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The impact of Russia's invasion of Ukraine on agricultural stock prices on the IDX

Oleh:

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Introduction

On February 24, 2022, Russia launched its "Special Military Operation" against Ukraine. While this marked the official beginning of the Russia-Ukraine war, there were clear indications that Russia had been plotting a military campaign in advance (International Crisis Group, 2022). Just days prior, on Monday, February 21st, President Putin recognized the Ukrainian rebel territories, and by Tuesday, February 22nd, Russian troops had entered the former Ukrainian Donetsk and Luhansk regions (Hassan & Mustafa, 2024).

The impact of the war on the IDX became particularly evident on February 24, 2022, the day of Russia's invasion. Investor concerns escalated, prompting precautionary withdrawals from riskier assets such as equities (Dwijaya et al., 2023). This shift in sentiment directly affected the Jakarta Composite Index, which closed the trading day down by 102.24 points or 1.48% to 6,817.82 (www.idx.co.id). The Consumer Non-Cyclicals sector—specifically the Agricultural Products industry—also suffered, dropping by 1.37% to 652.763, signaling a direct impact on the agricultural sector (Syamlan, 2022).

This study aims to examine the impact of Russia's military attack on Ukraine on February 24, 2022, focusing on the Indonesian capital market. Previous research has analyzed abnormal returns and business activity surrounding the RussiaUkraine conflict, with mixed findings. For instance, Emilia et al. (2022) studied the Japanese capital market and found differences in abnormal returns between the Russian-Ukrainian currency pair before and during the conflict, though trading volume remained unchanged. In contrast, Priyambodo & Yunita (2023), using a market-adjusted model, found no significant abnormal return differences but noted notable changes in business activity among oil and gas subcontractors listed on the IDX.

Problem Statement

Building upon this literature, the present study employs an event study methodology to investigate the differences in abnormal return, trading volume activity, and security return variability before and during the Russia-Ukraine conflict. The analysis is underpinned by signaling theory and the efficient capital market hypothesis, offering insights into how international geopolitical shocks are transmitted to emerging markets like Indonesia.

As a result, the conflict triggered a dramatic surge in global food prices, posing a significant threat to the United Nations' Sustainable Development Goal (SDG Target 2) of eradicating hunger and malnutrition by 2030 (World Bank Group, 2022)

Literature review and hypothesis

Signaling theory, originally proposed by (Spence, 1973) explains interactions between parties with asymmetric information. In this context, signaling involves deliberate actions by a signaler aimed at influencing the perceptions and behaviors of receivers. The theory addresses information imbalances in competitive environments (Taj, 2016). It elucidates how management signals to the market, stakeholders, and society, emphasizing the signal giver, the transmitted signal, the receiver, and the feedback. From a business perspective, signaling theory emphasizes how management conveys information through financial performance. These signals are interpreted by various stakeholders, including investors, employees, communities, and governments, whose feedback

Efficient capital markets According to (Fama, 1970) introduced the concept of efficient markets, proposing that in an efficient market, the price of every traded security reflects all available information. This implies that as new information enters the market, security prices adjust to reach equilibrium, allowing investors to fully assess the implications of the information.

Capital asset pricing model (CAPM) Firdiani et al. (2025) 3 https://www.malque.pub/ojs/index.php/msj The CAPM is an equilibrium model that helps us understand investor behavior and the mechanisms of price formation and market returns in a simplified manner (Hasmalini & Heikal, 2023). This model also assists in determining the relevant risk for an asset and clarifying the relationship between risk and expected return when the market is in equilibrium (Randl et al., 2023). Below are the steps and formulas for calculating abnormal returns using the CAPM method.

Literature review and hypothesis

.Calculating realized return

$Ri,t = (P\ i,t - Pi,t-1)\ P\ t-1$ (1)

Calculating market return

$Rm,t = (Market\ Index\ t - Market\ Index\ t-1)\ Market\ Index\ t-1$ (2)

Calculating risk-free return

$$Rf = \frac{\sum Rf}{N} \quad (3)$$

Calculating systematic risk (Beta)

$\beta = cov\ (r\ i - r\ m)\ var\ (rm)$ (4a)

Risk is a form of uncertainty about a situation that will occur later, based on the decisions made, considering various current factors. In CAPM, risk is beta (β). This can be explained using the following formula:

$\beta = \sum (Rit - \overline{Rit})\ n\ t=1\ .(Rmt - \overline{Rmt}) \sum (Rmt - Rmt)\ n\ t=1\ 2$ (4b)

Calculating the expected return

$E(Ri,t) = Rf + \beta\ [Rm,t - Rf]$ (5)

Literature review and hypothesis

Abnormal return

Abnormal return refers to the difference between actual and predicted returns. Realized returns are calculated based on historical data, while expected returns are projections derived from past performance and other relevant factors (Yudhistira & Purbawangsa, 2023). A positive abnormal return occurs when the realized return exceeds the expected return, while a negative abnormal return arises when it falls short. These deviations indicate how the market reacts to new information (Juniantara et al., 2023).

H1: There is a difference in abnormal return on the stock prices of companies in the agricultural product industry before and during the Russian invasion of Ukraine.

Calculating abnormal return

$$ARi,t = Ri,t - E(Ri,t) \quad (6)$$

Where ARi,t is the abnormal return of security i at time t; Ri,t, is the realized return, which is the calculation in the first formula; and E(Ri,t) is the expected return of security i at time t, which is the calculation in the fourth formula.

Literature review and hypothesis

Trading volume activity

Trading volume activity is the ratio of the total number of shares traded to the total number of shares outstanding (or available for trading) in the market over a specific period (Hartono, 2018). It plays a crucial role in technical analysis, as it indicates the supply and demand balance, showing the strength or weakness of investor interest in a stock. Published information can affect investor confidence, as evidenced by changes in stock trading volume (Ardana et al., 2024).

H2: There is a difference in the trading volume activity on the stock prices of companies in the agricultural products industry before and during the Russian invasion of Ukraine.

Calculating trading volume activity

TVA = The number of shares traded (7)

Trading volume activity or the number of shares traded can be accessed through the official website of the Indonesia Stock Exchange (www.idx.co.id).

Literature review and hypothesis

Security return variability

Market reacts to information from an event (Indriani & Mariana, 2021). The advantage of SRV is that its heterogeneity can be eliminated, making all SRV values positive owing to squaring in the analysis. However, its weakness is that it does not indicate the

Calculating security return variability

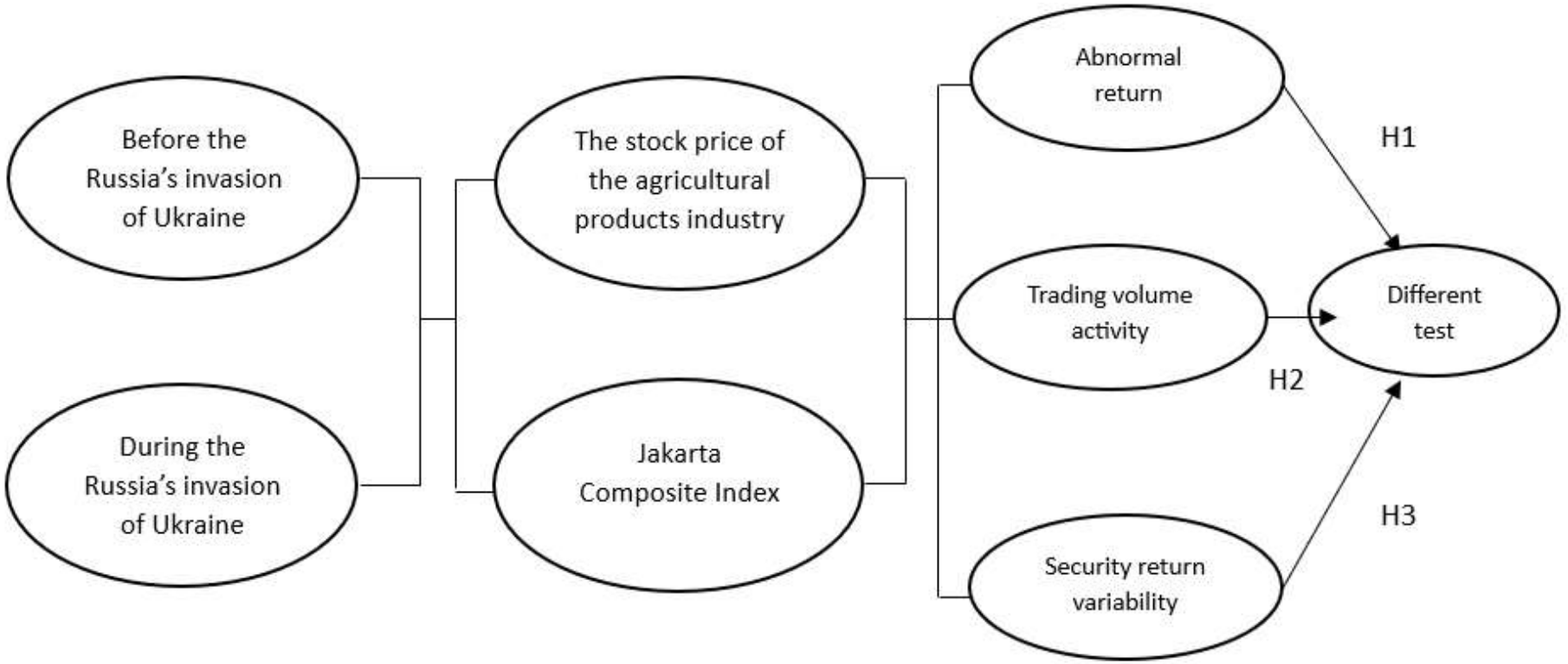
SRVi,t = (ARi,t) 2 V (ARi,t) (8)

Where SRVi,t is the security return variability of security i at time t; ARi,t 2 is the squared abnormal return, which is the calculation in the sixth formula, because squaring eliminates the heterogeneity in SRV, which means that the SRV value becomes positive. V(ARi,t) is a variation in the abnormal return, which can be described using the following formula:

$V(ARi,t) = SD$ (ARi,t) 2, (9)

Where SD (ARi,t) is the standard deviation of the squared abnormal return which is the calculation in the sixth formula.

Conceptual framework



Data and research methodology

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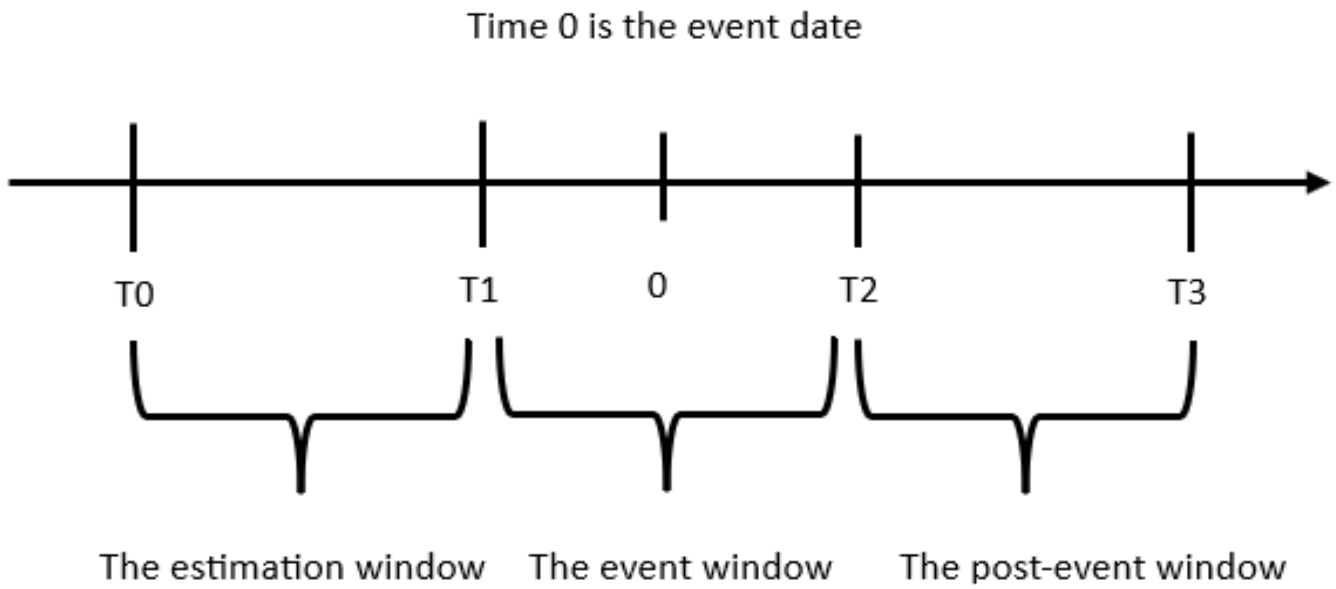

Data and research methodology

1. Population and Sample

The population in this study is the agricultural product industry on the Indonesia Stock Exchange, categorized within the Consumer Non-Cyclical sector. The samples were selected using the purposive sampling method, where the selected samples met the following criteria:

(1) The agricultural product industries were listed agricultural product industry that was conducting an Initial Public Offering (IPO) before February 2020

(2) The agricultural product industries were not delisted during the periode 2020 until 2024

2. Data analysis

Data were statistically analyzed using the SPPS program v.29. The collected underwent several testing stges. A normality test was conducted to identify whether the data used in this study were normally distributed (Fiona & Trenggana, 2020). A good regression model is one that has a normal or nearly normal distribution, making it suitable for statistical testing. The one-sample Kolmogorov-Smirnov test was employed as a normality test to measure the significance of the stock price distribution.

(1) If the significance value (asymp.sig) was >0.05, the data were considered normally distributed, and conversely

(2) If the significance value (asymp.sig) was <0.05, the data were considered not normally distributed.

3. Hypothetical test

In this study, the results of the data normality test serve as a guideline for determining which hypothesis testing method will be used. If the normality test results indicated that the data were not normally distributed, the Wilcoxon signed-rank test was used. However, if the data is normally distributed, the difference test used is the paired sample t-test. In the paired sample t-test and the Wilcoxon sign rank test, decision-making is based on the significance value;

(1) If the sig. (2-tailed) value <0.05, the hypothesis is accepted

(2) If the sig. (2-tailed) value >0.05, the hypothesis is rejected

Result and discussion

Description of the research object

A total of 19 agricultural product industries samples were selected using the purposive sampling technique

No	Criteria	2020	2021	2022	2023	2024
1	Listed agritcultral product industries	(21)	6	10	4	3
2	Delisted agricultural product industries	-	-	(2)	-	-
3	Overall samples	(19)				

Result and discussion

CAPM before and during the event Russia's invasion of Ukraine

Code Name	Realized return (Ri,t)	Market return (Rm)	Risk free (Rf)	Beta (β)
Jakarta Composite Index	0.2161	0.2161	0.0382	1
AALI	0.0102	0.2161	0.0382	2.0503
ANDI	0.0000	0.2161	0.0382	0.0254
ANJT	0.4375	0.2161	0.0382	3.1056
BEEF	-0.788	0.2161	0.0382	1.2950
BISI	0.0372	0.2161	0.0382	1.1940
BWPT	-0.1511	0.2161	0.0382	2.0721
CSRA	0.0438	0.2161	0.0382	1.3875
DSFI	0.2676	0.2161	0.0382	0.5382
DSNG	0.5384	0.2161	0.0382	0.9837
GZCO	0.4	0.2161	0.0382	0.6643
JAWA	1.8837	0.2161	0.0382	0.4777
LSIP	0.2989	0.2161	0.0382	1.4017
MGRO	0.1533	0.2161	0.0382	0.6858
PALM	2.9583	0.2161	0.0382	0.2848
SGRO	-0.09	0.2161	0.0382	0.0277
SIMP	0.6521	0.2161	0.0382	1.7873
SMAR	0.3313	0.2161	0.0382	1.2505
SSMS	0.2407	0.2161	0.0382	0.5273
UNSP	0.6231	0.2161	0.0382	1.3294

Code Name	Realized return (Ri,t)	Market return (Rm)	Risk free (Rf)	Beta (β)
Jakarta Composite Index	0.0363	0.0363	0.0511	1
AALI	-0.4621	0.0363	0.0511	1.4764
ANDI	0.0000	0.0363	0.0511	1.4444
ANJT	-0.3137	0.0363	0.0511	1.2534
BEEF	3.2456	0.0363	0.0511	3.9958
BISI	0.2819	0.0363	0.0511	0.9307
BWPT	-0.4137	0.0363	0.0511	-0.6451
CSRA	-0.3449	0.0363	0.0511	0.8534
DSFI	-0.4040	0.0363	0.0511	0.2931
DSNG	-0.2031	0.0363	0.0511	0.8591
GZCO	-0.3014	0.0363	0.0511	2.9942
JAWA	-0.3494	0.0363	0.0511	-5.7115
LSIP	-0.4098	0.0363	0.0511	1.0952
MGRO	-0.3052	0.0363	0.0511	-0.3323
PALM	-0.421	0.0363	0.0511	2.7644
SGRO	-0.1111	0.0363	0.0511	0.4996
SIMP	-0.28	0.0363	0.0511	0.9193
SMAR	-0.202	0.0363	0.0511	0.8305
SSMS	0.0187	0.0363	0.0511	-0.2357
UNSP	-0.042	0.0363	0.0511	1.3589

Result and discussion

Descriptive statistical analysis

	N	Minimum	Maximum	Mean	Std. Deviation
AR_Before	20	-1.05749246	2.86942323	0.1684179525	0.8241725162
AR_During	20	-0.49148430	3.25350409	-0.0897232155	0.8116369419
TVA_Before	20	15617	17625061928	897707631.15	3937345399.2
TVA_During	20	27767	24566310004	1236476176.9	5491287845.0
SRV_Before	20	0.00000000	12.13502270	1.3859183195	3.0558382946
SRV_During	20	0.00000000	18.97783684	2.9895450995	4.4301407835
Valid N (listwise)	20				

The one-sample kolmogrov-smirnov test analysis

	N	Asymp. Sig. (2-tailed)
AR_Before	20	0.000
AR_During	20	0.000
TVA_Before	20	0.000
TVA_During	20	0.000
SRV_Before	20	0.000
SRV_During	20	0.002

Result and discussion

Wilcoxon signed ranks test analysis

		N	Mean Rank	Sum of Ranks	z	Asymp.sig (2-tailed)
AR_Before – AR_During	Negative Ranks	16	9.75	156.00	-2.455	0.014
	Positive Ranks	3	11.33	34.00		
	Ties	1				
	Total	20				
TVA_Before – TVA_During	Negative Ranks	13	10.62	138.00	-1.232	0.218
	Positive Ranks	7	10.29	72.00		
	Ties	0				
	Total	20				
SRV_Before - SRV_During	Negative Ranks	5	8.80	44.00	-2.052	0.040
	Positive Ranks	14	10.43	146.00		
	Ties	1				

Result and discussion

There is a difference in trading volume activity on the stock prices of companies in the agricultural products industry before and during the Russian invasion of Ukraine.

There is no significant difference in the impact on the trading volume activity variable before and during an event. This indicates that there was no informational content from the Russian invasion of Ukraine. This indicates that there is no trading volume activity approaching normal returns as a result of stock price changes in the capital market, because there is no difference in trading volume activity. The absence of this difference implies that the information stemming from the Russian invasion of Ukraine did not significantly affect market participants. It also indicates that no meaningful signals were provided for investors in their decision-making processes. The lack of significant difference in trading volume activity before and during the invasion suggests that the market reaction was weak, as the event did not introduce information that impacted the capital market. The finding are consistent with studies by (Muhammad & Sulistyowati, 2023) and (Sahputra et al., 2022).

There is a difference in security return variability on the stock prices of companies in the agricultural products industry before and during the Russian invasion of Ukraine.

There was a significant difference in the impact on the security return variability variable before and during the event. This provides information that impacts and investors stock trading decisions. The increase in security return variability over time indicates that this result is in line with signaling theory, suggesting that the news of the Russian invasion was perceived as a positive signal. One reason for this positive perception may be the sanctions imposed on Russia by the European Union, the United States, and several Asian countries. The difference in security return variability before and during the Russian invasion of Ukraine indicates that the market reaction was semi-strong, as the events conveyed information that significantly affected the capital market.These findings are consistent with research conducted by (Surnyani & Wiarta, 2022)

Conclusion

Several conclusions were drawn from this study. Significant differences were observed in the abnormal return and security return variability variables on stock prices in the agricultural products industry before and during the Russian invasion of Ukraine. This indicates that the event provided signals for investors in their decision-making processes. The difference in abnormal return and security return variability before and during the Russian invasion of Ukraine indicates that the market reaction was in a semi-strong state, as the event brought information that influenced the capital market reaction. In contrast, the absence of a significant difference suggests that the information from the Russian invasion of Ukraine does not have a significant impact on market participants, and it also indicates that there is no information providing signals for investors in making investment decisions. The lack of difference in trading volume activity before and during the Russian invasion of Ukraine indicates that the market reaction was weak, as the event did not bring information that affected the capital market reaction.

The study focuses exclusively on Indonesia's agricultural sector, limiting its scope. Future research could explore global impacts and include additional variables, such as Return on Assets (ROA) and Current Ratio (CR), to provide deeper insights into market reactions. This study contributes to financial literature by highlighting the role of geopolitical events in shaping market behavior, offering valuable insights for investors and policymakers during periods of global uncertainty.

References

International Crisis Group. (2022). Answering Four Hard Questions About Russia's War in Ukraine. *International Crisis Group*, *2022*. http://www.jstor.org/stable/resrep45704

Hassan, N. A., & Mustafa, S. (2024). The Impact of Contemporary International Wars on International Security - A Case Russia's War on Ukraine and Israel's War on Gaza. *International Journal of Religion*, *5*(11), 390–403. https://doi.org/10.61707/vh723w24

Syamlan, L. (2022). *IDX-Energy Menjadi Penopang IHSG kala Perang Rusia! [IDX-Energy Becomes the Support of IHSG during the Russian War!]*. Investing.Com. https://id.investing.com/analysis/idxenergy-menjadi-penopang-ihsg-kala-perang-rusia-200235922

Emilia, E., Suud, C. L., Tangga, F. H. ., Rawis, C. I., & Maramis, J. B. (2022). Japanese Capital Market Reaction to The Russian and Ukraine War. *Jurnal EMBA*, *10*(4), 1645–1653. https://doi.org/10.35794/emba.v10i4.44290

Priyambodo, M. G., & Yunita, I. (2023). Analisis Reaksi Pasar Modal terhadap Peristiwa Perang Rusia dan Ukraina [Analysis of Capital Market Reactions to the Russia-Ukraine War Events]. *SEIKO: Journal of Management & Business*, *6*(1), 605–614. https://doi.org/10.37531/sejaman.v6i1.3741


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