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RISK ANALYSIS OF SHARIA STOCKS IN THE INFRASTRUCTURE, UTILITIES AND TRANSPORTATION SECTOR LISTED ON THE JAKARTA ISLAMIC INDEX (JII) 2015-2023

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Abstract

This research is intended to analyze the risk comparison using the Value at Risk (VaR) Variance Covariance and Value at Risk (VaR) Historical Simulation models in the Infrastructure, Utilities and Transportation subsectors. The development of infrastructure, utilities, and transportation plays a very important role in national development and is the main driver of regional growth and the industrial sector. Improvements in the regulatory and investment policy framework are expected to significantly increase the availability of infrastructure facilities and services. The population involved in this study includes 9 companies listed in the JII in the Infrastructure, Utilities, and Transportation sector, which are used as samples. The data used is secondary data obtained from www.yahoo.finance.com. Data analysis was carried out using a two-sample average test. The test results of the Value at Risk (VaR) Historical Simulation and Variance Covariance values are largest in INDX stocks, followed by other stocks, and those with the lowest risk level are TLKM stocks for the upcoming 5-day, 7-day, and 15-day periods with good values for alpha 1%, 5%, and 10%. The results concluded that the comparison between VaR Variance Covariance and VaR Historical Simulation produces a good level of risk and helps in determining sectors that are worth investing in the future, and can describe the fundamental strength of each sector.

Keywords: *Historical simulation, Value at Risk, Variance Covariance Risk*

1. Introduction

Infrastructure, utilities and transportation play an important role in national development and are key drivers for regional growth and the industrial sector (Palilu, 2019). The government's efforts to provide world-class infrastructure have involved regulatory updates and investments to repair damaged facilities and build new infrastructure. Improvements in the regulatory and investment policy framework are expected to significantly increase the availability of infrastructure facilities and services (Fay *et al*, 2017).

Infrastructure includes various physical and non-physical facilities that support economic growth and community services, based on data from the Investment Coordinating Board, the infrastructure, utilities and transportation sector index rose by 12.47% with growth dominated by the telecommunications (62.3%) and transportation (12.1%) subsectors. A company's performance affects profits and stock market prices, however, the severe impact of the COVID-19 pandemic in 2020 dealt a heavy blow to the construction sector in Indonesia (Dwijayati & Robiyanto, 2020).

The construction industry, as a crucial sector in the economy, has been significantly impacted by the pandemic. Many aspects of project implementation are directly exposed, such as materials, transportation, labor, and equipment, resulting in high uncertainty. (Jumas et al., 2022). Growth fluctuations between the construction and utilities subsectors, especially in 2020 In the second quarter, both recorded negative growth of -5% The construction subsector initially declined, but recovered in the second quarter of 2021.

The government faces challenges in funding large-scale infrastructure development that is essential for economic growth, cooperation with private sector and investor interests, particularly through Islamic financial products, is expected to help bridge the critical funding gap in infrastructure development in Indonesia, while risk is one of the main concerns for investors. This requires emphasizing stock diversification to reduce the risk of the relationship between returns and stock trading volume affecting investment risk, and is characterized by the concept of "high return/high risk". (S & Sudana, 2013).

VaR (Value at Risk) is used as a tool to measure the risk of a stock portfolio within a certain period of time and level of confidence, the infrastructure, utilities and transportation sector is an attractive investment destination because the government encourages large-scale infrastructure expansion even though Islamic stocks in this subsector are experiencing an increasing trend, but the lack of research on this matter is an obstacle in providing actual information to potential investors. (Maronrong et al., 2022).

Empirically, tests of the application of Value at Risk in determining stock investment decisions in the Infrastructure, Utilities and Transportation sectors include, First: (Sholeh et al., 2021) examined the Analysis of Stock Risk and Its Effect on the Volume of Trading Shares (Study of Syari'ah Pattern Shares on the Indonesia Stock Exchange). The findings of the study state that variables such as stock risk, stock returns, and BI Rate have a significant influence on the volume of stock trading in four samples of companies listed on the exchange. Independent variables such as BI Rate and stock systematic risk turned out to have a negative impact on stock trading volume. Meanwhile, stock returns also have a negative influence on each of the sample stock issuers (Halimatussaâ€™ diah & Putra, 2021).

According Hidayatullah & Qudratullah (2017) Analysis of Sharia Stock Investment Risk with the Value AT Risk-Asymmetric Power Autoregressive Conditional Heterocedasticity (VaR-APARCH) Model, the study states that the use of the VaR-APARCH (1,1) investment risk measurement method with the assumption of an initial investment value of. 10,000,000, - resulting in a large estimate of the risk value on the JII stock price index at a 95% confidence level In the next 1 day period around 235,766,- In the next 7 days period around 623,779,- In the next 10 days period around . 745.558,-.

Research conducted by Indah Lestari & Midiastuty (2016) Risk Analysis of Infrastructure Companies Listed on the Indonesia Stock Exchange Using Value at Risk (Var) results in return data from the stock exchange index showing stationary properties but not following a normal distribution. The appropriate return volatility model for homoskedastic data is simple standard deviation, while for heteroskedastic data is EWMA and ARCH/Garch other variants. VaR calculation utilizes the volatility of the three models. Second, the EWMA model provides a smaller risk value than ARCH/GARCH for heteroskedastic data, and simple standard deviation for homoskedastic data. Third, the backtesting results show that the simple standard deviation and ARCH/GARCH models are still valid, while the EWMA model is not valid for assessing VaR on stock indices. Finally, investors can mitigate risk by selecting infrastructure or infrastructure-supporting stock indices with the smallest VaR values, such as ISAT and WIKA for infrastructure, and INTP and PGAS for infrastructure support in the SMInfra18 index. This helps investors understand the potential risks associated with stock index selection.

Research conducted by Pratiwi & Setiyawan (2023) Value at Risk Analysis Using the Exponentially Weighted Moving Average (EWMA) Model produces volatility estimates showing that PTBA has the highest volatility while PGAS has the lowest volatility. Thus, PTBA can be called the most volatile stock while PGAS is considered the most stable. This volatility data is important in calculating investment risk using the Value at Risk method. Value at Risk calculation with the EWMA model and 95% confidence level shows the highest potential loss in one day after investment, which is 3.33% for PTBA, 3.06% for ADRO, and 2.60% for PGAS. This indicates that PTBA has the largest potential loss among these stocks.

According to Gunawan (2021) in his book GRC (Good Governance, Risk Management, And Compliance) The use of the VaR method in research aims to estimate the maximum potential loss of an investor's investment decision this investment portfolio composition has the main objective of optimizing returns, especially in this study is expected to provide added value for fund managers in minimizing stock risk, especially in the Islamic stock sector in the infrastructure, utilities and transportation sectors with renewable time series data, thus enabling them to formulate strategic policies and set risk limits based on investments in infrastructure, public works, and transportation this is expected to increase the wisdom and accuracy of investor stock selection.

2. Literature Review

2.1 Capital Markets

The capital market is a meeting place for sellers and buyers in obtaining capital, where companies as sellers (issuers) seek to sell securities or shares on the stock exchange (Omar *et al*., 2013). Its function is as a liaison between investors and companies in short, medium, and long-term stock trading, such as bonds. The capital market is also an alternative investment according to the Law of the Republic of Indonesia No. 8 of 1995, in Indonesia the capital market develops with Islamic financial principles, born from the growth of capital markets that have systematic regulation, Islamic capital markets offer stock products based on the Qur'an and Hadith, free from *usury, gharar, maisir, haram*, and *dzalim* (Wiyanti, 2013). The significant increase in the Islamic capital market can be seen from the growth of Islamic stocks that comply with the rules of the National Sharia Council and Bapepam-LK. In Islamic economics, the capital market is an instrument for long-term investment transactions, including equities, debt securities, and other instruments. The Islamic capital market is engaged in the Islamic Stock Exchange with the sharia principles of the Qur'an and Hadith as the foundation, regulated by the fatwa of National Sharia Council - Indonesian Ulema Council (DSN-MUI) and Capital Market and Financial Institutions Supervisory Agency (Bapepam-LK) and Financial Services Authority no. IX. A.1 regarding Sharia securities.

2.2 Investment

Investment is the commitment of funds in the present for future profits, where risk and return are linearly related. The higher the risk, the greater the expected return (Ernestia, 2020). Investment involves a wide range of securities, with the core being the placement of current funds for future growth (Sokolowska, 2014). There are two main activities: real investment (real assets such as factories, metals, land) and investment in financial assets (stocks, deposits, bonds). Investors are divided into institutional (banking, insurance) and individual. In Islam, the Prophet Muhammad SAW encouraged his people to invest productively, with sharia-compliant investment principles, namely the principle of maslahah and the halal principle as in the following hadith narrated by Imam Bukhori and Muslim;

حَدَّثَنَا يَحْيَى بْنُ أَيُّوبَ وَقُتَيْبَةُ يَعْنِي ابْنَ سَعِيدٍ وَابْنُ حُجْرٍ قَالُوا حَدَّثَنَا إِسْمَعِيلُ هُوَ ابْنُ جَعْفَرٍ عَنْ الْعَلَاءِ عَنْ أَبِيهِ عَنْ أَبِي هُرَيْرَةَ أَنَّ رَسُولَ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ إِذَا مَاتَ الْإِنْسَانُ انْقَطَعَ عَنْهُ عَمَلُهُ إِلَّا مِنْ ثَلَاثَةٍ إِلَّا مِنْ صَدَقَةٍ جَارِيَةٍ أَوْ عِلْمٍ لَهُ يُنْتَفَعُ بِهِ أَوْ وَلَدٍ صَالِحٍ يَدْعُو

"Narrated to us [Yahya ibn Ayyub] and [Qutaibah] -i.e. Ibn Sa'id- and [Ibn Hujr] they said; narrated to us [Isma'il] -i.e. Ibn Ja'far- from [Al 'Ala'] from [his father] from [Abu Hurairah], that the Messenger of Allah (blessings and peace of Allah be upon him) said: "When a man dies, all his deeds will cease except three things: charity, knowledge that is beneficial to him, and righteous children who pray for him.

2.3 Stock Risk

Stock risk refers to the possibility of fluctuations in value or changes in stock prices over time. This is caused by various factors such as market conditions, company performance, economic conditions, regulatory changes, and even unexpected events that can affect stock prices. (Machfiroh, 2016). This risk includes uncertainty over the outcome of a stock investment, where investors can experience losses if the stock price drops or does not meet expectations. Investments in stocks come with varying risks, and understanding these risks is important for investors to make smart investment decisions.

2.4 Value at Risk Concept

According to Nuryanto et al., (2018) the decline in stock prices in financial markets can reduce the value of assets (market risk) requires a calculation of potential losses, Recommendations from the G-30 suggest a best practice report and for that measurement of market risk can consistently be done with Value at Risk (VaR) which can estimate the maximum loss of a portfolio in a certain period with a certain level of confidence, often measured in currency values and useful as a risk prediction. VaR is a statistic that summarizes the largest loss in a time span with a confidence level.

2.5 The Concept of Holding Period

The time period in calculating Value at Risk (VaR) has great significance. This is due to the need for continuous risk monitoring during the investment process. Choosing the right time period when making an investment is highly subjective and depends on the type of investment being made. In this context, choosing a daily period allows investors to be more responsive to market changes and enables them to manage risk more effectively. However, it is important to remember that the choice of time period should be tailored to the specific characteristics of the investment instrument under consideration. A period that is too short may not provide an accurate picture of risk, while a period that is too long may make investors lose sensitivity to rapid market changes. Therefore, the accuracy of the time period is a key factor in determining the validity and usefulness of the VaR model in managing investment risk (Wicaksono et al., 2014).

2.6 Trust Level

The confidence level in Value at Risk (VaR) calculations is a relative concept and depends on how VaR is used in the investment context. The confidence level in VaR reflects the probability that the VaR value will not exceed the maximum expected loss. The higher the level of confidence chosen, the greater the risk that must be borne, and the greater the allocation of funds needed as capital to cover potential losses (Haryanti, 2013).

3. Research Methods

This research applies a quantitative descriptive approach using non-probability samples through purposive sampling techniques (Firmansyah & Dede, 2022). The data used is secondary data of Infrastructure, Utilities and transportation sector stock price reports listed on the Jakarta Islamic Index (JII), obtained from www.idx.co.id and www.finance.yahoo.com during the period 2015-2023. The research objective is to assess the level of risk generated by each stock and the *Value at Risk* (VaR) value of a portfolio consisting of five stocks, namely BALI, GIA, INDX, ISAT, JSMR, META, PGAS, SMDR and TLKM. Data analysis includes stationarity test, normality test, heteroscedasticity test, calculation of *Value at Risk with Historical Simulation* and *Variance Covariace* models with a confidence level of 90%, 95% and 99%, which means that the probability of risk at the time of the loss event is 10%, 5% and 1%.

Stock Return

Realized *return*, calculated using historical data. This realized return is important because it is widely used as data for portfolio analysis. Expected *return* can be calculated in several ways, namely as input from portfolio analysis (Krisnawan, 2019) with the following formula:

$$E(R) = \sum_{i=1}^{n} R_i pr_i$$

Where:

$E(R)$ = expected *return of* the security

R_i = *i-th return* that may occur

pr_i = *probability of the i-th* return event

n = the number of *returns* that occur

Calculation of *Value at Risk*

VaR is defined as the maximum loss value of the portfolio (Hartono, 2017: 250) VaR value can be calculated using historical simulation and Variance Covariance methods.

$$VaR_p = \alpha \,.\, \sigma_p . P . \sqrt{t} \quad \text{(i)}$$

$$VaR_p = Pz_{0,95} . \sigma . \sqrt{t} \quad \text{(ii)}$$

Where:

VaR_p =*VaR with confidence after period*

α = normal distribution Z value, standardized based on confidence *level*

σ = asset volatility value

P = the market value of an asset, some authors who write $P = V_0$

αth percentile

Maronrong et al., (2022) said Percentiles in descriptive statistics refer to a measure of dispersion that divides data into one hundred equal parts. In the context of the Value at Risk (VaR) method, percentiles attempt to describe the estimated investment loss that an investor may experience at the α confidence level. Determining the location of the αth percentile of the sorted return data is an important stage in the VaR calculation process as follows;

$$P_\alpha = \alpha * n$$

Value at Risk Calculation with *Historical Simulation*

The Historical Simulation method of calculating Value at Risk (VaR) is divided into two: single asset and portfolio calculations. However, both methods have the same approach. The return observation data, both from single assets and portfolios, are sorted from the largest loss to the largest gain. Then, the αth percentile value of the sorted return data is identified as the VaR estimate. Risk Matric, a risk measurement tool, uses exposure and uncertainty to measure risk, often using a 1-day holding period and 95% confidence level in VaR (Machfiroh, 2016). Calculation of the risk of a portfolio or diversification *Value at Risk* can be used formula;

$$VaR_p = \alpha \,.\, \sigma_p . P . \sqrt{t}$$

Calculation of Value at Risk with *Variance Covariance*

Anam et al., (2020) explain this method is based on the assumption that short-term fluctuations in market parameters and portfolio values follow a normal distribution. In addition, this method reflects the fact that market parameters are not independent, but are limited to the first dependent correlation level. The steps in calculating the Value at Risk (VaR) value with the variance-covariance method are as follows:

1. Identify relevant risk variables and collect related historical data.
2. Calculate the mean and variance of each risk variable.
3. Determine the correlation between risk variables expressed in the form of a covariance matrix.
4. Takes into account the relationship between risk variables to estimate future fluctuations in portfolio value.
5. Using the normal distribution to determine the probability of loss at a given confidence level.
6. Calculate the VaR value based on the normal distribution and predetermined parameters.

This process allows investors to estimate the risk of their portfolio by considering the relationship between risk variables and preparing appropriate risk management strategies, the diversified Value at Risk Variance Covariance formula can be used;

$$VaR_p = Pz_{0,95}.\sigma.\sqrt{t}$$

Normality Test

It is assumed that investment returns follow a normal distribution. Before calculating Value at Risk (VaR), the first step is to perform a normality test on the return data. One commonly used normality test method is the Kolmogorov-Smirnov test. The Kolmogorov-Smirnov test focuses on measuring the maximum deviation (D), which is the maximum difference between the cumulative frequency of the normal distribution and the cumulative frequency of the observed data.

Hypothesis:

H_0 = return data is normally distributed

H_1 = return data is not normally distributed

Two-Sample Mean Test

The two independent samples means test is a statistical procedure used to determine whether two mutually independent populations have the same or different means. In this context, the test compares the mean values of two groups of samples taken from different populations. This procedure is useful in identifying significant differences between two groups of data that are not related to each other. This method involves collecting data from two mutually independent populations with a significance level of α, Using this technique, researchers can make stronger conclusions about whether two mutually independent populations have the same or significantly different means, assisting in decision-making based on objective and reliable statistical analysis (Tarumasely, 2020).

Hypothesis:

$H_0 : \mu_1 = \mu_2$

$H_1 : \mu_1 \neq \mu_2$

The analysis between the best models of Stock Risk and Foreign Exchange Risk can be described in the following framework;

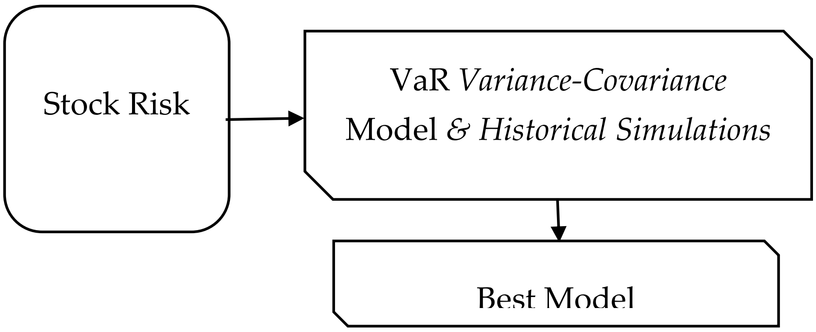

Figure 1 Research Conceptual Framework

4. Results and Discussion

4.1 Stationary Test

Assessing the stability of the stock data used in the research is a crucial task in the volatility calculation process. If the analyzed data does not meet the necessary stability standards, the volatility calculation results may contain substantial errors. In this context, data stability refers to the consistency and invariability of the statistical properties of the stock over the time analyzed. Failure to evaluate data stability can lead to inaccurate volatility estimates, which in turn can result in incorrect or inappropriate investment decisions.

The importance of data stability checks suggests that the accuracy and reliability of volatility analysis results depend on the quality of the data used. This emphasizes the need to use quality and reliable data in financial research to produce reliable analysis results. By ensuring data stability, volatility analysis becomes more robust and able to provide deeper insights for decision makers in managing risk and developing effective investment strategies. (Sidadolog et al., 2020).

H_0 = There is a unit root in the return data or it is non-stationary

H_1 =There is no unit root in the return data or it is stationary

The following are the results of the stationarity test on Infrastructure, Utilities and Transportation stock return data obtained during the research period:

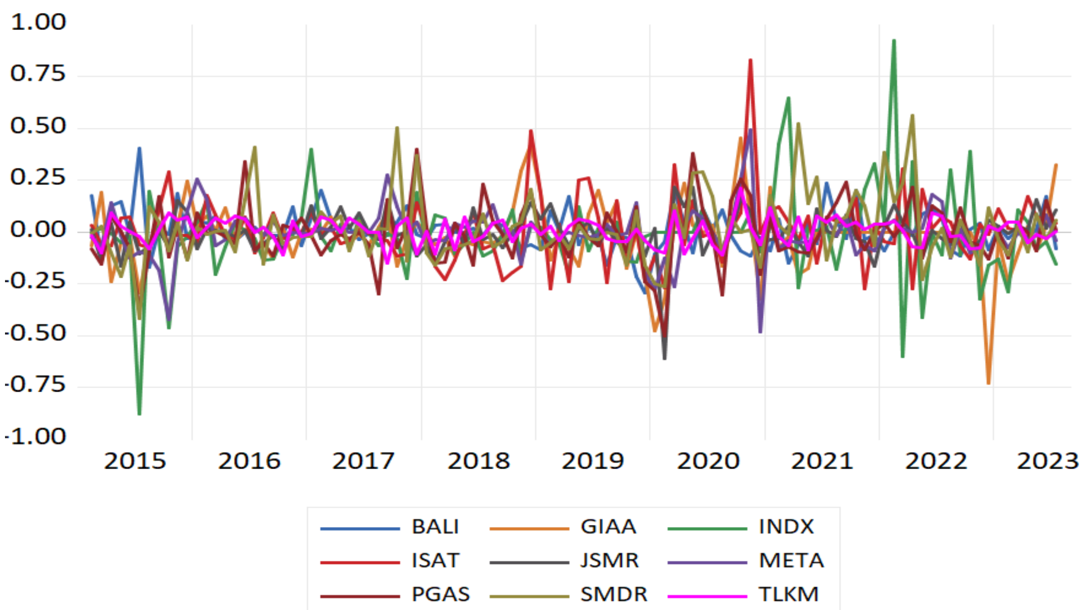

Figure 2 Data plot of utility and transportation infrastructure stocks

Source: Research data processed by E-views, 2023

Table 1 Unit Root Test

ADF		Test CrItical value		
ALPHA		1%	5%	10%
BALI	-10.159	-3.496	-2.89	-2.581
GIA	-7.636	-3.496	-2.89	-2.582
INDX	-12.408	-3.496	-2.89	-2.582
ISAT	-10.433	-3.496	-2.496	-2.582
JSMR	-11.048	-3.496	-2.496	-2.582
META	-8.878	-3.496	-2.496	-2.582
PGAS	-9.533	-3.496	-2.496	-2.582
SMDR	-9.788	-3.496	-2.496	-2.582
TLKM	-10.194	-3.496	-2.496	-2.582

Source: Research data processed by E-views, 2023

Based on Graph 2, it can be seen that the data has approached the horizontal data type, in other words, the data is stationary. Furthermore, the stationarity test results on BALI, GIA, INDX, ISAT, JSMR, META, PGAS, SMDR and TLKM stocks show that the ADF test statistic value < 5% critical value so that these stocks are stationary at the expected level.

4.2 Data Normality Test

Quraisy (2020) argues that normality testing on stock return data in this study has the aim of evaluating the extent to which the data distribution follows a normal distribution pattern. This aims to identify the alpha value required in the calculation of Value at Risk (VaR), a method used to assess financial risk by calculating the maximum possible loss in a certain period with a certain level of confidence. The normality testing process aims to ensure that the basic assumption of normal distribution is acceptable for the stock return data used. This assessment is crucial because the suitability of data with a normal distribution greatly affects the accuracy of the VaR calculation results and overall risk management in stock investment.

H_0 = Normal distribution return data

H_1 = Return data is not normally distributed

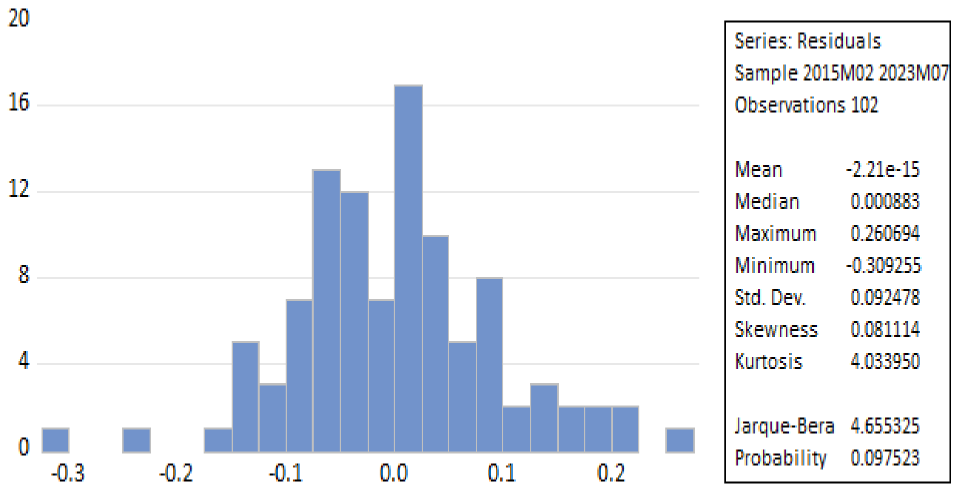

Figure 3 Normality test of infrastructure, utilities and transportation sector stocks

Based on Figure 3, it appears that the stock returns studied have a mean of -2.21e-15, standard deviation of 0.092478, skewness of 0.081114, and kurtosis of 4.033950. The skewness value is positive (-), meaning that the distribution of return data tends to be right-skewed or the distribution has a longer tail to the right. The results of the normality test on infrastructure, utilities and transportation sector stocks show that the probability value is 0.0975> 0.05, so the data is normally distributed, which means H_0 is accepted.

4.3 Heterosdecasticity Test

Heteroscedasticity testing on stock return data in this study aims to identify the presence of disproportionate variation in data volatility. The main objective is to ensure that the data used meets the requirement of no disproportionate pattern in volatility, thus allowing the use of Value at Risk Historical Simulation and Variance Covariance models in further analysis. The study expects homogeneous data in volatility so that these models can provide more accurate risk estimates in stock investment (Sari et al., 2017).

H_0 = No Heteroscedasticity problem

H_1 = There is hetrosdecasticity problem

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.776021	Prob. F(9,92)	0.6388
Obs*R-squared	7.196977	Prob. Chi-Square(9)	0.6166
Scaled explained SS	8.881859	Prob. Chi-Square(9)	0.4483

Figure 4 Heteroscedasticity test

H_0 Based on Figure 4, the results of the heteroscedasticity test on Infrastructure, Utilities and Transportation sector stocks show that the prob f statistic value of 0.638 >

prob critical value of 5%, so that these stocks are accepted, meaning that there is no heteroscedasticity problem.

4.4 Value at Risk Historical Simulation & Variance Covariance Calculation

In using the *Historical Simulation* & *Variance Covariance* method to measure VaR, infrastructure, utilities and transportation sector stock data can be directly used without requiring certain distribution testing. based on the Historical Simulation method, the results of VaR measurements for the period of 5 days, 7 days and 15 days ahead with an initial investment of 1,000,000 are presented in Table 1.

Table 2 Calculation ofValue at Risk Historical Simulation & Variance Covariance

Value at Risk		*Historical Simulation*			Variance Covariance		
Stock Code	Time Horizon	1%	5%	10%	1%	5%	10%
BALI	5	-220.385,70	- 325.041,49	- 656.794,96	- 282.841,47	- 363.023,10	- 513.430,50
	7	- 260.763,88	- 384.594,28	- 777.130,28	- 334.662,55	- 429.534,73	- 607.499,16
	15	- 381.719,23	- 562.988,37	- 1.137.602,24	- 489.895,80	- 628.774,46	- 889.287,71
GIA	5	- 387.816,15	- 631.185,17	- 1.612.035,14	- 445.180,59	- 571.383,11	- 808.118,03
	7	- 458.870,26	- 746.828,36	- 1.907.385,70	- 526.744,78	- 676.069,61	- 956.178,15
	15	- 671.717,27	- 1.093.244,78	- 2.792.126,77	- 771.075,41	- 989.664,57	- 1.399.701,49
INDX	5	- 436.230,02	- 710.801,86	- 1.939.744,88	- 602.340,45	- 773.095,60	- 1.093.403,86
	7	- 516.154,32	- 841.032,10	- 2.295.137,10	- 712.698,83	- 914.739,05	- 1.293.732,90
	15	- 755.572,56	- 1.231.144,93	- 3.359.736,69	- 1.043.284,27	- 1.339.040,86	- 1.893.831,04
ISAT	5	- 407.531,27	- 550.584,00	- 611.864,09	- 454.542,38	- 583.398,83	- 825.112,09
	7	- 482.197,50	- 651.459,77	- 723.967,35	- 537.821,80	- 690.286,80	- 976.285,80
	15	- 705.864,86	- 953.639,46	- 1.059.779,69	- 787.290,49	- 1.010.476,41	- 1.429.136,07
JSMR	5	- 241.281,45	- 303.832,08	- 1.326.880,21	- 289.237,06	- 371.231,75	- 525.040,14
	7	- 285.488,06	- 359.498,97	- 1.569.985,84	- 342.229,90	- 439.247,32	- 621.235,87
	15	- 417.911,72	- 526.252,61	- 2.298.223,95	- 500.973,28	- 642.992,24	- 909.396,20
META	5	- 268.394,34	- 441.133,34	- 1.074.121,46	- 348.368,89	- 447.126,63	- 632.379,72
	7	- 317.568,47	- 521.956,01	- 1.270.917,65	- 412.195,63	- 529.047,36	- 748.241,77
	15	- 464.872,64	- 764.065,36	- 1.860.432,94	- 603.392,61	- 774.446,03	- 1.095.313,80
PGAS	5	- 331.872,12	- 620.724,63	- 1.109.617,18	- 404.975,11	- 519.779,92	- 735.134,66
	7	- 392.676,39	- 734.451,29	- 1.312.916,76	- 479.173,01	- 615.011,90	- 869.823,06
	15	- 574.819,38	- 1.075.126,60	- 1.921.913,34	- 701.437,46	- 900.285,23	- 1.273.290,58
SMDR	5	- 354.128,69	- 463.864,60	- 917.727,84	- 466.071,69	- 598.196,54	- 846.040,78
	7	- 419.010,71	- 548.852,00	- 1.085.870,22	- 551.463,46	- 707.795,69	- 1.001.048,95
	15	- 613.368,88	- 803.437,05	- 1.589.551,24	- 807.259,85	- 1.036.106,80	- 1.465.385,61
TLKM	5	- 189.665,86	- 235.593,47	- 330.900,49	- 177.274,31	- 227.529,11	- 321.798,76
	7	- 224.415,67	- 278.757,95	- 391.526,74	- 209.753,79	- 269.216,07	- 380.757,43
	15	- 328.510,90	- 408.059,86	- 573.136,46	- 307.048,11	- 394.091,98	- 557.371,81

From the calculation results in Table 2, it can be seen that the value of Value at Risk (VaR) Historical Simulation and Variance Covariance is the largest in INDX shares, followed by other stocks such as, ISAT, SMDR, GIA PGAS, META, BALI and the lowest risk is TLKM shares. The data shows that INDX shares have the largest VaR value both with the Historical Simulation and Variance Covariance models for the upcoming 5-day, 7-Day and 15-day periods with values both with alpha 1%, 5% and 10% This indicates that the value of INDX shares has a significant level of risk of loss for investors and companies. In addition, the longer the time period used, the greater the VaR value recorded. Thus, the risk borne by investors and companies will also increase along with the increasing VaR value. On the other hand, TLKM stock value has the smallest VaR value both with the Historical Simulation and Variance Covariance models in the same period, namely for the next 5, 7 and 10 days. This indicates that the value of TLKM shares has a relatively small level of risk of loss for investors in infrastructure, utilities and transportation sector stocks.

From Table 1, it can also be seen that the VaR measurement results with both methods are not significantly different. To ensure that the VaR value from calculations with the Variance-covariance method and the Historical Simulation method is not significantly different, the average test of two independent samples is carried out. The results of the calculation prove that measurements with parametric methods (Variance covariance method) and with non-parametric methods (Historical Simulation method) will produce almost the same VaR value.

5. Conclusions

The results of both VaR tests show that its use as a tool to measure maximum potential losses has proven accurate. VaR assessment using two methods, both parametric (Variance-covariance) and non-parametric (Historical Simulation) methods, show no significant difference. This indicates that both provide accurate VaR value estimates in evaluating the risk of Islamic stocks in the infrastructure, utilities, and transportation sectors. Thus, the results support the use of both methods as reliable tools in estimating risk in stock investment in these sectors. This study has limitations, namely research data on infrastructure, utilities and transportation sector companies of only nine companies so that research only gets a little information related to the risk in these stocks, which in turn can increase the amount of research data on these sector companies so that more information is obtained by investors, besides testing the validity of the model generated by VaR can be compared between testing the average of two independent samples with other tests such as the likelihood ratio.

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