



## Capital Market Reaction To The Inaugural Of The Carbon Exchange On Lq45 Low Carbon Leaders Stock In Indonesia (Study of Events on LQ45 Low Carbon Leaders Index Shares)

<sup>1</sup> Farhan Al Azhar Besri, <sup>2</sup> Aimatul Yumna

<sup>1,2</sup> Padang State University

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Email :  
farhanbesri2000@gmail.com

### ABSTRACT

This research aims to analyze how the stock market responded to the event of the inauguration of the Carbon Exchange by the President of the Republic of Indonesia Joko Widodo, with a focus on companies included in the LQ45 *Low Carbon Leaders index*. This study uses a quantitative approach. The population studied consisted of companies listed on the Indonesian Stock Exchange. The research sample consisted of 27 of the 30 companies in the LQ45 *Low Carbon Leaders index* sector listed on the Indonesian Stock Exchange. Sampling was carried out using a purposive sampling method, using secondary data obtained through direct inspection on the idx.co.id and Yahoo Finance sites. Data analysis was carried out using descriptive statistical analysis, normality test using *Kolmogorov-Smirnov (KS)*, and difference tests using the *Paired Sample T-Test and Wilcoxon Signed-Rank methods*. The results of this study show that there is no significant difference in *Average Abnormal Return (AR)* and *Average Trading Volume Activity (TVA)* before and after the event, however there are differences in *Abnormal Return (AR)* and *Trading Volume Activity (TVA)* on each day. around the observation.

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## INTRODUCTION

The capital market plays an important role in driving a country's economy and is often used as the main indicator of that country's economic picture. The stability of a country's economy influences the performance of that country's capital market, as well as the Indonesian capital market. To attract buyers and sellers to participate, capital markets must be liquid and efficient. In this regard, investors will compete to find information that is relevant to the market. The issue of climate change has long been a global issue that needs the government's attention. Global competition in handling this problem is one of the main keys to Indonesia's sustainable development in the future. Recent news announcements from financial institutions and international media indicate that climate change is an important economic sector of the future (Paribas 2020).

Climate change cannot be separated from carbon emissions. Efforts to reduce carbon emissions are one effort to prevent or reduce the negative impacts of climate change. Realizing the risks that will arise, developed countries have already made efforts to manage carbon emissions. Developed countries use an interdisciplinary scientific approach to produce the most optimal policies to reduce carbon emissions, one of which is the carbon exchange (Irama 2020). Carbon exchanges are a form of global effort to overcome the impacts of climate change by reducing greenhouse gas emissions. This initiative is designed to provide economic incentives for businesses and countries to limit carbon dioxide (CO<sub>2</sub>) and other greenhouse gas emissions. By embedding the costs of carbon emissions into economic activity, carbon exchanges create incentives for companies to adopt cleaner, environmentally friendly technologies. The Indonesian carbon market is designed to facilitate the trading of carbon credit certificates issued for projects or activities to remove greenhouse gas emissions from the atmosphere to companies that produce carbon emissions below the government's pollution thresholds.

This is an important step in Indonesia's efforts to achieve the emission reduction targets set in the Paris Agreement, namely *Nationally Determined Contributions (NDC)* on climate change. and greenhouse gas emissions. The existence of the Carbon Exchange is one of the strategic steps taken by Indonesia to demonstrate its commitment to complete the ecosystem in supporting the *Net Zero Emission policy* by 2030 while simultaneously exploiting the potential for international carbon trading (Mardiansyah 2023). Based on VOA Indonesia news Tuesday, September 26 2023, President Joko Widodo officially launched and opened

carbon trading on the Indonesian carbon exchange or *IDX Carbon Exchange (IDX Carbon)* at the Main Hall of the Indonesian Stock Exchange (BEI), Jakarta. The inauguration of *IDX Carbon* marks the first buying and selling of carbon through an exchange in Indonesia. In the inauguration, the President of the Republic of Indonesia, Joko Widodo, stated that the inauguration of the carbon exchange is Indonesia's real contribution to fighting together with the world on climate change because profits from carbon trading will be reinvested in efforts to protect the environment, especially reducing carbon emissions (Financial Services Authority, 2023).

With this information the capital market will react to this news. The capital market reaction to the inauguration of the carbon exchange can vary depending on how big the impact is expected to be on the performance and profitability of these companies. Companies that are more environmentally friendly and have taken steps to reduce carbon emissions are expected to receive a positive response from investors, while companies with a large carbon footprint and have not taken mitigation steps may face pressure from investors. Various companies are trying to be actively involved in handling environmental changes from competitors so that the company can gain a competitive advantage. A positive market response is one of the company's sustainability strategies so that it can increase value on the stock market. Carbon performance can lead to increased shareholder value. Companies with good carbon performance will send a positive signal to the market. This action was appreciated by various investors by increasing the company's market share thereby increasing the relevance of the company's value by involving carbon performance. Disclosure of company carbon information will result in value appreciation for the Company. This research aims to test the information content whether there are differences in *average abnormal returns* and *average trading volume activity* before and after the inauguration of the carbon exchange in Indonesia. The data used to conduct research is secondary data obtained from the official website of the Indonesia Stock Exchange ([www.idx.co.id](http://www.idx.co.id)) and the official website of Yahoo Finance company shares ([www.yahoo.finance.com](http://www.yahoo.finance.com)). If investors utilize this information, this phenomenon will influence changes in *Abnormal Returns* and *Trade Volume Activity*.

This research uses three theories. **First** Theory, *Signaling theory* is a theory that pays attention to indications that describe the condition of a company (Harjito et al 2017). **Second**, An efficient capital market is defined as a market in which security prices reflect relevant information. The faster new information is reflected in security prices, the more efficient the capital market is. An efficient market condition is if the market reacts quickly to reach an equilibrium price that fully reflects the available information (Jogiyanto, 2013). **Third**, *return* is the result obtained from an investment which can be in the form of a realized return that has occurred or an expected return that has not yet occurred which is expected to occur in the future (Hartono 2022). **Fourth**, *Abnormal Return, Abnormal return* is the difference between the return obtained and the expected *return*, and can be used to see the reaction of stock prices to information. **Fifth**, Trade Volume Activity (TVA), namely *Trading volume activity* is an instrument that can be used to see the capital market reaction to information through the movement parameters of trading volume activity in the capital market (Primastono 2006). **Sixth**, *Event Study*. Event study is testing market reactions. Event studies have been widely carried out to measure the influence of an event on the price of a company's securities at the time the event occurs (Hartono 2022).

## METHOD

This research uses the event study method by observing the influence of a certain event in a certain period. Event study *itself* is a methodology that is often used as an analytical tool in research in the fields of economics and finance, especially in the capital markets. This research uses secondary data. Secondary data is data that is already available and collected by other parties (Anita and Yulianto, 2016). Secondary data used in this research is daily *closing* stock price data and daily trading volume downloaded via the official website [www.finance.yahoo.com](http://www.finance.yahoo.com). This research takes data from companies listed on the LQ45LCL stock index listed on the Indonesia Stock Exchange. The time used to conduct this research is from September 2023 until completion. The observation period is also called the *window period*. The observation period (*event window*) in this study was taken for 7 days around the announcement date, namely 7 days before the announcement date of the inauguration of the carbon exchange by the President and 7 days after the date of the announcement of the inauguration of the carbon exchange by the President. This period was taken to

avoid *confounding effects* from other events such as *rights issues, warrants, additional shores*, dividend announcements, bonus shares, mergers and so on.

The type of data in this research is quantitative data, namely data presented in the form of numbers that show the value of the variable size. The data source used in this research is secondary data. With the criteria, company data included in the LQ45LCL sector index on the Indonesia Stock Exchange (BEI), Data on daily closing share prices of companies on the Indonesia Stock Exchange (BEI) during the research period, News of the event of the inauguration of the carbon exchange in Indonesia. The population in this study are companies listed on the Indonesia Stock Exchange on the LQ45LCL index.

Abnormal return is the difference between the actual return that occurs and the expected return. Actual return is the return that occurs at time *t* which is the difference in price relative to the previous price. The expected return in this research uses a market-adjusted model assuming that the best estimator for estimating the return of a security is the market index return at that time. Stock trading volume is an indicator used to see market reactions to events or information related to a stock. Changes in trading volume are measured by trading volume activity (TVA).

**RESULTS AND DISCUSSION**

**Results**

**Descriptive Statistics**

The following is a description of the data from the *average abnormal return* and *average trading volume activity variables* which are presented in the following table:

Table 1. Descriptive Statistics on Average Abnormal Return and Average Trading Volume Activity

	<b>AAR Previous</b>	<b>AAR After</b>	<b>ATVA Before</b>	<b>ATVA After</b>
Mean	-0.000402	0.002116	0.001174	0.001167
Minimum	-0.0085	-0.0102	0.0009	0.0009
Maximum	0.0100	0.0142	0.0020	0.0015
Std. Dev	0.0077036	0.0103734	0.0003698	0.0002177
Sum	0.0028	0.0148	0.0082	0.0082
N	7	7	7	7

**Classic assumption test**

**a. Normality test**

The normality test used in this research is the *Kolmogorov-Smirnov (KS)* test. If the normality test results show that the sample is normally distributed, then the different test that will be used is the parametric test or *Paired Sample T-Test*.

Table 2. One-Sample Kolmogorov-Smirnov Test

<b>One-Sample Kolmogorov-Smirnov Test</b>			
<b>NPar Test</b>	<b>N</b>	<b>Statistical Tests</b>	<b>Asymp. Sig. (2-tailed)</b>
AAR Previous	7	0.234	0.200
AAR After	7	0.169	0.200

Based on the data processing results in table 2, it shows that *the average abnormal return (AAR)* before the inauguration of the Carbon Exchange obtained a *Kolmogorov-Smirnov value* of 0.234 with a significance level of  $(0.200) > \alpha = 0.05$ , this means that *Ha* is accepted so that the data is normally distributed. The *Kolmogorov-Smirnov average abnormal return* value after the inauguration of the Carbon Exchange was 0.169 with a significance level of  $(0.200) > \alpha = 0.05$ , this means that *Ha* is accepted so that the data is normally distributed.

Table 3. Analysis of Abnormal Return Normality Test Data

<b>One-Sample Kolmogorov-Smirnov Test</b>			
<b>NPar Test</b>	<b>N</b>	<b>Statistical Tests</b>	<b>Asymp. Sig. (2-tailed)</b>
AR H-1	27	0.138	0.200
AR H+1	27	0.230	0.001
AR H-2	27	0.168	0.048
AR H+2	27	0.180	0.025
AR H-3	27	0.158	0.081
AR H+3	27	0.117	0.200
AR H-4	27	0.147	0.137
AR H+4	27	0.141	0.182
AR H-5	27	0.107	0.200
AR H+5	27	0.136	0.200
AR H-6	27	0.181	0.023
AR H+6	27	0.114	0.200
AR H-7	27	0.242	0.000
AR H+7	27	0.248	0.000

In table 3, the results of data processing show that *the abnormal return* (AR) on the days of observing the inauguration of the carbon exchange obtained varying values, namely some days were Normally distributed and some days were not normally distributed, for those with Normal distribution they appeared on days namely D-3- H+3, H-4-H+4 and H-5-H+5 while H-1-H+1, H-2-H+2, H-6-H+6 and H-7-H+ 7 for non-normal distribution.

Table 4. Data Analysis Normality Test Average Trading Volume Activity

<b>One-Sample Kolmogorov-Smirnov Test</b>			
<b>NPar Test</b>	<b>N</b>	<b>Statistical Tests</b>	<b>Asymp. Sig. (2-tailed)</b>
ATVA Before	7	0.298	0.061
ATVA After	7	0.251	0.200

Based on the data processing results in table 4.4, it shows that *the average trading volume activity* (ATVA) before the inauguration of the Carbon Exchange obtained a *Kolmogorov-Smirnov* value of 0.298 with a significance level of  $(0.061) > \alpha = 0.05$ , this means that  $H_a$  is accepted so that the data is normally distributed. *Kolmogorov-Smirnov* value *Average trading volume activity* after the inauguration of the Carbon Exchange was 0.251 with a significance level of  $(0.200) > \alpha = 0.05$ . This means that  $H_a$  is accepted so that the data is normally distributed.

Table 5. Analysis of Trading Volume Activity Normality Test Data

<b>One-Sample Kolmogorov-Smirnov Test</b>			
<b>NPar Test</b>	<b>N</b>	<b>Statistics test</b>	<b>Asymp. Sig. (2-tailed)</b>
VAT H-1	27	0.230	0.001
VAT H+1	27	0.362	0.000
VAT H-2	27	0.352	0.000
VAT H+2	27	0.326	0.000
VAT H-3	27	0.355	0.000
VAT H+3	27	0.286	0.000
VAT H-4	27	0.241	0.000
VAT H+4	27	0.245	0.000
VAT H-5	27	0.324	0.000
VAT H+5	27	0.347	0.000
VAT H-6	27	0.297	0.000
VAT H+6	27	0.321	0.000

VAT H-7	27	0.278	0.000
VAT H+7	27	0.277	0.000

In table 5, the results of data processing show that *trading volume activity* (TVA) on the days of observing the inauguration of the carbon exchange all obtained the same value, that is, all days were not normally distributed, so the difference test was carried out using a non-parametric test or *the Wilcoxon Signed Rank Test*.

**Hypothesis testing**

**Hypothesis Test I**

Table 6. Paired Sample T-Test AAR Test Table for the Period Before and After the Event

Paired Sample T-Test	Paired Differences		
	Mean	Std. Deviation	Sig. (2-tailed)
AAR Before - AAR After	-0.0025177	0.0159446	0.691

Based on the results of calculations in statistical tests, *paired-sample t test analysis* with the help of the *Statistical Package for Social Science* (SPSS) program in table 4.6, *the average abnormal return* (AAR) variable shows a sig (2-tailed) value of 0.691, which means above the significance level. which has been determined at 0.05 so it can be concluded that Hypothesis 1 is rejected.

The first alternative hypothesis in this research is that there is a suspected difference in abnormal returns (AR) in shares included in the LQ45LCL Index on the observation days before and after the inauguration of the Carbon Exchange by the President of the Republic of Indonesia Joko Widodo.

Table 7. Paired Sample T-Test AR Test Table Period of Event Observation Days

Paired Sample T-Test	Paired Differences		
	Mean	Std. Deviation	Sig. (2-tailed)
AR H-3 – AR H+3	-0.0096524	0.0219728	0.031
AR H-4 – AR H+4	0.0081673	0.0310363	0.183
AR H-5 – AR H+5	0.0201644	0.0248689	0,000

Table 8. Table of Wilcoxon Signed Rank Test AR Period Days of Event Observation

Uji Wilcoxon Signed Rank Test	Test Statistics	
	Z	Asymp. Sig. (2-tailed)
AR H-1 – AR H+1	-4,277	0,000
AR H-2 – AR H+2	-2,715	0,007
AR H-6 – AR H+6	-2,427	0,015
AR H-7 – AR H+7	-1,562	0,118

Based on the results of statistical test calculations with the help of the *Statistical Package for Social Science* (SPSS) program on the first alternative hypothesis in tables 4.7 and 4.8 **namely**, *abnormal return* (AR) analysis for each day of the event period shows that there are sig (2-tailed) value results below the significance level (<0.05) on certain days, namely H-1-H+1 of 0.000, H- 2-H+2 is 0.007, H-3-H+3 is 0.031, H-5-H+5 is 0.000 and H-6-H+6 is 0.015. So the alternative hypothesis on several days can be accepted (H1a, H1b, H1c, H1e and H1f). Meanwhile, H-4-H+4 and H-7-H+7 show the results of sig (2-tailed) values above the level significance is 0.05, then the alternative hypothesis on these two days is rejected (H1d and H1g). This shows that the market response to this event occurred on certain days with the dominant days closest to the event.



**Hypothesis Testing 2**

Table 9. Table of Paired Sample T-Test ATVA for the period before and after the event

Paired Sample T-Test	Paired Differences		
	Mean	Std. Deviation	Sig. (2-tailed)
ATVA Before - ATVA After	0.0000070	0.0004785	0.970

Based on the calculation results of the statistical test, *paired-sample t test analysis* with the help of the *Statistical Package for Social Science* (SPSS) program in table 4.9, the *average trading volume activity* (ATVA) variable shows a sig (2-tailed) value of 0.970, which means above the level The significance has been determined at 0.05 so it can be concluded that Hypothesis 2 is rejected. This means that there is no significant difference in the difference in *average trading volume activity* (ATVA) before and after the inauguration of the Carbon Exchange by the President of the Republic of Indonesia Joko Widodo in companies listed in the LQ45LCL Index.

Table 10. Wilcoxon Signed Rank Test TVA Before and After Events

Use the Wilcoxon Signed Rank Test	Test Statistics	
	OF	Asymp. Sig. (2-tailed)
VAT H-1 – VAT H+1	-0.553	0.581
VAT H-2 – VAT H+2	-0.240	0.810
VAT H-3 – VAT H+3	-1.177	0.239
VAT H-4 – VAT H+4	-0.577	0.564
VAT H-5 – VAT H+5	-3.003	0.003
VAT H-6 – VAT H+6	-2.931	0.003
VAT H-7 – VAT H+7	-4.252	0.000

Based on the results of statistical test calculations with the help of the *Statistical Package for Social Science* (SPSS) program on the first alternative hypothesis in table 4.10 namely, analysis of *trading volume activity* (TVA) for each day of the event period shows that there are sig (2-tailed) value results below the significance level (<0.05) on certain days, namely H-5-H+5 of 0.003, H -6-H+6 is 0.003 and H-7-H+7 is 0.000. So the alternative hypotheses on several days can be accepted (H2e, H2f and H3g). Meanwhile, H-1-H+1, H-2-H+2, H-3-H+3 and H-4-H+4 show the results of sig (2-tailed) values above the level significance (> 0.05 ) then the alternative hypothesis on these two days is rejected (H2a, H2b, H3c and H2d). This shows that the market response to this event occurred on certain days with the dominant days being far away from the event.

Table 11. Hypothesis Research Summary Results

Hypothesis	Hypothesis Statement	Results
H1	There is a difference in average abnormal returns before and after the inauguration of the Carbon Exchange by the President of the Republic of Indonesia Joko Widodo.	Rejected
H2	There is a difference in average trading volume activity before and after the inauguration of the Carbon Exchange by the President of the Republic of Indonesia Joko Widodo.	Rejected

**CONCLUSION**

There was no significant difference in the *average abnormal return* (AAR) 7 days before and after the event of the inauguration of the Carbon Exchange by the President of the Republic of Indonesia Joko Widodo. However, there was a difference in the *abnormal return* (AR) in the days surrounding the observation of the event of the Inauguration of the Carbon Exchange by the President of the Republic Indonesia Joko Widodo , and there was no significant difference in *average trading volume activity* (ATVA) before and after the inauguration of the Carbon Exchange by the President of the Republic of Indonesia Joko

Widodo. However, there was a difference in *trading volume activity* (TVA) in the days surrounding the observation of the Inauguration event Carbon Exchange by the President of the Republic of Indonesia Joko Widodo. The reason for this lack of reaction is strongly suspected and can be understood by considering that investors may not see the inauguration of the Carbon Exchange as information that significantly changes company or market fundamentals. However, investors use this public information as a consideration for making short-term investments to take advantage of existing profits. Thus, the conclusion of this research shows that the event of the inauguration of the Carbon Exchange did not have a significant impact on *the average abnormal return* and *average trading volume activity* of shares, which can be interpreted as meaning that investors did not change their investment strategy significantly in response and chose to "wait and see" regarding the incident. However, this event was fully utilized by short-term investors or traders to take advantage of the events on the day of the inauguration of the Carbon Exchange by the President of the Republic of Indonesia, Joko Widodo.

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