International Journal of Islamic Economics
P-ISSN: 2686-2131 E-ISSN: 2686-2166
DOI: https://doi.org/10.32332/ijie.v7i01.10394 Vol 7, No 1, (2025) Pages. 58-68

Comparative Study of Risk and Return in Bitcoin, LQ45, and Jakarta Islamic Index Markets in Indonesia (2021-2024)

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Article History:
Submitted: March 24th, 2025
Revised: May 20th, 2025
Accepted: May 21st, 2025
Published: July 1st, 2025

By: International Journal of Islamic Economics (IJIE)

Abstract

Introduction: In digital era, investments are no longer in the form of physical instruments or those we can see; there are many non-physical investment instruments, such as Cryptocurrencies and stocks. However, before we jump directly into the world of investment, we need to analyze how an investment instrument can bring our money into profit and consider the risks of investment instruments to avoid losses.
Objective: This study examines the risks and returns of three investment instruments: Bitcoin, LQ45, and the Jakarta Islamic Index.
Method: This study used a Descriptive quantitative approach and comparative analysis. To obtain data, we used purposeful sampling, a non-probability sampling technique. Forty-eight samples were examined using historical monthly closing price data for Bitcoin, LQ45, and the Jakarta Islamic Index from 2021 to 2024.
Results: Research findings show that Bitcoin investment has the highest level of risk compared to LQ45 and Jakarta Islamic Index investments, then LQ45 investment has a moderate risk level, and Jakarta Islamic Index investment has the lowest level of risk compared to Bitcoin and LQ45 investments. In further findings, it is known that Bitcoin investment has the highest level of return compared to LQ45 and Jakarta Islamic Index investments, then LQ45 investment has a moderate level of return, and Jakarta Islamic Index investment has the lowest level of return compared to Bitcoin and LQ45 investments.
Implications: Thanks to this research, investors should be able to evaluate and assess the risk and return of investing in Bitcoin, LQ45 shares, and Jakarta Islamic Index Sharia shares. Additionally, prior investors can distinguish investment portfolios based on their investment instruments' risk and return requirements.

Keywords: Bitcoin; Conventional Stock; Cryptocurrency; Jakarta Islamic Index, LQ45, Return; Risk; Syaria Stock.

A. Introduction

Investment is a practice of direct or indirect capital investment, both short and long term, that aims to obtain a Return from the investment itself. It is a form of postponement of present consumption to obtain consumption in the future, in which there is an element of uncertainty risk, so compensation for the delay is needed (Martalena & Malinda, 2015).

Investment instruments are being used differently by investors due to the advancement of financial technology. As cryptocurrency acceptance rises in Indonesia, digital assets like Bitcoin become a more well-liked substitute option. However, the stock market remains the primary investment vehicle, whether represented by Sharia indices like the Jakarta Islamic Index (JII) or conventional indices like the LQ45. The capital market is defined as the activity of public offering and trading of securities based on Capital Market Law No. 8 of 1995. According to data from the Indonesia Stock Exchange (IDX), the number of individual capital market investors in Indonesia in October 2024 reached around 14 million people, an increase compared to the number of investors in December 2023, which was only around 12 million. This shows that the number of investors continues to grow every year.

On behalf of the shares they purchase, shares serve as a symbol of ownership in the business. Securities issued by a business that is a limited liability corporation or is widely known as an issuer that discloses ownership of shares are broadly defined as shares (Kasmir, K., 2016). As a result, purchasing shares entitles a person to own the business.

Sharia stocks are the same as conventional stocks; the difference is that Sharia stocks require companies to adhere to principles and operations that do not violate Islamic law. For example, companies that do not commit usury, their products are not prohibited goods, companies that do not practice gambling, and so on (Baiq Solatiyah & M. Yakub, 2023). The stock index is one of the important indicators for observing the movement of stock prices and company securities. The Indonesia Stock Exchange (IDX) has several conventional and sharia indices, including the JII Index as an Islamic stock index and the LQ45 index as a conventional stock index. Islamic stocks are the same as conventional stocks; the difference is that the stocks traded in the Islamic capital market must come from issuers meeting Sharia criteria. (Yafiz, 2008).

Virtual currency, or cryptocurrency, is also becoming a new investment. The terms "cryptography," which means secret code, and "currency," which means currency, are combined to form the term "cryptocurrency." According to (Syamsiah, 2017), cryptocurrency is a virtual currency system that works similarly to a physical currency and enables users to pay virtually for commercial transactions without incurring service costs while maintaining a centralized trust authority. Bitcoin is the original cryptocurrency. There are currently over 13,000 cryptocurrencies in total, with Bitcoin holding the greatest market capitalization at 57.3%, according to CoinMarketCap, a website that provides information about cryptocurrencies.

Bitcoin is the world's first cryptocurrency, created in 2009. The purpose of Bitcoin is to provide anonymous identities for the ownership and transfer of wealth assets across wallets (electronic wallets). Although Bitcoin transactions can occur anonymously, all transactions are recorded on a transparent public ledger that everyone can see. As of October 2024, around 19.5 million of the maximum total of 21 million Bitcoins have been successfully mined, which means that more than 92% of the Bitcoin Supply has been circulated. The data can be seen on the official websites www.investing.com and www.coinmarketcap.com.

While JII represents equities that adhere to Islamic Sharia rules, LQ45 represents top stocks with liquid performance and solid fundamentals. Bitcoin is renowned for its high volatility but significant potential rewards. Of course, each of the three has unique risk and return characteristics, particularly when considering how sensitive the economy will be between 2021 and 2024. From 2021 to 2024, many noteworthy events will greatly affect Indonesian and international financial markets. Low interest rate policies and significant fiscal stimulus marked the world's entry into the post-COVID-19 economic recovery period in 2021, which fueled a spike in transaction volumes and the price of riskier assets like Bitcoin. However, in 2022, the market was under tremendous pressure because of a surge in global inflation brought on by global supply chain disruptions.

This was because COVID-19 caused a shortage of labor and production materials in many industries worldwide, which in turn led to an increase in global demand that was not adequately met by supply, which in turn caused inflationary pressures. In addition, this year's conflict between Russia and Ukraine disrupted both countries' exports, and as a result, gasoline and food prices skyrocketed. The Fed and Bank Indonesia were among the central banks that raised interest rates aggressively due to this. This directly affected the asset value drop, weakening stock indices and cryptocurrency markets. Additionally, during this time the Financial Sector Development and Strengthening Act (P2SK), which contains provisions on the supervision of crypto assets and Islamic financial markets, as well as more robust government initiatives to promote the growth of the Islamic economy and finance, strengthened regulations on trading in crypto assets by Bappebti and the Financial Services Authority (OJK). These measures are significant steps toward structural reform in Indonesia's financial sector and increase the relevance of the JII index.

Both Indonesia's cryptocurrency and stock markets will do well in 2023 and 2024. A rise in investment interest, coupled with greater financial literacy or awareness, attracts new investors and boosts market growth over the previous year. Additionally, introducing new technologies like artificial intelligence (AI) increases investor interest in investing in the cryptocurrency market and traditional Islamic stocks.

With the rise in Indonesia's retail investor population, particularly among Gen Z and millennials, there has been a notable change in the country's investing preferences in favor of digital assets and Islamic financial products. Although the number of investments in cryptocurrencies, conventional stocks, or Sharia stocks is growing with time, market fluctuations with high volatility not only present a chance for investors to profit but also present a risk of losing money quickly. When considering economic factors, regulations, and complex market behavior, the most crucial aspect of investing is determining how to measure the risk and return of an investment instrument. For this reason, the 2021–2024 period is highly relevant and intriguing for research, particularly when comparing the risk and return characteristics of investment instruments such as Bitcoin, LQ45, and JII.

B. Literature Review

Modern portfolio theory assumes that return and risk should be considered with a formal description available to measure both in forming a portfolio. This theory can help investors build a portfolio of investment instruments to obtain optimal investment returns based on an acceptable level of risk using an efficient frontier. In making investments, Markowitz mentions two important parameters that investors can use in choosing investment instruments, namely mean and variance. Mean analysis can be used as a proxy for return and variance as a proxy for risk. Markowitz created a formula that allows investors to mathematically trade off risk tolerance and return expectations to produce an ideal portfolio. The goal of every investor is to maximize returns at all levels of risk (H.M. Markowitz, 1991).

Investment means giving up currently owned assets to acquire assets worth more in the future (Rakhimsyah et al., 2011). According to (Sunariyah et al, 2004), an investment is also an investment in one or more owned assets with a long-term goal of reaping future advantages.

Cryptocurrency, often known as cryptocurrency, was created in 1998 and is a digital asset intended to function as a means of exchange. It uses robust and decentralized cryptography to safeguard financial transactions, regulate its creation, and manage its use. More units and confirm the transfers of assets (Yusfandy D. Diranta Sembiring, 2022).

Bitcoin is the world's first cryptocurrency. It offers peer-to-peer transactions in which two or more people can transact at a faster and cheaper cost than traditional financial systems (Muhammad Naufal Hasani et al., 2022). The capital market trades various long-term financial instruments, such as debt or bond securities, equity or stock securities, mutual funds, derivative instruments, and others (Husnan, 2008).

Shares represent ownership of a business entity. They are generally defined as securities issued by a business entity in the form of a limited liability company, often referred to as an issuer that makes a statement regarding share ownership. Thus, the buyer of shares will become one of the business entity's owners (Kasmir, 2016).

Actual returns that deviate from anticipated returns are referred to as risk. This shows that investors are rational beings. However, risk preferences still depend on each investor. Bold investors will not hesitate to invest with high risk, followed by high Return expectations and vice versa (Ling Mukaromatun Nisa & Amalia Nuril Hidayati, 2022). Risk measurement can be done using standard deviation calculations:

$$\sigma\,(\%) = \sqrt{\frac{\sum_{i=1}^{i=n}(r_i - \bar{r})^2}{n}}$$

Description: σ: Standard deviation (SD)

ri: Return at period i

r̄: Average return

n: Number of observed data

The actual return, also known as the realized return, is a return that has already happened, and the computation is based on historical facts. Additionally, an expected return is a return that has not yet materialized but that investors anticipate obtaining in the future (Jogiyanto, 2015). Depending on the research, the return can be computed daily, in percentage terms, or over a period using continuous compounding (Morgan, 1996). Regarding the following formula for calculating returns:

$$R_T = \frac{P_T - P_{T-1}}{P_{t-1}}$$

Description: Rt = Individual Return

Pt = Price of an Issuer Period t

Pt-1 Price of an Issuer Period t-1.

C. Research Methodology

This study employs comparative analysis and descriptive research using a quantitative methodology. Research aimed at gathering information that characterizes the traits of individuals, occasions, and circumstances is known as descriptive research. The study's variables are return and risk. Historical data on the price of bitcoin, the LQ45 stock index, and the JII stock index in rupiah exchange rates over 4 years, from 2021 to 2024, served as the study's population. This time frame encompasses a period of severe global market volatility, including a bull run in the price of cryptocurrencies in 2021, a year in which the indonesian composite stock price index rose as a result of a large influx of retail investors into the stock market, which also coincided with the global recovery from the COVID-19 virus. In 2022, cryptocurrency and stock market fires, as well as inflation worldwide, made 2022 a challenging year for global markets due to several factors, including the conflict between Russia and Ukraine, which hindered the world's energy supply, resulting in soaring demand but limited supply, which in turn caused a rise in food prices and inflation. Then, 2023–2024 will be a good year for local and international markets. Financial literacy and interest in investing in Indonesia will rise, attracting many new investors. In addition, the development and application of new technologies, like robots and artificial intelligence (AI), are also growing quickly, enabling investors to better understand how an investment issuer's prices are moving.

Starting with the global recovery from the COVID-19 virus in 2021, then the occurrence of global inflation in 2022, and the increasing involvement of technology in 2023-2024 in the investment decision-making process, analyzing the comparison of investment instruments between Bitcoin, LQ45, and JII in terms of return and risk during the 2021-2024 period becomes increasingly interesting, because it reflects the influence not only of external market factors, but also of technological sophistication used in managing and diversifying asset portfolios.

This analysis only focuses on an asset's intrinsic return and risk. External factors such as monetary policy, global events, market sentiment, or technological developments may also affect asset performance. While not the focus, recognizing the potential influence of these factors will provide a richer context. Purposive sampling, a nonprobability sampling methodology, was used in this study to choose the sample. The researcher's criteria were used to determine how to withdraw the sample. The following are the sample criteria:

1. Bitcoin represents the world's first Cryptocurrency with the largest market capitalization for 2021-2024.
2. LQ45 stock index as a representative of the Conventional Stock Market on the Indonesia Stock Exchange (IDX) for 2021-2024.
3. The Jakarta Islamic Index (JII) as a representative of the Islamic stock market on the Indonesia Stock Exchange (IDX) for the 2021-2024 period.

Non-participant observation with secondary data is the data collection method employed in this study. The researcher observes the subject of the study independently and does not have to be involved in their activities to get data. The data collection technique is carried out by looking at historical data on the monthly closing price of Bitcoin, the LQ45 Stock Index, and the JII Sharia Stock Index for the 2021-2024 period. The data source is obtained from the website www.id.investing.com. This research will use descriptive and comparative statistical analysis. The comparative analysis used is the normality test, the homogeneity test, and the one-way ANOVA test.

D. Results and Discussion

By implementing these solutions, the halal market can achieve greater consistency and uniformity in certification, thereby supporting the growth of the global halal industry while ensuring the integrity and trustworthiness of halal products across different regions.

This chapter will discuss descriptive analysis, normality tests using the Kolmogorov-Smirnov test, hypothesis tests using the Kruskal-Wallis test, Levene's Homogeneity Test, and the One Way Anova Hypothesis Test—Welch Anova, as well as direct comparison tests of 3 variables using the Multiple Comparisons test—Games Howell between investment instruments. It will also discuss the research.

Descriptive Analysis (Return & Risk)

Table No 01 & 02
Investment Instruments Return & Risk

Invesment	***N***	***Minimum***	***Maximum***	***Mean***	***Std. Deviation***
Bitcoin Return	48	-.3602	.4313	.04387	.1864711
LQ45 Return	48	-.0705	.0647	-.00192	.0358537
JII Return	48	-.0810	.0494	-.00501	.0307128
Valid N	48				

Source: SPSS, Investing.com, 2024

Invesment	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
Bitcoin Risk	4	.1400	.2371	.177469	.0428271
LQ45 Risk	4	.0287	.0420	.036147	.0055761
JII Risk	4	.0242	.0340	.030979	.0046005
Valid N	4				

Source: SPSS, Investing.com, 2024

Based on Tables 1 and 2, all variables have the same amount of data, namely 48 Return data and 4 risk data, meaning each instrument has no missing data. This means the data is valid and can be continued at the next stage. The next analysis, namely the Data Normality Test between the return and risk of Bitcoin, the LQ45 Index and the JII Index.

Normality Test (Return & Risk)

Table No 03 & 04 Statistics
Normality Test of Investment Instruments Return & Risk

Invesment	Kolmogoro Smirnov			Shapiro Wilk		
	Statistics	*df*	*Sig.*	*Statistic*	*df*	*Sig.*
Bitcoin Return	.070	48	.200*	.975	48	.407
LQ45 Return	.083	48	.200*	.968	48	.210
JII Return	.069	48	.200*	.978	48	.485

Source: SPSS, Investing.com, 2024

Invesment	Kolmogoro Smirnov			Shapiro Wilk		
	Statistics	*df*	*Sig.*	*Statistics*	*df*	*Sig.*
Bitcoin Risk	.241	4	.	.911	4	.486
LQ45 Risk	.254	4	.	.957	4	.759
JII Risk	.329	4	.	.781	4	.072

Source: SPSS, Investing.com, 2024

This indicates that the data under study is normally distributed. The significance value of the Return from Bitcoin is 0.407 > 0.05, LQ45 0.210 > 0.05, and JII 0.485 > 0.05, as shown in the above table. Similarly, the significance value of the Risk of Bitcoin is 0.486 > 0.05, LQ45 0.759 > 0.05, and JII 0.072 > 0.05, as shown in the above table. The investigation may proceed because all of the data is regularly distributed.

Homogeneity Test (Return & Risk)

Table No 05 & 06
Homogeneity Test of Investment Instruments Return & Risk

	Levene Statistic	*df1*	*df2*	*Sig.*
Based on Median	52.844	2	141	.000
Based on Median and with adjusted df	49.815	2	51.824	.000
Based on trimmed mean	52.795	2	141	.000

Source: SPSS, Investing.com, 2024

	Levene Statistic	*df1*	*df2*	*Sig.*
Based on Median	4.585	2	9	.042
Based on Median and with adjusted df	3.657	2	3.219	.148
Based on trimmed mean	4.584	2	9	.042

Source: SPSS, Investing.com, 2024

Information may be gleaned from the above homogeneity test table of return investigation, namely a significant value of 0.000 where 0.000 < 0.05.The risk test table also shows a significant value of 0.042, where the value of 0.042 < 0.05, indicating that the variation across the groups or variables is not homogenous (heterogeneous). This indicates heterogeneity (not homogeneity) in the variance between groups or variables.

Because the data is normally distributed but based on tables 05 and 06 the data from Return and risk are not homogeneous, the hypothesis test will be carried out using the One Way Anova - Welch Anova test and continued with the comparison test between the three investment instruments using the Multiple Comparisons - Games Howell test.

Hypothesis Test (Return & Risk)

Table No 07 & 08

Homogeneity Test of Investment Instruments Return & Risk

Return of Invesment				
	Statistic[a]	df1	df2	Sig.
Welch	1.628	2	83.758	.202

Source: SPSS, Investing.com, 2024

Risk of Invesment				
	Statistic[a]	df1	df2	Sig.
Welch	20.963	2	5.294	.003

Source: SPSS, Investing.com, 2024

The above table indicates no significant difference between groups of investment instrument returns, with a significance value of 0.202 > 0.05. In contrast, the investment risk table above indicates a significant difference between groups of investment instrument risks, with a significance value of 0.003 < 0.05.

Comparison Test Between Variables (Return & Risk)

Table No 09

Comparison Test of Investment Instruments Return

Return Comparison (Sig)	**Bitcoin**	**JII**	**LQ45**
LQ45	.226		
Bitcoin		.183	
JII			.893

Source: SPSS, Investing.com, 20

After conducting a variable comparison test to support the Welch Anova test, the Multiple Comparisons - Games Howell test on returns shows no significant difference between LQ45 and Bitcoin returns, with a value of 0.226 > 0.05. The number 0.183 > 0.05 for the comparison of Bitcoin and JII returns indicates that there is no clear difference between the two. The value 0.893 > 0.05 for the comparison of LQ45 and JII returns indicates that there is no clear difference between the two.

Table No 10
Comparison Test of Investment Instruments Risk

Risk Comparison (Sig)	Bitcoin	JII	LQ45
LQ45	.013		
Bitcoin		.012	
JII			.387

Source: SPSS, Investing.com, 2024

Continued with the comparative variable test to strengthen the Welch Anova test, against the risk using the Multiple Comparisons - Games Howell test which shows that the comparison of Bitcoin risk with LQ45 risk has a value of 0.013 < 0.05, meaning that there is a significant difference in risk between Bitcoin and LQ45. The comparison of Bitcoin risk with JII risk has a value of 0.012 < 0.05, meaning there is no significant difference in risk between LQ45 and JII. The study results with the Multiple Comparisons - Games Howell test align with the Welch Anova hypothesis test study, showing a significant risk difference between investment instruments.

E. Conclusion

Based on the data analysis that has been done, it is known that investments in Bitcoin, LQ45, and JII have notably different levels of risk. The danger of investing in Bitcoin is higher than investing in LQ45 and JII, whereas the risk of investing in LQ45 is moderate and that of investing in JII is the lowest. Then, there is no difference in investment returns on Bitcoin, LQ45, and JII based on the results of the data analysis that has been carried out. The average return on the three investment instruments, however, indicates that investments in Bitcoin have the highest level of return when compared to those in LQ45 and JII. In contrast, investments in LQ45 have a moderate return, and investments in JII have the lowest level of return when compared to Bitcoin and LQ45. The findings of the conducted research demonstrate that as the financial instrument's risk increases, so does the return on that investment; conversely, the lower the risk of the investment instrument, the lower the return on that investment.

For future researchers, to increase data sources, not only on historical data, but also to include data on company financial reports or other data sources, and it is also recommended to expand the range of periods observed. Investment instrument variables used in this study are Bitcoin, LQ45, and JII. With this, it is recommended for future research to add other invest with instrument variables as comparisons in research or replace these variables with other investment instrument variables. in future research, it is recommended that comparisons not only be limited to risk and Return, but can involve other comparison variables such as the level of price volatility of the three investment instruments.

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