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The Impact of Bitcoin Halving Day on Stock Market in Indonesia

Muhammad Harits Zidni Khatib Ramadhani[1], Yana Ulfah[2], Muhammad Rinaldi[3]
Universitas Mulawarman[1,2,3]
Jl. Tanah Grogot, Gn. Kelua, Kec. Samarinda Utara, Kota Samarinda, Kalimantan Timur
Correspondence Email: muhammadharits@feb.unmul.ac.id
ORCID ID: 0000-0002-9837-9308

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ABSTRACT

This study aims to determine the impact of the bitcoin halving day phenomenon that occurred on May 11, 2020, on abnormal return and trading volume activity on listed firms of index LQ45 on the Indonesia Stock Exchange. At the bitcoin halving day, there was a jump in the price of bitcoin and other cryptocurrencies. Based on the event theory, the researcher wanted to find out whether capital market investors in Indonesia tend to switch investment instruments to the cryptocurrency market with this phenomenon. These data were taken weekly for four weeks before the halving and four weeks after the 5-month halving. Using the Paired sample T-test to determine whether there is a difference in abnormal return and trading volume. The results showed that there was a significant difference between stock price's abnormal return and trading volume before the halving day and after the bitcoin halving day. The abnormal return did not increase, but the trading volume decreased, which is thought to be due to the halving day.

Keywords: Abnormal Return, Cryptocurrency, Halving Day, Stock Price, Trading Volume.

INTRODUCTION

In this era, a new form of investment emerged, virtual currency or cryptocurrency Setiawan. (2020). The ownership of cryptocurrencies is managed in a decentralized database called a blockchain. Blockchain is not controlled by a single entity or company (centralized) but jointly owned and uses a consensus mechanism (Zimmerman, 2020). Blockchain offers anonymity, immutability, scalable, and traceability because all transactions are time-stamped, and any data entered into blocks cannot be changed so that it can be viewed through a ledger distributed across all networks stored by the network nodes. This system makes it unhackable and transparent; for this reason, people have started to believe in cryptocurrencies as an investment tool (Nakamoto, 2008).

The widely known cryptocurrency is Bitcoin as the mother of cryptocurrency because it is the earliest cryptocurrency created. There are hundreds or even thousands of cryptocurrencies. Bitcoin is considered valuable because of the scarcity factor. The number of bitcoins in circulation has been pegged at 21 million coins (Taskinsoy, 2021a). A shortage of Bitcoin and high demand will also increase demand for other cryptocurrencies (Taskinsoy, 2021b). Bitcoin is a newly recognized asset, making this instrument volatile, unstable, and fluctuating very quickly. The cycle of rising bitcoin prices can be mapped through historical data from the halving day cycle; fluctuations in cryptocurrency prices are caused by periodic Hash and Halving levels (Ashariansyah, Iriawan & Mukarromah, 2020). The halving day is a scheme every four years programmed on the bitcoin blockchain, reducing the amount of supply to be circulated by 50% (Meynkhard, 2019). New bitcoins will be out of mine in 2140. with the halving, the price of bitcoin has historically gone up. The theory around this is a simple supply and demand: the fewer bitcoins that are created, the more valuable they are (Finextra, 2020)

According to data compiled from Blockchaincenter.net (n.d.), The first Halving Day occurred on November 28, 2012. On the first Halving Day, the rewards for miners dropped from 50 BTC per block to 25 BTC per block. in April 2013, 5 months after the halving occurred, the BTC price touched 242 US dollars. The second Halving occurred on July 9, 2016. The reduction of rewards from 25 to 12.5 BTC per block brought the Bitcoin price from 635 US Dollars to 925 US Dollars in 5 months after the halving. Then at its peak on 17 December 2017, the Bitcoin price was ATH at 19,700 US dollars. This amount is equivalent to Rp. 286,261,685. On May 11, 2020, the third halving took place. Miners' rewards have decreased from 12.5 to 6.25 BTC per block. Just like the previous Halving Day, this reward reduction did not immediately show a direct impact on the price. The price had fallen by 30 percent in line with the unstable condition of the world economy due to the Covid-19 pandemic. The value of Bitcoin is 6,206 US dollars per BTC. However, this condition did not last long. In October 2021, exactly five months since the third halving day, bitcoin has increased to 13,845 US dollars per BTC, after it continuously touched ATH, its peak on 8 November 2021, the value of Bitcoin reached its highest point of up to 68,900 US dollars or around Rp. 999,050.00. Bitcoin seems to follow the Stock Flow model.

Therefore, the researcher wants to find out whether the third halving day that caused an increase in the price of bitcoin and other cryptocurrencies throughout the five months after the halving made investors who want to take advantage of the capital gain opportunity enter to cryptocurrency markets, will be tested for the information content of

the event by using an event study. The benchmarks used by researchers are Abnormal return and trading volume activity. The object of research is issuers listed on the LQ45 index. Because LQ45 issuers have a high market capitalization, these issuers can describe the capital market's general reaction. This research was conducted due to the lack of research on the impact of bitcoin halving day on abnormal returns and LQ45 stock trading volume activities.

LITERATURE REVIEW

Bitcoin

According to the journal (Segendorf, 2014), Bitcoin is a virtual currency for payments made entirely independent of governments and banks. Bitcoin payments are based on a new technical solution that is different from traditional payment systems, bitcoin has advantages in fees, speed, anonymity, and others, but its use also becomes riskier because it is not directly covered by the law legalizing the payment function (Kartawinata & Mahessara, 2018, p.39).

Abnormal Return

Abnormal returns, as defined by (Akbar, Saerang, & Maramis, 2019, p.125), are outcomes that are not as anticipated since the stock returns' summary of the actual outcomes differs from the anticipated outcome. In contrast, abnormal returns, in the words of (Hartono, 2013, p. 94), are the excess of actual returns (actual returns) over normal returns. Normal returns are anticipated or anticipated by investors.

Trading Volume Activity

An indicator called trading volume activity is used to track and quantify how the capital market responds to news and events. Investors can view stock market buying and selling activity using the trading volume activity parameter. Trading activity on the stock exchange will increase as stock buying and selling operations increase.

Event Study Theory

In capital markets, an event study is conducted empirically to analyze an event's impact on a capital market. In other words, this study was done to examine the reaction of capital markets to an event. In capital market research, particularly in testing market efficiency, event study is a methodology used to test the efficiency of the semi-strong form (Bowman, 1983).

Based on the Event Study theory, which studies external phenomena in the capital market, it is investigated whether the halving day phenomenon can significantly change the capital market. Researchers want to know whether stock prices and trading volumes have changed up or down due to the halving day on bitcoin. Research that has been carried out has given several results, such as the halving day event harming the stock market in the United States (Du et al., 2019). Other researchers have shown that cryptocurrencies correlations between the majority of the selected pairs of cryptocurrencies and stock market indices are time-varying (Umar et al., 2020). Further research shows that the increase in cryptocurrency prices also increases stock prices in the banking sector (Sihombing, Nawir, & Mulyantini, 2020). Furthermore, other research shows that cryptocurrencies have a low correlation with the stock price index (Tiwari, Raheem, & Kang, 2019). In another study that examined stock exchanges that reacted between traditional financial markets and the centralized Bitcoin market using a regime-switching model, the results showed that stocks reacted significantly in traditional markets to the Bitcoin market (Matkovskyy, Jalan, & Dowling, 2019). Other research

shows that the movement of cryptocurrencies is not the same as that of stocks (Liu & Tsyvinski, 2018).

This study compares stock prices and volume four months before and after the halving. Soaring cryptocurrency prices are suspected to allegedly make investors tempted to switch instruments from stocks to cryptocurrencies, the hypothesis is:

H_1: There is a difference in Abnormal Return between before and after the bitcoin halving day.

H_2: There is a difference in Trading Volume Activity before and after the bitcoin halving day.

RESEARCH METHOD

This study uses data from LQ45 issuers. The selection of this company is based on LQ45 issuers, which tend to have high liquidity and market capitalization of the total number of shares. The data used is 41 companies, which consists of 8 weeks of the total number of stock prices and trading volumes. LQ45 has a high financial condition, growth prospect, and transaction value. LQ45 shares are known as frequently purchased shares. It is hoped that by examining all LQ45 shares, we can describe the general reaction of the capital market. This research uses the Paired sample T-Test analysis.

The data used are stock prices and trading volume activity, which can be accessed on the yahoo finance website. The data is the closing price every week, at four weeks before the halving and four weeks in the 5th month after the halving. Because based on historical data, the cryptocurrency market reaction occurs after 5 (months) since the halving day, that in both cases the bitcoin halving in 2012 and 2016 took five months for the market to react to the halving, (Meynkhard, 2019). In 2020 the halving day occurred in May 2020.

Consistent with (Rofiah, maslichah & Mawardi, 2019. p.26), this study applies the following steps in calculating abnormal return variables. Calculating abnormal returns with the following equation.

$$AR_{it} = R_{it} - E[R_{it}]$$

AR_{it} is the abnormal return in the event period t, R_{it} is the realized return in period t, and $E[R_{it}$ is the expected return in the event period t. to calculate the expected return with the following equation.

$$E(R_{it}) = RM_t$$

$E(R_{it})$ is the expected return of the i-th security at period t, while RM_t is the market return which is calculated by the following formula.

$$Rm_t = \frac{\text{Indeks IHSG}_t - \text{Indeks IHSG}_{t-1}}{\text{Indeks IHSG}_{t-1}}$$

R_{mt} is the market return for the t-event period, the IHSG index is the IHSG market index in the t (current) period, and the IHSG-1 index is the IHSG market index in period t-1 (previous period). The next step is to recalculate the realization with the following formula.

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$$R_{it} = \frac{Pt - Pt-_{1}}{Pt-_{1}}$$

R_{it} is the return on stock i in period t, Pt is the stock prIce i in period t, and Pt-1the is stock prIce i in period t-1..calculating the Average Abnormal Return (AAR) with the following formula.

$$AAR_t = \frac{\sum^{n} Ari,t}{n}$$

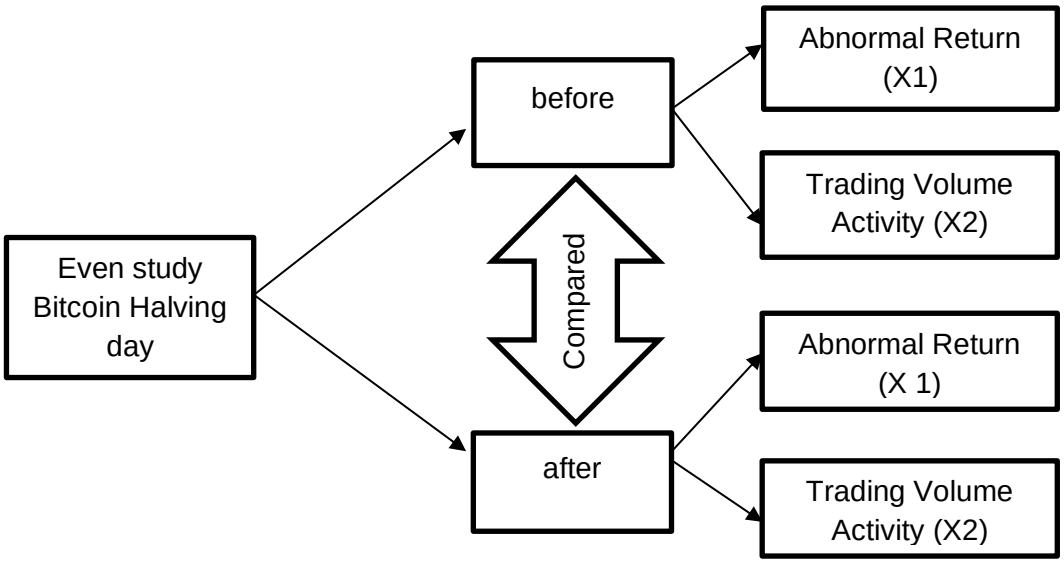
AARt is the average abnormal return on the t-th date, Ari,t is the i-th securities abnormal return on the t-the day, and n is the number of securities. Consistent with Hartawan et al. (2015), this study applies the following steps in calculating the Trading Volume Activity (TVA) variable. To calculate the Trading Volume Activity (TVA) of each security using the following formula.

$$TVA = \frac{\Sigma \text{ Traded shares}}{\Sigma \text{ outstanding shares}}$$

Calculating the average Trading Volume Activity (ATVA) of all stocks sampled.

$$ATVAt = \frac{\sum^{n} TVAi,t}{n}$$

Figure 1. Research Model



RESULTS

Analysis

Table 1. Descriptive Research variable X1 (Abnormal Return) Before

Abnormal Return Before Bitcoin Halving day				
Event	Min	Max	Mean	Std
M-4	-0,2112	0,2602	0,0089	0,0828
M-3	-0,1654	8,5299	0,1800	1,3560
M-2	-0,9458	0,1863	0,0096	0,1632
M-1	-0,0800	0,1808	0,0050	0,0605
	-0,9458	8,5299	0,0509	0,6285

Note: W=Week, M=Montth

Table 2. Descriptive Research variable X1 (Abnormal Return) After

Abnormal Return After Bitcoin Halving day				
Event	Min	Max	Mean	Std
>+5B M+1	-0,2434	0,6361	0,0909	0,1934
>+5B M+2	-0,0417	0,2189	0,0152	0,0501
>+5B M+3	-0,0695	0,1525	0,0121	0,0508
>+5B M+4	-0,0568	0,0841	-0,0075	0,0242
	-0,2434	0,6361	0,0277	0,0768

Note: W=Week, M=Montth

From the results of descriptive analysis, the mean value of the abnormal return variable shows a decrease, the smaller the (X1) abnormal return, the smaller the gap between the actual and the expected return, and the bitcoin halving event is thought to not indicate a price reaction in the stock market in Indonesia.

Table 3. Average Stock Price

X1 Before halving	X1 After Halving
Average price	Average price
22311	23679
20990	23449
21940	22756
21351	22531

Explains that there is an increase in average prices from before the halving day to after the halving day. The output results illustrate that the mean average value for X1 before is smaller than X1 After. This means there is an increase in stock price after the bitcoin halving day.

Table 4. One Sample Test

Event	Test Value = 0					
	t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference		Response
				Lower	Upper	
W-4	0,678	39	0,502	-176,005877	353,455877	No Reaction

W-3	0,840	39	0,406	-2536,627229	6136,677229	No Reaction
W-2	0,372	39	0,712	-425,898380	618,098380	No Reaction
W-1	0,525	39	0,603	-143,362538	243,762538	No Reaction
+5M W+1	2,973	39	0,005	290,663399	1527,686601	Reaction
+5M W+2	1,921	39	0,062	-8,035955	312,585955	No Reaction
+5M W+3	1,511	39	0,139	-41,100394	283,750394	No Reaction
+5M W+4	-1,960	39	0,057	-152,388035	2,388035	No Reaction

We also test the reaction to weekly abnormal returns, assessing reactions based on weekly abnormal return data, reactions occur only in the first week of 5 months after the halving day

Table 5. Descriptive Research variable X2 (Trading Volume Activity) Before

Trading Volume Activity Before Bitcoin Halving day				
Event	Min	Max	Mean	Std
M-4	0,0010	0,3316	0,0243	0,0551
M-3	0,0011	0,2345	0,0212	0,0434
M-2	0,0009	0,1323	0,0155	0,0271
M-1	0,0015	0,1062	0,0132	0,0197
	0,0009	0,3316	0,0185	0,0160

Table 6. Descriptive Research variable X2 (Trading Volume Activity) After

Trading Volume Activity After Bitcoin Halving day				
Event	Min	Max	Mean	Std
>+5B M+1	0,0008	0,0804	0,0112	0,0172
>+5B M+2	0,0007	0,1424	0,0172	0,0275
>+5B M+3	0,0009	0,1738	0,0187	0,0337
>+5B M+4	0,0005	0,0426	0,0065	0,0093
	0,0005	0,1738	0,0134	0,0108

A descriptive analysis of the trading volume activity variable from 0.0185 to 0.0134 shows a decrease in the average trading volume activity indicating a decrease in activity in the stock market which is thought to have occurred due to the bitcoin halving day event.

Table 7. Data Normality test AAR and TVA

One-Sample Kolmoogorov-Smirnoov Test					
		AAR_BEFORE	AAR_AFTER	TVA_BEFORE	TVA_AFTER
N		4	4	4	4
Normal Parameters [a,b]	Mean	0,003249	0,027691	0,021036	0,013396
	Std. Deviation	0,0275620	0,0433320	0,0055451	0,0056301
Most Extreme Differences	Absolute	0,276	0,363	0,262	0,252
	Positive	0,169	0,363	0,210	0,174
	Negative	-0,276	-0,208	-0,262	-0,252
Test Statistic		0,276	0,363	0,262	0,252

Monte Carlo Sig. (2-tailed)[e]	Sig.		0,365	0,068	0,465	0,548
	99% Confidence Interval	Lower Bound	0,352	0,061	0,452	0,535
		Upper Bound	0,377	0,074	0,478	0,561

This study conducted a normality test using the one-sample Kolmogorov-Smirnov test. The basis for decision making is if the count is significant > 0.05 then the data is normally distributed and vice versa if the count is significant < 0.05 the data is not normally distributed (Ghozali, 2011, p.173). Table 2 shown the average abnormal return variable has a sig value of 0.360 and 0.069, the average trading volume activity variable has a sig value of 0.463 and 0.545, and the overall results have a value of > 0.05, so it can be concluded that the two variables are normally distributed.

Table 8. Paired Sample Test X1

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	AAR_SEBELUM - AAR_SESUDAH	-0,0244420	0,0494090	0,0247045	-0,1030627	0,0541788	-0,989	3	0,395

presents the results of the hypothesis testing conducted in this paper using the paired t-test. This test is carried out to compare two interrelated variables and is carried out if the data is normally distributed. significance value (sig.) of 0.395. Therefore the value of sig. 0.395 > 0.05, it can be said that there is no relationship between abnormal returns before the bitcoin halving day in Indonesia and abnormal returns after Bitcoin halving day in Indonesia, h_1 rejected.

Table 9. Paired Sample Test X2

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	TVA_SEBELUM - TVA_SESUDAH	0,0076402	0,0038520	0,0019260	0,0015108	0,0137696	3,967	3	0,029

Table 6 shows the results of testing the hypothesis that the average X2 before the Bitcoin halving day event in Indonesia and trading volume activity after the bitcoin halving day event in Indonesia obtained Sig. (2- tailed) of 0.029 < 0.5. These results show that H_2 is accepted.

DISCUSSION

The results of the Average X1 analysis explain that the first hypothesis (H_1) in this study is rejected, the results of the Paired T-test there are no differences X1 before and after the halving day. this explains that there was no market reaction to the bitcoin halving day that influenced the market prices significantly, even when comparing the average market price before and after bitcoin halving day, there is an increase in the price of the stock price, is suspected that the majority of investors in the capital market did not relinquish their ownership in the stock market because they hoped that prices would continue to rise in the long term, but short-term investors or traders began to hesitate to make purchases because they assumed the existing prices were too high, however in small quantities, there were still buyers who fill in the available lot offers so that this is enough to make the price go up, The increase in stock prices indicates that there is no large sale that can make prices fall, investors are starting to enter the cryptocurrency market by using other funds and diversifying investment instruments, according to (Gil- Alana, Abakah & Rojo, 2020, p.2) cryptocurrency is a new investment asset class in investors' portfolios as it is a diversification option.

Meanwhile, the results of the trading volume activity (TVA) analysis state that the hypothesis (H_2) is accepted, the activities of investors in buying and selling shares varied significantly.. And there was a decrease in activity marked by a decline in trading volume. Based on the nature of an investor who always looks for large profits, it is suspected that the decrease in trading volume activity is caused by traders starting to look at new instruments that offer higher returns, (Katsiampa, 2017) and Vandezande (2017). concluded that the high volatility in cryptocurrencies might be the reason for the high returns in cryptocurrencies. This instrument attracts investors who like high risk and high returns (Ashariansyah et al., 2020).

CONCLUSION

There is no significant difference between X1 before and after the bitcoin halving day event in Indonesia. evidenced by the value of sig. of 0.395 > 0.5 with a mean value before and after of 0.0024442, a t-value of -0.988 was obtained. This result implies that the market does not react to the bitcoin halving day event.

There is a considerable difference between X2 before and after the bitcoin halving day. This is evidenced by the value of sig. of 0.029 < 0.5 with a mean value before and after of 0.00076402, a t-value of 3.967 was obtained. A positive t value indicates that the average TVA after the event is smaller than the average TVA value before the event. The results of this study support the event study theory that an event can change a market and react to the market and investor behavior.

LIMITATION

Further researchers can use other variables such as the bid-ask spread. BAS is a condition where the asking price exceeds the offer price for an asset in the market. These variables can be used to find out how big the gap between demand and supply is. The

more significant the gap, it shows that the liquidity in an asset is low. Low liquidity can be an indication of reduced activity in the investment. Then, share price volatility, SPV, can be used to describe changes in the ups and downs of stock price conditions. The higher the volatility in the stock market, the more speculative the asset tends to be.

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There is no conflict of interest regarding the results of research, systematic writing, and publishing of articles.

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