for the 13 shares of the Construction Services Sector is calculated for the return of the shares, and the average share per share is then calculated before COVID 19 and during COVID-19.

Table 4: Stock Return (R_i)

NO	Ticker Code	AVERAGE RETURN SAHAM	
		BEFORE	DURING
1	ACST	(0,0067)	0,0058
2	ADHI	(0,0027)	0,0039
3	IDPR	(0,0025)	0,0013
4	JKON	0,0024	(0,0023)
5	NRCA	(0,0012)	0,0011
6	PBSA	0,0016	(0,0004)
7	PPRE	(0,0033)	0,0025
8	PTPP	(0,0017)	0,0028
9	SSIA	0,0008	0,0001
10	TOTL	(0,0020)	0,0002
11	WEGE	(0,0017)	0,0014
12	WIKA	0,0005	0,0012
13	WSKT	(0,0025)	0,0030

Risk Free (R_F)

The Risk free rate data (R_F) that used was the historical BI-7-Day-Repo Rate data from the research period. The value (R_F) applied in this research was divided into 2 periods, before COVID-19 of 5.44% and (R_F) during COVID-19 of 4.04%. The value was gained from the following data:

Table 5: Risk Free (R_F)

NO	BEFORE COVID-19		DURING COVID-19	
	TANGGAL	BI-7DAY-RR	TANGGAL	BI-7DAY-RR
1	21-Mar-19	6,00%	19-Mar-20	4,50%
2	25-Apr-19	6,00%	14-Apr-20	4,50%
3	16-Mei-19	6,00%	19-Mei-20	4,50%
4	20-Jun-19	6,00%	18-Jun-20	4,25%
5	18-Jul-19	5,75%	16-Jul-20	4,00%
6	22-Agu-19	5,50%	19-Agu-20	4,00%
7	19-Sep-19	5,25%	17-Sep-20	4,00%
8	24-Okt-19	5,00%	13-Okt-20	4,00%
9	21-Nov-19	5,00%	19-Nov-20	3,75%
10	19-Des-19	5,00%	17-Des-20	3,75%
11	23-Jan-20	5,00%	21-Jan-21	3,75%
12	20-Feb-20	4,75%	18-Feb-21	3,50%
	AVERAGE	5,44%	AVERAGE	4,04%

Market Return (R_M)

The data ( ) that used in this research were the average return of the Jakarta Composite Index (^JCI) from March 12, 2019 to March 01, 2021, so that ( ) before COVID 19 was -0.06 and (R) during COVID-19 was 0.08.

Table 6: Market Return (R_M)

	N	IHSG MIN	MAX	MEAN	AVERAGE ^JCI	RETURN
BEFORE COVID-19	240	5.453	6.525	6.226	-0,06	
DURING COVID-19	240	3.938	6.435	5.272	0,08	

Portfolio Beta (β_P)

Portfolio beta (β_P) equals the weighted-average of the beta coefficient of all the individual stocks in a portfolio. The beta used in this research applies the Aswath Damodaran industry BETA with the Engineering/Construction Industry. The data β_P released by Aswath Damodaran before COVID-19 pandemic on 5 Jan 2020 showed values of 1.10 and during COVID-19 on 5 Jan 21 was 1.04.

Standard Deviation (σ_{TR})

The standard deviation ( ) of the returns of shares formed from each of 13 Construction Services Sector Company Shares was calculated using stock portfolio return data, so that the standard deviation showed before COVID-19 and during COVID19 is obtained in table 7. This can illustrate that the volatility of portfolio returns during COVID-19 was greater than before COVID-19 which can be considered from the larger Standard Deviation

Table 7: Standard Deviation

NO	Ticker Code	STANDARD DEVIATION	
		BEFORE	DURING
1.	ACSS	(0,001)	0,007
2.	ADHI	(0,008)	(0,001)
3.	IDPR	(0,057)	(0,039)
4.	JKON	(0,052)	(0,043)
5.	NRCA	(0,056)	(0,039)
6.	PBSA	(0,053)	(0,041)
7.	PPRE	(0,058)	(0,038)
8.	PTPP	(0,056)	(0,038)
9.	SSIA	(0,054)	(0,040)
10.	TOTL	(0,056)	(0,040)
11.	WEGE	(0,056)	(0,039)
12.	WIKA	(0,054)	(0,039)
13.	WSKT	(0,057)	(0,037)

The Calculation of using the Sharpe Ratio, Treynor Ratio, and Jensen Ratio

Table 8: Stock Performance of the Sharpe Ratio, Treynor Ratio, & Jensen Ratio

Ticker Code	SHARPE RATIO		TREYNOR RATIO		JENSEN RATIO	
	BEFORE	DURING	BEFORE	DURING	BEFORE	DURING
ACST	-1,4099	-0,3961	-0,0555	-0,0333	-0,0005	0,0066
ADHI	-2,6476	-0,7700	-0,0519	-0,0351	-0,0084	-0,0013
IDPR	-1,3265	-0,6277	-0,0517	-0,0376	-0,0569	-0,0391
JKON	-1,4088	-1,6455	-0,0472	-0,0411	-0,0520	-0,0427
NRCA	-3,7637	-1,4561	-0,0506	-0,0378	-0,0557	-0,0393
PBSA	-1,0702	-1,0917	-0,0480	-0,0392	-0,0528	-0,0408
PPRE	-2,3056	-0,8148	-0,0525	-0,0364	-0,0577	-0,0379
PTPP	-2,1253	-0,8298	-0,0509	-0,0362	-0,0561	-0,0376
SSIA	-2,1821	-0,8907	-0,0487	-0,0388	-0,0536	-0,0403
TOTL	-4,6844	-1,4875	-0,0513	-0,0387	-0,0564	-0,0402
WEGE	-1,9838	-0,9431	-0,0510	-0,0375	-0,0561	-0,0390
WIKA	-2,1299	-0,8388	-0,0490	-0,0377	-0,0539	-0,0392
WSKT	-2,4105	-0,7819	-0,0516	-0,0360	-0,0568	-0,0374

Stock Performance of Using the Sharpe Ratio

The Sharpe Ratio used to measure stock performance by the standard deviation of stock returns from each stock. Based on the calculation of the Sharpe Ratio, the higher the result is, the better the stock's performance will be. The Sharpe Ratio both before and during COVID 19 pandemic in the results of this research, showed negative numbers. Of the 13 stocks, two stocks that showed Sharpe's performance during COVID-19 were worse than before COVID-19, namely JKON which performed the value before -1.4088 and the value after -1.6455 and PBSA with the value before -1.0702 the value after -1.0917. Meanwhile, 11 stocks showed that Sharpe's performance during the COVID-19 pandemic was better than during the COVID-19 pandemic, namely ACST, ADHI, IDPR, NRCA, PPRE, PTPP, SSIA, TOTL, WEGE, WIKA, and WSKT. This indicated that the risk of adjusted return of 11 increased during the COVID-19 pandemic. The result of calculation showed negative because the risk-free rate is greater than the average stock return.

Stock Performance of Using the Treynor Ratio

The Treynor ratio adjusted to measure stock performance by the use of average return and beta in a certain period as a risk that is concerned as a measurement benchmark. Stock performance is stated “good” if the Treynor ratio showed positive and the value tends higher. The Treynor ratio both before and during COVID 19 in the results of this research, showed negative numbers which slightly meant that there was no stock performance which performed good results. Meanwhile, stock performance according to Treynor ratio from the results of this research showed that all of stocks during COVID-19 have performed better results compared to before COVID19. This is certainly because the systemic risk-adjusted or ($\boldsymbol{\beta_P}$) of the Construction Service Sector Companies during the COVID-19 pandemic was lower than before the COVID-19 pandemic. While, the negative number was generated because the average risk free is significantly greater than the resulting average return.

Stock Performance of Using the Jensen Ratio

The Jensen Ratio is one of the ways to accurately measure stock performance by calculating the excess return obtained from the stock exceeding the expected results. The higher the Jensen Ratio value is, the better the stock performance will be showed. The stock performance based on Jensen’s measure in the results of this research showed that all stocks during the outbreak of COVID-19 performed better results compared to before the pandemic. This is because the excess return to market which generated during the COVID-19 pandemic is greater than before. Of the thirteen stocks calculated, there was one company that has a positive value during the COVID19 pandemic, namely ACST; this is because the resulting average return performed higher than the total risk.

T-TEST (STATISTICS TEST)

Based on the calculation results of the Sharpe Ratio, Treynor Ratio, and Jensen Ratio, then the calculation of the T-Test before COVID-19 and during COVID-19 were carried out. The T-Test test used a paired sample test. This test is part of the parametric inferential statistics, which aims to test differences or comparisons. The following is the output table for the paired sample t-test:

Table 9: Output Paired Sample T-test

	Mean	Std Deviation	Std Error	95% Confidence Interval of the Difference		t	Sig. - 2-tailed)
				Lower	Upper		
Sharpe Before – Sharpe During	-1,29802019	0,89955989	0,24949302	-1,84161879	-0,75442159	-5,203	0,000
Treynor Before – Treynor During	-0,01341530	0,00403006	0,00111774	-0,01585065	-0,01097996	-12,002	0,000
Jensen Before – Jensen During	-0,01450353	0,00443727	0,00123068	-0,01718494	-0,01182211	-11,785	0,000

Based on the output table of paired samples t-test above, it can be noted that the mean difference between Sharpe's measure before and during COVID-19 was -1.29802019. This value showed the difference result of the average both before and during pandemic which gained between -1.84161879 to -9.75442159 (which is 95% Confidence Interval of the Difference lower upper). Next, the mean difference between Treynor's measure before and during COVID-19 was -0.01341530. This value indicated the difference result of the average both before and during pandemic which showed between -0.01585065 to -0.01097996 (which is 95% Confidence Interval of the Difference lower upper). The last, the mean difference between Jensen's measure before and during COVID-19 was -0.01450353. This value meant the difference result of the average before and during pandemic which obtained between -0.01718494 to -0.01182211 (which is 95% Confidence Interval of the Difference lower upper). The standard deviation used to determine the difference between the sample values and the average. From the calculation results gained that the standard deviation of Sharpe was 0.89955989, Treynor was 0.00403006 and Jensen was 0.00443727. Then, for the value of std. error which has a deviation from Sharpe was 0.24949302, Treynor was 0.00111774 and Jensen was 0.00123068.

Furthermore, the test results in the output table of paired samples t-test gained the some values that sig. was (2 tailed), the Sharpe Ratio was 0.000 < 0.05, which meant there was a significant difference between the Sharpe Ratio before and during the outbreak of COVID-19. While the value of sig. (2 tailed) of the Treynor Ratio is 0.000 < 0.05 referred that there was a significant difference between the Treynor Ratio before and during COVID-19. And the value of sig. was (2 tailed), the Jensen Ratio was 0.000 < 0.05 which it could be said that there was a significant difference between the Jensen Ratio before and during COVID-19 pandemic.

During the pandemic, although the Construction Services Sector received special exceptions, several projects carried out by construction companies were delayed due to the implementation of Large-Scale Social Restrictions (PSBB) which restricted the mobilization activities. The government has also implemented a policy of refocusing the budget by reallocating the budget in order to accelerate in reducing the pressure of COVID-19 pandemic. This condition triggered the cash flow of construction companies. The impact of this condition for construction companies listed on the Indonesia Stock Exchange (IDX) which they also performed stock prices whose their performance was not as good as before the pandemic due to the decreased of stock prices. The decline in stock prices was in contrast to the performance of the Sharpe, Treynor, and Jensen Ratio because Construction Sector Stocks performed an improvement, this was because stock returns during the outbreak of COVID-19 were better than before the pandemic. This is because at the beginning of the COVID-19 Pandemic, the stock price of the Construction Services Sector performed such a great decline, but time by time, the stock price of the Construction Services Sector increased gradually which could be seen in the average return showing a better number. This obviously can also be considered in the Market Return before pandemic was -0.06 and during Pandemic at 0.08. In addition, the value of risk free was in decline during the COVID-19 Pandemic which also affected the calculation; this decline was also one of the policies of the Government for economic recovery.

Table 10: Stock Performance Ranking Summary of the Sharpe, Treynor, and Jensen Ratio before COVID-19 Pandemic

SHARPE		TREYNOR		JENSEN	
PBSA	-1,0702	JKON	-0,0472	ACST	-0,0005
IDPR	-1,3265	PBSA	-0,0480	ADHI	-0,0084
JKON	-1,4088	SSIA	-0,0487	JKON	-0,0520
ACST	-1,4099	WIKA	-0,0490	PBSA	-0,0528
WEGE	-1,9838	NRCA	-0,0506	SSIA	-0,0536
PTPP	-2,1253	PTPP	-0,0509	WIKA	-0,0539
WIKA	-2,1299	WEGE	-0,0510	NRCA	-0,0557
SSIA	-2,1821	TOTL	-0,0513	PTPP	-0,0561
PPRE	-2,3056	WSKT	-0,0516	WEGE	-0,0561
WSKT	-2,4105	IDPR	-0,0517	TOTL	-0,0564
ADHI	-2,6476	ADHI	-0,0519	WSKT	-0,0568
NRCA	-3,7637	PPRE	-0,0525	IDPR	-0,0569
TOTL	-4,6844	ACST	-0,0555	PPRE	-0,0577

Table 10 is the rank of the results of the Sharpe, Treynor & Jensen Ratio before COVID-19. Of the three methods, positive numbers indicated the performance is good which could be said that the higher the value is, the better the performance will be. Based on table 10 above, all values show negative numbers which the best numbers belonged were the values with the smallest negative numbers or close to zero. Based on the results of the Sharpe Ratio method, the three highest rankings of shares of Construction Services Sector Companies before the COVID19 pandemic were; 1) PBSA (-1.072), 2) IDPR (-1.3265), and 3) JKON (-1.4088). While, the lowest Sharpe Ratio were: 1) TOTL (-4, 6844), 2) NRCA (-3.7637), and 3) ADHI (-2.6476). Next, based on the Treynor Ratio method, the three highest rankings of the shares of Construction Services Sector Companies before the COVID-19 pandemic were; 1) JKON (-0.0472), 2) PBSA (-0.0472), and 3) SSIA (-0.0487). The lowest Treynor Ratio were; 1) ACST (-0.0555), 2) PPRE (-0.0525), and 3) ADHI (-0.0519). The last, using the Jensen Ratio method, the three highest rankings of the shares of Construction Services Sector Companies before the COVID-19 pandemic were; 1) ACST (-0.0005), 2) (-0.0084), and 3) JKON (-0.0520) while in the lowest Jensen Ratio were; 1) PPRE (0.0577), 2) IDPR (-0.0569), and 3) WSKT (-0.0568). Therefore, the best stock performance prior to the COVID19 Pandemic consistently from the three methods was JKON.

Table 11: Stock Performance Ranking Summary of the Sharpe, Treynor, and Jensen Ratio during COVID-19 Pandemic

SHARPE		TREYNOR		JENSEN	
ACST	-0,3961	ACST	-0,0333	ACST	0,0066
IDPR	-0,6277	ADHI	-0,0351	ADHI	-0,0013
ADHI	-0,7700	WSKT	-0,0360	WSKT	-0,0374
WSKT	-0,7819	PTPP	-0,0362	PTPP	-0,0376
PPRE	-0,8148	PPRE	-0,0364	PPRE	-0,0379
PTPP	-0,8298	WEGE	-0,0375	WEGE	-0,0390
WIKA	-0,8388	IDPR	-0,0376	IDPR	-0,0391
SSIA	-0,8907	WIKA	-0,0377	WIKA	-0,0392
WEGE	-0,9431	NRCA	-0,0378	NRCA	-0,0393
PBSA	-1,0917	TOTL	-0,0387	TOTL	-0,0402
NRCA	-1,4561	SSIA	-0,0388	SSIA	-0,0403
TOTL	-1,4875	PBSA	-0,0392	PBSA	-0,0408
JKON	-1,6455	JKON	-0,0411	JKON	-0,0427

Table 11 is a rank table of the results of the Sharpe, Trenor & Jensen Ratio during the COVID-19 pandemic. Of the three methods, positive numbers showed that the performance is good. The higher the value is, the better the performance will be. As presented in the table 11 above, almost all values showed negative numbers, which the best numbers were the values with the highest positive numbers, the smallest negative numbers, or close to zero. Based on the table of the Sharpe Ratio method, the three highest rankings of shares in Construction Services Sector Companies during the COVID-19 pandemic were; 1) ACST (-0.3961), 2) IDPR (-0.6277), and 3) ADHI (-0.7700) while other results for the lowest Sharpe Ratio were; 1) JKON (-1.6455), 2) TOTL (-1.4875), and 3) NRCA (-1.4561). Next, in accordance with the results of Treynor Ratio method, the three highest rankings of shares of Construction Services Sector Companies during the COVID-19 pandemic were; 1) ACST (-0.0333), 2) ADHI (-0.0351), and 3) WSKT (-0.0360) while the lowest Treynor Ratio included; 1) SSIA (-0.0388), 2) PBSA (-0.0392), and 3) JKON (-0.0411). And the last, measured by the Jensen Ratio method, the three highest rankings of shares of Construction Services Sector Companies during the COVID-19 pandemic consisted of; 1) ACST (0.0066), 2) ADHI (-0.0013), and 3) WSKT (-0.0374) while for the lowest Jensen Ratio were namely; 1) SSIA (- 0.0403), 2) PBSA (-0.0408), and 3) JKON (-0.0427). Thus, the best stock performance before the COVID19 Pandemic from the three methods consistently performed by ACST & ADHI while JKON performed the highest result in the period before COVID-19 but, in contrast it showed the lowest performance during the period of COVID-19 Pandemic.

CONCLUSION AND SUGGESTIONS

Conclusions

Based on the results of data analysis, it can be concluded that the comparison of return and risk performance of the shares of Construction Services Sector Companies between the situation before and during the COVID-19 Pandemic measured by the Sharpe Ratio were 11 stocks have already showed a larger negative value (worse). For comparison of investment risk (risk adjusted) shares of Construction Services Sector Companies before and during the COVID-19 pandemic examined by using the Treynor Ratio, then it has been better achieved in the situation before the COVID-19 pandemic. Furthermore, a comparison of the stock performance of Construction Services Sector Companies before and during the COVID-19 pandemic carried out by the Jensen Ratio has contributed that the Jensen Ratio during the outbreak of COVID-19 is better than before pandemic. From the results of the overall data analysis, it can be likely said that there were found differences using the three methods of the Sharpe, Treynor, and Jensen Ratios for the situation before and during the COVID-19 pandemic.

Research Contribution

This research contributes in the form of developing insight in the field of economics, especially Stock Investment. The main impact of the implementation of research results is expected to be a reference for investors in investing their shares to the construction service company sector during the COVID-19 pandemic, because this research hopefully can provide the results of risk adjusted returns during the COVID 19 pandemic. Therefore, the results of this study showed that the Sharpe, Treynor and Jensen method could present three results which were well-performed during the COVID-19 Pandemic. Initially, the Sharpe Ratio used when investors assume that a small part of stock returns is influenced by the market. Then, the Treynor Ratio is applied when investors assume that the stock is effective and well diversified. Last, the Jensen Ratio is adjusted when investors find out whether the actual returns obtained and the expected returns are different.

Limitations and Suggestions

The limitation in this study with the objective of this research was to determine the shares performance in the Construction Services Sector companies can be seen though the risk adjusted return. The results found that the risk adjusted returns during the COVID-19 pandemic has performed better results. So for further research, it is necessary to calculate the risk & return of other methods such as; Sortion Ratio, Information Ratio, ModiglianiModigliani (M2), Reward to Market Risk or other stock performance measurements.

Besides, the future writers and researchers hopefully can conduct any further research on other sectors such as; the sectors of health, telecommunication, manufacturing, and other sectors whether they have the same comparison results.

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