

Russian Invasion of Ukraine: Impact on Stock Trade Volume and Price of Indonesian Coal Companies

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ABSTRACT

The war resulted in inflation and fuel shortages. The coal sector was significantly affected by Russia's incursion into Ukraine. The objective of this study is to examine the disparities in the price and trading volume of PT Bumi Resources stocks prior to and following Russia's hostile actions towards Ukraine. The utilized observation data spans a period of 48 weeks preceding and following the announcement of Russian military intervention in Ukraine. Descriptive analysis is employed to provide a detailed description of the chosen variables, while the paired t test is utilized to ascertain the presence of any disparities. The research findings indicate notable disparities in the price and trading volume of PT Bumi Resource shares prior to and after to the announcement.

Keywords: stock price, stock trading volume, invasion.

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INTRODUCTION

Wars create results in rising energy prices and energy security challenges. Russia's invasion of Ukraine resulted in a further energy crisis.(Zakeri et al., 2022). Global equity markets are significantly influenced by war among other events, for example financial crises, health crises, natural disasters, elections and terrorism (Leigh et al., 2003). The Russian invasion of Ukraine had a major impact on global financial markets (Yousaf et al., 2022).

World bank data shows that energy prices will increase by more than 50% in 2022 (World Bank, 2022). China is the largest coal consuming country, accounting for 53% of world demand, while India is the second largest consumer. Other countries that experienced a significant increase in demand were the United States increasing 15%, Germany increasing 19% and Poland increasing 12% (IEA, 2023).

The increasing world demand for coal also affects countries that are suppliers or producers of coal in the world. Apart from being the world's largest coal consumers, China and India are also the top coal producers and importers. Meanwhile, Indonesia is the third largest coal producer in the world.

An impact on coal prices happen when demand for coal increases but producers experience production shortages. Moreover, this is coupled with Russia's military action against Ukraine. The following is coal price data from year to year:



Figure 1: Coal Price Graph

Source: Kementrian ESDM (2023)

One of the coal companies in Indonesia, namely PT Bumi Resources, also experienced profits from the increase in coal prices. Every year, PT Bumi Resources produces between 80-85 tons. This is much greater than that of PT Adaro Indonesia Tbk., PT Kideco Jaya Agung Tbk., and PT Berau Coal Tbk., so PT Bumi Resource was named the largest contributor to Non-Tax State Revenue, with a value of more than IDR 9 trillion.

Based on the background above, the author was interested in conducting a research entitled Russian Invasion of Ukraine: Impact on Stock Trade Volume and Price of Indonesian Coal Companies.

LITERATURE REVIEW

Research conducted by Tambunan et al. (2023) showed that there were significant differences in the price and trading volume of shares of public companies in the energy sector. It was due to an increase in stock buying and selling activity in the energy sector. Thus, it increased the demand for this energy and also caused the stock priced to increase greatly.

Impact of the Russia-Ukraine Conflict

Statistically, the increase in world oil prices has a small and significant impact on inflation. Two factors influence this increase. The first factor is the increase in commodity prices against the appreciation of the rupiah in the short term. The second factor is the existence of fuel subsidies (Dano, 2022).

The study conducted by Yousaf et al. (2022), on the impact of war on stock prices in Europe, showed that there were significant differences in most of the G20 stock markets. Similar results were also revealed by Ahmed et al. (2022). They argued that there was a significant difference in the form of a decrease in the STOXX Europe 600 average abnormal returns (AARs) and cumulative abnormal returns (CARs).

Significant differences lead to volatility in the EU (FTSE EU) UK (FTSE London) and US (S&P500) stock markets. This was driven by the Russo-Ukrainian War (Ngwakwe, 2022). The impact of international trade isolation on Russia caused a decrease in production of 10.1% (Mardones, 2022).

The Russian-Ukrainian war harmed world stock trading (Boungou & Yatie, 2022). This opinion is in line with research conducted by Syamsul Bakhri Mokh et al. (2022). His research revealed that there were significant differences in energy sector stocks before and after the declaration of Russia's invasion of Ukraine.

According to Tambunan et al. (2023), there were revealing differences in the variables of abnormal return, trading volume activity, and market capitalization before and after the Russian invasion of Ukraine. The results of research by Martins Antonio Miguel et al. (2023) showed that there was a negative and statistically significant stock price reaction at and at the start of a military conflict. Moreover, it showed a higher negative stock market reaction for banks listed in Russia and for foreign banks with high Russian exposure.

METHODOLOGY

Object

The object of this study was PT. Bumi Resources Tbk. This company is engaged in the coal mining industry. PT Bumi Resources Tbk is also the largest coal producer in Indonesia. The company also operated several coal mines in several provinces in Indonesia, including Kalimantan, Sumatra, and Sulawesi.

Data and Analysis

The secondary data source used in this study reported on stock prices and trading volume of the company's shares on the official web of Yahoo Finance. The data used in this study were quantitative data for 48 weeks before the declaration of Russian military action against Ukraine and 48 weeks after the declaration of Russian military action against Ukraine.

The data obtained were tested using the paired sample t-test. This test was carried out on the same population group but had two or more data conditions, namely the condition of the sample data as a result of the treatment given to the sample group. The paired sample t-test aimed to determine whether there was a difference in the mean of two paired samples (Gani, 2015).

Hypothesis

The hypothesis generated in this study were

H_0 : There is no significant difference in the share price of PT. Bumi Resource Tbk in 48 weeks before the declaration of military action and 48 weeks after the declaration of Russian military action against Ukraine.

H_1 : There is a significant difference in the share price of PT. Bumi Resource Tbk in 48 weeks before the declaration of military action and 48 weeks after the declaration of Russian military action against Ukraine.

RESULTS AND DISCUSSION

During 2020, the performance of PT Bumi Resources Tbk recorded a poor share price performance due to the COVID-19 pandemic. In 2020, the outbreak affected global coal demand and suppressed coal prices. PT Bumi Resources Tbk's share price touched its lowest figure in the first quarter of 2020, which was IDR 50.00.

As coal prices rose, PT Bumi Resources Tbk's share price gradually rose and reached a high of Rp 73.00. PT. Bumi Resources Tbk went on to improve in 2021. The share price reached its highest in the first quarter of 2021 at IDR 99.00. In addition, the company's share trading volume had also increased during 2020-2021. The highest share trading volume occurred in the fourth quarter of 2020; it is 10,582,704,200.

Table 1: Share Prices and After the Declaration of Military Action, Difference in Share Prices (in Rupiah)

Week	Share price 48 weeks before the declaration of military action	Stock price 48 weeks after the declaration of military action	Share Price Difference
1	99.00	76.00	23.00
2	71.00	81.00	10.00
3	63.00	82.00	19.00
4	65.00	75.00	10.00
5	58.00	54.00	4.00
6	61.00	58.00	3.00
7	60.00	53.00	7.00
8	61.00	54.00	7.00
9	62.00	58.00	4.00
10	65.00	58.00	7.00
11	60.00	66.00	6.00
12	62.00	68.00	6.00
13	61.00	57.00	4.00
14	65.00	56.00	9.00
15	63.00	56.00	7.00
16	63.00	56.00	7.00
17	63.00	55.00	8.00

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18	60.00	55.00	5.00
19	60.00	57.00	3.00
20	61.00	58.00	3.00
21	63.00	65.00	2.00
22	58.00	66.00	8.00
23	59.00	65.00	6.00
24	60.00	70.00	10.00
25	60.00	75.00	15.00
26	58.00	86.00	28.00
27	57.00	113.00	56.00
28	57.00	107.00	50.00
29	57.00	133.00	76.00
30	54.00	138.00	84.00
31	53.00	171.00	118.00
32	52.00	178.00	126.00
33	56.00	192.00	136.00
34	54.00	180.00	126.00
35	55.00	147.00	92.00
36	56.00	137.00	81.00
37	68.00	186.00	118.00
38	86.00	162.00	76.00
39	87.00	182.00	95.00
40	74.00	182.00	108.00
41	72.00	173.00	101.00
42	71.00	185.00	114.00
43	70.00	181.00	111.00
44	69.00	185.00	116.00
45	67.00	181.00	114.00
46	68.00	172.00	104.00
47	69.00	172.00	103.00
48	69.00	168.00	99.00
	Rata-Rata =	50.52	

Source: Yahoo Finance, 2023

The share price of PT Bumi Resources Tbk showed the highest value of IDR 99.00 in the first week of 2021 before the declaration of the Russian military action and the lowest value of IDR 52.00. Meanwhile, after the declaration of Russian military action against Ukraine, the share price of PT Bumi Resources Tbk reached the highest price of Rp. 192.00 and the lowest of Rp. 53.00 two weeks after Russia declared its invasion of Ukraine over.

Table 1 illustrates that the difference in share prices showed that the average difference in stock prices 48 weeks before and 48 weeks after the declaration of military action was IDR 50.52. The difference in share prices showed the highest price in week 33, namely after the declaration of military action, which was IDR 136.00. The high difference in share prices was caused by the share price after the declaration, which reached its highest point. Furthermore, since the difference in stock prices before and after the declaration of military action was not too far, the difference in the lowest share price was in week 21 of IDR 2.00.

The share price prior to the declaration of Russian military action against Ukraine in the first week, namely the beginning of 2021, had the highest price, reaching 99.00. However, in week 2 the share price decreased until week 3. And from week 4 to week 36 there was a fairly stable stock movement, until entering week 37 the share price of PT Bumi Resources Tbk began to experience a slight increase which was quite high until week 39 the share price is 87.00. At the end of 2021, in the 40th week, the share price of PT Bumi Resources Tbk continued to be stable until the 48th week.

At the turn of the year from 2021 to 2022, the share price of PT Bumi Resources Tbk experienced a drastic decline until in week 7 it reached the lowest price of 53.00. This decrease was caused by the months when Russia's declaration of military action against Ukraine began to occur. After the Russian troops withdrew in early March, namely the 7th week, PT Bumi Resources Tbk's share price began to increase little by little, although not consistently.

From week 24 to week 33, the stock price reached its highest value of 192.00. Even in week 34, the Bumi company experienced a decline until week 36 when it reached a price of 137.00. Furthermore, it had increased from the previous weeks until the share price is not less than 160.00. The

high share price of PT Bumi Resources Tbk was certainly caused by coal prices and demand for coal exports continues to increase.

Table 2 illustrates the trading volume of PT Bumi Resources Tbk shares for the period 48 weeks before and 48 weeks after the declaration of Russian military action against Ukraine.

Table 2: Stock Trading Volume Before and After the Declaration of Military Action

Week	Stock Trading Volume 48 Weeks Prior to Declaration of Military Action	Stock Trading Volume 48 Weeks After Declaration of Military Action	Stock Trading Volume Activity (TVA) 48 Weeks Prior to Declaration of Military Action	Stock Trading Volume Activity (TVA) 48 Weeks After Declaration of Military Action
1	181,549,700	4,220,018,000	0.0956	1.4391
2	342,140,900	3,103,011,200	0.1802	1.0582
3	10,988,776,800	2,667,187,900	5.7863	0.9096
4	2,777,625,700	3,402,316,400	1.4626	1.1603
5	2,080,369,500	2,262,769,700	1.0954	0.7716
6	2,525,544,300	23,273,978,300	1.3299	7.9368
7	1,718,062,200	9,810,556,700	0.9047	3.3456
8	1,552,471,000	5,891,895,700	0.8175	2.0092
9	1,987,673,400	8,010,393,300	1.0466	2.7317
10	6,275,183,900	3,529,713,200	3.3043	1.2037
11	1,331,930,400	9,673,864,000	0.7013	3.2990
12	1,038,568,000	10,643,238,400	0.5469	3.6295
13	850,580,200	6,864,147,900	0.4479	2.3408
14	1,461,221,000	5,538,664,200	0.7694	1.8888
15	1,033,729,800	-	0.5443	0.0000
16	1,901,875,500	10,037,760,500	1.0015	3.4231
17	606,127,800	3,350,148,400	0.3192	1.1425

Week	Stock Trading Volume 48 Weeks Prior to Declaration of Military Action	Stock Trading Volume 48 Weeks After Declaration of Military Action	Stock Trading Volume Activity (TVA) 48 Weeks Prior to Declaration of Military Action	Stock Trading Volume Activity (TVA) 48 Weeks After Declaration of Military Action
18	981,609,300	3,261,528,100	0.5169	1.1122
19	1,070,990,200	3,643,676,200	0.5639	1.2426
20	1,822,990,000	4,738,104,400	0.9599	1.6158
21	2,900,858,400	10,166,950,100	1.5275	3.4671
22	1,695,142,200	18,048,701,700	0.8926	6.1549
23	1,569,999,900	9,094,791,000	0.8267	3.1015
24	2,308,704,500	10,548,177,700	1.2157	3.5971
25	1,198,822,100	11,513,590,200	0.6313	3.9263
26	1,216,028,500	9,829,962,500	0.6403	3.3522
27	643,673,600	35,978,529,500	0.3389	12.2693
28	721,470,100	17,028,643,400	0.3799	5.8071
29	678,589,700	27,824,339,800	0.3573	9.4886
30	1,318,176,500	17,014,213,700	0.6941	5.8021
31	467,963,500	26,704,782,900	0.2464	9.1068
32	461,845,500	35,559,439,200	0.2432	12.1264
33	1,094,865,000	39,498,621,000	0.5765	13.4697
34	494,928,100	32,658,336,600	0.2606	11.1371
35	496,930,600	34,187,154,600	0.2617	11.6584
36	877,013,100	19,591,754,200	0.4618	6.6811
37	7,754,811,100	23,563,716,800	4.0834	8.0356
38	15,334,078,400	29,158,088,300	8.0744	9.9434
39	6,698,256,600	17,735,037,400	3.5271	6.0480
40	3,289,335,100	14,655,777,800	1.7320	4.9979
41	2,114,615,200	15,269,919,900	1.1135	5.2073

Week	Stock Trading Volume 48 Weeks Prior to Declaration of Military Action	Stock Trading Volume 48 Weeks After Declaration of Military Action	Stock Trading Volume Activity (TVA) 48 Weeks Prior to Declaration of Military Action	Stock Trading Volume Activity (TVA) 48 Weeks After Declaration of Military Action
42	2,067,636,000	12,811,864,600	1.0887	4.3691
43	1,316,341,900	8,292,822,700	0.6931	2.8280
44	1,693,878,600	10,746,679,900	0.8919	3.6648
45	1,298,916,200	8,900,036,000	0.6840	3.0351
46	1,033,263,000	7,228,394,000	0.5441	2.4650
47	913,535,000	2,805,850,600	0.4810	0.9568
48	1,011,887,700	1,934,114,200	0.5328	0.6596

Source: Yahoo Finance, 2023

Table 2 describes before the declaration of Russian military action against Ukraine. The trading volume of PT Bumi Resources Tbk shares showed the highest amount of 15,334,078,400 and the lowest amount of 181,549,700. Meanwhile, after the Russian military action against Ukraine, the trading volume of PT Bumi Resources Tbk shares showed the highest number in week 23 of 39,498,621,000 and the lowest number in week 4 of 0. This was because in week 4 after the Russian military action against Ukraine PT Bumi Resources Tbk had no nominal value to trading volume.

The first week before the declaration of Russian military action, the trading volume of shares showed the lowest value of 181,549,700 and increased from week 2 to week 3 reaching a nominal value of 10,988,776,800. increased again in the 10th week, although the increase was not higher than in the 3rd week. In the 11th week, stock trading decreased again and the trading volume of PT Bumi Resources Tbk was in a stable price position until the 36th week. There was an increase in the 37th week and a drastic increase in week 38 reaching a nominal value of 15,334,078,400. After this increase, the Bumi company experienced a very drastic decline and was in a stable position.

At the turn of the year, in the first week of 2022, the Bumi company experienced an increase in its trading volume. In weeks 3, 4, and 5 again

decreased. However, in the 6th week, the Bumi company immediately experienced a high increase. In week 5, namely the month of February when the Russian military action declaration event took place, the Bumi company experienced high trading volume.

From week 7 to week 8, stock trading began to decline. In the following weeks until the 12th week, stock trading slowly increased. Then in the 13th week, the earth company decreased until the 15th week with a nominal value of 0 because there was no amount of trading volume. In week 16 the Bumi company experienced an increase even though in the 17th week the Bumi company experienced a decline again until the 19th week. From that decrease, the Bumi company began to experience a fairly high increase even though there was a decrease the nominal was still higher compared to the previous year, namely before Russia’s declaration of military action against Ukraine.

Descriptive Statistical Test Results

Descriptive analysis was carried out to present and analyze data and perform calculations to clarify the situation or characteristics of the data in question. Measurements used in descriptive statistics were the number of samples, minimum value, maximum value, mean value and standard deviation. The variables in this study covered an analysis of the Russian military action declaration against Ukraine on stock prices and trading volume at PT Bumi Resources Tbk.

**Table 3: Descriptive Statistical Test Results
Share Price of PT Bumi Resources Tbk**

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Price_Before	48	52.00	99.00	63.7917	8.93465
Price_After	48	53.00	192.00	110.1042	53.88018
Valid N (listwise)	48				

Source: Data processed by, SPSS 25 (2023)

As shown in Table 3 the minimum company price was 52.00 and the maximum f99.00 with an average price of 63.7917 and a standard deviation

of 8.93465. The share price of PT Bumi Resources Tbk 48 weeks had increased after the declaration of Russian military action against Ukraine. Moreover, the maximum price before declaration was even lower than the minimum price after declaration. The company’s minimum price was 53.00 and the maximum price was 192.00 with an average price of 110.1042 and a standard deviation of 53.88018.

**Table 4: Descriptive Statistics Results
Stock Trading Volume Activity**

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Activity_Before	48	0.0956	8.0744	1.154058	1.4786024
Activity_After	48	0.0000	13.4697	4.492008	3.5979023
Valid N (listwise)	48				

Source: Data processed by SPSS 25 (2023)

PT Bumi Resources Tbk stock trading volume activity in the 48 weeks before the Russian military action against Ukraine showed a minimum value of 0.0956 and a maximum value of 8.0744 with an average stock trading volume activity of 1.154058 and a standard deviation of 1.4786024.

PT Bumi Resources Tbk stock trading volume activity in 48 weeks after Russia’s military action against Ukraine had increased. The minimum stock trading volume activity was 0.0000. This was due to 4 weeks after the declaration PT Bumi Resources did not carry out trading volume activities and the maximum stock trading volume activity was 13.4697 with an average price of 4.492008 and a standard deviation of 3.5979023. The standard deviation of stock trading volume activity before the declaration showed a smaller number compared to after the declaration. This showed that the wide range of data variation was greater after the declaration of military action.

Paired Sample T-Test Results

Paired sample t-test is a test used to compare the difference between the two means of two paired samples with normally distributed data conditions.

Table 5: Paired Sample Test Results for Stock Price Statistics

		Paired Samples Statistics			
	Mean	N	Std. Deviation	Std. Error Mean	
Pair 1	Price-Before	63.7917	48	8.93465	1.28961
	Price-After	110.1042	48	53.88018	7.77693

Source: Data processed by SPSS 25 (2023)

The results of the paired sample statistical test showed that the share price of PT Bumi Resources Tbk for the period of 48 weeks prior to the declaration of Russian military action against Ukraine with an average share price of 63.7917. The 48-week period following the Russian military action showed the average stock price value to be 110.1042. So based on the results of the Paired Sample Statistical Test, the value of PT Bumi Resources Tbk’s share price had decreased due to the declaration of Russian military action against Ukraine.

PT Bumi’s revenue had increased significantly from 2021 to 2022 based on quarterly data. From January to March 2022 there was a decrease because in these months Russian military action against Ukraine began. After this incident, the Bumi company gained profits, namely the demand for coal exports increased so revenues also increased. Initially, the cost of goods increased from 2021 to 2022. An increase in revenue that was higher than these expenses indicated effective cost management so that the company experienced a profit. Meanwhile, the company’s profit had also experienced a sizeable increase from 2021 to 2022. This showed the potential growth of the Bumi company.

Table 6: Share Price Paired Sample T-Test Results

		Paired Samples Test				t	df	Sig. (2-tailed)	
		Paired Differences							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1	Price_Before - Price_After	-46.31250	52.82696	7.62491	-61.65185	-30.97315	-6.074	47	0.000

Source: Data processed by SPSS 25 (2023)

The results of the Paired Sample T-test on the stock price of PT Bumi Resources Tbk in the period 48 weeks before and 48 weeks after the

declaration showed that the average share price of PT Bumi Resources Tbk in the 48 weeks before and after the declaration was -46.31250.

The significance value of the comparison between stock prices before and after the declaration of Russian military action against Ukraine was 0.000. It showed that the value was smaller than 0.05. Based on the requirements of the Paired Sample T-test, if the significance value is less than 0.05, H0 is rejected and H1 is accepted. In other words, there was a significant difference in the share price of PT Bumi Resources Tbk in the 48 weeks before and 48 weeks after the declaration of Russian military action against Ukraine.

Table 7: Paired Sample Test Results for Trading Volume Statistics

Paired Samples Statistics					
	Mean		N	Std. Deviation	Std. Error Mean
Pair 1	Activity_Before	1.154058	48	1.4786024	0.2134179
	Activity_After	4.492008	48	3.5979023	0.5193125

Source: Data processed by SPSS 25 (2023)

The results of the paired sample statistical test showed the trading volume of PT Bumi Resources Tbk shares in the period 48 weeks before and 48 weeks after the declaration of Russian military action against Ukraine. The results obtained were that the average trading volume of PT Bumi Resources Tbk shares was greater after the Russian military action against Ukraine, with an average share price trading volume value of 4.492008. Prior to the Russian military action, the average stock trading volume value was 1.154058. Consequently, based on the results of the Paired Sample Statistical Test, it was found that the trading volume of PT Bumi Resources Tbk shares increased due to the Russian military declaration of action against Ukraine.

Table 8: Results of the Paired Sample T-test Stock Trading Volume Activity

Paired Samples Test									
Paired Differences									
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)	
				Difference					
				Lower	Upper				
Pair 1	Activity_Before - Activity_After	-3.3379500	3.8012928	0.5486693	-4.4417304	-2.2341696	-6.084	47	0.000

Source: Data processed by SPSS 25 (2023)

The results of this study indicated that there was a very drastic increase of -3.3379500 in the average trading volume of PT Bumi Resources Tbk shares in the 48-week period before and after the Russian military action against Ukraine.

The significance value of the comparison between stock trading volume before and after the declaration of Russian military action was 0.000. It exposed that the value is much smaller than 0.05. Based on the requirements of the Paired Sample T-test, if the significance value is less than 0.05, H_0 is rejected and H_1 is accepted. In other words, there was a significant difference in the trading volume of PT Bumi Resources Tbk shares in the 48 weeks before and 48 weeks after the declaration of Russian military action against Ukraine.

The results of the study are similar to those of research conducted by Tambunan et al. (2023). They revealed that share prices and trading volume in the mining sector listed on the IDX had increased significantly.

CONCLUSION

It can be concluded that there was a significant difference in the share price of PT Bumi Resources Tbk before and after the declaration of Russian military action against Ukraine after testing the data and evaluating the results of the data on share prices and trading volume of shares at PT Bumi Resources Tbk.

In addition, the results of this study showed a significant difference in the trading volume of PT Bumi Resources Tbk shares before and after the declaration of Russian military action against Ukraine. The results have similarities with previous research conducted by Tia Amelia (2023). The results showed that there was a significant difference in the share price and trading volume of the company PT Adaro Energy, Tbk.

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