

Research Article

Fifth Package Sanctions: Prohibition of Russian Coal Trade to the European Union: Implications for Stock Trading in the Indonesian Coal Sub-Sector

¹Dwi Anasthasia Pasaribu, ²Augustina Kurniasih

Master of Management Universitas Mercubuana, Jakarta, Indonesia.

Received Date: 20 February 2025

Revised Date: 04 March 2025

Accepted Date: 07 March 2025

Published Date: 13 March 2025

Abstract: The purpose of the study was to analyze the impact of the Fifth Package Sanctions on the prohibition of Russian coal trade to the European Union on Abnormal Trading Volume, Abnormal Return, and the profitability of coal sub-sector companies listed on the Indonesia Stock Exchange (IDX). The total population consists of 29 companies in 2023, with a purposive sampling method used to obtain 20 companies listed on the IDX. The analysis technique used is inferential analysis to determine whether there are differences in the performance of coal companies listed on the IDX before and after the imposition of the Russian coal trade sanctions to Europe. Research The study concludes that there is no significant effect on Abnormal Trading Volume (ATVA) and Abnormal Return before and after the event day. The findings indicate that Return on Assets (ROA) is insignificant between before and after implementing Fifth Package Sanctions.

Keywords: Abnormal Trading Volume Activity, Abnormal Return, Profitability, ROA.

I. INTRODUCTION

Coal is one of the most important energy sources in the world after crude oil, with total reserves reaching 100 trillion tons. Europe, Eurasia, the Asia-Pacific, and North America are the most widespread locations. Zou et al. (2016) In 2021, coal ranked second with a share of 26.90% of the total global energy source needs after oil.

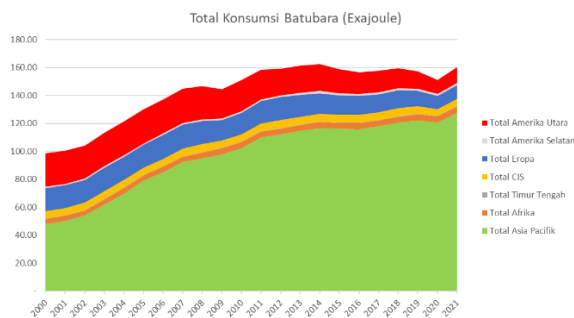


Fig. 1 World's total coal consumption

Figure 1 shows that the world's demand for coal increased by 6.3% in 2021 compared to the previous year. Significant increases occurred in North America by 13.5%, South America by 11.4%, Asia Pacific by 6.0%, and Europe by 5.9%. The cumulative global demand for coal reached 160.10 Exajoules. British Petroleum (2022)

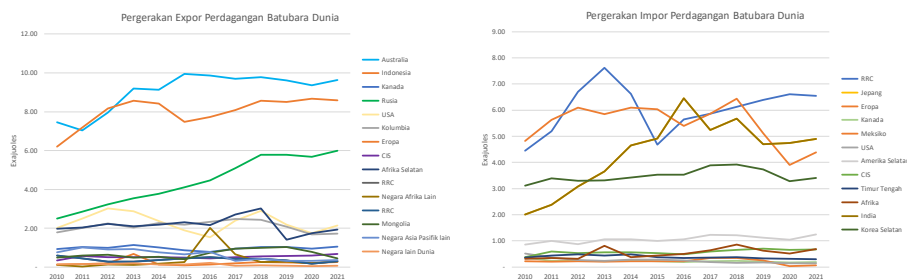


Fig.2 World's export-import 2010-2021



Figure 2 shows the three countries with the largest coal export volumes: Australia, Indonesia, and followed by Russia. The highest coal-importing countries are China, Japan, and Europe. Russia is one of the main exporting countries of coal commodities to Europe. British Petroleum (2022). Amid Europe's dependence on coal imports from Russia, a geopolitical conflict arose between Russia and Ukraine, triggered by Russia's invasion of Crimea on February 24, 2022. The impact was the imposition of Fifth Package Sanctions by the European Union on Russia, which included a ban on imports of coal and solid fossil fuels to Europe. Council of the European Union (2023).

Considering the needs and import capabilities of European Union countries and Indonesia's coal export capacity to the world, the author finds that the geopolitical conflict between Russia and Ukraine can potentially affect the stock trading of coal subsector companies in Indonesia. Inter-country conflicts can impact commodity price fluctuations, currency exchange rates, trade risks, inflation, and energy and food security. These price changes are influenced by government policies and investors (Sokhanvar and Bouri, 2022).

Several researchers have examined the impact of Russia's first invasion and annexation of Crimea on February 24, 2022, on the energy sector. Nerlinger and Utz (2022), Afdhal et al. (2022), Ahmed and Kamal (2022), Wang et al. (2022), Febriandika et al. (2023), Beraich et al. (2022), and Saputra (2023) found that there were abnormal returns due to Russia's invasion of Ukraine. The invasion also had a significant effect on the abnormal return of stocks based on research conducted by Afdhal et al. (2022), Yousaf et al. (2022), Alam et al. (2022), and Tajaddini and Gholipour (2023) in G20 countries and Indonesia. In addition to abnormal returns, research by Tosun and Eshraghi (2022) showed that Russia's first invasion of Ukraine on February 24, 2022, significantly impacted abnormal trading volume in G8 and G10 countries. This is further supported by research by Febriandika et al. (2023), which showed that Russia's invasion of Ukraine significantly affected the abnormal trading volume of energy sector sharia stocks in Indonesia.

Previous research examined the event of the Russian invasion of Ukraine on February 24, 2022, while this study investigates the implementation of Fifth Package Sanctions, which prohibits the trade of Russian coal to the European Union, on April 8, 2022. The previous research was conducted in European countries (Hungary, Poland, Slovakia, France, Germany, Italy, Romania, and Spain), Asia (India, Japan, Turkey, Indonesia), Australia, the United States, and South Africa. This study is conducted on the stocks of the coal sub-sector listed on the Indonesia Stock Exchange (IDX).

II. LITERATURE REVIEW

Previous research on market reactions has been conducted by Pratama and Bahri (2024), Ahmed and Kamal (2022), Yousaf et al. (2022), and Tajaddini and Gholippur (2023), which links the geopolitical conflict between Russia and Ukraine to trading volume and stock prices. This study is related to Shleifer's (2000) opinion that there are three assumptions of the Efficient Market Hypothesis (EMH). First, investors are assumed to be rational and able to assess rationally. Second, some investors behave irrationally, and their actions are random and cancel each other out, thus not affecting stock prices. Third, when irrational investors and arbitrageurs meet in the market, they eliminate each other's influence on market prices. Several researchers in Indonesia, namely Widoretmo and Fitriyah (2024) and Febriandika et al. (2023), have examined the market reaction to the Russian invasion of Ukraine on April 8, 2022, regarding the trading of energy sector stocks on the Indonesia Stock Exchange (IDX). The market reaction is measured by the occurrence of Abnormal Trading Volume Activity (ATVA) and Abnormal Returns (AR).

III. METHOD

This research is a quantitative study with an event study approach. An event study is a study that examines market reactions to an event whose information is published as an announcement. If an announcement contains information and is noted by market participants, changes in trading will occur in the market. Furthermore, the event study method can be used to compare values that occur before and after the event (Fama, 1969). The event being studied is the European Union's Fifth Package Sanctions against Russia. An official announcement on the European Union's website indicates that trade sanctions were imposed on April 8, 2022. Thus, the event date is April 8, 2022.

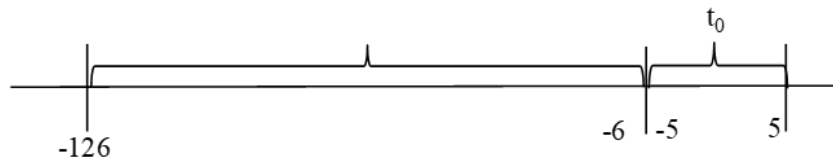


Fig 3. Estimation Period and Event windows

The population of this study is companies in the coal sub-sector listed on the Indonesia Stock Exchange (IDX). In 2023, there are 29 companies. The research sample consists of 20 companies that meet the criteria: 1) listed on the IDX in 2023, 2) stocks traded during the event window, 3) did not conduct corporate actions on the event date, and 4) have audited financial statements for 2021-2023.

The research data consists of secondary data. Stock prices refer to the closing trading prices. The trading volume and stock prices are daily data obtained from <https://finance.yahoo.com/>. The company's performance is profitability, measured by Return on Assets (ROA). The ROA measurement is sourced from the companies' financial statements taken from the website www.idx.co.id.

Suppose the announcement of Fifth Package Sanctions impacts the trading of coal sub-sector stocks on the Indonesia Stock Exchange. In that case, abnormal trading changes will be measured by Abnormal Trading Volume Activity (ATVA) and Abnormal Return (AR). ATVA is obtained from the difference between expected Trading Volume Activity (TVA) and actual TVA. Similarly, AR is obtained from the difference between expected and actual returns. Expected TVA and expected return are derived from a study of historical trading volume and stock return data during the estimation period (H-126 to H-6). Actual trading and actual return are measured during the event period (H-5 to H+5).

Table 1: Variable and measurement

Variable	Measurement
Trading Volume Activity (TVA)	$\sum TVA_{i,t} = \frac{\sum \text{stock } i \text{ traded in time } t}{\sum \text{stock } i \text{ traded in BEI}}$
Expected Trading Volume Activity	$ETVA_{i,t} = \sum_{i=1}^n \frac{\sum TVA_i}{\sum i}$
Abnormal Trading Volume Activity	$ATVA_{i,t} = ETVA_{i,t} - TVA_{i,t}$
Actual Return	$R_{i,t} = \frac{P_{it} - P_i(t-1)}{P_i(t-1)}$
Average abnormal return	$AAR_t = \sum_{i=1}^n \frac{AR_{i,t}}{T}$
Expected Return	$ER_{i,t} = \frac{\sum R_{i,j}}{T}$

If there is ATVA or AR during the event period, statistical testing is needed to conclude whether the ATVA and AR that occurred are significant. The testing is conducted using a t-test.

$$t_{stat} = \frac{\overline{ATVA_{i,t}}}{\hat{\sigma}_{[ATVA_{i,t}]}}$$

$ATVA_{i,t}$ = Abnormal trading volume stock-i in period window-t

$\hat{\sigma}_{[ATVA_{i,t}]}$ = error standard of Abnormal trading volume stock-i in the event period

$$t_{stat} = \frac{\overline{AAR_{i,t}}}{\hat{\sigma}_{[AAR_t]}}$$

$AAR_{i,t}$ = average abnormal return stock-i in period window-t

$\hat{\sigma}_{[AAR_t]}$ = error standard AR in the event period

According to Ross et al. (2016), there are several ways to assess a company's profitability, one of which is the return on assets (ROA). This ratio can help evaluate the effectiveness of asset management and its operational activities. The profit generated from using assets reflects the company's performance in generating profit. ROA is obtained by comparing net income with the company's total assets.

IV. RESULTS AND DISCUSSION

Table 2 shows ATVA around the announcement date of Fifth Package Sanctions. There are positive and negative ATVA values from 5 days before (t-5) to 5 days after (t+5) the announcement. However, the occurring ATVA is insignificant because the calculated state is smaller than the t_{table} value (1.725). Thus, the announcement of Fifth Package Sanctions does not contain information that leads to abnormal trading volume. This finding also indicates that the Indonesian capital market meets the semi-

strong form. This research finding is not in line with Febriandika et al. (2023), who found significant ATVA around Russia's invasion of Ukraine on February 24, 2022, in Sharia-compliant companies in the energy sector listed on the IDX.

Table 2: Abnormal Trading Volume Activity on Event Window

Day t	ATVA(%)	t _{stat}
Sample Size = 20		
t-5	17.41	0.1131568
t-4	-34.34	-0.3946731
t-3	31.33	0.3257024
t-2	42.94	0.3266747
t-1	44.61	0.2497304
t0	19.55	0.3640691
t+1	30.81	0.2968903
t+2	8.66	0.1478876
t+3	35.15	0.4104062
t+4	-7.24	-0.2449820
t+5	1.92	0.0285401

Table 3 shows that there are abnormal returns around the announcement date of the Fifth Package Sanctions. The AR values are both positive and negative. However, the AR occurring is insignificant because the calculated t_{stat} is smaller than the t_{table} value (1.725). The results of this study are not in line with previous research stating that significant changes occurred due to Russia's invasion of Ukraine on February 24, 2022, affecting the stock market in the energy sector on the IDX (Widoretno and Fitriyah, 2024; Pratama and Bahri, 2024). The findings of this study also do not align with the research by Febriandika et al. (2023), which examined sharia stocks in the energy sector on the IDX. Additionally, this study does not support the findings of Beraich et al. (2022), who studied stocks in Europe, China, and the United States, and Ahmed et al. (2023), who researched European stocks across all industry types. Furthermore, this study does not support the findings of Kamal et al. (2023), who examined all industry types in the Australian stock market.

Table 3: Abnormal Return in Event Window

Day t	AR (%)	t _{stat}
sample size = 20		
t-5	0.41	0.2065140
t-4	1.73	0.4193613
t-3	1.32	0.3865059
t-2	3.07	0.6643302
t-1	1.28	0.4466372
t0	2.71	0.6245725
t+1	-0.32	-0.0843571
t+2	-0.51	-0.1548931
t+3	2.65	0.8569837
t+4	-0.22	-0.0910126
t+5	-0.79	-0.2837032

The test for differences in company performance before and after implementing Fifth Package Sanctions was conducted using a paired sample test or Wilcoxon Rank test approach. The period before the sanctions were imposed is 2021, while the periods after the sanctions are 2022 and 2023. The results of the data distribution test for the years 2021 and 2022 yielded a Jarque-Bera probability value of 0.116372. This value is greater than 0.05. Thus, it can be concluded that the data is normally distributed, so a paired sample test is used to find the difference in performance between 2021 and 2022. The results of the data distribution test for the years 2021 and 2023 yielded a Jarque-Bera probability value of 0.091941. This value is also greater than 0.05. Therefore, it can be concluded that the data is normally distributed, so a paired sample test is used to find the difference in performance between 2021 and 2023.

Company performance is measured by profitability using the ROA metric. Table 4 shows that the average ability to generate profit for companies in the coal sub-sector in 2021 was 19.78%. This value increased in 2022 to 25.27%. The Paired Sample t-test for ROA in 2021 and 2022 yielded a probability of 0.4314 (> 0.05). This means there is no significant difference in the profitability of companies between 2021 and 2022.

Table 4: Performance Differences between 2021-2022

	2021	2022	t-value	Probability
ROA (%)	0.19778	0.25267	-0.7953	0.4134

Like Table 4, Table 5 shows that the average ability to generate profit for companies in the coal sub-sector in 2021 was 19.78%. This value decreased in 2023 to 15.23%. The Paired Sample t-test for ROA in 2021 and 2023 yielded a probability of 0.4048 (> 0.05). This means there is no significant difference in the profitability of companies between 2021 and 2023.

Table 5. Performance Differences between 2021-2023

	2021	2023	t-value	Probability
ROA (%)	0.197777	0.152267	0.836013	0.4048

This study's findings align with Sumirat (2023), who researched the impact of Russia's invasion of Ukraine on the Indonesian stock market in the mining sector. Sumirat (2023) also found no significant changes in the profitability of mining sector companies before and after Russia's invasion of Ukraine.

The restriction of coal trade from Russia to the European Union has not led to an increase in coal sales from companies in Indonesia, so the performance of these companies has not changed significantly before and after the sanctions were imposed. Profitability has likely remained unchanged for a couple of reasons. First, the gas supply in Europe remains strong due to the certainty of pipeline flows from Norway, along with a steady increase in the arrival of Liquefied Natural Gas (LNG) tankers in Europe (ESDM, 2023). This situation has prevented an increase in demand for Indonesian coal. The second possibility is that coal prices have further declined amid an oversupply and weak demand from China, the world's largest coal consumer (ESDM, 2023). The drop in coal prices has resulted in no change in company performance. The third possibility is the rising shipping costs. Increased freight costs for coal are driven by macro trade conditions, including increased iron ore imports by China and dispersed ports' geographic position in Indonesia. Another consideration is product quality. The European market generally requires high-calorific coal, whereas Indonesian coal typically has low to medium-calorific values (ESDM, 2012). Due to the quality of Indonesian coal, demand remains unchanged, and therefore, company performance has also remained stable.

IV. CONCLUSION

The study on the Fifth Package Sanctions' impact on Indonesia's coal sub-sector stock trading found no significant abnormal trading volume activity or abnormal returns around the announcement date. The performance of companies in the coal sub-sector, based on profitability, did not show significant differences before and after the Fifth Package Sanctions were imposed.

V. REFERENCES

- [1] Zou C, Zhao Q, Zhang G, Xiong B. Energy revolution: From a fossil energy era to a new energy era. *Natural Gas Industry B*. 2016 Jan 1;3(1):1-11.
- [2] British Petroleum. 2021. *Statistical Review of World Energy 2021*. London: British Petroleum.
- [3] British Petroleum. 2022. *BP Statistical Review of World Energy 2022* 71st edition. London: British Petroleum.
- [4] Sokhanvar Amin and Bouri Elie, Commodity price shocks related to the war in Ukraine and exchange rates of commodity exporters and importers, *Borsa Istanbul Review*. 23(1)(2023)44-54.
- [5] General Secretariat of the Council. <https://www.consilium.europa.eu/>. Retrieved from EU adopts fifth round of sanctions against Russia over its military aggression against Ukraine. 2022. <https://www.consilium.europa.eu/en/press/press-releases/2022/04/08/eu-adopts-fifth-round-of-sanctions-against-russia-over-its-military-aggression-against-ukraine/>.
- [6] Nerlinger Martin and Utz Sebastian, The impact of the Russia-Ukraine conflict on energy firms: A capital market perspective, *Finance Research Letters*,50 (2022) 103243.
- [7] Afdhal Muhammad, Basir Indra dan Mubarak Muhammad Agung, Dampak Invasi Rusia Terhadap Reaksi Pasar pada Perusahaan Sektor Pertambangan di Indonesia, *Jurnal Akun Nabelo: Jurnal Akuntansi Netral, Akuntabel, Objektif*. 5(1) (2022)828-835.
- [8] Ahmed Shaker, Hasan Mostafa M. and Kamal Md Rajib, Russia-Ukraine crisis: The effects on the European stock market, *European Financial Management*. 29(4) (2022) 1078-1118.
- [9] Febriandika Nur Rizqi, Wati Rima Mila and Hasanah Mauzhotul, Russia's invasion of Ukraine: The reaction of Islamic stocks in the energy, *Business Perspectives*. 20(1)(2023) 218-227.
- [10] Mohamed Beraich, Karim Amzile, Jaouad Laamire, Mohamed Amine Fadali, and Omar Zirari, Volatility Spillover Effects of the US, European and Chinese Financial Markets in the Context of the Russia-Ukraine Conflict, *International Journal of Financial Studies*. 100(4)(2022) 95.
- [11] Saputra Bangkit Reaksi Pasar Modal Sebelum dan Sesudah Terjadinya Invasi Rusia ke Ukraina pada Perusahaan Sektor Energi yang Terdaftar di Bursa Efek Indonesia [Journal] // Fakultas Ekonomi dan Bisnis Universitas Lampung. - 2023. - pp. 53-54.
- [12] Yousaf Imran, Patel Ritesh, and Yarovaya Larisa, The reaction of G20+ stock markets to the Russia-Ukraine conflict "black-swan" event: Evidence from event study approach, *Journal of Behavioral and Experimental Finance*. 35 (2022) 100723.
- [13] ESDM. (2023). Retrieved from <https://www.esdm.go.id/assets/media/content/content-laporan-kinerja-direktorat-jenderal-minyak-dan-gas-bumi-tahun-2023.pdf>
- [14] ESDM (2012). <https://www.minerba.esdm.go.id/berita/>. Retrieved from Direktorat Jendral Mineral dan Batubara: <https://www.minerba.esdm.go.id/berita/minerba/detil/20121013-batu-bara-indonesia-sulit-bersaing-di-pasar-eropa>
- [15] Fama E., Cochrane, J. & Moskowitz, T., *The Fama Portfolio: Selected Papers of Eugene F. Fama* Chicago: University of Chicago Press (2017)
- [16] Wang Y., Bouri E., Fareed Z., & Dai, Y, Geopolitical risk and the systemic risk in the commodity markets under the war in Ukraine, *Finance Research Letters*. 49(2022) 103066.
- [17] Onur Kemal Tosun dan Arman Eshraghi, Corporate decisions in times of war: Evidence from the Russia-Ukraine conflict, *Finance Research Letters*. 48

(2022) 102920.

- [18] Widoretno Astrini Aning and Fitriyah Ni'mah Nur Aida, Event Study: The Impact of The Russia-Ukraine Invasion On Stock Prices and Abnormal Returns, *Jurnal Akuntansi Bisnis*, 17(1) (2024) 39-52.
- [19] Pratama Andre Putra and Bahri Saiful, The Impact of Russian-Ukrainian War Towards Abnormal Stock Return and Trading Volume Activity, *Universal Business and Management Review*. 1(1) (2024) 10-20.
- [20] Sumirat E., & Hakam, D. F, The Impact of Russian-Ukraine Conflict on Profitability and Valuation of Indonesian Coal Stocks, *Journal of Economics and Business UBS*. 12(6) (2023) 3646-3659.
- [21] Tajaddini Reza and Hassan F. Gholipour, Trade dependence and stock market reaction to the Russia-Ukraine war [Journal], *Internal Review of Finance*. 23(3) (2023) 680-691.