



Indonesia Stock Market Index (IDX) Before and During the Russian-Ukrainian War Period 2020-2023

Iman Murtono Soenhadji¹, Venai Letisa Bidjae²

¹Faculty of Economic, Gunadarma University, Jawa Barat, Indonesia

²Faculty of Economic, Gunadarma University, Jawa Barat, Indonesia

Corresponding author: iman.soenhadji@gmail.com¹

Abstract: The objective of this study was to examine the impact of the Federal Reserve's interest rate, inflation, world oil price, and the exchange rate of the Indonesian Rupiah on the IDX Composite both before and during the Russia-Ukraine conflict. Data collected from the period January 2020 to June 2023. The study aimed to analyze the combined effect of these variables on the IDX Composite, as well as their individual effects. Additionally, the study sought to identify the variable that exerted the most significant influence on the IDX Composite during the period under investigation. This research employs quantitative data obtained from secondary sources. The data analysis techniques used in this study encompass classical assumption testing, multiple linear regression analysis, hypothesis testing, coefficient of determination analysis, and paired sample t-tests. The findings of this study elucidate that the Federal Reserve's interest rate, inflation, global oil prices, and exchange rates collectively influence the IDX Composite both before and during the Russia-Ukraine conflict. The pre-war global oil price and the Federal Reserve's interest rate during the conflict have a partial impact on the IDX Composite. World Oil Price before the war and the Fed Interest Rate during the war are the most dominant variables affecting the IDX Composite.

Keywords: IDX Composite, Inflation, Rupiah Exchange Rate, The Fed Interest Rate, World Oil Price

INTRODUCTION

The Stock Exchange or Capital Market is the main place for investors to trade securities, such as stocks and bonds. In Indonesia, the Financial Services Authority, Otoritas Jasa Keuangan (OJK) regulates and supervises the financial sector, including the Stock Exchange. OJK issues regulations to govern various aspects of securities trading and ensure that trading runs efficiently. The global economy is currently affected by the Russia- Ukraine war, causing disruptions in trade, rising commodity prices, and tightening global financing. This has led to high global inflation rates. Uncertainty in global financial markets has reduced capital flows, which may affect exchange rates in developing countries, including Indonesia. Monetary and

fiscal measures can be a solution to addressing the impact of inflation and global economic uncertainty. Despite global conditions, the Stock Exchange remains an important element in fundraising for companies and asset allocation for investors. The IDX composite is calculated based on the increase or decrease in share prices of a group of stocks selected as representative of the stock market as a whole. The following is the IDX composite data for the period January 2020 to June 2023,

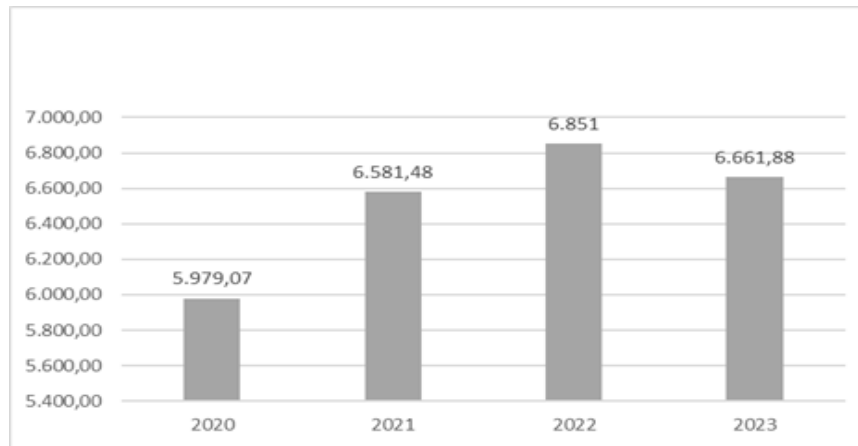


Figure 1. IDX Composite Movement, Jan 2020 – Jun 2023

Source: Processed data, 2023

Based on Figure 1, it can be seen that from 2020 to 2021 before the Russia-Ukraine war, the IDX composite value experienced a significant increase from 5,979.07 to 6,581.48. This increase indicates a positive trend in the Indonesian stock market, where investors responded positively to economic factors. From 2022 to June 2023 during the Russia-Ukraine war, the IDX composite value decreased from 6,851 to 6,661.88. This decline was due to the negative impact of the Russia-Ukraine War on the stock market which affected the decline in the value of the IDX composite, the impact of the Federal Reserve interest rate on the IDX composite, proved to be negligible (Mahendra, Amalia, and Leon, 2022). In contrast to the research findings of Saputro, Ghassania, and Gustyana (2021) stated that interest rates set by the Federal Reserve can have an impact on the IDX composite. Based on the findings of previous research, it is concluded that inflation does not have a significant effect on the IDX composite (Miyanti and Wiagustini, 2018). In contrast to this conclusion, the findings of Prawoto and Putra's research (2020) suggested that there is a relationship between inflation and its impact on the IDX composite. Previous research findings, it is known that the IDX composite can be influenced by World Oil Prices (Mahendra, Amalia, and Leon, 2022). the research findings of Prasada and Pangestuti (2022) stated that world oil prices have no impact on the IDX composite. According to Ahmad (2021), previous research findings show that there is no significant effect of the Rupiah Exchange Rate on the IDX composite. However, showed that there is a relationship between the rupiah exchange rate and the performance of the IDX composite (Waryati and Solaiman, 2022).

The objectives of this study are as follows:

- 1) To analyze simultaneously the effect of Federal Reserve interest rate, inflation, world oil price, and Rupiah exchange rate on IDX composite before and during Russia- Ukraine;
- 2) To partially analyze the effect of Federal Reserve interest rate, inflation, world oil price, and Rupiah exchange rate on IDX composite before and during the Russia- Ukraine war;
- 3) To determine the effect of Federal Reserve interest rate, inflation, world oil price, and exchange rate on IDX composite before and during the Russia-Ukraine war which has the most dominant effect;
- 4) To determine the difference between Federal Reserve interest rate, inflation, world oil

price, and Rupiah exchange rate on IDX composite before and during the Russia- Ukraine war.

METHOD

This study utilized data information covering many economic indicators, namely the IDX composite, Federal Reserve interest rate, inflation rate, world oil price, and Rupiah exchange rate. This study used quantitative data, specifically collected from secondary sources such as statistical reports available on the official websites of the Indonesia Stock Exchange, Central Bank of Indonesia, Investment, the Fed, and the Ministry of Trade. The data collection period starts from January 2020 to June 2023.

This research used quantitative analysis method as its analysis approach. This study used descriptive statistical tests to test standard assumption tests which include normality tests, multicollinearity tests, heteroscedasticity tests, and autocorrelation tests. Hypothesis testing included several statistical tests including the F test, t test, coefficient of determination test, and paired sample t-test. The operational definitions of the variables included in the study are stated in Table 1 as follows:

Table 1. Operational Definition of Variables

No.	Variable	Operational Definition	Measuring Instrument	Unit of measurement
1.	The Fed interest rate	The Fed Rate is the interest rate charged on unsecured loans of funds, most of which are held by depository institutions and other entities in accounts at the Federal Reserve (www.federalreserve.gov/).	Using the Fed's benchmark.	Percent
2.	Inflation	Inflation refers to a widespread and sustained phenomenon characterized by a progressive increase in the prices of goods and services over a period of time (www.bi.go.id).	Using BI's benchmark	Percent
3.	World Oil Prices	West Texas Intermediate (WTI) is a light, sweet crude oil produced in the United States and priced based on the Cushing, Oklahoma crude oil trading center (www.eia.gov).	Closing price of WTI benchmark	Dollar/barrel
4	Rupiah Exchange Rate	According to Hady (2016), exchange rate refers to the valuation of one unit of foreign currency against a domestic currency, or the valuation of a currency relative to another foreign currency.	Middle rate of IDR to USD.	Rupiah
5.	IDX Composite	IDX Composite is a comprehensive index used to assess the price performance of all stocks listed on the main board and development board of the Indonesia Stock Exchange (www.idx.co.id).	Closing price of <i>IDX Composite</i> .	Rupiah

Source: Processed data, 2023

RESULT AND DISCUSSION

Result

The capital market, as defined in the Law of the Republic of Indonesia No. 8 of 1995, encompasses all activities related to the solicitation and exchange of securities, including public undertakings and the various bodies and works associated with the issuance of such securities. Capital market refers to a market where various long-term financial products, including debt securities, equities, mutual funds, derivative instruments, and other similar instruments, are traded and exchanged. The capital market plays an important role in a country's economic framework through the performance of two fundamental functions. First, it serves as a mechanism for businesses to obtain funding or raise capital from investors.

Second, it provides individuals with the opportunity to invest in various financial instruments, including but not limited to stocks, bonds, and mutual funds (Rahmi & Benget, 2022). The index in question is a metric used to evaluate the price performance of all stocks listed on the Indonesia Stock Exchange. The IDX composite serves as a reflection of the market value fluctuations of the collection of stocks included in the index. The IDX composite is often used as a benchmark to assess the performance and sentiment of the stock market in Indonesia. The movement of the IDX composite will provide a comprehensive analysis of the fluctuations in the shares of companies on the Indonesian stock exchange over a period of time. The Federal Reserve has the ability to adjust interest rates to manage inflation, oversee economic expansion, or address fluctuations in financial market conditions. Interest rate policy has a significant impact on lending activity, investment, and consumer spending. The term "interest rate" refers to the interest rate set by the Federal Reserve or the central bank of the United States. Interest rates refer to the rates used by the Federal Reserve to manage monetary policy and impact the broader economic landscape (Frederic, 2017).

Inflation is a phenomenon characterized by a planned or natural increase in commodity prices, which occurs not only in certain regions but also throughout the country (Irma & Nurbetty, 2017). Inflation is one of the main economic problems that receives great attention from economists. Inflation can be caused by demand-side factors and supply-side factors. In a theoretical context, inflation relates to ongoing changes in the overall price level, which can be caused by an increase in aggregate demand or a decrease in aggregate supply. Crude oil is one of the most important energy commodities in the world as it is the main source of fossil fuels for various purposes, such as vehicle fuel, airplane fuel, etc. Crude oil prices can be affected by a variety of factors, including global supply and demand, geopolitical tensions, currency exchange rate fluctuations, as well as global economic growth forecasts. WTI crude oil is also considered a "light" and "sweet" crude oil due to its high API gravity and low sulfur content. These properties make WTI easier to process into various other fuel and energy products. As stated by Sukirno (2016), the concept of exchange rates relates to the monetary valuation of a country's currency required to obtain or exchange one unit of foreign currency. Fluctuations in the exchange rate of the rupiah against foreign currencies can have a significant impact on a country's economy, thus affecting international trade, inflationary trends, import and export spending, and the competitiveness of domestic products in the global market. The Rupiah Exchange Rate refers to the valuation or proportional value of the Rupiah (IDR) against several international currencies, including the United States Dollar (USD), Euro (EUR), Japanese Yen (JPY), and others.

The Research Model is shown in Figure 2 as follows:

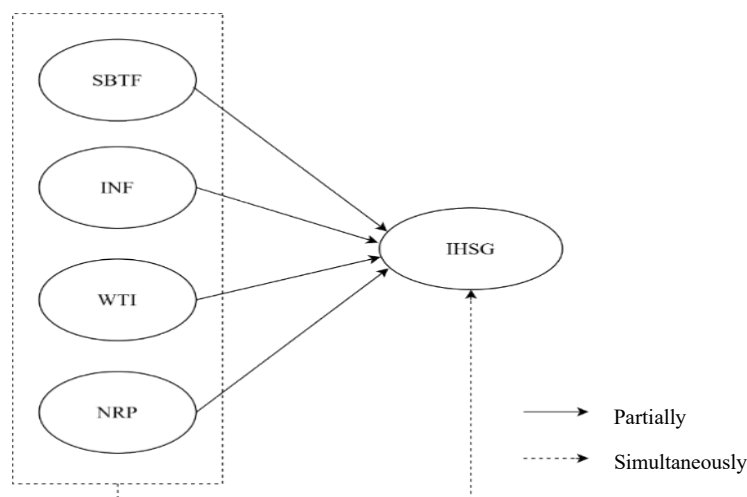


Figure 2. Research Model

Discussion

Descriptive Statistical Test is used to provide an overview of data measured using the average value, minimum value, maximum value and standard deviation of all research variables. The descriptive Statistical Test Results are shown in Table 2 below:

Table 2. Descriptive Statistical Test Results Before and During the War

Before the War	Fed Interest Rate	INF	WTI	IDR Exchange Rate	IDX Composite
Mean	0.3700	1.8132	54.7988	14480.92	5725.935
Maximum	1.7	2.98	88.15	16367.00	6631.15
Minimum	0.25	1.32	18.84	13662.00	4538.93
Std. Dev	0.41533	0.5087	18.63872	492.9519	645.8691
Before the War	Fed Interest Rate	INF	WTI	IDR Exchange Rate	IDX Composite
Mean	3.1618	4.4624	87.33412	14981.23	6956.008
Maximum	5.25	5.95	114.6700	15737.00	7228.91
Minimum	0.25	2.06	68.09000	14349.00	6661.88
Std. Dev	1.81130	1.11936	13.61936	431.2707	162.2006

Source: Data processed using SPSS 25, (2023)

Table 3. Results of Multiple Linear Regression Analysis of variables before and during the War

	Before the War		After the War	
	Unstandardized		Unstandardized	
	B	Sig	B	Sig
Constant	8328.559		7517.722	
Fed Interest Rate	-106.596	.604	-93.315	.042
INF	145.652	.376	96.483	.069
WTI	29.122	.000	-.816	.873
IDR Exchange Rate	-.305	.070	-.042	.750

Source: Data processed using SPSS25, 2023

Based on Table 3 above, the results of multiple linear regression analysis on the variables before and during the war obtained the following regression equation:

Before the war:

$$\text{IDX Composite} = 8,328.559 - 106.596 \text{ Fed Interest Rate} + 145.652 \text{ INF} + 29.122 \text{ WTI} - 0.305 \text{ IDR Exchange Rate} + e$$

During the war:

$$\text{IDX Composite} = 7,517,722 - 93,315 \text{ Fed Interest Rate} + 96,483 \text{ INF} - 0.816 \text{ WTI} - 0.042 \text{ IDR Exchange Rate} + e$$

The analysis results can be seen as follows, The initial value before the war was positive at 8,328,559. This indicates that if there was no change in the Fed Interest Rate, World Oil Price, and Rupiah Exchange Rate, the IDX Composite would stay at the level of 8,328,559. The constant value observed during the wartime is 7,517,722 which indicates that if there was no change in the Fed Interest Rate, Inflation, World Oil Price, and Rupiah Exchange Rate then

the IDX Composite would remain at 7,517,722. The coefficient of the pre-war Fed interest rate variable shows a negative value of - 106.596. Therefore, this negative coefficient indicates that a decrease in the interest rate would result in a decrease in the IDX Composite by 106.596 points. During the war, the coefficient of the Fed rate variable had a negative value of -93.315. Therefore, the negative coefficient indicates that the Federal interest rate adversely affected the IDX Composite resulting in a decline of approximately 93.315.

The coefficient of the pre-war inflation variable of 145.652 indicates a positive relationship with the IDX Composite. This means that for every one-unit increase in pre-war inflation, the IDX Composite was expected to grow by 145.651. The coefficient value of the Inflation variable during the war period was observed to be positive at 96.483. This indicates that an increase in inflation was associated with an increase in the IDX Composite. The coefficient value of the World Oil Price variable before the war was positive at 29.122, which would increase the IDX Composite by 29.122. The coefficient value of the World Oil Price variable during the war was negative at - 0.816, which would decrease the IDX Composite by 0.816.

The coefficient value of the Rupiah Exchange Rate variable before the war was negative -0.305 indicating a decrease in the IDX Composite by 0.305. The coefficient of the wartime Rupiah Exchange Rate variable has a negative correlation of - 0.042. Consequently, the negative coefficient indicates that the IDX Composite would decrease by 0.042.

Hypothesis Test

The F test was used to determine whether or not the independent factors together have a significant effect on the dependent variable. The following table presents the results of the F test on the variables before the war:

Table 4. Results of F Test of Variables Before the War

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8881700.277	4	2220425.069	39.306	.000 ^b
	Residual	1129827.938	20	56491.397		
Total		10011528.22	24			

Source: Data processed using SPSS25, 2023

In Table 4, F test on the variables before the war yields a significance level of 0.000, lower than the predetermined threshold of 0.05. It can be concluded that the Federal Reserve interest rate, inflation, world oil price, and Rupiah exchange rate affected the IDX composite. The following table shows the results of the F test on the variables during the war:

Table 5. Result of the F Test on Variables During the War

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	277619.673	4	69404.918	5.811	.008 ^b
	Residual	143325.053	12	11943.754		
Total		420944.726	16			

Source: Data processed using SPSS25, 2023

Based on the findings presented in Table 5, the results of the F test on the variables during the war showed a significance level of 0.008, smaller than the predetermined threshold of 0.05. It can be concluded that there is a simultaneous effect of the Fed interest rate, inflation, world oil price, and Rupiah exchange rate on the Indonesia Stock Exchange or IDX composite. The t-test was used to assess the significance of the independent variables on the dependent variable separately for each variable (Sugiyono, 2021). The results of the t test on the variables

before and during the war are presented in Table 6 below:

Table 6. Results of the t-test on Variables Before and During the War

Variable	Before the War	During the War
	Sig	
Fed Interest Rate	.604	.042
INF	.376	.069
WTI	.000	.873
IDR Exchange Rate	.070	.750

Source: Data processed using SPSS25, 2023

Based on Table 6, the t-test on the variables before and during the war obtained the following results:

- 1) The significance value of the Fed Interest Rate variable before the war was $0.604 > 0.05$. This indicates that the fed interest rate did not have a large impact on the IDX composite. The significance value of the Federal Reserve interest rate variable during the war was 0.042 , which is less than the generally accepted threshold of 0.05 . This indicates that the Federal Reserve's interest rate policy did not have a major impact on the IDX composite;
- 2) The significance value of the pre-war inflation variable was $0.376 > 0.05$. This indicates that inflation did not have a large impact on the IDX composite. The significance value of the war time inflation variable was $0.069 > 0.05$. This indicates that inflation did not have a large impact on the IDX composite;
- 3) The significance value of the pre-war World Oil Price variable was $0.000 < 0.05$. This indicates that fluctuations in world oil prices had a large impact on the IDX composite. The variable representing World Oil Price during the war period showed a significant value of $0.873 > 0.05$. This indicates that fluctuations in world oil prices did not have a large impact on the IDX composite;
- 4) The pre-war Rupiah Exchange Rate had a significance value of 0.070 which exceeds the threshold set at 0.05 . This observation indicates that changes in the Rupiah Exchange Rate did not have a significant effect on the performance of the Indonesia Stock Exchangeor IDX composite. The significance value of the variable reflecting the Rupiah ExchangeRate during the war was 0.750 , which is above the threshold of 0.05 . This indicates that changes in the Rupiah Exchange Rate did not have a significant effect on the performanceof the IDX composite.

The coefficient of determination was used to assess the magnitude of the relationship between the independent variables and the dependent variable. The evaluation of this research was based on the Adjusted R Squared value. By the findings of Sujarweni (2016), it is known that when the number of independent variables exceeds two, the coefficient of determination is assessed by considering the Adjusted R Squared results. The following are the results of the coefficient of determination of the variables before the war:

Table 7. Results of the Coefficient of Determination Before the War

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942 ^a	.887	.865	237.67919

Source: Data processed using SPSS25, 2023

Based on the results presented in Table 8, the Adjusted R Square coefficient reached

a value of 0.865 or equivalent to 86.5%. The findings presented indicate that the IDX composite as the dependent variable was influenced by the Fed Interest Rate, Inflation, World Oil Price, and Rupiah Exchange Rate, which accounts for 86.5% of the observed variation. The remaining 13.5% was due to additional independent factors not included in this study.

The following are the results of the Coefficient of Determination of the variables during the war as shown in Table 8 below:

Table 8. Results of the Coefficient of Determination During the War

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.812 ^a	.660	.546	109.28749

Source: Data processed using SPSS25, 2023

Based on the findings presented in Table 8, it can be seen that the Adjusted R Square value was recorded at 0.546 or equivalent to 54.6%. The value presented shows that the IDX composite as the dependent variable was influenced by several factors such as the Fed Interest Rate, Inflation, World Oil Price, and Rupiah Exchange Rate which account for 54.6% of the observed variation. The remaining 45.4% was caused by other independent variables not included in this study.

Paired Sample T-Test is a statistical test used to test the average difference between two data sets that come from one group. Paired Sample T-Test was a statistical test used to compare two sets of data that are ratio type and follow a normal distribution.

The following are the results of the Paired Sample T-Test as shown in Table 9 below,

Table 9. Results of the Paired Sample T-Test

Paired Sample Test						
95% Confidence Interval of the Difference						
		Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Fed Interest Rate Before- Fed Interest Rate During	-3.83491	-1.63568	-5.273	16	.000
Pair 2	INF Before- INF During	-3.42333	-1.75667	-6.589	16	.000
Pair 3	WTI Before- WTI During	-55.58600	-28.97518	-6.736	16	.000
Pair 4	IDR Exchange Rate Before- IDR Exchange Rate During	-849.87238	-34.24527	-2.298	16	.035

Source: Data processed using SPSS25, 2023

This study shows that before the Russia-Ukraine war, there was no statistically significant effect of the Federal Reserve interest rate variable on the IDX composite. This indicates that interest rate changes made by the Federal Reserve did not have a major influence on the stock market, such as the IDX composite, during the period of economic stability. This study is in line with the findings of Mahendra, Amalia, and Leon (2022) who also concluded that the US Federal Reserve interest rate had no significant effect on the IDX composite.

However, in the context of the Russia-Ukraine war, it is noteworthy that the Federal Reserve interest rate had an adverse impact on the IDX composite, thus emerging as the main variable in this study. During this period, it was observed that fluctuations in interest rates

implemented by the Federal Reserve had a noticeable impact on the IDX composite. The Federal Reserve's decision to raise interest rates may result in an increase in borrowing costs, which may reduce the propensity of companies to spend or grow. This could lead to a decrease in demand in the stock market and ultimately have a negative impact on the IDX composite. This observation is in line with the findings of Saputro, Ghassania, and Gustyana (2021) which show that fluctuations in the Federal Reserve's interest rates had the potential to impact the IDX composite.

The Effects of World Oil Price on the IDX composite Before and During the Russia-Ukraine War

This study shows that before the Russia-Ukraine war, the World Oil Price variable showed a significant positive impact on the IDX composite. This variable is the dominant variable in the study. The IDX composite was directly affected by fluctuations in global oil prices. The global economy was heavily influenced by the world oil price which is recognized as a crucial commodity. However, it should be noted that the IDX composite remained unaffected by the World Oil Price variable in the Russia-Ukraine war. Evidence shows that the conflict between Russia and Ukraine resulted in global instability, thus affecting oil prices on a worldwide scale. However, the impact on the IDX composite was not significant. Despite being a crude oil importing country, Indonesia showed a good level of economic diversification, meaning that fluctuations in world oil prices may not have a large direct effect on the IDX composite. This observation is in line with previous research conducted by Prasada and Pangestuti (2022) which also concluded that fluctuations in world oil prices did not have a significant impact on the IDX composite.

The Effect of Rupiah Exchange Rate on IDX composite Before and During the Russia-Ukraine War

This study showed that the Rupiah exchange rate variable did not have a statistically significant impact on the IDX composite, both before and during the Russia-Ukraine conflict. This means that variations in the Rupiah exchange rate against the USD did not have a large impact on the Indonesian stock market. Throughout the study period, the Rupiah (IDR) and US Dollar (USD) exchange rates were relatively stable. During the study period, the Rupiah to USD exchange rate was relatively stable, with limited fluctuations in the range of IDR 13,662 to IDR 14,381, so this change was not very sensitive to the movement of the IDX composite. Although the weakening of the Rupiah against the USD might affect stock prices in the IDX composite, the relatively small fluctuations in the Rupiah exchange rate during the Russia- Ukraine war did not have a major impact on the IDX composite. The conclusion of this study is in line with previous research conducted by Fadhil (2021) which also concluded that fluctuations in the Rupiah Exchange Rate did not have a significant effect on the IDX composite.

CONCLUSIONS

Based on this research, the following conclusions are obtained:

1. The Fed Rate, Inflation, World Oil Price and Rupiah Exchange Rate before and during the Russia-Ukraine war simultaneously have a significant effect on the IDX composite;
2. Prior to the Russia-Ukraine war, the Fed Rate, Inflation, and Rupiah Exchange Rate did not show significant impact partially. However, during the war, the Fed Interest Rate showed a partial but significant effect. In contrast, Inflation, World Oil Price, and Rupiah Exchange Rate partially did not have a significant effect on IDX composite;
3. The dominant variables in this study are the Fed Interest Rate during the Russia- Ukraine war and the World Oil Price before the Russia-Ukraine War the Fed InterestRate, Inflation,

World Oil Price, and Rupiah Exchange Rate showed differences between the periods before and during the Russia-Ukraine war.

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