

Comparative Analysis of Stock Price and Trading Volume Before and After The Fed Interest Rate Increase: An Event Study on LQ45 and Dow Jones Index Companies

Nabila Salmarani¹, Lindrianasari², Ratna Septiyanti³, Niken Kusumawardani⁴
{salmaraninabila@gmail.com¹, lindrianasari@feb.unila.ac.id², ratna.septiyanti@feb.unila.ac.id³,
niken.kusumawardani@feb.unila.ac.id⁴}
Department of Accounting, University of Lampung, Lampung¹²

Abstract. This study examines a comparative analysis of stock prices and trading volumes in response to Federal Reserve interest rate in 2022. The research aims to investigate the market reactions following these events. This analysis use secondary data and the purposive sampling method is used to draw samples. Depend on the samples taken, namely LQ45 Index with Dow Jones Index, 75 research samples were obtained. This market reaction study uses stock prices as measured by abnormal return variables, and stock volume is measured by trading volume activity. The analysis outcomes show that there is a noteworthy outcome on stock prices in the increase in the Federal Reserve interest rate and an insignificant effect on stock volume.

Keywords: Abnormal Returns, Event Study, Trading Volume Activity

1 Introduction

Russia's conflict with Ukraine is a topic of discussion in the international world, and the causes of this conflict have been going on for a long time. As reported on CNBC's official website, [cnbc.com](https://www.cnbc.com), Russia invaded Ukraine after Russian President Vladimir Putin officially announced military action on February 24, 2022. The conflict between these two countries can also cause various problems within the country, especially in terms of the continuity of people's lives and security. The conflict between Russia and Ukraine can also cause problems regarding safety and global stability, inviting various international countries to respond to the conflict between

The European Union and other countries directly criticized the clash between Russia and Ukraine and penalized it through economic sanctions on Russia. The economic sanctions take the shape to ban Russia from bilateral relations and trade. In addition, restrictions on employment in the energy sector, a disallow on carrying out main and additional debt transactions, sanctions against the extractive industry sector were imposed on Russia [1]. [2] argues that through the sanctions imposed on Russia, one of the countries with the largest natural gas and oil exporters in the world, Russia immediately took steps to counter these sanctions by reducing the amount of supply, which resulted in a potential increase in market prices. However, it could have the opposite effect because this will cause inflation, especially USA.

Punishment given by the USA with other countries in the international world can disrupt the economic sector, especially financial markets. This could affect the rate scenario of Federal Reserve interest in increasing interest rates, which impacts the global economy. The raised interest rates of Federal Reserve is to control inflation in the United States. The increase of this interest rates has an effect on the process of circulation of money, which is difficult to occur. This also results in weakening manufacturing, reduced investment incentives, increased borrowing costs, and slow economic recovery [3]. The Federal Reserve raised key interest rates seven times in 2022. During the 2022 period from March to the end of 2022, the Federal Reserve interest rate has expand by 425 bps to the range of 4.25%-4.50%, and this level is the highest level of increase in the last 15 years. According to [4] via the official databox page, the Fed raised the benchmark interest rate to reduce the inflation level that arose from the increase in food and energy commodity prices from Russia's war against Ukraine.

The Fed's policy of increasing interest rates is one effort that can be implemented to reduce money circulating in society in order to increase the currency exchange rate. However, the Fed's efforts to increase interest rates will also decrease a country's economic growth rate, such as through the property, trade, and real sectors [5]. High interest rates are used to absorb public funds for investment and consumption to decrease and be stored in banks. This is done when inflation is high, and the value of money is low, while interest rates are low so that investment and consumption increase funds will circulate, and the business world can run [6].

This research is interesting because the highest Fed interest rate increase compared to the previous year will only occur in 2022. This type of analysis is an event study case that uses LQ45 index companies with the Dow Jones index, intending not only to prove empirically the dissimilarity of stock prices during Federal Reserve interest rate but also the difference in stock trading volume.

2 Literature Review

The Fed Comparison of Stock Prices Before and After The Fed's Interest Rate Increase

According to [7] explains that the correlation between price and information is that the price of securities behaves as if the capital market participants see the cues from the information. If prices have properties like this, they fully reflect the information system. The declaration of the Federal Reserve hike is a negative signal because this event risks pushing the Indonesian economy toward a recession, eventually reducing profits [8]. Research by [9] shows that the interest rate of The Fed significantly influences the movements of the United States capital market. Based on the theory above, the first alternative of hypothesis in this analysis is as follows:

H_1 : There are dissimilarity in abnormal returns before and after the Federal Reserve interest rate hike in 2022 for LQ45 index companies

H_2 : There are dissimilarity in abnormal returns before and after the Fed's interest rate hike in 2022 for Dow Jones Index companies

Comparison of Stock Trading Volume Before and After The Fed's Interest Rate Increase

One of the factors that influences stock movements is Stock Trading Volume and the sum of all trades for a specific stock that occur on the stock exchange at a specific time. Stock of Trading Volume Activity indicators can be accustomed to see stock trading activity, where a stock is categorized as being widely popular with investors or an active stock if the stock trading volume shows a large volume. Research conducted by [10] stated that the Fed's increase rate declaration could influence investors' decisions in transacting in the capital market, resulting in a difference in the average TVA. According to [11] there is a dissimilarity of TVA or (Trading Volume activity) that occurred during BI 7-Day Reverse Repo Rate increase due to the Fed's increase in interest rates on the LQ45 stock index on June 29, 2018. Research Conducted from [11] stated that the trade reacted to the declaration of Federal Reserve interest rate, which was indicated by the dissimilarity in average trading volume activity before and after the event. Based on the theory, second alternative hypothesis of this analysis is as follows:

H_3 : There are dissimilarity in trading volume activity before and after the 2022 Federal Reserve interest rate increase for LQ45 Index companies

H_4 : There is a dissimilarity in trading volume activity before and after the 2022 Federal Reserve interest rate increase for Dow Jones Index companies

3 Methodology and Data Analysis

Sampel and Data

This type of analysis includes event studies that use quantitative data and the data sources are secondary data, namely data obtained by accessing idx.co.id and www.finance.yahoo.com. The population in this analysis includes all corporation registered on BEI (Indonesia Stock Exchange) and NYSE (New York Stock Exchange) in 2022. As reported on the formal web page on Indonesian Stock Exchange via idx.co.id (2022) there are 835 corporation register on BEI in the 2022 observation term and from nyse.com (2022) reported that there are 2,535 companies registered on the New York Stock Exchange in the 2022 observation time. Meanwhile, this analysis use the sample that using a purposive sampling technique, spesifically companies included in LQ45 Index and Dow Jones index in the research period, so 75 companies will be used as samples.

Testing the Hypotheses

The variables of abnormal return and trading volume activity variables are tested using the Paired Sample t-test on normally distributed data in hypotheses 1 and 2. For data that is not normally distributed will be using Wilcoxon Signed Rank test. The research variable used in this analysis is abnormal return which is the difference between actual return and expected return.

$$AR_{i,t} = R_{i,t} - R_{m,t} \quad (1)$$

$AR_{i,t}$ = Abnormal Return

$R_{i,t}$ = Actual Return

$R_{m,t}$ = Expected Return

In addition, this study also uses trading volume activity as a research variable where TVA is acquired by differentiating the number of issuer shares traded in a certain time with the full number of issuer shares outstanding in the same time.

$$TVA = \frac{\text{Traded Stock Volume}}{\text{Shares Outstanding}} \quad (2)$$

4 Research and Result

Table 1. The Conclusion of Abnormal Return Index LQ45 Test on the Fed's Interest Rate Increase for the 2022 Period using the Wilcoxon Signed Rank test.

Test Statistics	
	AAR After 2022 Fed Increase - AAR Before 2022 Fed Increase
Z	-2,045 ^b
Sig (2-tailed)	0,041
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

(source: data summarized from descriptive statistics SPSS 29)

The conclusion of this test that using Wilcoxon Signed Rank combined abnormal return for the event of an increase in the Fed's interest rate were obtained Sig. (2-tailed) 0.041 which has a value smaller than 0.05 or $0.041 < 0,05$. This shows that the abnormal return hypothesis is supported, meaning that there is a significant difference in abnormal returns before and after the United States Federal Reserve interest rate increase on LQ45 Index.

Table 2. The Conclusion of Abnormal Return Index Dow Jones Test on the Fed's Interest Rate Increase for the 2022 Period using the Wilcoxon Signed Rank test.

Test Statistics	
	AAR After 2022 Fed Increase - AAR Before 2022 Fed Increase
Z	-,909 ^b
Sig (2-tailed)	0,363
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

(source: data summarized from descriptive statistics SPSS 29)

The conclusion of this test that using Wilcoxon Signed Rank results of the Wilcoxon Signed Rank combined abnormal return test for the event of an increase in the Fed's interest rate were obtained Sig. (2-tailed) 0.363 which has a value greater than 0.05 or $0.363 > 0,05$. This shows that the abnormal return hypothesis is not supported, meaning that there is no significant difference in abnormal returns before and after the United States Federal Reserve interest rate increase on Dow Jones Index.

Table 3. The Conclusion of Trading Volume Activity Index LQ45 Test on the Fed's Interest Rate Increase for the 2022 Period using the Paired Sample t-Test.

Paired Samples Test										
		Paired Differences				t	df	Significance		
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One - Side d p	Two - Side d p
					Lower	Upper				
Pair 1	ATVA After 2022 Fed Increase - ATVA Before 2022 Fed Increase	-0,00004067	0,00053554	0,00013828	-0,00033724	0,00025591	-0,294	14	0,386	0,773

(source: data summarized from descriptive statistics SPSS 29)

The conclusion of TVA that using Paired Sample t-Test for the event of an increase in the Fed's interest rate were obtained Sig. (2-tailed) 0.773 which has a value greater than 0.05 or $0.773 > 0.05$. This shows that the trading volume activity hypothesis is not supported, meaning that there is no significant difference in trading volume activity before and after the United States Fed interest rate increase on the LQ45 Index.

Table 4. The Conclusion of Trading Volume Activity Index Dow Jones Test on the Fed's Interest Rate Increase for the 2022 Period using the Paired Sample t-Test.

Test Statistics	
	ATVA After 2022 Fed Increase - ATVA Before 2022 Fed Increase
Z	-,738 ^b
Asymp. Sig. (2-tailed)	0,460
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

(source: data summarized from descriptive statistics SPSS 29)

The conclusion of TVA that using Paired Sample t-Test for the event of an increase were obtained Sig. (2-tailed) 0.460 which has a value greater than 0.05 or $0.460 > 0.05$. This shows that the abnormal return hypothesis is not supported, meaning that there is no significant difference in trading volume activity before and after the United States Fed interest rate increase on the Dow Jones Index.

5 Implication and Suggestion for Future Research

The H_1 shows that the analysis of the market reaction test before and after the Federal Reserve interest rate hike event for LQ45 Index Companies show a significant difference in abnormal returns, so **Hypothesis 1 is supported**. This event has significant information content due to the Sig. (2-tailed) of the observation period is less than 0.05. The H_2 shows that the results of the market reaction test on the Dow Jones index companies show no significant difference in abnormal returns, so **Hypothesis 2 is not supported**. This event has insignificant information content due to the Sig. (2-tailed) of the observation period is greater than 0.05. The H_3 shows no differences in trading volume activity before and after the declaration of the Fed's interest rate increase on the Dow Jones Index Companies, so **Hypothesis 3 is not supported**. The H_4 shows that there is no difference in trading volume activity before and after the announcement of the Fed's interest rate increase on the Dow Jones Index Companies, so **Hypothesis 4 is not supported**. From the analysis of TVA for the increase in Federal Reserve interest rate both for the LQ45 index and for the Dow Jones index, there is no significant difference between trading volume activity for events before and after the Fed's increase.

The test results on the variable abnormal return on the LQ45 index show a difference in the average abnormal return before and after the announcement of the Fed's interest rate hike because the changes in the abnormal return are quite significant. Meanwhile, testing on the abnormal return variable on the Dow Jones index shows that there is no difference in the average abnormal return before and after the announcement of the Fed's interest rate increase. That is because the changes in abnormal returns are not significant enough, which is reflected in the average abnormal return before and after the event. The test outcomes on trading volume activity variable show that there is no difference in the average trading volume activity before and after the announcement of the Fed's interest rate hike on the LQ45 index companies and the Dow Jones index. This is because the changes in trading volume activity are not significant enough, which is considered TVA during the event.

References

- [1] V. Astrov, R. Grieveson, A. Kochnev, M. Landesmann, & O. Pindyuk.: Possible Russian Invasion Of Ukraine, Scenarios For Sanctions, And Likely Economic Impact On Russia. Ukraine And The EU. *Policy Note*, vol. 55 (2022)
- [2] D. Steinbock.: The Unwarranted War The avoidable war that will penalize severely Ukraine, Russia, the US and the NATO, Europe, developing countries and the global economy. no. March, pp. 1–14 (2022)
- [3] Y. R. T. Hutagaol, R. P. P. Sinurat, & S. M. Shalahuddin.: Strategi Penguatan Keuangan Negara Dalam Menghadapi Ancaman Resesi Global 2023 Melalui Green Economy. pp. 378–385 (2022)
- [4] V. B. Kusnandar.: (2022)
- [5] M. Murtadho.: Pengaruh Suku Bunga Terhadap Nilai Tukar Serta Pengaruhnya Terhadap Indeks Harga Saham (Studi Sasus Indonesia, China dan Australia). *e-Journal Manaj. Kinerja*, vol. 2, no. 2, pp. 1–10 (2016)
- [6] J. Frikasih, M. C. Muaja, S. R. Nussy, G. Manampiring, & J. B. Maramis.: Reaksi Pasar Modal Terhadap Kenaikan Suku Bunga The Federal Reserve Bank Amerika Serikat 15 Juni 2022 Pada Indeks Saham Nasdaq 101 Yang Terdaftar Di New York Stock Exchange The Capital Market Reaction To The Increase In The United States Federal Reserve's. *J. EMBA*, vol. 10, no. 4, pp. 1445–1454 (1445)
- [7] A. Hartati.: Analisis Perbandingan Harga Saham dan Volume Perdagangan Saham Sebelum dan Sesudah Publikasi Laporan Keuangan. no. 200812014, pp. 1–79 (2014)
- [8] Misgayanti & I. Zuhroh.: Pengaruh Suku Bunga Luar Negeri Federal Reserve (the Fed), Nilai Tukar

- Rupiah/Us \$ Dan Inflasi Terhadap Indeks Harga Saham Gabungan Di Bursa Efek Indonesia Periode 2006-2008. *J. Ekon. Pembang.*, vol. 7, no. 1, p. 19 (2009) doi: 10.22219/jep.v7i1.3580.
- [9] B. S. Bernanke & K. N. Kuttner.: Bernanke and Kuttner 2005.pdf (2005)
- [10] D. Purba.: Reaksi Pasar Modal Indonesia Atas Pengumuman Kenaikan Tingkat Suku Bunga Acuan. (2018)
- [11] G. A. D. A. Miyanti & L. P. Wiagustini. Pengaruh Suku Bunga the Fed, Harga Minyak Dan Inflasi Terhadap Indeks Harga Saham Gabungan (Ihsg) Di Bursa Efek Indonesia. *E-Jurnal Ekon. dan Bisnis Univ. Udayana*, vol. 5, p. 1261 (2018) doi: 10.24843/eeb.2018.v07.i05.p02.
- [12] A. U. Abonyi.: Invasion of Ukraine by Russia: The Legal Implications. *Law Soc. Justice Rev.*, vol. 2, no. 3, pp. 176–183 (2022)
- [13] Andrian, T., & Lestari, T. P.: Analysis of the Impact of The Fed Rate Target on Bank Indonesia's Monetary Policy. *Journal of Economic & Business Dynamics*, 10(2), 180–193 (2013)
- [14] Budiarto, A., YKPN, S., & Murtanto.: Event Study: Study of Methodology and Its Application in the Field of Economics and Finance (2002)
- [15] Damodaran, A.: *Investment Valuation: Tools and Techniques for determining the value of any asset.* New York: John Wiley & Sons, Inc (2002)
- [16] Darwati, S., & Santoso, N. T.: Against the Composite Stock Price Index in the Capital Markets in ASEAN Countries. October 2014, 47–56 (2015)
- [17] Ghozali.: *Multivariate Analysis Application with IBM SPSS Program* (2016)
- [18] Hartono, J.: *Portfolio and Investment Analysis: A Modular Approach* (2nd Edition). Publisher Andi (2017)
- [19] Hermuningsih, S., Rahmawati, A. D., & Mujino, M.: Factors Affecting Stock Returns. *Journal of Economics and Business*, 19(3), 78 (2018)
- [20] Hutabarat, G. F. I.: Indonesian Foreign Policy Direction After the Russo-Ukrainian War Based on National Interest Perspective. *Journal of Al Azhar Indonesia Social Sciences Series*, 3(3), 154 (2022)
- [21] Islami, L. N., & Sarwoko, E.: The reaction of the Indonesian Capital Market to the Change of the Minister of Finance (Study Event of Shares Registered on the Bej) (2012)
- [22] Kammer, A., Azour, J., Selassie, A. A., Goldfajn, I., & Rhee, C.: How war in Ukraine is reverberating across world's regions. Washington: IMF (2022)
- [23] Mankiw, N.G.: *Principles of Economics*, 3th edition, Translated by Chriswan Sungkono. Salemba Empat, Jakarta (2002)
- [24] Nasir, A., & Mirza, A.: The Effect of Exchange Rates, Inflation, Deposit Interest Rates and Stock Trading Volume on Stock Returns in Banking Companies Listed on the Indonesia Stock Exchange. *Journal of Economics*, University of Riau, 19(04), 8864 (2011)
- [25] Pamungkas, A., Suhadak, & NP, M. G. W. E.: The Influence of the 2014 Indonesian Presidential Election on Abnormal Return and Trading Volume Activity. *Journal of Business Administration (JAB)*, 20(1), 1–9 (2015)
- [26] Pratiwi, K. R. D. I., & Wirakusuma, I. G. M.: *E-Journal of Accounting*, Udayana University Reaction of the Indonesian Capital Market to the Announcement of an Increase in the Reference Interest Rate by the Fed in the US Kadek Rosita Dewi Indra Pratiwi 1 Faculty of Economics and Business, Udayana University (Unud), Bali, Indonesia email: rosit. 25, 1966–1993 (2018)
- [27] Putu, N., Anjani, P., Wahyuni, A., & Tungga Atmadja, A.: Analysis of Investor Reaction to the Influence of Bi Interest Rate Increase Events Due to the Fed's Interest Rate Increase on the LQ45 Stock Index. *Scientific Journal of Accounting Students) Ganesha University of Education*, 9(3), 2614–1930 (2018)
- [28] Shabrina, I.N.: The reaction of the Indonesian Capital Market to Domestic Economic Events (Event Study on the Announcement of the Ratification of the Tax Amnesty Law on 28 June 2016) (2016)

- [29] Sitompul, A., & Danarti, H. T.: Analysis of Abnormal Returns Before and During the Announcement of Covid-19 in Indonesia (Case Study on Stocks in the Food and Beverages Sector and the Student Scientific Journal of FEB Universitas Brawijaya, 10(1) (2022)
- [30] Sitthipongpanich, T.: Understanding the Event Study (2011)
- [31] Steinbock, D.: The avoidable war that will penalize sharply Ukraine, Russia, the. March, 1–14 (2022)
- [32] Tandelilin, E.: Portfolios and Investments: Theory and Applications (2010)
- [33] Canisius.Wijayaningsih, R., Rahayu, S. M., & Saifi, M.: The Influence of the BI Rate, FED Rate, and Rupiah Exchange Rate on the Composite Stock Price Index (IHSG) (Study on the Indonesian Stock Exchange for the 2008-2015 period). Journal of Business Administration S1 Universitas Brawijaya, 33(2), 69–75 (2016)