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Analysis on Risk, Real Returns, and Performance Measurement of Sharia Stocks and Non-sharia Stocks

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Abstract

Indonesia is predominantly Muslim, however, this does not necessarily mean that the number of sharia stock investors in Indonesia is also large. Referring to SOTS data's, the number of sharia stocks investors is still very small compared to the number of stock investors as a whole. Therefore, research is needed to understand the comparison of risks, returns, and performance measurement of sharia and non-sharia stocks. Using purposive sampling, a sample of 19 stocks were obtained consisting of 14 sharia stocks and 5 non-sharia stocks from 2014 to 2018. This research is an explanatory comparative method and is a quantitative type using a different test. The results show that there is a difference in risk between sharia and non-sharia stocks. However, there is no difference in yields between Sharia and non-Sharia stocks. Performance measurement based on Risk-Adjusted Performance using the Sharpe ratio show that non-Sharia stocks are more dominant in performance than Sharia stocks. Total risk (SD) of sharia stocks (7.945062) is higher and is somewhat bigger than the average non-sharia stock risk (6,186363) and the real returns between sharia and non-sharia stocks, although descriptively statistical the real returns of sharia stocks (0.066179%) is lower than the non-sharia stocks (1.175495%).

Keywords: Stock, Risk, Return, Sharpe Ratio

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Abstrak
Indonesia mayoritas berpenduduk muslim, namun demikian tidak serta merta membuat jumlah investor saham syariah di Indonesia juga banyak. Mengacu pada data SOTS jumlah investor saham syariah masih sangat kecil dibandingkan jumlah investor secara keseluruhan. Untuk itu diperlukan kajian tentang perbandingan risiko, imbal hasil maupun pengukuran kinerja saham syariah dan non syariah. Menggunakan purposive sampling, diperoleh sampel sebanyak 19 saham, yang terbagi atas 14 saham syariah dan 5 saham non syariah periode tahun 2014-2018. Penelitian ini termasuk eksplanatori comparatif method dan termasuk jenis kuantitatif dengan menggunakan Tes Uji beda. Hasil penelitian menunjukan, bahwa, ada perbedaan risiko diantara saham syariah dibandingan non syariah. Namun demikian tidak ada perbedaan imbal hasil diantara keduanya. Risk Adjusted Performance dengan menggunakan rasio sharpe menunjukan

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bahwa saham non syariah lebih lebih dominan kinerjanya dibandingkan dengan saham syariah. Total risk (SD) saham syariah (7.945062) lebih tinggi dan agak lebih besar dari rata-rata risiko saham non syariah (6.186363) dan return riil antara saham syariah dan non syariah, meskipun secara statistik deskriptif return riil syariah saham (0,066179%) lebih rendah dibandingkan saham non syariah (1,175495%).

***Kata Kunci** : Saham, Risk, Return, Rasio Sharpe*

A. INTRODUCTION

Indonesia is a country with the most important Muslim population within the world. According to the 2016 BPS report, Indonesia's Muslim population is projected to achieve 87% of Indonesia's total population in 2019 (Ali, 2020, p. 29).This means that the majority of the population is Muslim. The potential market for Muslims is one of the motivations for the development of various sharia-based investments in Indonesia. This is important for providing facilities for the Muslim population in terms of investment to comply with Islamic law. According to the Creed Theory, it is obligatory to apply Islamic law to anyone who has declared the Shahadah as a logical consequence of his credo statement (S Praja, 2015, p. 137).

However, the reality in the field shows the opposite. Referring to the data obtained, it shows that sharia stock investors are still few in numbers compared to total stock investors as a whole. This data can be obtained from the number of users of the Sharia Online Trading System (SOTS). However, this increase is still very small compared to the potential of the majority Muslim population. The 2018 data show the SOTS users are only around 4.88% while the Muslim population is around 87.18%.

The reality that arises among the Muslim population needs to be explored to get answers to the existing phenomena. One of the phenomena is that people still underestimate sharia-based investment instruments compared to non-sharia (Syafrida et al., 2015, p. 201). According to other data, the sharia financial literacy index is only around 8.1% with an inclusion index of 11.1% (OJK, 2017). Likewise, there are still doubts in the Muslim community regarding the status of sharia financial instruments, both in the bank and non-bank financial institutions (Emilia et al., 2018, p. 67).

Year	Number of Sharia Stock Investors	Number of Investors in CBEST	Persentage
2012	531	281.256	0.19
2013	803	320.506	0.25
2014	2.705	364.465	0.74
2015	4.908	434.108	1.13
2016	12.283	535.994	2.29
2017	23.207	628.491	3.69
2018	39.711	813.969	4.88

Table 1
Development of the Number of SOTS Investors

This research is an explanatory comparative method and is a quantitative type using a different test. The non-probability sampling technique used in this study is purposive sampling. Purposive sampling is a data source sampling technique with certain considerations or criteria. Methode and quantitative use to obtain answers to this research, a comparative hypothesis was made as There is a difference between the risk of sharia and non-sharia stocks and there is a difference between sharia and non-sharia stock returns.

B. DISCUSSION

The most important part in a research result is the discussion section. In this discussion section, it will begin with explanation of some keywords that limit this research, methods, sample determination, descriptive data processing, and results. These results are then analyzed and discussed with previous research, both appropriate and unsuitable.

1. Risk and Return

There are two important elements that an investor must pay attention to in carrying out investment activities among other elements. The two elements are the presence of risk and returns (Prasetyo, 2018, p. 23). Based on sharia economic thought, the element that must be the first and foremost concern in investing activities is the risk. Generally, the risks in investment can be categorized into two, namely unsystematic risk and systematic risk. So that knowledge and understanding of risk become an important element that must be owned by any fund owner who is an investor or is a potential investor (Amtiran, 2017, p. 8).

Therefore, it is necessary to identify the risks before making investment. Various methods of measuring risk have been developed. With the development of various risk measurement methods, it is expected that investors will be able to make investments. One of the risk measurement methods is using Standard Deviation (SD). Measuring risk using this method is formulated,

$$\text{Risiko Total} = \sqrt{\frac{\sum_1^n (x_1 - \bar{x})}{n-1}}$$

Where:

X_1: i period of stock returns
$\bar{X}$: The average returns on stocks in one period
n: Number of periods

The existence of the method of risk measurement formulation above shows that risk is an element that can be calculated and estimated. Accordance with what has been previously mentioned, that in addition to risk, returns must also be considered. Returns is an element that must also be considered in making investment. Sometimes it becomes the main focus of some fund owners in making their investment. This is of course in line with one of the investment objectives itself that is to make a profit. If it is associated with inflation, what is called profit is if the returns obtained is higher than the inflation rate.

This study, the returns is not only capital gains or nominal returns, but also the adjusted returns (real returns). Where the adjusted returns (real returns) comes from the nominal returns that has been adjusted to the rate of inflation. The formulation that can be calculated,

$$\text{Imbal hasil disesuaikan } (real\ return) = \frac{(1+R)}{(1+IF)} - 1$$

Where:
R: Nominal returns
IF: Inflation rate

The nominal returns consists of two (2) elements namely: capital gain/loss plus dividend yield. So that the nominal returns can be calculated with formula,

$$\text{Nominal Return} = \frac{\text{Pt} - \text{Pt} - 1}{\text{Pt} - 1} + Deviden\ Yield$$

Where:
Pt: Closing price for period t
Pt_{-1}: Closing price of shares period t-1
Dividend Yield: Dividend/average current share price for Cum Dividend.

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To avoid a bias in the statistical analysis of the capital gain calculation as affected by the magnitude of the divider, the calculation of capital gain is carried out in the following way (Husnan, 2005) :

$$R = Ln(P_t/P_{t-1})$$

To get the real returns, previously calculated the nominal returns with the following formula:

$$R = Ln(P_t/P_{t-1}) + \textit{Deviden Yeild}$$

2. Performance

Risk and returns have a linear relationship, which means that the greater the risk that must be borne, the greater the returns that must be compensated. (Hartono, 2017, p. 83). The higher the risk borne, the higher the potential return will be followed. Likewise, conversely, the lower the risk, the lower the potential returns.

As mentioned above, there are two elements that an investor must pay attention to in making investment namely risk and returns. For this reason, there is a method to measure the performance of investment instruments that accommodates both namely the Risk-Adjusted Performance method. By knowing the performance of investment instruments based on the method above, it is expected that an investor can choose the best investment instrument in his investment basket. Because an investor is always faced with several choices on the magnitude of the combination of risk and returns in making investment.

One of the methods applied to calculate this performance is the Sharpe Ratio. Mathematically the Sharpe Ratio is formulated as follows:

$$\text{Spi} = \frac{Rpi - Rf}{SDpi}$$

Where :

Spi: i Stock Sharpe Ratio
Rpi: Average i stock real return
Rf: *Risk-Free Rate*
Sdpi: *Standard deviation of i stock real return*
Rpi-Rf: i stock risk premium

In the formula above, there is a risk-free rate component that is not in line with Islamic law. For this reason, an adjustment is needed to comply the Islamic law by replacing the risk-free rate with components that are accommodated by the Islamic law.

3. Stocks

Share or stock is a proof of ownership of a company whose share of ownership (hishshah) cannot be ascertained, and has a value of advice, while sharia stocks are stocks that meet the requirements and criteria based on sharia principles. (MUI, 2020). Referring to the fatwa above, there are Sharia stocks and non-Sharia stocks.

To adopt various MUI DSN fatwas relating to the criteria and provisions of sharia stocks, the government subsequently poured them into various positive laws and regulations. Law in Indonesia has an important role regarding legal certainty of the Islamization of economy in the country (Nopriansyah, 2019, p. 189). Changes to the criteria and conditions are made by the government from time to time. And finally, along with the merger of Bapepam LK into the Financial Services Authority (OJK) following Law No.21 of 2011, the criteria for sharia stocks were updated to become the Financial Services Authority Regulation (POJK) No.35/POJK.04/2017 with the same criteria as stated in the Bapepam LK Decree, namely fulfilling the following financial ratios:

a) Not carrying out activities and types of business that are contrary to the Sharia Principles in the Stock Market which include gambling and games classified as gambling; ribawi financial services; risks buying and selling that contain elements of uncertainty *(garar)* and/or gambling (*maisīr*); not carrying out other activities that are contrary to sharia principles based

on the provisions of the National Sharia Council - Indonesian Ulema Council and; producing, distributing, trading, and/or making available:

1) goods or services that are haram in substance (*ḥaram li-żātihi*);
2) goods or services are haram not because of their substance (ḥ*aram li-gairihi*) determined by the National Sharia Council - Indonesian Ulema Council;
3) goods or services that destroy morals and are harmful; and/or other goods or services that are contrary to sharia principles based on the provisions of the National Sharia Council - Indonesian Ulema Council; and

b) Not conducting transactions that are against the Sharia Principles in the Stock Market;
c) Meeting the financial ratios. Total debt based on interest compared to total assets is not more than 45% (forty-five percent); and the total interest income and other non-halal income compared to the total business income and other income is not more than 10% (ten percent);

As a logical consequence of the above criteria for sharia stocks, not all shares listed on the Indonesia Stock Exchange (IDX) can fulfill it. Companies/issuers' stocks that meet the above criteria are called sharia stocks, while companies/issuers' stocks that cannot meet the above criteria are called non-sharia stocks.

In terms of the number of sharia stocks in Indonesia, since the launch of the Indonesian Sharia Stock Index (ISSI) in 2011, it has continued to grow. Growth in quantity, in terms of the number of sharia stocks constituents. This shows that many issuers' stocks in Indonesia can meet the criteria as sharia stocks.

Announcement	Date	Number	Increase(%)
Penguman-00633/BEI.PSH/12-2011	6 Des 2011	235	
Pengumuman-00630/BEI.PSH/11-2012	30 Des 2012	300	27.6
Pengumuman-00676/BEI.PSH/11-2013	28 Des 2013	311	3.6
Pengumuman-00891/BEI.OPP/12-2014	22 Des 2014	316	1.6
Pengumuman-00957/BEI.OPP/11-2015	27Nov2015	315	-0.3
Pengumuman-00909/BEI.OPP/11-2016	28Nov 2016	331	5
Pengumuman-01016/BEI.OPP/12-2017	28 Des 2017	365	10.2
Pengumuman-0089/BEI.OPP/11-2018	28Nov 2018	395	8.2
Pengumuman-00558/BEI.PQP/l 1-2019	27Nov 2019	423	7.1
Pengumuman-00356/BEI.PQP/l 1-2020	26Nov 2020	421	-0.5

Table 2
Growth in the Number of Sharia Stocks on the IDX for the Period of 2011 to 2020

Looking at the data at table 2, it can be seen that the number of sharia stocks continues to experience growth. The growth in the number of sharia stocks was also accompanied by an increase in the Jakarta Islamic Index (JII) and its market capitalization. To complete the data, here is the data on the development of the JII index and Composite Stock Price Index (IHSG) and their capitalization (*Statistik Mingguan Pasar Modal - Juni 2020*, n.d.)

Year	JII	Capitalization	IHSG	Capitalization
2012	594.79	1,671.00	4,316.69	4,126.99
2013	585.11	1,672.01	4,274.18	4,219.02
2014	691.04	1,944.53	5,226.95	5,228.04
2015	603.35	1,737.29	4,593.01	4,872.70
2016	694.13	2,035.19	5,296.71	5,753.61
2017	759.07	2,288.02	6,355.65	7,052.39
2018	685.22	2,239.51	6,194.50	7,023.50
2019	698.09	2,318.57	6,299.54	7,265.02
2020	538.65	1,794.08	4,904.09	5,676.11

Table 3
Development of JII and IHSG Index Figures and Capitalization (IDR trillion)

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To provide a clearer picture, then the changes are calculated from time to time. From this data, the changes can be calculated. Change can be either an increase or a decrease. After calculating, changes in index numbers and market capitalization between JII and JCI.

Year	JII		IHSG	
	Index	Capitalization	Index	Capitalization
2013	-0.0160	0.0006	-0.0100	0.0220
2014	0.1810	0.1630	0.2230	0.2390
2015	-0.1230	-0.1060	-0.1210	-0.0670
2016	0.1500	0.1710	0.147 0	0.1800
2017	0.0940	0.1240	0.1990	0.2250
2018	-0.1630	-0.1350	-0.0940	-0.0780
2019	0.0187	0.0353	0.0169	0.0343
2020	-0.2283	-0.2262	-0.2215	-0.2187

Table 4

Percentage of change in JII and JCI Index and Capitalization Figures (%)

Various regulations and implementations concerning sharia stocks have been stipulated by the State and stock exchange authorities, however, the number of sharia stock investors is not proportional to the total Muslim population. For this reason, research is needed to understand the comparison of risks, returns between sharia and non-sharia stocks. Likewise, knowing the measurement of the performance of sharia and non-sharia stocks. This study uses total risks, in terms of returns using the inflation rate as an adjustment factor. Likewise, performance measurement does not use a risk-free rate but uses the amount of zakat so that it is in line with Islamic law. The results of this study are expected not to be biased to answer phenomena that occur in the field.

4. Research Method

The following are the results of purposive sampling based on the criteria:

Criteria	Total
Sharia Stock	395
Consistent to become the JII members during the research period	14
Total Samples	14 x 60 (840)

Table 5

Sharia Stock Sample Criteria

Meanwhile, the criteria for non-sharia stocks data from purposive sampling are based on the criteria, as follows:

Criteria	Total
Consistent to become the IDX30 members during the research period	16
Not becoming the JII members during the research period	5
Total Samples	5 x 60 (300)

Table 6

Non-Sharia Stock Sample Criteria

Based on the above criteria, the following sample is obtained,

No	Code stock	Initial	No	Code Stock	Initial
	ADRO	SS1	1.	BBCA	SNS1
	AKRA	SS2	2.	BBNI	SNS2
	ASII	SS3	3.	BBRI	SNS3
	BSDE	SS4	4.	BMRI	SNS4
	ICBP	SS5	5.	GGRM	SNS5
	INDF	SS6			
	KLBF	SS7			
	PGAS	SS8			
	SMGR	SS9			
.	SMRA	SS10			
.	TLKM	SS11			
.	UNTR	SS12			
.	UNVR	SS13			
.	WIKA	SS14			

Table 7
Sharia Stock and Non-sharia Stock Samples

The percentage of the total sample of sharia and non-sharia stocks, when compared to the existing population,

Instrument	Number of Population	Number of Samples	Percentage
Sharia Stock	395	14	3.5 %
Non-Sharia Stock	224	5	2.2 %

Table 8
Percentage of stock samples to population

Panel data that combines times series and cross-section data is used in this study. Time series data for the period 2014 to 2018, with the monthly data period sup. The method used in this research is an explanatory comparative method, by comparing the risks and returns on sharia and non-sharia stocks. Where this method is used to test hypotheses about whether or not there is a difference between the two with different tests. Due to using numerical data in the research process, this research is of a quantitative type.

After applying the existing formula, obtain the risk data for the study period,

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	Stock Initial	2014	2015	2016	2017	2018
Sharia Stock	SS1	0.63384	8.80336	9.37396	7.04628	12.39554
	SS2	9.27388	5.79514	7.89080	5.92570	8.83683
	SS3	4.70465	10.15607	5.98190	4.64691	5.95511
	SS4	5.46657	10.51763	9.12821	3.05678	9.70262
	SS5	5.85662	7.20052	6.64213	3.84386	4.59550
	SS6	3.49151	8.96554	8.61239	4.26956	5.92794
	SS7	3.98818	6.96231	7.06997	4.17276	6.23977
	SS8	2.71729	13.47872	12.46173	10.78883	16.63163
	SS9	4.04667	8.98204	5.17680	6.73921	13.97889
	SS10	9.27265	15.66353	35.96994	10.33611	14.63599
	SS11	5.87160	5.08334	5.63330	5.87015	6.16413
	SS12	5.86729	6.91744	9.18215	4.60239	9.27197
	SS13	2.72353	5.39413	6.92626	3.57780	5.32299
	SS14	9.63884	9.61813	9.37929	6.97538	18.12384
Non-Sharia Stock	SNS1	4.96465	5.30285	4.00358	3.71818	4.91676
	SNS2	3.75825	12.34262	6.58076	6.16123	8.76396
	SNS3	5.29487	11.20839	5.82097	5.14782	6.65238
	SNS4	3.90167	8.46113	6.69396	4.47516	4.12248
	SNS5	6.06628	7.95575	5.18625	6.25265	6.90645

Table 9

Summary of Total Risk (SD) of Sharia Stocks and Non-sharia Stocks

The data will then be processed to obtain descriptive statistics and inferential statistics in the form of different tests. In descriptive statistics, the total risk of sharia and non-sharia stocks,

Sharia Stock		**Non-Sharia Stock**	
Mean	7.945062	Mean	6.186363
Standard Deviation	4.831212	Standard Deviation	2.191745
Minimum	0.633841	Minimum	3.718183
Maximum	35.96994	Maximum	12.34262
Sum	556.1543	Sum	154.6591
Count	70	Count	25

Table 10

Descriptive Static Processing Results

It can be seen that the average risk sample data for total sharia stocks during the study period is generally 7.945062, higher than the risk for non-sharia stocks which only has an average of 6.186363. The range of risk sample data for total sharia stocks is wider, where the lowest is 0.633841 and the highest is 35.96994 with a standard deviation (SD) of 4.831212. The range of risk sample data for total non-sharia stocks where the lowest is 3.718183 and the highest is 12.34262 with a standard deviation of 2.191745. This illustrates that the risk sample data for sharia stocks are more dispersive.

Furthermore, the calculation results of the average returns (real returns) of each stock,

	Stock Initial	2014	2015	2016	2017	2018
Sharia Stock	SS1	-0.40463	-6.58271	9.96726	0.74710	-3.32138
	SS2	-1.03332	4.52068	-1.70678	0.35351	-3.12589
	SS3	0.31051	-1.76853	2.66322	-0.10471	-0.11537
	SS4	4.66756	-0.22513	-0.45609	-0.54023	-2.78288
	SS5	1.53024	0.09695	1.76240	0.16700	1.28096
	SS6	-0.31663	-2.21759	3.28878	-0.38873	-0.08813
	SS7	2.57143	-2.90854	0.89383	0.73040	-1.03200
	SS8	1.76607	-6.52090	-0.10568	-3.90589	1.32879
	SS9	0.66935	-2.96117	-2.05372	0.69445	1.03596
	SS10	4.83981	0.50295	-2.07027	-3.10555	-1.59749
	SS11	2.07457	0.64703	2.07789	0.83245	-1.36473
	SS12	-1.19795	-0.13563	1.62990	4.14444	-2.17193
	SS13	1.31854	1.01804	0.23201	2.87835	-1.81288
	SS14	6.29776	-2.97806	-0.54934	-3.67438	0.41717
Non Sharia Stock	SNS1	2.03383	-0.08871	0.74740	3.05448	1.25980
	SNS2	3.17421	-1.75923	0.78135	4.80666	-1.00302
	SNS3	3.47475	-0.24329	0.15586	3.69086	0.03522
	SNS4	2.15758	-1.39262	1.82694	2.58527	-0.72420
	SNS5	2.51649	-0.97017	1.00640	2.22375	0.03778

Table 11
Real Return of Sharia Stocks and Non-sharia Stocks (Per Month within %)

Meanwhile, the results of descriptive statistics from the stock real return data,

Sharia Stocks		**Non-Sharia Stocks**	
Mean	0.066179	Mean	1.175495
Standard Deviation	2.696694	Standard Deviation	1.76919
Minimum	-6.58271	Minimum	-1.75923
Maximum	9.967264	Maximum	4.806656

Table 12
Results of Real Returns Descriptive Statistics

It can be seen that the average real return of sharia stocks during the study period was only 0.066179%, lower than the average real return on non-sharia stocks of 1.175495%. The range of sample data on the real return of sharia stocks is wider, where the lowest is -6.58271 and the highest is 9,967264 with a standard deviation of 2.696694. The sample data range for the lowest real return of non-sharia stocks is -1.75923 and the highest is 4.806656 with a standard deviation of 1.76919. This illustrates that the sample data on the real return of sharia stocks are more dispersive.

5. Sharia and non-sharia stocks

Referring to the results of the normality test, the total risk (SD) of shares based on both sharia and non-sharia are not normally distributed. For this reason, a non-parametric alternative test is used with the Mann Whitney test. The results of inferential statistical processing are show : Asymp Sig (2-tailed) of 0.033. This figure is smaller than the significance level in this study (α)

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of 0.05, so that as the basis for the decision making of the Mann Whitney test if the Sig (2-tailed) <α (0.05) then Ho is rejected and H1 is accepted. Thus it can be said that there is a difference between the risk of sharia and non-sharia stocks. This is supported by the results of descriptive statistics, which illustrate that the average risk (SD) of sharia stocks (7.945062) during the study period is higher than the average risk of non-sharia stocks (6.186363). So it can be said that sharia stocks are riskier than non-sharia stocks during the research period (Prasetyo, 2020, p. 27).

Furthermore, based on the normality test of sample data, the real return of stocks is normally distributed. So that the different test used is the Independent Sample t-Test.

		t-test for Equality of Means						
		T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Return	Equal variances assumed	-.920	93	.058	-1.107022	.5765154	-.251868	.037822
	Equal variances not assumed	-.321	64.32	.023	-1.107022	.4770085	-.059865	-.15418

Table 14
Independent Samples Test

Based on the homogeneity test, the results show that the real return of shares in the study period is homogeneous. For this reason, the sig (2-tailed) value used is the Equal variance assumption. It can be seen from the table above that the value is 0.058. This figure is greater with the significance level in this study (α) of 0.050, so that as the basis for the T Independent t-Test decision, if the value of Sig (2-tailed)> (greater) than α (0.05) then Ho is accepted and H2 is rejected.

Thus it can be said that there is no difference between the yield (real return) between sharia and non-sharia stocks in the study period. Although statistically descriptive the return (real return) of sharia stocks (0.066179%) is lower than that of non-sharia (1.175495%). However, the difference between the two is not statistically significant. Meanwhile, previous research states that debt policy influences firm value (Faisal & Nissa, 2018, p. 78). This means that the criteria for limiting the amount of debt in the criteria for sharia stocks have not had a different effect.

There is a difference in risk and the other hand is no difference in the yield between sharia and n on-sharia stocks, followed by performance measurement using the Risk-Adjusted Performance method. One such method is the Sharpe ratio. However, it is necessary to adjust the risk-free rate component to the Sharpe ratio, so that it is following Islamic law.

Various alternative adjustments are presented, namely Cyril and Ri'fat by eliminating the risk-free rate, which represents the time value of money that contains usury (Cyril & Ri'fat, 1987, p. 109). Then Ashker uses the percentage of zakat to replace the risk-free rate. This is because a Muslim is obliged to pay zakat on his income by 2.5%, so the risk-off free is equal to the percentage of zakat (Ashker, 1987, p. 211). Next, Shaikh, proposed replacing the risk of free with Nominal Gross Domestic Product (NGDP) (Shaikh, 2010, p. 112). Hanif said, proposing an inflation rate to replace the risk of rate (Hanif, 2011, p. 62). Furthermore, it was developed by Setia Mulyawan by replacing the risk of rate with the Production Index (PI) (Mulyawan, 2015, p.

211). From the various alternatives above, this study chose to use Asher's opinion, namely by using the percentage of zakat. So that the results of measuring the performance of sharia and non-sharia stocks during the study period,

Category	Stock Initial	Average Real Return	Premium Risk	Standard Deviation	Sharpe Ratio	Rank
Sharia Stock	SS1	0.08113	-0.12720	7.65060	-0.01663	
	SS2	-0.19836	-0.40669	7.54447	-0.05391	
	SS3	0.19702	-0.01131	6.28893	-0.00180	
	SS4	0.13265	-0.07568	7.57436	-0.00999	
	SS5	0.96751	0.75918	5.62773	0.13490	3
	SS6	0.05554	-0.15279	6.25339	-0.02443	
	SS7	0.05102	-0.15731	5.68660	-0.02766	
	SS8	-1.48752	-1.69585	11.21564	-0.15120	
	SS9	-0.52303	-0.73136	7.78472	-0.09395	
	SS10	-0.28611	-0.49444	17.1756	-0.02879	
	SS11	0.85344	0.64511	5.72450	0.11269	
	SS12	0.45377	0.24544	7.16825	0.03424	
	SS13	0.72681	0.51848	4.78894	0.10827	
	SS14	-0.09737	-0.30570	10.74710	-0.02844	
Non Sharia Stock	SNS1	1.40136	1.19303	4.58121	0.26042	1
	SNS2	1.19999	0.99166	7.52136	0.13185	4
	SNS3	1.42268	1.21435	6.82489	0.17793	2
	SNS4	0.89059	0.68226	5.53088	0.12336	5
	SNS5	0.96285	0.75452	6.47348	0.11656	

Table 15

Performance Measurement Results using Sharpe Ratio of

Sharia Stocks and Non-sharia Stocks

Statistically, there is a significant difference between the total risk of sharia and non-sharia stocks, but there is no significant difference in the real return on sharia and non-sharia stocks. After deepening in terms of performance measurement, non-sharia stocks are better than non-sharia stocks. This can be seen from the top 5 rankings based on performance measurements with the Sharpe ratio dominated by non-sharia stocks (SNS1, SNS3, SNS2, and SNS4) and only one sharia stock is in the top 5, namely stocks with the SS5 stock initial.

The results of this study indicate that non-sharia stocks are superior to sharia stocks. This research strengthens previous research. Where it is found that the performance of the non-sharia index is superior to the sharia index in Pakistan and Indonesia.(Haroon et al., 2019, p. 27). This is the reason why the number of Islamic investors is still small compared to non-Islamic investors. This fact is very reasonable considering that in terms of investment, investors will be rational in choosing their investment instruments.

Other research shows that sharia stocks are superior to non-sharia stocks during the crisis. Meanwhile, during the non-crisis period, non-sharia stocks were indeed superior. So that sharia stocks become the right investment choice during times of crisis.(Ho et al., 2014, pp. 116–119). If all this time sharia-based investors have only relied on the spiritual market, then there must be a leap so that they can also be accepted by the rational market. The biggest challenge today is how sharia stocks can provide a performance that is at least competitive with non-sharia stocks.

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C. Conclusion

The beginning of the development of astronomy in Java was marked by the teaching of astronomy by Syekh Abdurahman al-Miṡrīi who came to Batawī in 1847. Then the falak books afterwards were written by falak scholars in Arabic and Indonesian. Based on astronomical data, the books of astronomy written by Javanese scholars have actually taken data from the Kitab al-Maṭlā 'al-Said by Syekh Husain Zaid al-Miṡrī. The pattern of transmission and development of astronomy in Java is carried out through writing books, teaching in educational institutions, and developing applications and equipment. From this, it can be seen that from the development of sources in the form of astronomy books, they were successfully developed with contemporary astronomical data which were then technically developed with software and applications. The development of astronomy in Java is also due to the role of educational institutions and communities formed by the astronomical scientific community and religious organizations.

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