

# Abnormal Return Analysis of Heatwave Announcement in China Has the Potential to Increase Indonesia's Coal Exports in Bumi and Adro Stocks

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## ABSTRACT

*This study aims to determine the heatwave announcement in China can increase Indonesia's coal export potential. On the abnormal Return on shares of PT Bumi Resource Tbk (BUMI) and PT Adaro Energy Indonesia Tbk (ADRO). The method used to analyze this research is an event study. Hypothesis testing was carried out using normality tests, paired sample t-tests and one-sample T-tests. From the results of this study, it was found that there was no significant abnormal difference in return after the announcement was published. Therefore, the results were obtained that the published announcement did not contain information for investors because there was no abnormal return around the event.*

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## INTRODUCTION

The capital market is declared optimal if it can meet two main conditions, protection for investors and market must be efficiency (Widiyo, 2018). Miller (1999) and several other financial experts state that one of the most important discoveries in the development of financial theory is the theory of efficient markets. This theory continues to be highlighted and empirically tested in almost all capital markets in different parts of the world. The main keyword to determine whether a market can be efficient is to look at the relationship between information and security movement. Capital market efficiency can be assessed well if the price movement of security describes all the relevant information available (Cho, 2022).

The sooner new information is reflected in the security's price. The more efficient the capital market will be. Investors will find it challenging to make above-average profits (abnormal returns). According to Sakowski (2018), efficiency in the context of investment can be expressed in the sentence, "What information can we squeeze from the market?" This expression means that when all information can be accessed quickly and cheaply by all market participants, the price created is an equilibrium price. As a result, no investor can get abnormal returns by utilizing the information he has. Not only the company's internal sector but the external sector also affects changes in the stock price of a company. Macroeconomic and microeconomic conditions have a significant influence on the movement of stock prices in the market, even the economic conditions of other countries that correlate with each other also have an influence on the movement of the stock price of an issuer (Liu, 2022).

The climate is one of the factors that significantly impact a region's economy (Khadijah, 2022). That's what is now happening to China. Since the beginning of July 2022, the air temperature in China has reached 40 degrees Celsius. Conditions in drought and the receding of several significant rivers, including the Yangtze. According to a report by The Guardian, 80% of China's energy supply is supported by hydroelectric power generation. As a result, large manufacturing companies were forced to suspend their operations. Responding to this, Dan Wang, economist of Hang Seng Bank, on Friday (19/8/2022) issued an official warning regarding the impact of the heat wave on the economic sector.

Data from China's state media reports noted that vehicle factories such as Tesla and SAIC motors were disrupted in production activities due to a reduction in electricity supply. Not stopping there, 16 other vehicle factories also stopped their activities due to the power cut carried out on Friday (12/8/2022). As a measure to overcome the energy crisis, the Chinese government then made the use of coal more effective. Nationally, China needs 8.16 million tonnes of thermal coal daily during the first week of August. This number has increased by 22% from July and is predicted to increase to 69% in September.

On Tuesday (23/08/2022), Chief Economist of Bahana Sekuritas, Putera Satria Sambijantoro, said that Indonesia, as a country producing significant commodities such as coal, has the potential to benefit due to the *heatwave* that afflicts China. The increasing value of exports and the trade balance surplus provide room for

fiscal and monetary reforms. On the other hand, China is now storing several crucial energy *commodities (rationing)*, such as coal, from supplying countries such as Russia, Australia, and Indonesia. On the same date, Mohammad Faisal, Executive Director of CORE Indonesia, stated that this *heatwave* is a condition that will shake global supply chains. Countries with export need to China will benefit because of the enormous demand to restore manufacturing companies that have stalled production.

As a new coal-producing country, Indonesia has several companies that focus on the sector. Among them are BUMI and ADRO, which are the two largest coal processing companies in Indonesia. BUMI is the most extensive coal processing company code in Indonesia, Bumi Resource Tbk. Established on June 26, 1973, initially, this company was engaged in the hospitality and tourism industry. BUMI's business fields were transformed into the mining, oil, and natural gas industries. Based on the company's last articles of association, BUMI's scope of activities is more concentrated on coal. Meanwhile, ADRO is the company code of PT Adaro Energy Indonesia which conducted its IPO and was listed on the IDX in 2008. The company is headquartered in Jakarta with a focus on coal mining.

The study aims to test and analyze whether the announcement of a heatwave in China has the potential to increase coal exports in Indonesia, is considered to have information content and will provide abnormal returns on the shares of two coal mining companies, BUMI and ADRO. The expected use of the results of this study is to be able to provide theoretical and practical understanding. Namely, for practical understanding, this research is expected to add insight and know the form of market efficiency. Meanwhile, in practical understanding, this research is expected to contribute thoughts and considerations for investors in decision-making.

Previous studies on the form of market efficiency have shown varying results. In Indonesia, research conducted by Yunita (2019), Grisella (2018), and Hase (2018) shows that the Indonesian market is inefficient. Meanwhile, research conducted by Nigrum (2022), Khoirunnisa (2019), and Suarjaya (2018) shows that the Indonesian capital market has been in a semi-strong efficient form. These varied results make similar studies attractive to re-conduct.

## RESEARCH METHOD

### 1.1 Object and Scope of Research

In this study, the method used is an event study. The population taken is all companies engaged in coal mining in Indonesia, have conducted an Initial Public Offering (IPO), and are listed on the Indonesia Stock Exchange (IDX). The samples used were from two coal mining companies: PT Bumi Recourse Tbk (BUMI) and PT Adaro Energy Indonesia Tbk (ADRO). According to Sugiyono (2015), research variables are everything that has any form set by the researcher to be studied, so that information about it has a measurable value. The variables used in this study are actual Return, Expected Return and abnormal Return.

The published event date set as event day ( $t=0$ ) is a heatwave announcement in China that can increase Indonesia's coal export potential on August 23, 2022. The study took an estimated one hundred days before the announcement ( $t-100$ ) to thirty-one days before the announcement ( $t-31$ ). The window period takes 30 days before the announcement ( $t-30$ ) until 30 days after the announcement ( $t+30$ ) is published to the public.

This study uses quantitative data. This quantitative data is in the form of BUMI's stock price, ADRO's share price and the Jakarta Composite Index (JCI) from March 18, 2022, to October 4, 2022. The data sources used are secondary data obtained from Yahoo Finance, statistical journals, books, and other journals that have been previously published (Sekaran, 2006)

### 1.2 Research Operations

#### 1) Calculating actual returns

An actual Return is an acceptable profit on a certain period of investment. Mathematically it can be formulated as follows:

$$R_{i,t} = \frac{(P_{i,t} - P_{i,t-1})}{P_{i,t-1}}$$

$R_{i,t}$  = i-th company return in the t-the period  
 $P_{i,t}$  = Daily share price of security i at time t  
 $P_{i,t-1}$  = daily share price of security i at time t-1

#### 2) Calculating expected Return

The expected return calculation using the market model method is carried out in two stages. First, form an expectation model using realization data during the estimated period. Second, use this expectation model to estimate the Return of expectations in the window period. Expectation models can be formed using the OLS (Ordinary Least Square) regression technique with the following equations:

$$E(R_{i,t}) = \alpha_i + \beta_i RM_i + \varepsilon_{it}$$

$E(R_{i,t})$  = Return on the i-th Estimated Realization of Securities in the j-th Estimated Period

$\alpha_i$  = Intercept for i-th securities

$\beta_i$  = Slope coefficient, which is the beta of the i-th security

$RM_i$  = Market return on the j-th estimate

$\varepsilon_{it}$  = I-th securities residue error in the j-th estimated period

### 3) Calculating abnormal returns

Abnormal Return is the difference between actual Return and Expected Return. The calculation of abnormal returns is mathematically formulated by:

$$AR_{it} = R_{i,t} - E(R_{i,t})$$

$AR_{it}$  = abnormal Return on shares i in period t

$R_{i,t}$  = actual Return on shares i in period t

$E(R_{i,t})$  = Expected Return of Stock I in the t-th period

### 4) Calculating Cumulative Abnormal Return (CAR)

Cumulative abnormal returns are obtained by summing the abnormal returns of each security in the window period. The calculation can be formulated by

$$CAR_{it} = \sum_a^t AR_{ia}$$

$CAR_{it}$  = cumulative abnormal Return for i-th security on day t

$AR_{ia}$  = abnormal Return for i-th security on day a

## 1.3 Stages of Hypothesis Testing

Hypothesis testing in this study used computer software in the form of Microsoft Excel programs and SPSS series 25 programs. The stages for conducting hypothesis testing are described as follows:

### 1) Data Collection

The data used is secondary data on the share prices of BUMI and ADRO companies and IHSG. The data was obtained from Yahoo. Finance with a period starting from March 18, 2022, to October 4, 2022

### 2) Descriptive Statistical Test

Descriptive statistical tests state an overview or description of a person seen from the lowest value (minimum), highest value (maximum), average value (mean) and data dissemination rate (standard deviation).

### 3) Test Data Normality

The purpose of the normality test is to determine whether the statistical test is used in customarily distributed research or not. First, the data will be tested for normality with the (Iryanto, 2018) Kolmogorov-Smirnov normality test. If the data is average, then the test is carried out with one sample T-test parametric test. Meanwhile, the Wilcoxon Signed Rank Test is used if the data is abnormal (Suwarto, 2020). The guideline for decision-making in normality tests is to compare the significance value with the  $\alpha$  level used. A regression model can be said to be normally distributed if it qualifies:

- Significance or probability value (P-Value) > 0.05, then the normal distribution (H0 rejected or Ha accepted)
- Significance or probability value (P-Value) < 0.05, then the data distribution is abnormal (H0 accepted or Ha rejected)

## 1.4 Hypothesis Test Methods

### 1) Hypothesis 1: There is an Abnormal Return around the date of the announcement

If the distribution data is average, then the first hypothesis test in this study uses a Paired sample T-test. However, if the distributed data is abnormal, then the Wilcoxon Signed Rank Test is used. The hypothesis testing steps are carried out as follows:

- Determining the Hypothetical Zero (H0)

Based on previous research, it was obtained

**H0** = There is no abnormal difference in returns before and after the announcement on the shares of BUMI and ADRO companies.

- Determining alternative hypotheses (Ha 1)

**Ha 1** = There is an abnormal return before and after an announcement on the shares of BUMI and ADRO companies.

- With a significance level of 0.05 for testing, there is an abnormal return around the announcement

- Determining whether a hypothesis is accepted or rejected:

- If Sig. (2-tailed) > 0.05; then H0 is accepted, and Ha is rejected.
- If Sig. (2-tailed) < 0.05; then H0 is rejected and Ha is accepted
- 

### 2) Hypothesis Testing 2: Market Reaction Speed

The second hypothesis testing was carried out by looking at the abnormal test results of significant and non-prolonged returns on the date of the published announcement. It used a one-sample T-test to see the market reaction speed. If there is an abnormal positive return that is only significant on the day the

announcement is published, then the market reacts quickly to the information, and it can be said that the capital market is already half as efficient as informationally vital. (Iryanto, 2018)

### 3) Hypothesis Testing 3: Market Efficiency

The third hypothesis can be proven if the first and second hypotheses are proven (Iryanto, 2018). The first step is to test the information content. Testing the content of this information is carried out by looking at the market's reaction to the announcement. The market will react if the announcement has information content. The presence or absence can see this reaction of abnormal returns around the announcement date. The results of testing the information content need to be analyzed for the speed of market reaction in absorbing existing information.

## RESULTS AND DISCUSSIONS

### Normality Test

The results of the normality test using the Kolmogorov-Smirnov test can be seen in the following table.

Table 1. Kolmogorov Smirnov BUMI Normality Test

| No. | Variable                 | Statistics | Df | Sig. (2-tailed) |
|-----|--------------------------|------------|----|-----------------|
| 1   | BUMI Before Announcement | .137       | 30 | .158            |
| 2   | BUMI After Announcement  | .121       | 30 | .200            |

Source: Data processed with SPSS series 25, 2022

Table 1 is the normality test result for abnormal stock *return* data 30 days before to 30 days after the announcement. Based on the table, the results showed that the *abnormal value* of BUMI company returns is distributed normally.

The acquisition of Asymp shows this *Sig. (2-tailed)* Thirty days before the announcement of 0.158 and 30 days after the announcement of 0.200. With the results of *Asymp.Sig. (2-tailed)* a value greater than the significant value of  $\alpha$  by 0.05 ( $0.200 > 0.05$ ). The *abnormal data* of the BUMI's returns are normally distributed. Furthermore, a paired sample T-test will be conducted to see whether there are abnormal returns differences before and after the announcement.

Table 2. Kolmogorov Smirnov ADRO Normality Test

| No. | Variable                 | Statistics | Df | Sig. (2-tailed) |
|-----|--------------------------|------------|----|-----------------|
| 1   | ADRO Before Announcement | .099       | 30 | .200            |
| 2   | ADRO After Announcement  | .167       | 30 | .320            |

Source: Data processed with SPSS series 25, 2022

Table 2 is the normality test result for abnormal stock return data 30 days before to 30 days after the announcement. Based on the table, the results showed abnormal data of normally distributed ADRO returns.

The acquisition of *Asymp.Sig. (2-tailed)* Thirty days before the announcement of 0.200 and 30 days after the announcement of 0.320. With the results of *Asymp.Sig. (2-tailed)* valued at more than a significant value of  $\alpha$  of 0.05 ( $0.320 > 0.05$ ), meaning that this abnormal data of ADRO return are normally distributed. Furthermore, a paired sample T-test will be conducted to see whether or not there is an abnormal return before and after the announcement.

### T-test

The results of the T-test during the window period can be seen in tables 3 and 4 as follows:

Table 3. Paired Sample T-Test BUMI

| Variable                  | Mean           | t count | Df | Sig. (2-tailed) |
|---------------------------|----------------|---------|----|-----------------|
| Difference Before - After | 16745507,10000 | 1.219   | 30 | .233            |

Source: Data processed with SPSS series 25, 2022

Table 3 is the result of hypothesis 1 testing using the Paired sample t-test. Analysis of abnormal return data 30 days before to 30 days after the announcement on BUMI shares obtained an *Asymp.Sig (2-tailed)* value of 0.233. The value is greater than the significant  $\alpha = 0.05$  ( $0.233 > 0.05$ ). Hypothesis 1 shows abnormal returns before and after the announcement of the shares of the BUMI company **is rejected**. Since the results show that there is no abnormal difference in returns, it indicates that investors think this announcement does not contain information that is relevant to them. So they don't react and result in abnormal differences.

Table 4. Paired Sample T-Test ADRO

| Variable                  | Mean           | t count | Df | Sig. (2-tailed) |
|---------------------------|----------------|---------|----|-----------------|
| Difference Before - After | -5210350.96667 | -.912   | 30 | .369            |

Source: Data processed with SPSS series 25, 2022

Table 4 is the results of hypothesis testing 1 using paired sample t-test. Analysis of abnormal return data 30 days before to 30 days after the announcement on ADRO shares obtained an *Asymp.Sig (2-tailed)*

value of 0.369. The value is greater than the significant  $\alpha = 0.05$  ( $0.369 > 0.05$ ). Hypothesis 1, There is an abnormal return before and after the announcement in shares of the ADRO company, **is rejected**. Since the results show that there is no abnormal difference in returns, it indicates that investors think this announcement does not contain information that is relevant to them. So they do not react and result in abnormal returns.

### Test One Sample T-Test

The results of the calculation of one sample T-test on abnormal returns of BUMI and ADRO can be seen in table 5 as follows:

Table 5. Test One Sample T-Test BUMI and ADRO

| BEFORE ANNOUNCEMENT |        |    |                 | AFTER THE ANNOUNCEMENT |        |    |                 |
|---------------------|--------|----|-----------------|------------------------|--------|----|-----------------|
| Day                 | t      | Df | Sig. (2-tailed) | Day                    | t      | Df | Sig. (2-tailed) |
| H-1                 | -.825  | 1  | .561            | H+1                    | 3.137  | 1  | .196            |
| H-2                 | 1.428  | 1  | .389            | H+2                    | 1.237  | 1  | .433            |
| H-3                 | 1.894  | 1  | .309            | H+3                    | 2.019  | 1  | .293            |
| H-4                 | -.454  | 1  | .729            | H+4                    | 1.721  | 1  | .335            |
| H-5                 | .022   | 1  | .986            | H+5                    | 1.006  | 1  | .498            |
| H-6                 | 1.359  | 1  | .404            | H+6                    | -.119  | 1  | .925            |
| H-7                 | -.414  | 1  | .750            | H+7                    | 1.131  | 1  | .461            |
| H-8                 | 3.680  | 1  | .169            | H+8                    | 1.914  | 1  | .307            |
| H-9                 | 2.274  | 1  | .264            | H+9                    | 1.249  | 1  | .430            |
| H-10                | -.643  | 1  | .636            | H+10                   | 1.609  | 1  | .354            |
| H-11                | -.699  | 1  | .612            | H+11                   | 1.442  | 1  | .386            |
| H-12                | -.814  | 1  | .565            | H+12                   | -.714  | 1  | .605            |
| H-13                | 1.589  | 1  | .358            | H+13                   | .567   | 1  | .672            |
| H-14                | -.857  | 1  | .549            | H+14                   | 1.724  | 1  | .335            |
| H-15                | 1.429  | 1  | .389            | H+15                   | -.806  | 1  | .568            |
| H-16                | .597   | 1  | .658            | H+16                   | 2.006  | 1  | .294            |
| H-17                | -.445  | 1  | .734            | H+17                   | 1.237  | 1  | .433            |
| H-18                | 1.377  | 1  | .400            | H+18                   | -1.444 | 1  | .386            |
| H-19                | 1.809  | 1  | .321            | H+19                   | -.453  | 1  | .729            |
| H-20                | 1.224  | 1  | .436            | H+20                   | -.273  | 1  | .831            |
| H-21                | .151   | 1  | .905            | H+21                   | 4.136  | 1  | .151            |
| H-22                | 2.085  | 1  | .285            | H+22                   | 1.278  | 1  | .423            |
| H-23                | -.123  | 1  | .922            | H+23                   | -.280  | 1  | .826            |
| H-24                | 1.441  | 1  | .386            | H+24                   | -.989  | 1  | .504            |
| H-25                | 3.225  | 1  | .191            | H+25                   | 1.568  | 1  | .361            |
| H-26                | -.908  | 1  | .531            | H+26                   | -.133  | 1  | .916            |
| H-27                | -.412  | 1  | .751            | H+27                   | 13.725 | 1  | .046            |
| H-28                | 1.114  | 1  | .466            | H+28                   | 2.552  | 1  | .238            |
| H-29                | 1.270  | 1  | .425            | H+29                   | 1.537  | 1  | .367            |
| H-30                | 51.005 | 1  | .012            | H+30                   | 1.652  | 1  | .347            |

Source: Data processed with SPSS series 25, 2022

Based on the calculation results of table 5, it can be seen that during the observation period ranging from ( $t = 0$ ) to day 30 ( $t + 30$ ), the p-value fluctuates. The p-value, however, is always greater than the level of

significant  $\alpha = 0.05$  ( Sig. (2-tailed)  $> \alpha$  ( 0.05) ). The market did not react to the announcement. It is proven by the absence of abnormal positive return values around the announcement. That is, the announcement is judged to be irrelevant to them. So the second hypothesis that there is an abnormal return that is positive and not prolonged in the announcement made on August 23, 2022, about the heatwave in China, which has the potential to increase coal exports in Indonesia, **is rejected**.

### Hypothesis Test Analysis And Discussion

Based on the tests that have been carried out, then further discussion of the research hypothesis is carried out:

#### 1) Hypothesis 1: Information Content against abnormal returns

From the calculation results of tables 3 and 4, it is obtained that the p-value is greater than the level of significant  $\alpha = 0.05$  ( Sig. (2-tailed)  $> \alpha$  (0.05) ). Both indicate that this first hypothesis **is rejected**. The absence of abnormal returns around the announcement can be caused by the following:

##### a) Investors judged that the announcement did not contain any relevant information.

Tandelilin (2001) reveals that if investors consider an announcement relevant, they will react quickly and form a new market equilibrium price so that the new securities formed can reflect all the information in it. In this study, the market did not react, as evidenced by the absence of abnormal returns. That is, investors are likely to consider that the announcement is irrelevant or contains information for them.

##### b) Wait and See Action

Based on research conducted by I Made and Nyoman Ari (2014), the absence of abnormal returns around the announcement can be influenced by wait-and-see actions taken by investors. They do not want to take too fast a risk in making decisions from external information of the issuer's company. Moreover, the heatwave in China is a long-term event. Investors will likely consider that the coal stock price will remain stable because exports will be carried out relatively long.

#### 2) Hypothesis 2: The speed of market reaction

Another aspect tested to determine the efficiency of the semi-strong form market in information is the speed at which the market reacts to information. A market is said to be semi-informationally efficient if an announcement that is judged to have information content is responded to quickly by the market and quickly reaches a new equilibrium price. Testing the market reaction speed can be done by looking at the abnormal movement of stock returns after an announcement.

The results from table 5 show that the market did not react at all. Then the speed of market reaction in this study is not proven. Referring to the research conducted by Suarjana (2011), the reaction cannot be said to be half-strong efficient because the market is relatively prolonged. An informationally efficient market reacts quickly, i.e. only at the time of announcement (Solikhin, 2010). The results of this test do not support the second hypothesis (Ha2). The market reacts slowly and prolonged. Then the second hypothesis **is rejected**.

#### 3) Hypothesis 3: Market Efficiency

Following the framework of hypothesis development, the third hypothesis is affected by the results of H1 and H2. Since the test results of the previous two hypotheses are not proven, the third hypothesis is also unproven and **rejected**. Referring to research conducted by Safitri (2017), a slow-reacting and prolonged market is confident that the market is inefficient in a semi-strong form in terms of information.

## CONCLUSION

This study aims to determine the abnormal returns from BUMI and ADRO stocks around the heatwave announcement in China can increase the potential for Indonesian coal exports published on August 23, 2022. The results of the research hypothesis are summarized in the following table:

Table 6. Summary of Research Results

| Hypothetical Variables           | Research Hypothesis | Decisions and Results |          |
|----------------------------------|---------------------|-----------------------|----------|
|                                  |                     | Result                | Decision |
| Abnormal Return of BUMI and ADRO | Hypothesis 1        | Unproven              | Rejected |
|                                  | Hypothesis 2        | Unproven              | Rejected |
|                                  | Hypothesis 3        | Unproven              | Rejected |

Based on the table above, it can be concluded that from the three hypotheses, the results are rejected. The announcement on August 23, 2022, did not contain relevant and significant information, so the market did not react. Nor can this event prove the half-strong market efficiency in Indonesia.

### Recommendations

This research has several disadvantages, including a sample of only two companies, BUMI and ADRO. So it cannot describe the population thoroughly. In subsequent studies, it would be better if the samples used were more so they could better represent the population. In addition, the estimated period and the window used are pretty limited. In subsequent studies, it would be better if the estimation period and window were extended.

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