

# Comparison of the Performance of Cryptocurrency Bitcoin and Stock as an Alternative Investment

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## ARTICLE INFO

### Article history:

Received Oct 02, 2023

Revised Oct 18, 2023

Accepted Oct 24, 2023

### Keywords:

Bitcoin,  
Cryptocurrency,  
Stock

## ABSTRACT

The research aims to test whether there is a real difference between the investment performance of bitcoin and other investment instruments, namely shares. This research is quantitative research. The unit of analysis in this research is the monthly closing price of bitcoin and LQ45 shares for the period January 2018 to April 2021, namely 80 pieces of data. The analytical method used is the comparative method and the data used is secondary data. The results of this research show that there is no real difference between bitcoin and LQ45 shares when viewed from returns, there is a real difference between bitcoin and LQ45 shares when viewed from risk, there is a real difference between bitcoin and LQ45 shares when viewed from Sharpe performance measures. When making an investment, pay close attention to the returns and risks of both bitcoin and shares, don't be tempted by the potential profits without knowing the various risks that could occur and spreading assets across several investment instruments is one of the things recommended by this research.

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## 1. INTRODUCTION

In the financial sector, investment has many investment instruments in the capital market, such as shares, bonds, gold, property, and most recently cryptocurrency (Cryptocurrency) (Jayadi et al., 2022). Basically, investment in the capital market is also known for its high risk-high return characteristics. The increase and decrease in share prices that occur in the capital market is very volatile because it is driven by the forces of supply and demand.

Normal investment profits are relatively high and have an impact on the development of the financial sector, but the risks contained in every investment in the financial sector are also relatively high. One of the investments that has begun to receive attention from the world community since 2013 is investment in digital currency or commonly known as Cryptocurrency. Cryptocurrency is a technology for creating digital or virtual currency that uses cryptography for security which is almost impossible to counterfeit (Al Umar et al., 2022).

Bitcoin is one of the first cryptocurrencies known to people and is the coin that has the largest market capital to date (Sihombing et al., 2021). One very unique characteristic is that no one can control Bitcoin, either institutions or the government. Just as the internet can be used by everyone,

so is the character of Bitcoin. Bitcoin uses a blockchain database that is not controlled by any party, but is very open to the public so it is very impossible for someone to fake transactions on the blockchain. All transactions are recorded directly, transparently and spread across millions of servers. Bitcoin uses peer-to-peer network technology where each user can receive and obtain transactions without any third party intermediaries and also with pseudonymous identities. And there is anti-double-spending technology, which means that bitcoin cannot be claimed by anyone else if it is in the user's wallet.

In Indonesia, the Commodity Futures Trading Supervisory Agency (Bappebti) determines cryptocurrency (crypto currency) as a commodity subject that can be traded on the futures trading exchange. According to Nandana, Country Manager of Luno Indonesia (in wartaekonomi.co.id, 2021), bitcoin is considered attractive enough to be used as a modern and sophisticated currency and investment instrument. Judging from the many Bitcoin exchange websites in Indonesia and also the many forums that talk about Bitcoin in Indonesia. Bitcoin is often compared to other investment instruments, such as shares.

The importance of discussing the performance measurement of an investment instrument in this research is bitcoin and shares, considering that capital market trading has a speculative tendency among investors. This research was conducted using all monthly closing prices. The aim of this research is expected to contribute to research related to investment risk management in bitcoin and shares.

## 2. RESEARCH METHOD

### Types of research

This research is quantitative research using comparative methods, namely comparing the existence of one or more variables in two or more different samples, or at different times (Sugiyono, 2006). In this study, the unit of observation is the monthly closing price of bitcoin and LQ45 shares and the unit of analysis is all monthly closing prices of bitcoin and LQ45 shares for the period January 2018 – April 2021, namely 40 data from each instrument so that a total of 80 observations were obtained.

### Concept Definition

The concept definition in this research includes the concepts of Cryptocurrency Bitcoin and Stocks.

A. Cryptocurrency, according to Aves (2018), cryptocurrency is a digital peer-to-peer exchange medium that uses cryptography to process and secure transactions. The term cryptocurrency was first proposed by Wei Dan in 1998 in an internet article under the name cypherpunks.

B. Bitcoin, according to Aves (2018), bitcoin is seen as a digital currency that can provide a safe and low-cost platform for digital payments, bitcoin can be classified between currencies and commodities with associated financial benefits

Shares, proof of ownership of a company that can be traded are on the capital market. In Indonesia, the capital market is PT. Indonesian Stock Exchange (BEI). BEI has the Composite Stock Price Index (IHSG). BEI also has various sectoral stock indices based on the company's field (Fahmi, 2015). Operationally, each is explained in the table below.

**Table 1.** Operational Definition of Concept

Concept	Definition	Research subject	Formulation	Scale
Return (Jones C.P, 2016)	Comparison of returns for period t with returns for period t-1	Bitcoin	$R_{tBTC} = \frac{P_t - P_{t-1}}{P_{t-1}}$	Ratio
		Stock	$R_{LQ45} = \frac{P_t - P_{t-1}}{P_{t-1}}$	
Standar Deviasi (Risk) (Jones C.P, 2016)	A statistical value that measures the dispersion of a dataset relative to the mean and is calculated as	Bitcoin	$\sigma^{BTC} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$	Ratio
		Stock	$\sigma^{LQ45} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$	

Concept	Definition	Research subject	Formulation	Scale
Sharpe (William F. Sharpe)	square root of variance. Comparison of risk-free rate of return with standard deviation	Bitcoin	$S^{BTC} = \frac{\bar{R}_{pi} - \bar{R}_f}{\sigma_{pi}}$	Ratio
		Stock	$S^{Lq45} = \frac{\bar{R}_{pi} - \bar{R}_f}{\sigma_{pi}}$	

### Data collection

The data collection technique in this research uses literature study and documentation through secondary data obtained from IDX publications, focused on the data used closing stock prices of bitcoin and LQ45 shares for the period January 2018 – April 2021.

### Data analysis method

The data analysis method used in this research is quantitative analysis which is used to analyze bitcoin and stock performance measures. Returns, standard deviations and performance measurements using the Sharpe method are processed using the Microsoft Excel program. Then, the researcher carried out a hypothesis test using a non-parametric statistical test, namely the Kolmogorov Smirnov two-sample test. Testing was carried out using the Statistical Package for the Social Sciences (SPSS) application and then analyzing the results.

### Hypothesis test

The hypothesis test used in this test is the independent sample t test. The reason for choosing this test tool is because the t test is a test of the balance of two population distributions. T test This test is used to find out whether there are differences between the two sample groups studied. The data used is usually on an interval or ratio scale.

The t test is carried out by comparing the difference between two average values with the standard error of the difference in the average of two samples. So the purpose of the t-test is to compare the means of two groups that are not related to each other. Do the two groups have the same average value or are they significantly different? The principle of testing this test is to look at the differences in variance between the two groups of data, so that before testing, you must first know whether the variances are the same (equal variance) or the variances are different (unequal variance).

## 3. RESULTS AND DISCUSSIONS

### T test

#### Test t test on Bitcoin and Stock Returns

Based on data generated from SPSS calculations, the results of hypothesis testing with the t test on bitcoin and stock returns are as follows:

**Table 2.** T Test Return Results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Return	Equal variances assumed	49.553	.000	1.578	78	0.119	5.8895	3.73253	-1.54139	13.3204
	Equal variances not assumed			1.578	42.399	0.122	5.8895	3.73253	-1.64094	13.4199

Source: Secondary Data processed with SPSS

The results of this research show that the returns provided by bitcoin and shares do not have a real difference. This can be seen from the calculated t value of 1.578 < t table 1.990. If you look at the average value, the return given by bitcoin is higher, namely 5.8612, followed by shares, namely -0.0283. The results of this research are in line with research conducted by Nurcahya (2019) which states that bitcoin is an investment instrument that provides the highest returns. According to Fahmi (2015), return is one of the factors that motivates investors to invest and is also a reward for the investor's courage to bear the risks of the investment they make.

### T Test on Bitcoin and Stock Risks

Based on data generated from SPSS calculations, the results of hypothesis testing with the t test on bitcoin and stock risks are as follows.

**Table 3.** Risk t test results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Risk	Equal variances assumed	19.032	.000	8.299	78	.000	0.022075	0.00266	0.01678	0.02737
	Equal variances not assumed			8.299	50.009	.000	0.022075	0.00266	0.016733	0.02742

Source: Secondary Data processed with SPSS

The results of this research show that the risks provided by bitcoin and shares have significant differences. This can be seen from the calculated t value of 8.299 > t table 1.990. If you look at the average value, the risk given by Bitcoin is higher, namely 0.0324, followed by shares, namely 0.0104. The results of this research are in line with research conducted by Liu and Tsyvinki (2018) which states that bitcoin and shares are different. According to Jones (2016), risk is the level of potential loss that will arise because the actual return does not match the expected return.

### T Test on the Performance of Bitcoin and Stocks using the Sharpe Method

Based on data generated from SPSS calculations, the results of hypothesis testing using the t test on the performance of bitcoin and shares using the Sharpe method are as follows.

**Table 4.** Sharpe Performance t Test Results  
Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Sharpe	Equal variances assumed	7.792	0.01	4.933	78	.000	6.968213	1.412497	4.156147	9.78028
	Equal variances not assumed			4.933	68.258	.000	6.968213	1.412497	4.149812	9.78661

Source: Secondary Data processed with SPSS

The results of this research show that the performance provided by bitcoin and shares has significant differences. This can be seen from the calculated t value of 4.933 > t table 1.990. If you look at the average value, Bitcoin's Sharpe performance value is -0.5178, followed by shares, namely -7.4860. The results of this research are in line with research conducted by Mahessara & Kartawinata (2018) and Henriques & Sadorsky (2018) which stated that bitcoin has the best performance.

The Sharpe method is used to compare the return of an instrument to the standard deviation/dispersion of its returns. Bitcoin resembles a commodity or currency according to Aves (2018). If you look at the research data, only bitcoin has a sharpe value above 4, meaning that bitcoin can provide a return above the risk-free rate which is higher than the risk compared to shares.

#### 4. CONCLUSION

Based on the discussion of this research, when compared to bitcoin and shares there is no difference, namely that it can provide capital gains to investors. This can happen because bitcoin price movements closely follow demand from market players and are influenced by circulating news. The performance shown by bitcoin during the research period was very volatile and had a value far greater than that of shares. This occurs due to returns that fluctuate over time based on the data that has been obtained, causing high return dispersion. The return given by Bitcoin is higher than the return dispersion. The advice is related to the results of the discussion "never put all your eggs in one basket", which means don't put all the eggs you have in the same basket. Because if the basket falls, you will lose all the eggs you have. Likewise, the principles that investors must adhere to when investing. It is better to spread assets across several investment instruments. Future researchers are advised to increase the research period and add other variables so that the results obtained are more accurate and can provide more information.

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