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Comparative Analysis of the Performance of Cryptocurrency Bitcoin, Sharia Stocks, and Gold as Investment Alternative

Riniawati Riniawati[1], Ahmad Fatoni[2], Tenny Badina[3]
Universitas Sultan Ageng Tirtayasa, Serang-Banten, Indonesia[1-3]
riniawatii02@gmail.com[1], ahmadfatoni@untirta.ac.id[2], tennybadina@gmail.com[3]

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Abstract

Purpose: This study aims to analyze and compare the performance of Bitcoin, JII (Jakarta Islamic Index) stocks, and ANTAM gold as investment alternatives from 2019 to 2023.

Methodology/approach: A quantitative approach with a comparative method was used, utilizing secondary time series data. Monthly closing prices of Bitcoin, JII stocks, and ANTAM gold from 2019-2023 were analyzed. The study used saturated sampling with 180 data points. Parametric (One-Way ANOVA) and non-parametric (Kruskal-Wallis) tests were applied, depending on data normality and homogeneity.

Results/findings: The study found no significant difference in returns between Bitcoin, JII stocks, and ANTAM gold ($p = 0.412 > 0.05$). However, a significant difference was observed in risk levels ($p = 0.00 < 0.05$), with Bitcoin being the riskiest. Performance analysis via the Sharpe and Treynor indices showed Bitcoin as the best-performing instrument, followed by gold and JII stocks. The Jensen index revealed no significant difference in performance, with JII stocks slightly outperforming the others.

Conclusions: Bitcoin offers the highest return but carries the highest risk. JII stocks and gold show lower risk but also lower returns. Bitcoin outperforms other instruments in performance based on Sharpe and Treynor indices, while JII stocks are slightly better when using the Jensen index.

Limitations: The study focused only on JII-listed Islamic stocks, and data were limited to the 2019-2023 period.

Contribution: This research provides insights for investors, particularly Muslim investors, on the comparative performance of these investment options.

Keywords*: Bitcoin, Cryptocurrency, Gold, Investment, JII (Jakarta Islamic Index) Stocks*

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1. Introduction

The dynamics of the global financial market exhibit rapid and complex change. The increasingly integrated global financial market has heightened both the risks and opportunities for investors (Widyaningsih, W, & Siddi, 2020). Accurate information and appropriate strategies are essential to address emerging challenges. Investors continually seek investment alternatives that offer optimal returns while minimizing risk. Cryptocurrency, particularly Bitcoin, Sharia stocks, and gold, are three investment instruments that have attracted considerable attention from investors in recent years. The uniqueness of each investment instrument offers both opportunities and challenges in building a balanced investment portfolio.

According to Darmawansayah (2022), cryptocurrency is a virtual currency that can be used as a tool for electronic transaction. Additionally, cryptocurrencies can be used for investment or trading. Unlike conventional currencies, which are regulated by the government or financial institutions, cryptocurrencies operate in a decentralized manner using blockchain technology. There are 545 types of cryptocurrency assets that have been officially listed and traded on the cryptocurrency asset market in Indonesia (Bowa & Robiyanto, 2023); however, only 10 types of cryptocurrency assets have the highest market capitalization in Indonesia, including Bitcoin, Ethereum, Polkadot, Solana, Polygon, Decentraland, Chainlink, Aave, Tron, and Radix (Dwyer, 2015). This study focuses solely on Bitcoin as a cryptocurrency asset.

The high volatility and potential for significant returns have attracted the interest of many investors. The following are the price trends of Bitcoin cryptocurrency from 2019 to 2024.

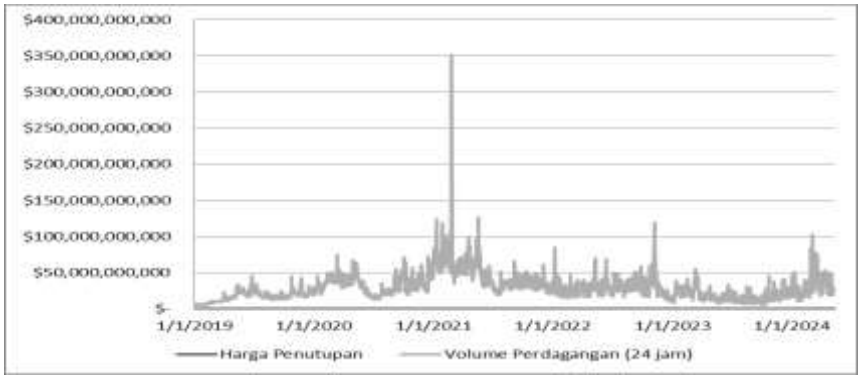

Figure 1. Bitcoin Price Period 2019-2024 (Price in USD)
Source: CoinMarketCap. com (processed data).

Based on Figure 1 above, it can be seen that the price of Bitcoin continues to fluctuate from year to year. The exchange rate of Bitcoin tends to fluctuate like a high-risk speculative investment, which is different from traditional currencies, which are more stable (Febriana, Koesoemasari, & Nirmala, 2024). This means that investing in Bitcoin is more akin to gambling on high-risk stocks than exchanging money like the dollar (Brzeszczyński, Gajdka, & Schabek, 2020; Yermack, 2024).

Conversely, Sharia stocks have gained popularity as an investment alternative that complies with Islamic financial principles. Sharia stocks are securities in the form of shares that do not contradict Sharia principles in the capital market (BEI 2022). With strong economic growth in various developing countries, Shariah stocks offer attractive investment opportunities with stable growth potential. The performance of Sharia stocks in the capital market is believed to have high growth potential, even when the economy slows down. Sharia stocks and other Sharia assets are considered more resilient to crises than other investment products in the capital market (Indarningsih, 2022; Santoso et al., 2025).

For this study, the researcher used data from stocks officially listed on the Jakarta Islamic Index (JII). On July 3, 2000, the Jakarta Islamic Index (JII) was introduced as the first Islamic stock index in the Indonesian capital market, consisting of 30 stocks with large market capitalizations and high liquidity listed on the Indonesia Stock Exchange (BEI, 2019). The following is the price trend of the Jakarta Islamic Index (JII) from 2019 to 2024.

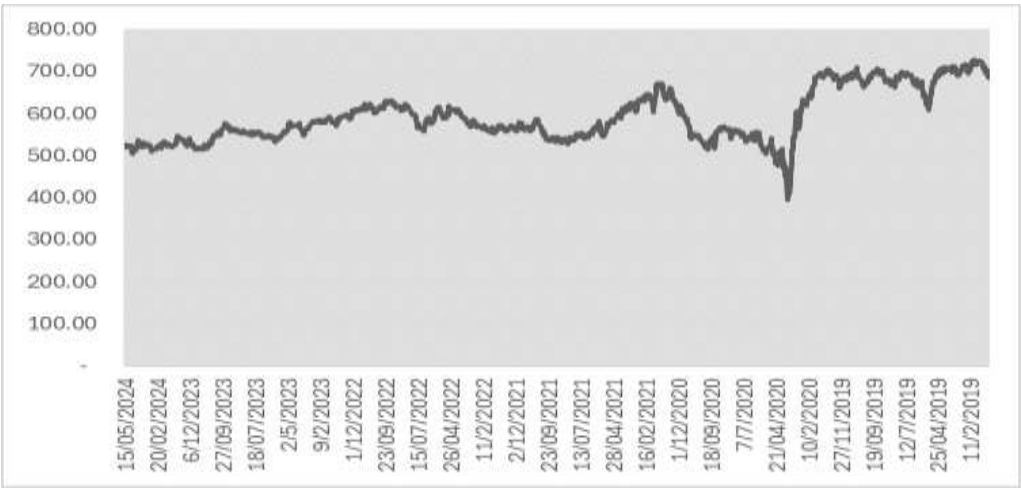

Figure 2. Jakarta Islamic Index Stock Prices Period 2019-2024
Source: id.investing.com (data processed).

Based on Figure 2, it can be seen that the stock prices of the Jakarta Islamic Index (JII) fluctuate year by year. Gold remains one of the oldest investment instruments and has long been recognized as one of the most stable and secure investment assets. In the world of investment, gold is considered a safe haven asset because, for several generations, it has been known as a metal that serves as a hedge against inflation and economic instability (Shafira, Ferli, Haryanti, & Wijaya, 2023). Gold is viewed as a more stable investment alternative because it tends to have more controlled risks than stocks or other financial instruments. Gold is also considered a portfolio diversification instrument that helps minimize risk (Bowa & Robiyanto, 2023). The following are the data for ANTAM gold prices from 2019 to 2024:

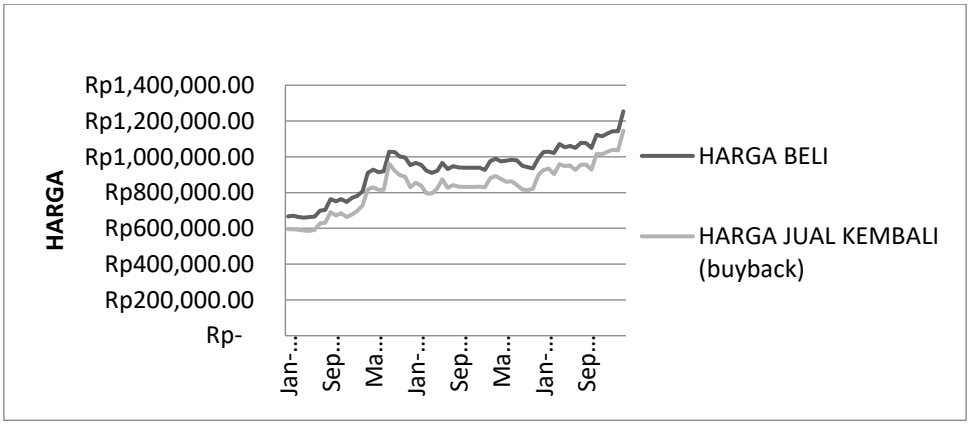

Figure 3. ANTAM Gold Prices Period 2019-2024 Per Gram (Price in Rupiah)
Source: Harga-Emas.org (data processed).

Based on Figure 3, it can be observed that the price of ANTAM gold tends to fluctuate and experience an increase each year. Therefore, gold is worth considering as an investment instrument. Research comparing the performance of Bitcoin, stocks, and gold has shown varied results. Brzeszczyński et al. (2020) state that the returns from Bitcoin investments are significantly higher than those from investments in other currencies, despite the relatively high risk involved. These findings align with those of Meiyura and Azib (2020), who found a significant difference between the returns of Bitcoin and gold. Similarly, Afrizal, Marliyah, and Fuadi (2021) found a significant difference between the returns of Bitcoin, stocks, and gold. These results confirm that there are significant differences in the returns of Bitcoin, stocks, and gold.

However, some studies have reported the opposite. In a study conducted by (Lumbantobing & Sadalia, 2021), it was concluded that there is no significant difference in the returns of the three assets. A similar

finding was also observed by Hamdika, Saragih, and Sinaga (2022), who stated that there is no significant difference in the returns of Bitcoin, stocks, and gold. The research conducted by Widiawira and Akbar (2023) further reinforce the statement that there is no significant difference in the returns of Bitcoin, stocks, and gold. Meanwhile, based on the research conducted by Hamdika et al. (2022), it was stated that there is a significant difference between the performance of Bitcoin, stocks, and gold using the Treynor index method. These findings are in line with the research conducted by Afrizal et al. (2021), who found similar results, and are further reinforced by Widiawira and Akbar (2023), who also concluded that there is a significant difference between the performance of Bitcoin, stocks, and gold using the Treynor index method.

However, according to Lumbantobing and Sadalia (2021), there is no significant difference in the performance of Bitcoin, stocks, and gold using the Treynor index method. This finding aligns with the research conducted by Ramadhani, Septyasari, Hasannah, and Kustiawati (2022), which states that there is no significant difference in the performance of Bitcoin, stocks, and gold using the Treynor index method. Based on the research conducted by Lumbantobing and Sadalia (2021), there is a significant difference in the performance of Bitcoin, stocks, and gold using the Jensen index method. This finding aligns with the research conducted by Annisak, Zainuri, and Fadillah (2024), which states a similar result.

Ramadhani et al. (2022), in their research, also state the same, that there is a significant difference in the performance of Bitcoin, stocks, and gold using the Jensen index method. However, according to the research conducted by Hamdika et al. (2022), it shows that there is no significant difference in the performance of Bitcoin, stocks, and gold using the Jensen index method. Based on the phenomena explained above, there is inconsistency in the research results among previous studies that examined the performance of cryptocurrency Bitcoin, stocks, and gold as investment alternatives, with different conclusions being drawn. Therefore, further research is needed to explain the relationship between the performance of Bitcoin, stocks, and gold as investment alternatives.

The novelty of this study lies in the inclusion of the Jakarta Islamic Index (JII) stock variable, whereas previous studies have focused only on Bitcoin, gold, and conventional stocks. The researcher chose Sharia stocks as a variable because the number of Sharia stock investors in Indonesia is still relatively low compared to the number of Bitcoin and gold investors. This is despite the fact that Indonesia is the second-largest Muslim-majority country in the world, with a population of 236 million. However, the number of Sharia stock investors in Indonesia has not yet reached 1 million people (PT Syariah Saham Indonesia, 2024). Meanwhile, the number of cryptocurrency investors in Indonesia continues to increase, from 18.83 million in January 2024 to over 19 million in February 2024 (Bappebti, 2024), even though the Indonesian Ulema Council (MUI) has officially declared the use of cryptocurrency as haram (forbidden).

The use of digital currencies (cryptocurrencies) is prohibited, both as a medium of exchange and as an investment vehicle (haram) (MUI, 2021). However, gold remains the preferred commodity and the most traded in 2024, with gold transactions in the multilateral market reaching 28.9% in January-February 2024 (ICDX, 2024). Therefore, further research is necessary to explain the relationship between the performance of cryptocurrency Bitcoin, Sharia stocks, and gold as investment alternatives and to introduce the Jakarta Islamic Index (JII) stock variable as an innovation in this study.

2. Literature Review

2.1 Investment

Investment refers to placing funds or committing financial resources to obtain economic returns or profits from those funds within a certain period, typically in the form of periodic cash flows and/or final value (Hidayat, 2011). Meanwhile, investment from a Sharia perspective is an investment that is carried out in compliance with Islamic Sharia principles, both in the real and financial sectors (Pardiansyah, 2017).

2.2 Cryptocurrency Bitcoin

According to Darmawansayah (2022), cryptocurrency is a virtual currency that can be used as a tool for electronic transaction. Additionally, cryptocurrencies can be used for investment or trading. Cryptocurrency is a form of virtual or digital money that only exists in the digital world and has no physical form (Ausop & Aulia, 2018). Bitcoin is the first cryptocurrency to be widely accepted and has become a favorite among investors in the cryptocurrency world (Alfian, 2022). Bitcoin is an electronic transaction system that does not rely on trust-based mechanisms. This system uses a coin framework consisting of digital signatures to exert strong control over ownership. However, to prevent double spending, a peer-to-peer network with proof-of-work is required. This network records a public history of transactions that is difficult for attackers to alter, provided that the majority of the computational power is controlled by honest computational points. The simplicity of this network structure renders it robust.

2.3 Stocks

A stock is a certificate that states that the holder owns a portion of the company that issued it. A person or party can be considered a shareholder if their name is listed in the shareholder register (DPS). The DPS is typically prepared a few days before the General Meeting of Shareholders (RUPS) and can be accessed by all parties. Additionally, proof of stock ownership can be found on the back page of the stock certificate, where the issuing company (issuer) records the shareholder's name (Adnyana, 2021). According to Rahmadewi, Febriansah, Khalifah, and Malik (2024), Sharia stocks are ownership rights in a company that complies with Sharia principles and excludes stocks with special privileges. Sharia stocks represent proof of ownership in a company issued by an issuer whose activities and management do not conflict with Sharia principles. In the Sharia context, the capital invested in a company must adhere to Sharia principles, using the musyarakah contract for private stocks and the mudharabah contract for public company stocks (Abdullah, Abdul Rahman, & Mashur, 2021; Waroi, Umar, & Ngutra, 2025).

2.4 Gold

Emas Gold, known as Aurum in Latin, means "the glow of the sun" because its shine resembles the halo surrounding the sun. In the periodic table of elements, gold belongs to the transition metal group with the symbol Au and atomic number 79. Along with silver and platinum, gold is classified as a precious metal owing to its non-reactive chemical properties and resistance to corrosion and oxidation. Gold has a melting point of approximately 1000°C and does not react or dissolve with most chemical elements or common solvents. It also has physical properties that make it malleable, allowing it to be shaped into the desired forms. Due to its unique chemical and physical properties, as well as its rarity and difficulty in extraction, gold holds a high economic value (Hasria, Idrus, & Warmada, 2019).

2.5 Return and Risk

2.5.1 Return

Return is the reward for investors willing to bear the risk of their investments. Return (rate of return) is the level of return that an investor expects from their investment (Desiyanti, 2017). The following formula was used to calculate the return:

$$\boldsymbol{R_t = \frac{P_t - P_{t-1}}{P_{t-1}}}$$

Where:
R_t is the return in period t
P_t is the price at the end of period t
P_{t-1} is the price at the beginning of period t-1

2.5.2 Risk

Risk refers to the possibility that an investment made by an investor will fail to meet the expected rate of return (Prasasti, 2022). The risk can be calculated using the following formula:

$$\sigma=\sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(R_i-\bar{R})^2}$$

Where:
σ is the standard deviation
N is the number of observations
R_i is the return in period i
$\bar{R}$ is the average return

2.6 Sharpe Index Method

The Sharpe Index was developed by William F. Sharpe, a renowned economist and finance professor who was awarded the Nobel Prize in Economic Sciences in 1990. The Sharpe Index method, also known as the reward-to-variability ratio, is used to measure the performance of an investment portfolio. This index compares the risk premium of the portfolio, which is the difference between the average rate of return of the portfolio and the average risk-free rate of return, with the portfolio's risk, expressed in terms of the standard deviation of the portfolio's returns. The higher the Sharpe Index value, the better the portfolio performance, as it indicates that the portfolio provides a higher return per unit of risk taken. To calculate portfolio performance using the Sharpe Index, the following formula is used:

$$S=\frac{R_p-R_f}{\sigma_p}$$

Where:
S is the Sharpe Index
R_p is the average portfolio return
R_f is the average risk-free rate of return
σ_p is the standard deviation of portfolio returns (total risk)

2.7 Treynor Index Method

The Treynor Index was developed by Jack L. Treynor and is often referred to as the reward-to-volatility ratio. This index is used to measure the performance of an investment portfolio by considering market risks. Market risk cannot be eliminated through diversification and affects all market investments. Unlike the Sharpe Index, which uses the standard deviation as a measure of total risk, the Treynor Index uses beta (β) to measure systematic or market risk. The Treynor Index helps investors understand how well their portfolio performs relative to the market risk taken. The higher the Treynor Index value, the better the portfolio performance in terms of return per unit of market risk. To calculate portfolio performance using the Treynor Index, the following formula is used:

$$T=\frac{R_p-R_f}{\beta_p}$$

Where:
T is the Treynor Index
R_p is the average portfolio return
R_f is the average risk-free rate of return
β_p is the portfolio's beta, which measures the sensitivity of the portfolio's returns to market movements

2.8 Jensen Index Method

The Jensen Index, also known as Jensen's Alpha, was developed by Michael C. Jensen. This method is used to measure the performance of an investment portfolio by considering risk-adjusted returns. The index compares the portfolio return with the expected return based on the Capital Asset Pricing Model (CAPM). The Jensen Index measures how much the portfolio return exceeds or falls below the expected return calculated using CAPM. In other words, the Jensen Index shows the portfolio manager's ability to generate additional returns beyond what market risk can explain. The Jensen Index helps investors evaluate portfolio managers' performance by assessing whether they can generate extra returns above what is expected based on market risk. A positive alpha indicates good performance, whereas a negative

alpha indicates poor performance relative to the expected return. To calculate portfolio performance using the Jensen Index, the following formula is used:

$$\boldsymbol{\alpha = (R_p - R_f) - (R_m - R_f)\beta_p}$$

Where:

α is Jensen's Alpha (Jensen Index)

R_p is the average portfolio return

R_f is the average risk-free rate of return

β_p is the portfolio's beta (measuring the portfolio's market risk)

R_m is the average market return

2.9 Hypothesis Development

A hypothesis is a temporary answer to a problem formulation that needs to be tested for validity. The hypothesis is often understood as a guess or prediction about the results that will be obtained from a research study (Fauzi, 2015). According to Kuncoro and Nazir in Fauzi (2015), a hypothesis must be expressed in the form of a concept that can be tested for truth. Hypotheses assist researchers in formulating the outcomes of the research. A good hypothesis leads to the execution of an accurate test. The hypotheses proposed in this study are as follows:

a. Return Hypothesis

H_1 : There is a significant difference between the returns of Bitcoin, Sharia stocks, and gold as alternative investments.

H_0 : There is no significant difference between the returns of cryptocurrency Bitcoin, Sharia stocks and gold as alternative investments.

b. Risk Hypothesis

H_1 : There is a significant difference between the risks of Bitcoin, Sharia stocks, and gold as alternative investments.

H_0 : There is no significant difference between the risks of cryptocurrency Bitcoin, Sharia stocks and gold as alternative investments.

c. Investment Performance Hypothesis (Sharpe Index)

H_1 : Here, there is a significant difference between the performance of cryptocurrency Bitcoin, Sharia stocks, and gold as alternative investments using the Sharpe method.

H_0 : There is no significant difference between the performances of cryptocurrency Bitcoin, Sharia stocks, and gold as alternative investments using the Sharpe method.

d. Investment Performance Hypothesis (Treynor Index)

H_1 : There is a significant difference between the performances of cryptocurrency Bitcoin, Sharia stocks, and gold as alternative investments using the Treynor method.

H_0 : There is no significant difference between the performances of cryptocurrency Bitcoin, Sharia stocks, and gold as alternative investments using the Treynor method.

e. Investment Performance Hypothesis (Jensen Index)

H_1 : There is a significant difference between the performances of cryptocurrency Bitcoin, Sharia stocks, and gold as alternative investments using the Jensen method.

H_0 : There is no significant difference between the performances of cryptocurrency Bitcoin, Sharia stocks, and gold as alternative investments using the Jensen method.

3. Research Methodology

This study used a quantitative approach with a comparative method. The data used in this study are time-series data based on secondary sources. The population in this study consists of the monthly closing prices of Bitcoin, Jakarta Islamic Index (JII) stocks, and ANTAM gold from 2019 to 2023. The sampling technique used in this study was saturated sampling. The population under study includes 180 monthly closing price data points from the three investment instruments (Zahra, Sholihah, & Fathurohman, 2025).

The monthly closing price data of the three investment instruments were processed using Microsoft Excel based on the formulas for each research variable to obtain the values for each variable. Subsequently, the values of these variables were processed and analyzed using SPSS software. If the

results of the normality and homogeneity tests were met, a parametric statistical test, namely One-Way ANOVA, was performed. However, if the normality and homogeneity tests are not met, a non-parametric statistical test, namely the Kruskal-Wallis test, is conducted. Since the results of the normality and homogeneity tests in this research do not meet the criteria, the next analysis is conducted using the non-parametric statistical test, Kruskal-Wallis, to compare the three investment instruments under study (Nurohman, 2022; Omilovna, 2025).

4. Results and Discussion

4.1 Results

4.1.1 Descriptive Analysis

Table 1. Missing Value Test

Variabel	**Instrumen**	***Statistics***					
		Valid		***Missing Cases***		**Total**	
		N	***Percent***	**N**	***Percent***	**N**	***Percent***
Return	*Bitcoin*	60	100,0%	0	0,0%	60	100,0%
	Saham JII	60	100,0%	0	0,0%	60	100,0%
	Emas ANTAM	60	100,0%	0	0,0%	60	100,0%
Risk	*Bitcoin*	60	100,0%	0	0,0%	60	100,0%
	Saham JII	60	100,0%	0	0,0%	60	100,0%
	Emas ANTAM	60	100,0%	0	0,0%	60	100,0%
Investment Performance (Sharpe Index)	*Bitcoin*	60	100,0%	0	0,0%	60	100,0%
	Saham JII	60	100,0%	0	0,0%	60	100,0%
	Emas ANTAM	60	100,0%	0	0,0%	60	100,0%
Investment Performance (Treynor Index)	*Bitcoin*	60	100,0%	0	0,0%	60	100,0%
	Saham JII	60	100,0%	0	0,0%	60	100,0%
	Emas ANTAM	60	100,0%	0	0,0%	60	100,0%
Investment Performance (Jensen Index)	*Bitcoin*	60	100,0%	0	0,0%	60	100,0%
	Saham JII	60	100,0%	0	0,0%	60	100,0%
	Emas ANTAM	60	100,0%	0	0,0%	60	100,0%

Source: Processed Secondary Data (2024)

Based on Table 1, the missing value analysis (MVA) results show that all the data used in this study are valid, with no missing data (missing cases = 0) for each variable and instrument tested. Therefore, all the required data were fully available, allowing for optimal analysis without the need for imputation or deletion of data. This ensured that the results obtained from the study were based on complete and reliable data.

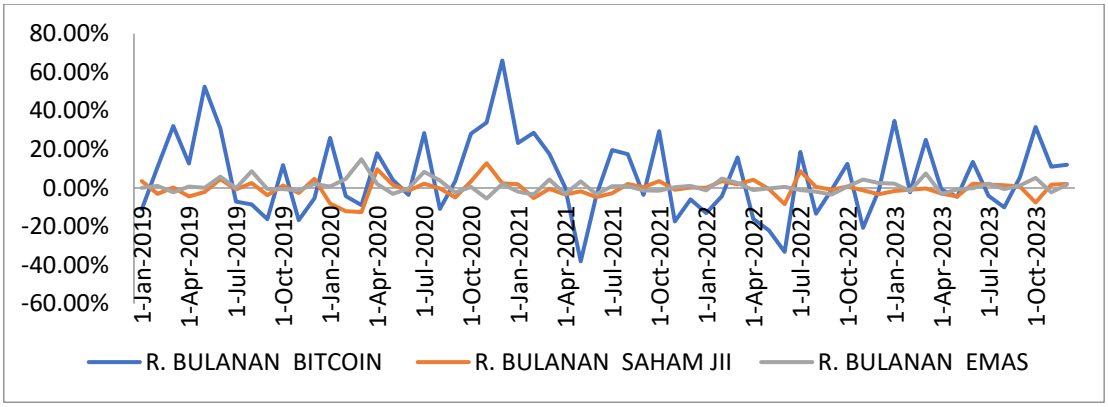

Figure 4. Comparison of Monthly Returns for Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold
Source: Processed Secondary Data (2024)

Based on Figure 4, the monthly returns of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold fluctuate. Bitcoin experienced the highest return in December 2020 at 66.10%, and the lowest return occurred in May 2021 at -38.04%.The highest return for Sharia stocks (Jakarta Islamic Index) was also in December 2020 at 12.86%, and the lowest was -12.47% in March 2020. The highest return for ANTAM gold occurred in March 2020 at 14.93%, while the lowest return occurred in November 2020 at -5.46%.

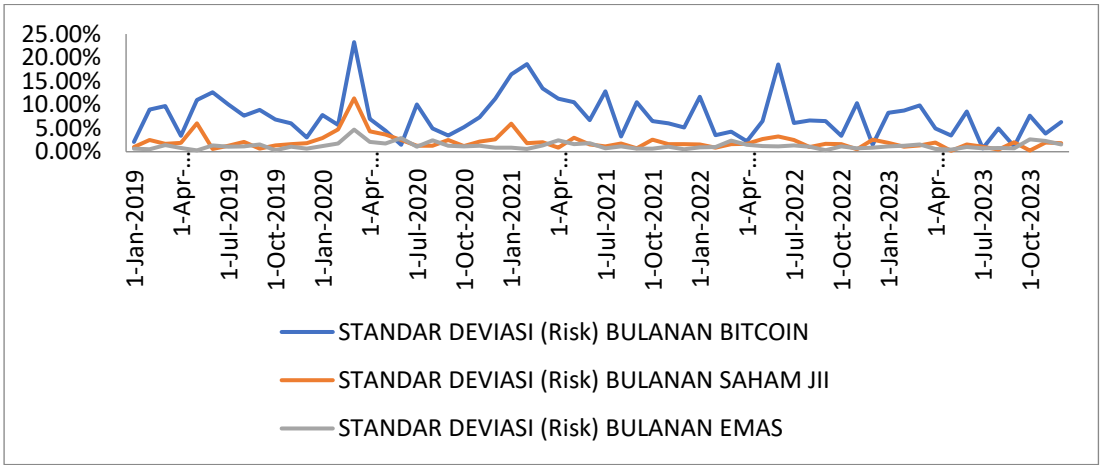

Figure 5. Comparison of Monthly Risk for Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold
Source: Processed Secondary Data (2024)

Based on Figure 5, the monthly risks for Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold fluctuate. The highest risk for Bitcoin occurred in March 2020 at 23.28%, and the lowest risk occurred in July 2023 at 0.71%. The highest risk for Sharia stocks (Jakarta Islamic Index) was in March 2020 at 11.34%, and the lowest was 0.20% in May 2023. The highest risk for ANTAM gold occurred in March 2020 at 4.70%, whereas the lowest risk occurred in May 2019 at 0.29%.

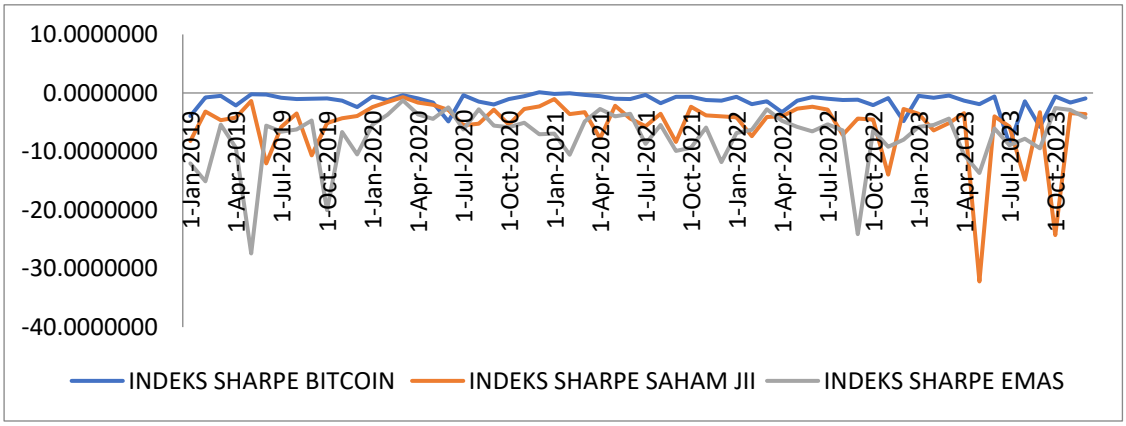

Figure 6. Comparison of Monthly Performance for Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold Using the Sharpe Index
Source: Processed Secondary Data (2024)

Based on Figure 6, the monthly performances of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold using the Sharpe Index show fluctuations. The average Sharpe value for Bitcoin during the study period (January 2019 to December 2023) was -1.40. The highest Sharpe value for Bitcoin occurred in December 2020 at 0.12, while the lowest Sharpe value occurred in July 2023 at -8.85. The highest Sharpe value for Sharia stocks (Jakarta Islamic Index) was in March 2020 at -0.71, and the lowest was -32.20 in May 2023. Meanwhile, the highest Sharpe value for ANTAM gold occurred in March 2020 at 1.27, while the lowest Sharpe value occurred in May 2019 at -27.42.

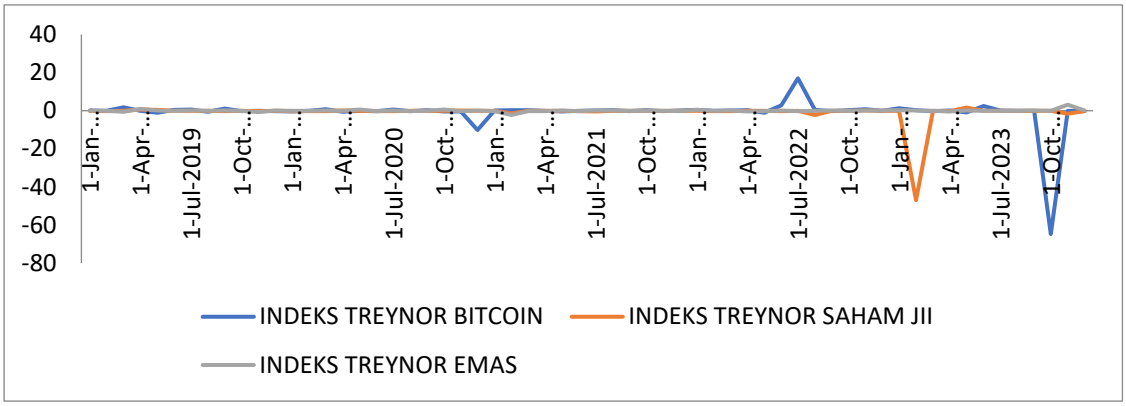

Figure 7. Comparison of Monthly Performance for Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold Using the Treynor Index
Source: Processed Secondary Data (2024)

Based on Figure 7, the average Treynor value for Bitcoin during the study period (January 2019 to December 2023) was -0.83656. The highest monthly Treynor value for Bitcoin was 17.0159, while the lowest was -64.8195. The average Treynor value for Sharia stocks (Jakarta Islamic Index) during the study period was -0.9246. The highest monthly Treynor value for Shariah stocks (Jakarta Islamic Index) was 1.6436, while the lowest was -47.0060. The average Treynor value for ANTAM gold during the study period was -0.0006. The highest monthly Treynor value for ANTAM gold was 3.1305, while the lowest was -2.2369.

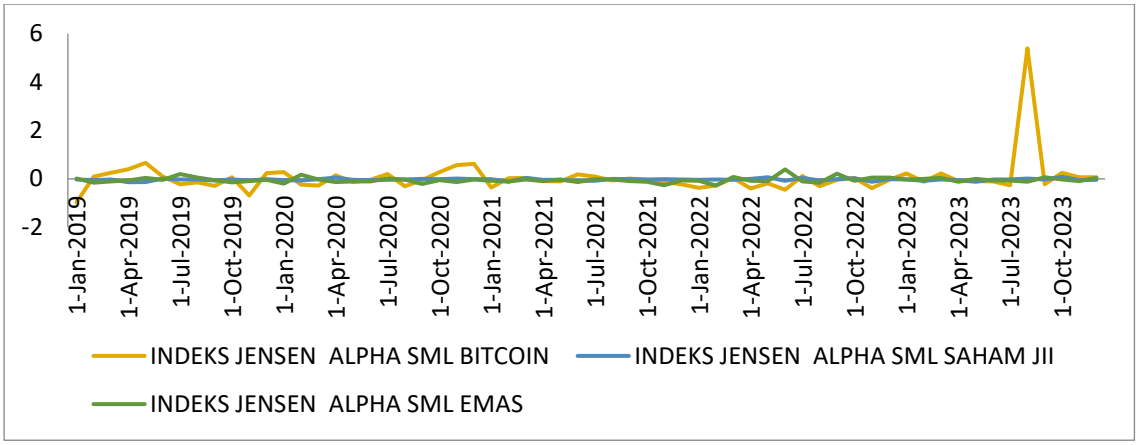

Figure 8. Comparison of Monthly Performance for Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold Using the Jensen Index
Source: Processed Secondary Data (2024)

Based on Figure 8, the average Jensen value for Bitcoin during the study period (January 2019 to December 2023) was 0.0490. The highest monthly Jensen value for Bitcoin was 5.3960, whereas the lowest was -0.9753. The average Jensen value for Shariah stocks (Jakarta Islamic Index) during the study period was -0.03100. The highest monthly Jensen value for Shariah stocks (Jakarta Islamic Index) was 0.0884, while the lowest was -0.1390. The average Jensen value for ANTAM gold during the study period was -0.0461. The highest monthly Jensen value for ANTAM gold was 0.389174, whereas the lowest was -0.2744.

4.1.2 Normality Test

Table 2. Kolmogorov-Smirnov Normality Test

Variable	**Instrument**	***Kolmogorov-Smirnov Test***			**Decision**
		Statistic	**df**	**Sig.**	
Return	*Bitcoin*	0,130	60	0,013	Not Normal
	Saham JII	0,096	60	0,200	Normal
	Emas ANTAM	0,125	60	0,020	Not Normal
Risk	*Bitcoin*	0,101	60	0,200	Normal
	Saham JII	0,212	60	0,000	Not Normal
	Emas ANTAM	0,159	60	0,001	Not Normal
Investment Performance (Sharpe Index)	*Bitcoin*	0,233	60	0,000	Not Normal
	Saham JII	0,269	60	0,000	Not Normal
	Emas ANTAM	0,207	60	0,000	Not Normal
Investment Performance (Treynor Index)	*Bitcoin*	0,453	60	0,000	Not Normal
	Saham JII	0,466	60	0,000	Not Normal
	Emas ANTAM	0,301	60	0,000	Not Normal
Investment Performance (Jensen Index)	*Bitcoin*	0,297	60	0,000	Not Normal
	Saham JII	0,121	60	0,029	Not Normal
	Emas ANTAM	0,130	60	0,014	Not Normal

Source: Processed Secondary Data (2024)

Based on the results of the normality test in Table 2, the significance (Sig.) of The values for all types of data in the study indicate that most of the data have Sig. < 0.05, except for the return of Sharia stocks (Jakarta Islamic Index) and the risk of Bitcoin, where both have significance. > 0.05. According to the

normality test criteria, data are considered normally distributed if the significance (Sig.) The values were greater than 0.05. Therefore, most of the data are not normally distributed, except for the returns of Sharia stocks (Jakarta Islamic Index) and the risk of Bitcoin. The data tested include return, risk, the performance of Bitcoin, the performance of Sharia stocks (Jakarta Islamic Index), and the performance of ANTAM gold, measured using Sharpe, Treynor, and Jensen methods. Because most of the data do not meet the normality assumption, the next step is to perform the Kruskal-Wallis test.

4.1.3 Homogeneity Test

Table 3. Levene's Homogeneity Test

Levene's Test Of Equality of Error Variances					
Data Group	*Levene Statistic*	df1	df2	Sig.	Decision
Return	78,573	2	177	0,000	Variance Not Homogeneous
Risk	40,026	2	177	0,000	Variance Not Homogeneous
Investment Performance (Sharpe Method)	9,086	2	177	0,000	Variance Not Homogeneous
Investment Performance (Treynor Method)	2,133	2	177	0,122	Homogeneous Variance
Investment Performance (Jensen Method)	8,608	2	177	0,000	Variance Not Homogeneous

Source: Processed Secondary Data (2024)

Based on Table 3, the results of the homogeneity of variance test for the return, risk, Bitcoin performance, Sharia stock performance (Jakarta Islamic Index), and ANTAM gold performance measured using the Sharpe and Jensen methods show that the significance values (Sig.) are < 0.05. However, for investment performance measured using the Treynor method, the significance value is > 0.05. This indicates that the variances for the return, risk, and investment performance groups measured using the Sharpe and Jensen methods are not homogeneous (different), thus requiring the Kruskal-Wallis test.

The Kruskal-Wallis test is necessary even though the homogeneity test for investment performance measured using the Treynor method showed homogeneous results (Sig. > 0.05), because the variances for the return, risk, and investment performance groups measured using the Sharpe and Jensen methods were not homogeneous (Sig. < 0.05). The Kruskal-Wallis test is used when the variance between groups of data is not homogeneous or does not meet the assumptions of parametric tests, thus requiring a nonparametric test.

4.1.4 Kruskal-Wallis Test

Table 4. Kruskal-Wallis Ranks

Ranks		
Data Group	**Investment Instrument**	**Mean Rank**
Return	*Bitcoin*	94,77
	Saham JII	83,22

	Emas ANTAM	93,52
Risk	*Bitcoin*	143,00
	Saham JII	78,55
	Emas ANTAM	49,95
Investment Performance (Sharpe Index)	*Bitcoin*	123,43
	Saham JII	63,77
	Emas ANTAM	41,20
Investment Performance (Treynor Index)	*Bitcoin*	98,88
	Saham JII	71,87
	Emas	96,63
Investment Performance (Jensen Index)	*Bitcoin*	90,45
	Saham JII	98,43
	Emas ANTAM	82,62

Source: Processed Secondary Data (2024)

Based on the data in Table 4, the following conclusions were drawn:

1) Return Variable: Bitcoin has the highest rank, with a value of 94.77, indicating that it provides higher returns than other investment instruments. ANTAM gold ranks second with a value of 93.52, which is almost equal to that of Bitcoin. Meanwhile, Sharia stocks (Jakarta Islamic Index) have the lowest rank, with a value of 83.22, indicating that the return from Sharia stocks is lower than that of the other instruments.
2) Risk Variable: Bitcoin has the highest rank, with a value of 143.00, indicating that Bitcoin has a very high risk compared to Sharia stocks (Jakarta Islamic Index) and ANTAM gold. Sharia stocks (Jakarta Islamic Index) ranked second with a value of 78.55, showing that the risk level was more moderate. Meanwhile, ANTAM gold has the lowest rank, with a value of 49.95, indicating that ANTAM gold has a lower risk than Bitcoin and Sharia stocks (Jakarta Islamic Index).
3) Investment Performance (Sharpe Index): Bitcoin ranked first with a value of 123.43, indicating that it had the best performance. Sharia stocks (Jakarta Islamic Index) rank second with a value of 63.77, and ANTAM gold ranks third with a value of 41.20, showing that both instruments have lower investment performance than Bitcoin based on the Sharpe index.
4) Investment Performance (Treynor Index): Bitcoin ranks first with a value of 98.88, indicating that it has the best performance. ANTAM Gold ranks second with a value of 96.63, and Sharia stocks (Jakarta Islamic Index) rank third with a value of 71.87.
5) Investment Performance (Jensen Index): Sharia stocks (Jakarta Islamic Index) ranked first with a value of 98.43, indicating that Sharia stocks have better performance. Bitcoin ranks second with a value of 90.45, and ANTAM gold ranks last with a value of 82.62, indicating that Sharia stocks (Jakarta Islamic Index) are superior based on the Jensen Index.

Tabel 5. Kruskal-Wallis Test

Test Statistics					
	Return	*Risk*	Sharpe Index	Treynor Index	Jensen Index
Chi-Square	1,776	100,406	88,126	10,205	2,764
df	2	2	2	2	2
Asymp. Sig.	0,412	0,000	0,000	0,006	0,251

Source: Processed Secondary Data (2024)

Based on the data in Table 5, the following conclusions were drawn:

a) For the Return variable, the significance value (Asymp. Sig.) is 0.412 > 0.05. Therefore, $\mathbf{H_1}$ is rejected, and $\mathbf{H_0}$ is accepted, indicating that there is no significant difference between the returns of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold.

b) For the Risk variable, the significance value (Asymp. Sig.) is 0.000 < 0.05. Therefore, $\mathbf{H_1}$ is accepted, and $\mathbf{H_0}$ is rejected, indicating a significant difference between the risks of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold.
c) For the Investment Performance (Sharpe Index**)** variable, the significance value (Asymp. Sig.) is 0.000 < 0.05. Therefore, $\mathbf{H_1}$ is accepted, and $\mathbf{H_0}$ is rejected, indicating a significant difference between the investment performances of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold based on the Sharpe index.
d) For the Investment Performance (Treynor Index) variable, the significance value (Asymp. Sig.) is 0.006 < 0.05. Therefore, $\mathbf{H_1}$ is accepted, and $\mathbf{H_0}$ is rejected, meaning that there is a significant difference between the investment performances of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold based on the Treynor index.
e) For the Investment Performance (Jensen Index**)** variable, the significance value (Asymp. Sig.) is 0.251 > 0.05. Therefore, $\mathbf{H_1}$ is rejected, and $\mathbf{H_0}$ is accepted, meaning that there is no significant difference between the investment performances of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold based on the Jensen index.

4.2 Discussion

4.2.1 Comparison of Returns between Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold

The results indicate no significant difference in the returns generated by Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold. This is evidenced by a significance value of 0.412 > 0.05, meaning that there is no significant difference between the returns of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold. These findings align with the research conducted by Lumbantobing and Sadalia (2021), who also stated that there is no significant difference in the returns of Bitcoin, stocks, and ANTAM gold. This result is further supported by the studies of Hamdika et al. (2022) and reiterated by Widiawira and Akbar (2023), who also found no significant difference in the returns of Bitcoin, stocks, and gold. Thus, this study suggests that, in general, the returns provided by Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold are relatively similar for investors, even though there are differences in the average returns of each asset. Although no significant difference is found between the returns of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold, Bitcoin generates higher returns based on average ranking.

4.2.2 Comparison of Risk between Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold

The results indicate a significant difference in the risks associated with Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold. This is evidenced by a significance value of 0.00 < 0.05, meaning that there is a significant difference in the risks of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold.

Bitcoin carries a much higher risk than Sharia stocks (Jakarta Islamic Index) and ANTAM gold does. Sharia stocks (Jakarta Islamic Index) ranked second, with a more moderate risk level. Meanwhile, ANTAM gold has the lowest risk compared to Bitcoin and Sharia stocks (Jakarta Islamic Index). These findings align with the research conducted by Lumbantobing and Sadalia (2021), who stated that there is a significant difference in the risks of Bitcoin, stocks, and gold. Febriansyah and Saryadi (2022) also made a similar statement, noting that Bitcoin carries a very high risk compared to stocks and gold. This finding is further reinforced by Hertanto, Muchtar, and Sihombing (2024), whose research also found a clear difference in the risk levels of Bitcoin, stocks, and gold.

4.2.3 Comparison of Investment Performance between Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold using the Sharpe Index

The results indicate a significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold when using the Sharpe index. This is evidenced by a significance value of 0.00 < 0.05, meaning that there is a significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold based on the Sharpe Index. In terms of investment performance with the Sharpe index, Bitcoin has a better performance than Sharia stocks (Jakarta Islamic Index) and ANTAM gold.

These findings align with the research conducted by Lumbantobing and Sadalia (2021), who stated that there is a noticeable difference in the performance of Bitcoin, stocks, and gold when analyzed using the Sharpe index. Hertanto et al. (2024) also support this finding, stating that there is a significant difference in the investment performances of the three instruments. Furthermore, Widiawira and Akbar (2023) reinforced this view by indicating a significant difference in the investment performance of Bitcoin, stocks, and gold when analyzed using the Sharpe index.

4.2.4 Comparison of Investment Performance between Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold using the Treynor Index

The results of this study show a significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold using the Treynor index. The significance value is 0.006 < 0.05, indicating a significant difference between the investment performances of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold using the Treynor index. In terms of investment performance with the Treynor index, Bitcoin performs the best. ANTAM Gold ranked second, and Shariah stocks (Jakarta Islamic Index) ranked third.

These results are consistent with those of Hamdika et al. (2022), who found a significant difference in the investment performance of Bitcoin, stocks, and gold when using the Treynor index. Liestyowati, Possumah, Yadasang, and Ramadhani (2023) also made similar observations, and these findings were further reinforced by Widiawira and Akbar (2023), who stated that there is a significant difference in the investment performance of Bitcoin, stocks, and gold when using the Treynor index.

4.2.5 Comparison of Investment Performance between Bitcoin, Sharia Stocks (Jakarta Islamic Index), and ANTAM Gold using the Jensen Index

The results show no significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold using the Jensen index. This is evidenced by a significance value of 0.251 > 0.05, meaning that there is no significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold using the Jensen Index. In terms of investment performance with the Jensen index, Sharia stocks (Jakarta Islamic Index) have a better performance than Bitcoin and ANTAM gold.

These findings are consistent with Hamdika et al. 's (2022) researchHamdika et al. (2022), which stated that there is no significant difference in the investment performance of Bitcoin, stocks, and gold using the Jensen index. This is further supported by the study conducted by Setiawati and Diatmika (2023), who found no significant difference in the investment performance of Bitcoin, Sharia stocks, and ANTAM gold using the Jensen index.

5. Conclusion

5.1 Conclusion

Based on the results of the research and the discussion of the research hypotheses, the following conclusions can be drawn.

1. There is no significant difference in the returns generated by Bitcoin, Sharia stocks (Jakarta Islamic Index), ANTAM gold. This is evidenced by the significance value of 0.412 > 0.05, meaning that there is no significant difference between the returns of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold.
2. There are significant differences in the risks associated with Bitcoin, Sharia stocks (Jakarta Islamic Index), ANTAM gold, and gold ETFs. This is evidenced by the significance value of 0.00 < 0.05, meaning that there is a significant difference between the risks of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold.
3. The Sharpe index shows a significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold. This is evidenced by the significance value of 0.00 < 0.05, meaning that The Sharpe index shows a significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold.
4. The Treynor index shows a significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold. The significance value is 0.006 < 0.05, meaning

The Treynor index shows a significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold.

5. There is no significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold, using the Jensen index. This is evidenced by the significance value of 0.251 > 0.05, meaning there is no significant difference in the investment performance of Bitcoin, Sharia stocks (Jakarta Islamic Index), and ANTAM gold using the Jensen Index.

5.2 Recommendations

1. Bitcoin provides a higher return and better performance than Sharia stocks (Jakarta Islamic Index) and ANTAM gold. However, it is important to note that Bitcoin carries a very high risk, even exceeding the return generated. Therefore, investors must carefully consider and thoroughly assess the risks that may arise from these three investment instruments to avoid future losses in the market.
2. Muslim investors are advised to choose halal investment instruments, such as gold or Sharia stocks, rather than investing in cryptocurrency assets, including Bitcoin, as cryptocurrencies do not have underlying assets (they have no physical form), and there is no authority or institution that oversees or guarantees them. If investors fall victim to fraud, no institution or authority can be held accountable, unlike Sharia stocks or gold.
3. Sharia-compliant cryptocurrencies should be developed, and the government should create clear regulations related to cryptocurrencies to protect the public, especially as the number of cryptocurrency investors in Indonesia continues to rise.

5.3 Limitations and Future Studies

This study focuses only on Sharia-compliant stocks listed on the Jakarta Islamic Index (JII). Future studies could be expanded by using data from other Sharia stocks not listed on the JII. Furthermore, the data used in this study only covered the period from 2019 to 2023. Future studies should extend the analysis period to gain a broader perspective.

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