

# ANALYSIS OF STOCK MARKET REACTION DURING COVID-19 PANDEMIC IN INDONESIA IN 2021 (STUDY OF FINANCIAL SECTOR INDEX COMPANIES OF INDONESIA STOCK EXCHANGE)

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## ABSTRACT

Throughout 2021, the Indonesian stock market went through various dynamics due to Covid-19. This study aims to determine the stock market reaction to financial sector index companies using the variables Abnormal Return (AR), Security Return Variability (SRV), and Trade Volume Activity (TVA). The research time was conducted before and after the second spike in Covid on July 15, 2021, starting from the launch of IDX-IC on January 25, 2021 to July 15, 2021, and after the peak on July 15, 2021 to December 31, 2021. The type of research used is quantitative with secondary data sources. The number of samples was 51 banking sub-sector companies from 104 financial sector index companies. Data analysis was carried out using descriptive tests, normality tests, paired sample t-tests if the data was normally distributed and Wilcoxon signed rank tests if the data was not normally distributed. The results obtained were that there was no significant difference in AR, SRV, and TVA in the period before and after the second peak of Covid-19.

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## 1. INTRODUCTION

The financial sector has a very strategic role and is one of the sectors that can influence and play an important role in triggering economic growth. One of the quite complex challenges for Indonesia as a developing country is how to increase the role of the financial sector so that economic growth becomes better. The financial sector (bank or non-bank) can be likened to blood in the human body, where if the flow is smooth, the body will be healthy and fresh. The financial sector is a sector consisting of companies that provide financial services to commercial and retail customers, including investment funds, banks, and insurance companies. This collection of financial companies or institutions and their supporting institutions are referred to as the Financial Services Industry (IJK). The activities of these institutions or companies are supervised by the Financial Services Authority (OJK) as regulated in Law Number 21 of 2011 concerning the Financial Services Authority. The stock market as one type of market in the financial sector where shares are bought and sold publicly, brings together buyers and sellers of shares as well as institutions and professions related to shares. The definition of shares is a proof of ownership of the value of a company, while the financial sector is one of the sectors in the BEI (Indonesia Stock Exchange) which includes financial institutions, financial intermediaries, securities companies, insurance, and investment companies. In order to provide complete information about stock exchange developments to the public, The Indonesia Stock Exchange (IDX) delivers stock price movement data through print and electronic media. One indicator of stock price movement is through the stock price index and until now the Indonesia Stock Exchange (IDX) has several types of indexes and is supplemented with sectoral indices.

PT Bursa Efek Indonesia (IDX) launched a new industrial classification, namely the Indonesia Stock Exchange Industrial Classification (IDX-IC) replacing the Jakarta Stock Industrial Classification (JASICA) based on the announcement No. Peng-00007/BEI.POP/01-0021 dated January 13, 2021 concerning the New IDX Industrial Classification, PT Bursa Efek Indonesia (IDX) on January 25, 2021 has launched 11 new sectoral indices included in the IDX-IC Sectoral Index group. The World Health Organization (WHO) declared the COVID-19 outbreak a pandemic on March 11, 2020. The COVID-19 pandemic that has attacked has had a very broad impact on all countries in the world, including Indonesia. The biggest impact felt is economic growth which is under great pressure. This situation has put pressure on various economic sectors including the financial sector in the country. The financial sector regulatory and supervisory authority, namely the Financial Services Authority (OJK) said that the Covid-19 pandemic has dealt a heavy blow to the capital market, one of which is the Composite Stock Price Index (IHSG). The Covid-19 pandemic

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has sparked a crisis throughout the world, ranging from a health crisis, social to economic crisis, and also in the financial sector. Speculation and news about covid-19 in the midst of uncertain pandemic conditions greatly affect the movement of the economy and capital markets. Investors build speculation on the Indonesian capital market. The seriousness of the Indonesian government in handling covid-19 is also a concern for investor sentiment.

In early 2021, precisely on January 13, 2021, the government officially implemented a free Covid-19 vaccination program as an effort to suppress the spread of the Covid-19 virus. Confirmed positive cases of Covid-19 in Indonesia even reached more than 1 million on January 26, 2021, making Indonesia the country with the highest number of Covid-19 cases in Southeast Asia. Investor panic was exacerbated by the emergence of various mutation variants of the Covid-19 virus such as Delta which was first discovered in mid-2021 (the transmission rate can be 6 times that of the Alpha variant), followed by the Omicron variant which appeared at the end of 2021 to early 2022. Indonesia experienced a peak spike in Covid-19 on July 15, 2021 due to the emergence of the Delta variant with confirmed positive cases reaching 56,757 cases. After the peak spike, new daily cases of Covid-19 began to decline and at the end of July 2021, the number of new cases was recorded at 37,284 cases. In July 2021, the JCI closed at 6,070.04, which means it increased by 1.41% compared to the previous month's close at 5,947.46. Based on the 2021 Capital Market Fact Book published by the Financial Services Authority (OJK), the average daily stock trading value experienced a very sharp increase of 45.19% from IDR 9,209.91 billion in 2020 to IDR 13,372.20 billion in 2021 and the average trading frequency also experienced a significant increase of 91.14% to 1,295 thousand times in 2021 from 677 thousand times in the previous year. Mangantar et al., (2021) stated that the PSBB (Large-Scale Social Restrictions) event as a form of government handling to overcome Covid-19 has an impact on the formation of stock price fluctuations. Mangantar et al., (2021) stated that there was a significant difference in Abnormal Return which means that the market reacted to the PSBB announcement or stock prices that were still influenced by information and events, while the Trade Volume Activity indicator showed insignificant results which means that the PSBB announcement event also had an impact on investor trading activities whose fluctuations were very small on a daily basis.

In addition to supervising the financial services sector, the Financial Services Authority (OJK) also has another task, namely providing valid, honest, credible, correct and non-discriminatory information services to the public. The Financial Services Authority (OJK) in its press release stated that until the end of 2021, the stability of financial services was maintained, accompanied by the intermediation function of banking and stocks in the capital market which continued to improve with the control of the Covid-19 pandemic. Although the situation during the Covid-19 pandemic in the financial sector tended to be stable, the author wants to know the changes in Abnormal Return, Security Return Variability and Trade Volume Activity that occurred in stocks on the Indonesia Stock Exchange (IDX), especially financial sector stocks in 2021.

### Literature Review

Based on previous research, Maramis et al., (2020) explained the capital market reaction to the corona virus (covid-19) incident in food and beverage companies listed on the Indonesia Stock Exchange with research results that the covid-19 incident did not have a significant impact on the capital market reaction to the variables AR, TVA and Market Capitalization. Research conducted by Komang Endri Agustiawan et al., (2020) showed the results of the study on the reaction of the Indonesian capital market before and after the announcement of the government's policy on the emergency status of the Covid-19 disaster also had no significant impact on AR and TVA. According to Azisana-bely, Muhammad Nursyafi (2020), the implementation of the 2018 Asian Games in Indonesia (Event Study on LQ-45 stocks on the IDX did not have a significant impact on Average AR and Average TVA. Meanwhile, research conducted by Purba, Fransisko (2017) found that the political event of the 2017 DKI Jakarta gubernatorial election had a significant impact on the capital market (variable AR) but did not have a significant impact on stock trading volume (TVA). Based on research conducted by Mangantar et al., (2021), the results of the study were presented, namely the announcement of PSBB due to Covid-19 had a significant impact on the capital market (variable AR) but did not have a significant impact on stock trading volume (TVA) in the telecommunications industry on the IDX. Talumewo et al., (2021) examined the reaction of the Indonesian capital market before and after the announcement of the implementation of New Normal (Event Study on BUMN companies listed on the Indonesia Stock Exchange) and the results of the study showed that the announcement of the New Normal had a significant impact on the capital market (variables AR and TVA). Research conducted by Halimatusyadiyah (2020) revealed that the reaction of the Indonesian capital market to the announcement of the first case of the corona virus in Indonesia (case study on LQ45 shares) had a significant impact on the capital market with variables AR and TVA. Another study conducted by

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Suheny et al., (2021) on the impact of Covid-19 on changes in stock prices and transaction volume (case study at PT. Matahari Department Store, Tbk, found that Covid-19 had a significant impact on the capital market (stock price variables and TVA). According to Diantriasih, Ni Komang, et al. (2018), conducting a comparative analysis of Abnormal Return, Security Return Variability and Trading Volume Activity before and after the 2018 simultaneous regional elections, the results of the study were that the 2018 simultaneous regional elections did not have a significant difference in the capital market (AR and SRV variables), but there was a significant difference in stock trading volume (TVA). Furthermore, research conducted by Dewi, Ayu Trisna (2021) on an empirical study of Abnormal Return before and after the announcement of a Right Issue in a Go Public company on the IDX, showed that the announcement of a Right Issue in a Go Public company did not have a significant impact on the capital market, either in terms of stock price or AR.

## 2. METHOD

The operational definition of variables in the research conducted includes independent variables and dependent variables.

### **Variabel Dependen (Y)** **Abnormal Return (AR)**

According to Jogiyanto (2014: 647) abnormal return is the excess of the return that should occur over the normal return. To estimate the expected return, researchers use the market adjusted model (Market Adjusted Model). The data used in calculating Actual Return is as follows: accumulation of closing prices of financial sector shares in the banking subsector on day t, accumulation of closing prices of financial sector shares in the banking subsector before day t. The data used in calculating Expected Return is the daily closing price of the IHSG.

### **Security return variability (SRV)**

Security Return Variability (SRV) is an analysis of the average variability of returns to see whether the market as a whole considers that information is informative and results in changes in the distribution of stock returns. The data used in calculating Security Return Variability (SRV) is as follows: Abnormal stock return on day t and Average abnormal return

### **Trade Volume Activity (TVA).**

Trading Volume Activity (TVA) is the amount of stock buying and selling activity in a certain period. According to Tandellin (2010: 35), in addition to stock prices, there is another indicator that attracts investors' attention in stock trading, namely trading activity. The data used in calculating Trading Volume Activity (TVA) is as follows:

1. tradable shares data
2. listed shared stock data (outstanding shares)
3. stock transaction volume data

### **Variabel Independen (X)**

Variabel independen in study This is the covid-19 pandemic event in Indonesia in 2021. The type of research used is quantitative with the data used being secondary data related to stock price data of companies listed on the Indonesia Stock Exchange in the financial sector. The data sources used in this study are secondary data. The data used in this study are:

1. Company data is included in the financial sector index on the Indonesia Stock Exchange (IDX) financial sector.
2. Daily closing price data of companies listed on the IDX during the research period.
3. Financial sector stock transaction volume data
4. Closing price data for IHSG (Composite Stock Price Index)
5. Tradeable Share (daily traded share data)
6. Listed Share (outstanding share data)
7. News/information about the Covid-19 pandemic in Indonesia

The population of this study is companies listed on the Indonesia Stock Exchange (IDX) and included in the financial sector index on the Indonesia Stock Exchange with 5 (five) sub-sectors, namely banks, financing services, investment services, insurance, as well as holding and investment companies, of which there are 104 companies listed. The research sample that The companies used were the financial services sector companies in the banking subsector which met the testing time requirements, amounting to 51 companies with the following criteria:

1. The banking subsector is the subsector with the most dominant number of data samples among the other sectors.

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2. 51 companies in the banking sub-sector had the same number of daily stock trading transactions, namely 247 days in the period from January 25, 2021 to December 31, 2021.
3. During 2021, the 51 companies did not carry out corporate actions in the form of mergers so that each issuer can be taken as a sample.

The data analysis techniques used in this study are descriptive tests, normality tests, paired sample t-tests if the data is normally distributed and Wilcoxon signed rank tests if the data is not normally distributed in the period before and after the peak of the Covid-19 spike on July 15, 2021. The research location was obtained from the website <http://www.idx.co.id> and sources related to this research. The research period was 5 (five) months starting from data collection until the research was completed.

### 3. RESULTS AND DISCUSSION

PT Indonesia Stock Exchange (IDX) launched a new industrial classification called IDX Industrial Classification (IDX-IC) on January 25, 2021. IDX-IC is a new approach in the classification of companies listed on the Indonesia Stock Exchange, replacing the Jakarta Stock Industrial Classification (JASICA) which has been used since 1996. This aims to provide guidance for its users on groups of companies with similar market exposure. Among the 11 new sectors, there is the financial sector which is the focus of this writing. IDX-C has 4 levels of classification consisting of 12 sectors, 35 sub-sectors, 69 industries and 130 sub-industries. Financial Sector based on IDX Industrial Classification (IDX-IC) includes companies that provide financial services such as Banks, Consumer Finance Institutions, Venture Capital, Investment Services, Insurance, and Holdings Companies. In this study, data analysis was carried out on each variable covering 51 banking sub-sector companies with the following details:

1. Abnormal Return (AR)

The Abnormal Return (AR) value is obtained by comparing the accumulated value of Actual Return with the Expected Return of daily closing shares for the period before and after the peak of the Covid-19 spike in the financial sector, banking sub-sector, of 51 companies. Actual Return value is obtained by calculating the total percentage of the accumulation of closing prices of financial sector shares on day t divided by the accumulation of closing prices of financial sector shares before day t minus 1. Expected Return value is obtained by calculating the percentage difference in the accumulated daily IHSG closing prices starting from January 25, 2021 to December 31, 2021. In calculating the Expected Return Value, this study uses the Market Adjusted Model method, which is a way to measure a company's stock performance by comparing it with the performance of the IHSG or relevant stock market index.

2. Security Return Variability (SRV)

Security Return Variability (SRV) value is obtained by calculating the square value of the Abnormal return compared to the Abnormal Return Variance value of financial sector companies, while the Abnormal Return Variance value is obtained from the difference in the average square value of the Abnormal return divided by the number of days of the study minus 1. The number of research days is 247 days in the period from January 25, 2021 to December 31, 2021.

3. Trade Volume Activity (TVA)

Trade Volume Activity Value (TVA) is obtained by pairing the accumulated data of Tradeable Shares (traded shares) with the accumulated data of Listed Shares (outstanding shares).

#### Variable Characteristics

The characteristics of the variables in this study are as follows:

1. Abnormal Return (AR)

- a. Abnormal Return (AR) is the difference between the actual return of an asset and the normal or expected return.
- b. measured relative to a benchmark or reference. This allows investors to assess whether an asset is performing better or worse than expected in the context of a particular market or reference.
- c. can be used to identify the causes of changes in an asset's performance. Whether the changes are caused by internal company factors, external market factors, or other factors.
- d. used in conjunction with specific events and helps assess the impact of an event on an asset's performance, such as a company earnings announcement, policy change, or macroeconomic market event.
- e. a very important variable in making investment decisions, whether the investment can be selected based on a high Abnormal Return (AR) or avoided based on a low Abnormal Return (AR).

- f. Abnormal Return (AR) also has limitations, namely that it does not always perfectly reflect the factors that influence asset performance, and the interpretation Abnormal Return (AR) must be done with caution.

Abnormal Return (AR) becomes positive or negative depending on the comparison between the actual return of a financial asset and the expected rate of return (normal return). Following are common situations that cause AR to be positive or negative:

- a. Abnormal Return (AR) positive: When the actual return on an asset is higher than the expected rate of return (normal return). This indicates that the asset is performing better than anticipated in a given market or benchmark context. It can also be caused by a variety of factors, such as better company performance, positive news announcements, strong earnings growth, or other internal or external factors that support an asset's performance.
- b. Abnormal Return (AR) : When the actual return of an asset is lower than the expected rate of return (normal return). This indicates that the asset is performing worse than anticipated. It can also be caused by various factors, such as weaker than expected company performance, negative news announcements, declining profits, other internal or external factors that affect performance. asset.

## 2. Security Return Variability (SRV)

- a. measure the level of variation or fluctuation in the return rate of a security in a certain period. Security Return Variability (SRV) can be used as an important indicator in analyzing investment risk and performance.
- b. measures the volatility of asset returns, the higher the Security Return Variability (SRV) value, the greater the fluctuations in the rate of return on the asset.
- c. Security Return Variability (SRV) indicates that the asset has significant fluctuations in its rate of return, which can be a sign of higher risk. Conversely, a low Security Return Variability (SRV) indicates greater stability in the rate of return. its return.
- d. used in risk analysis and is a component important in the assessment of investment risk in helping investors and analysts to understand how stable or volatile an asset is in generating returns and the extent to which it can provide diversification in their portfolio. Investors seeking lower levels of risk tend to choose assets with lower Security Return Variability (SRV). On the other hand, investors who are willing to accept risk may be more interested in assets with Security Return Variability (SRV) higher if there is a greater potential return
- e. can be influenced by external factors such as market conditions, economic changes, or news that affects asset prices. This can cause significant fluctuations in Security Return Variability (SRV).

Security Return Variability (SRV) value indicates greater variability in the rate of return. This indicates that the rate of return on the asset varies significantly over a period of time. A high Security Return Variability (SRV) can be considered a sign of a greater level of risk or greater fluctuation in asset performance. The higher the Security Return Variability (SRV), the greater the fluctuation in the asset's return level, which can be considered a higher risk. On the other hand, a low Security Return Variability (SRV) indicates greater stability in rate of return.

## Trade Volume Activity (TVA)

- a. measures the total amount of assets traded in a day and can be used as a leading indicator of daily market activity and measures the average trading volume over a certain period, such as weekly or monthly.
- b. covers fluctuations in trading volume from one period to another and is often analyzed in relation to price movements. Significant price changes supported by high trading volumes may indicate important trends or changes in the market.
- c. can be used to measure the relationship between an asset's trading volume and external factors, such as economic news, political events, or corporate announcements.
- d. is often used as an indicator of the liquidity of an asset. More liquid assets have Trade Volume Activity (TVA) high because it is easier to trade. A sudden increase in trading volume may indicate sudden interest from investors or an important event that influence the market.
- e. can reflect market sentiment, identify assets that have high trading volumes, used to make price chart analysis in identifying patterns and signals trading, can affect the spread between the buy price and the sell price of an asset, and Trade Volume Activity (TVA) can vary between different markets and asset classes, for example, volume Stock trading can differ by trading volume foreign currency.
- f. Trade Volume Activity Variable (TVA) is an important indicator in financial market analysis and provides information about trading activity, liquidity, and investor interest in an asset. This indicator

is used by various stakeholders, including investors, analysts, and traders, to make investment decisions.

Trade Volume Activity (TVA) becomes high when the volume trading of an asset increases significantly compared to the previous period or its historical average. This can occur in several situations, namely:

- a. There is positive sentiment, for example when there is optimism or strong interest from investors or traders in certain assets, then the trading volume can increase significantly.
- b. positive news such as announcements of good news, positive company performance, or other positive events.
- c. important events such as monetary policy announcements, political events, or macroeconomic events.

Trade Volume Activity (TVA) becomes low when the volume trading of an asset tends to stagnate or decline significantly. This can happen in the following situations, namely:

- a. there is negative sentiment for example when there is uncertainty in markets related to certain assets, trading volumes may decrease as investors may be cautious.
- b. sluggish/less active market conditions and holidays/certain days where trading volumes tend to be lower due to some market players do not participate.
- c. uncertainty in the global economy or unstable market conditions may cause a decrease in trading volume.

#### Abnormal Return (AR) test

Table 1  
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Before covid	116	-.02067	.01950	.0005404	.00604229
After covid	116	-.15439	.01585	-.0010879	.01528974
Valid N (listwise)	116				

This information provides an overview of the range of data values in each group. For the Before covid group, the average is 0.0005404. This shows that the average value in the Before covid group is close to zero. While for the After covid group, the average is -0.0010879. This shows that the average value in the After covid group is slightly negative. Standard deviation measures the spread of data around the mean. For the Before covid group, the standard deviation is 0.00604229. This indicates that the data in the Before covid group has relatively small variations around its mean. While for the After covid group, the standard deviation is 0.01528974. This indicates that the data in the After covid group has slightly larger variations compared to the Before covid group.

#### Descriptive test of Security Return Variability (SRV)

Table 2  
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Before covid	116	-.020670	.019500	.00054043	.006042290
After covid	116	-.154395	.015846	-.00108819	.015290139
Valid N (listwise)	116				

This information provides an overview of the range of data values in each group. For the Before covid group, the average is 0.00054043. This shows that the average value in the Before covid group is close to zero. While for the After covid group, the average is -0.00108819. This shows that the average value in the After covid group is slightly negative.

Standard deviation measures the spread of data around the mean. For the Before covid group, the standard deviation is 0.006042290. This indicates that the data in the Before covid group has relatively small variations around its mean. While for the After covid group, the standard deviation is 0.015290139. This indicates that the data in the After covid group has slightly larger variations compared to the Before covid group.

#### Descriptive test of Trade Volume Activity (TVA)

Table 3

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### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Before covid	116	.999833	.999833	.99983332	.00000000
After covid	116	.999833	.999833	.99983332	.00000000
Valid N (listwise)	116				

The Before Covid group consisted of 116 days of observation. collected before covid on January 25 to July 15, 2021. The minimum value in the Before Covid group is 0.999833, which indicates the lowest point in the pre-covid data range. On the other hand, the maximum value in the Before Covid group is 0.999833, which is the highest point in the pre-covid data range. In terms of average, the Before Covid group has a mean value of 0.99983332, which indicates the middle or central value of the pre-covid data group. In addition, the standard deviation in the Before Covid group is 0.000, which describes the level of variation or spread of data in the group before covid. The higher the standard deviation value, the greater the variation of data in the group. The After Covid group also consists of 116 observations collected after the covid event from July 16 to December 30, 2021. The minimum value in the After Covid group is 0.999833, indicating the lowest point in the range of the post-covid data. The maximum value in the After Covid group is 0.999833, which is the highest point in the range of the post-covid data. In terms of average, the After Covid group has a mean of 0.99983332, which is the middle or central value of the post-covid data group. The standard deviation in the After Covid group is 0.000, indicating the level of variation or spread of the data in the covid group.

### Abnormal Return (AR) Normality Test

Table 4

#### One-Sample Kolmogorov-Smirnov Test

		Before covid	After covid	
N		116	116	
Normal Parameters <sup>a,b</sup>	Mean	.0005404	-.0010879	
	Std. Deviation	.00604229	.01528974	
Most Extreme Differences	Absolute	.072	.279	
	Positive	.072	.213	
	Negative	-.056	-.279	
Test Statistic		.072	.279	
Asymp. Sig. (2-tailed) <sup>c</sup>		.197	.000	
Monte Carlo Sig. (2-tailed) <sup>d</sup>	Sig.	.148	.000	
	99% Confidence Interval	Lower Bound	.139	.000
		Upper Bound	.157	.000

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 1502173562.

Based on the test results in table 4, with a significance level of 0.05, it can be concluded that the Abnormal Return variable data is not normally distributed. Where, the Asymp. Sig. (2-tailed) value shows the significance value for the Before covid group is 0.197 (> 0.05), while for the After covid group it is 0.000 (<0.05), This shows that the significance value of Before covid is normally distributed and the significance value of After covid is not normally distributed. Because one of the data is not normally distributed, the normality assumption is not met for the data. Because the data is not normally distributed, this study uses a non-parametric statistical test method (Wilcoxon signed rank test).

### Security Return Variability (SRV) Normality Test

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**Table 5**  
**One-Sample Kolmogorov-Smirnov Test**

		Before covid	After covid	
N		116	116	
Normal Parameters <sup>a,b</sup>	Mean	.0005404	-.0010879	
	Std. Deviation	.00604229	.01528974	
Most Extreme Differences	Absolute	.072	.279	
	Positive	.072	.213	
	Negative	-.056	-.279	
Test Statistic		.072	.279	
Asymp. Sig. (2-tailed) <sup>c</sup>		.197	.000	
Monte Carlo Sig. (2-tailed) <sup>d</sup>	Sig.	.148	.000	
	99% Confidence Interval	Lower Bound	.139	.000
		Upper Bound	.157	.000

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 1502173562.

Based on the test results in table 5, with a significance level of 0.05, it can be concluded that the Abnormal Return variable data is not normally distributed. Where, the Asymp. Sig. (2-tailed) value shows the significance value for the Before covid group is 0.197 (> 0.05), while for the After covid group it is 0.000 (<0.05), This shows that the significance value of Before covid is normally distributed and the significance value of After covid is not normally distributed. Because one of the data is not normally distributed, the normality assumption is not met for the data. Because the data is not normally distributed, this study uses a non-parametric statistical test method (Wilcoxon signed rank test).

#### Trade Volume Activity (TVA) Normality Test

**Table 6**  
**One-Sample Kolmogorov-Smirnov Test**

		Before covid	After covid
N		116	116
Normal Parameters <sup>a,b</sup>	Mean	.99983332	.99983332
	Std. Deviation	.00000000 <sup>c</sup>	.00000000 <sup>c</sup>

a. Test distribution is Normal.

b. Calculated from data.

c. The distribution has no variance for this variable. One-Sample Kolmogorov-Smirnov Test cannot be performed.

Based on the test results in table 6, with a significance level of 0.05, it can be concluded that the Trade Volume Activity variable data not normally distributed. This is because the distribution does not have a difference in value, where both are the same, so the assumption of normality is not met for the data. Because the data is not normally distributed, this study uses a non-parametric statistical test method (Wilcoxon signed rank test).

#### Wilcoxon Signed Rank Abnormal Return (AR) Test

The average negative rank (Mean Rank) is 62.21, and the total number of negative ranks (Sum of Ranks) is 3608.00. While Positive Ranks (Positive Ranks) in the same group, there are 58 positive ranks. This shows that in some data pairs, the value of After covid is higher than the value of Before covid. The average positive rank is 54.79, and the total number of positive ranks is 3178.00. In addition, there are no data pairs that have the same value or the same difference. Therefore, the number of Ties is 0, as can be seen in table 7 below:

Table 7

**Ranks**

		N	Mean Rank	Sum of Ranks
After covid - Before covid	Negative Ranks	58 <sup>a</sup>	62.21	3608.00
	Positive Ranks	58 <sup>b</sup>	54.79	3178.00
	Ties	0 <sup>c</sup>		
	Total	116		

a. After covid < Before covid

b. After covid > Before covid

c. After covid = Before covid

The higher average negative rating (62.21) than the average positive rating (54.79) also supports the conclusion that there is a more significant decrease in the value of After covid compared to Before covid. Although there are no pairs of data with the same value, it is important to note that the absence of a significant difference between After covid and Before covid is indicated by the Ties category which has a count of 0.

### Wilcoxon Signed Rank SRV Test

Table 8  
**Ranks**

		N	Mean Rank	Sum of Ranks
After covid - Before covid	Negative Ranks	58 <sup>a</sup>	62.21	3608.00
	Positive Ranks	58 <sup>b</sup>	54.79	3178.00
	Ties	0 <sup>c</sup>		
	Total	116		

a. After covid < Before covid

b. After covid > Before covid

c. After covid = Before covid

The average negative rank (Mean Rank) is 62.21, and the total number of negative ranks (Sum of Ranks) is 3608.00. While Positive Ranks (Positive Ranks) in the same group, there are 58 positive ranks. This shows that in some data pairs, the value of After covid is higher than the value of Before covid. The average positive rank is 54.79, and the total number of positive ranks is 3178.00. In addition, there are no data pairs that have the same value or the same difference. Therefore, the number of Ties is 0.

The higher average negative rating (62.21) than the average positive rating (54.79) also supports the conclusion that there is a more significant decrease in the value of After covid compared to Before covid. Although there are no pairs of data with the same value, it is important to note that the absence of a significant difference between After covid and Before covid is indicated by the Ties category which has a count of 0.

### Wilcoxon Signed Rank Test TVA

Table 9  
**Ranks**

		N	Mean Rank	Sum of Ranks
After covid - Before covid	Negative Ranks	0 <sup>a</sup>	.00	.00
	Positive Ranks	0 <sup>b</sup>	.00	.00
	Ties	116 <sup>c</sup>		
	Total	116		

a. After covid < Before covid

b. After covid > Before covid

c. After covid = Before covid

Based on the test results in table 9, the ranking results of the Wilcoxon Signed Rank Test between the Before covid and After covid groups. In the negative ranking, there are no observations that have a negative difference between the After covid and Before covid groups. This is indicated by the number 0 a in the Negative Ranks column. In other words, there is no data that shows that After covid is smaller than Before covid in this sample. Since there are no observations with a negative difference, the average rank cannot be calculated. Therefore, the average value of the ranks for negative ranks is 0.00. In addition, there are also no negative ranks, so the number of ranks is also 0.00.

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In Ties (same rank), the number of pairs of observations that have the same rank is 116 c. This shows that all observations in the sample have the same difference or no difference between the After covid and Before covid groups. In this case, no observations get a negative rank or a positive rank because no difference is detected. This shows that in the context of this sample, there is no significant change between the After covid and Before covid groups.

**Abnormal Return (AR) in the period before and after the second peak of Covid-19**

Table 10

**Test Statistics<sup>a</sup>**

	After covid - Before covid
Z	-.592 <sup>b</sup>
Asymp. Sig. (2-tailed)	.554

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

This table lists the Z test statistic value (-0.592) and the two-tailed asymptomatic significance value (Asymp. Sig. 2-tailed) of 0.554. The Z test statistic value (-0.592) is based on positive ranks. The Z test statistic value (-0.592) is a calculation result that measures the magnitude of the difference between two related data groups. In this context, a negative value indicates that overall, the After covid group tends to have lower values compared to the Before covid group. The absolute value of this test statistic reflects the magnitude of the difference between the two data groups.

Based on the results of the statistical analysis, it can be seen in Table 10 that the statistical value of the two-tailed asymptomatic significance value (Asymp. Sig. 2-tailed) is 0.554 (> 0.05), so there is not enough strong statistical evidence to reject the null hypothesis. The results of the study showed that there was no significant difference in AR before and after the second peak of Covid-19 indicated the following:

1. The stock market has reached a level of relative stabilization and reflects the balance and rapid adjustment of investors to changing external conditions.
2. reflects a high degree of market efficiency where stock prices accurately reflect all available information and investors can adjust their expectations quickly.
3. reflects that the market has given a significant reaction at the peak of the first spike in the Covid-19 pandemic so that investors can anticipate the second spike.

The results of the study which showed that there was no significant difference in AR before and after the second peak of Covid-19 have implications and can provide valuable insights for various stakeholders in the financial world, including:

1. provides an understanding that changes in the second pandemic situation do not significantly affect stock performance and can help investors make calmer investment decisions and not panic about market volatility.
2. can be used as a basis for designing risk management strategies and planning better strategic actions.
3. Encourage further research to explore other factors influencing market reactions.
4. Provides a deeper understanding of how stock markets can be adaptive to unexpected events.

**SRV during the period before and after the second peak of Covid-19**

Table 11

**Test Statistics<sup>a</sup>**

	After covid - Before covid
Z	-.592 <sup>b</sup>
Asymp. Sig. (2-tailed)	.554

This table lists the Z test statistic value (-0.592) and the two-tailed asymptomatic significance value (Asymp. Sig. 2-tailed) of 0.554. The Z test statistic value (-0.592) is based on positive ranks. The Z test statistic value (-0.592) is a calculation result that measures the magnitude of the difference between two

related data groups. In this context, a negative value indicates that overall, the After covid group tends to have lower values compared to the Before covid group. The absolute value of this test statistic reflects the magnitude of the difference between the two data groups.

The results of the statistical analysis can be seen in the statistical value of the two-tailed asymptomatic significance value (Asymp. Sig. 2-tailed) of 0.554 (>0.05), so there is not enough strong statistical evidence to reject the null hypothesis. The results of the study showed that there was no significant difference in Security Return Variability (SRV) before and after the second peak of Covid-19 indicated the following:

1. Reflecting the global economic uncertainty remains high, the pandemic situation and continued economic turmoil could result in steady fluctuations in stocks.
2. The stable response of Security Return Variability (SRV) can be caused by monetary policy measures taken by central banks and governments to maintain financial market stability, for example related to low interest rate policies and ongoing economic stimulus which can have an impact on controlled market volatility.
3. Investors and financial institutions have better access to information on the Covid-19 pandemic and related developments that may affect their investment decisions in reducing the level of uncertainty expected in the stock market.

The results of the study, which showed that there was no significant difference in SRV before and after the second peak of Covid-19, have very important implications for stakeholders in the financial world, including:

1. Effective risk management will be key in dealing with market uncertainty.
2. Companies need to ensure they have a good business resilience plan in place to deal with market fluctuations that may continue.
3. The government and central bank must continue to monitor the impact of economic and monetary policies on SRV and respond appropriately.
4. Better investor education about high market volatility and how to manage it is an important part of helping individual investors make better decisions.

#### TVA before and after the second peak of covid-19

Table 12  
Test Statistics<sup>a</sup>

	After covid - Before covid
Z	.000 <sup>b</sup>
Asymp. Sig. (2-tailed)	1.000

a. Wilcoxon Signed Ranks Test

b. The sum of negative ranks equals the sum of positive ranks.

The Z test statistic value obtained is -0.000. This Z value describes the magnitude of the difference between the two groups of data being compared, namely Before covid and After covid. In this case, a negative value indicates that overall, the After covid group tends to have a smaller value than the Before covid group. The Asymp. Sig. (2-tailed) value is 1.000. This value indicates the probability of obtaining a difference or test statistic value that is at least as large or more extreme than that observed, if the null hypothesis is true. In this study, a significance value of 1.000 (> 0.05) indicates that there is not enough strong statistical evidence to reject the null hypothesis. This means that there is no significant difference between the two groups of data being compared.

The results of the study showed that there was no significant difference in TVA before and after the second peak of COVID-19 indicated the following:

1. Reflects that investors and market players remain active in trading shares.
2. Reflects the effects of monetary and economic policies taken by governments and central banks in maintaining financial stability. Economic stimulus and other policies can affect trading volumes and minimize extreme fluctuations.
3. Better access and more efficient trade execution can keep market participants active. Investments in advanced e-trading technology and infrastructure play a role in maintaining stable trading volumes.

The results of the study, which showed that there was no significant difference in TVA before and after the second peak of Covid-19, have very important implications for stakeholders in the financial world, including:

1. TVA will provide investors with confidence to carry out trading activities without being overly affected by extreme daily fluctuations.
2. The market has the capacity to adapt to uncertain situations and allows investors to focus more on long-term goals.
3. The government and central bank can design more targeted economic policies and take effective steps to help reduce the impact of market fluctuations on the real economy.
4. Companies related to the stock market need to continue to invest in advanced trading technology and infrastructure in order to ensure smooth trading and minimize disruptions.
5. Investor education on how to manage risk and invest wisely becomes very important in conditions with stable TVA which will help in making better decisions in stock trading.

#### 4. CONCLUSION

Based on the statistical analysis conducted, the following conclusions can be drawn: *AR* there is no significant difference before and after the second peak of covid-19 spike on the stock market reaction during the covid-19 pandemic. This result illustrates the unique conditions faced by the market during the pandemic, high uncertainty and volatility during this period can result in unpredictable market reactions or investors have adjusted their expectations for companies that are better during the crisis. *SRV* did not have a significant difference before and after the second peak of Covid-19 spike on the stock market reaction during the Covid-19 pandemic. Although there was high uncertainty during the Covid-19 pandemic, *SRV* was not a dominant factor in influencing changes in stock prices. Other factors such as government policies, overall economic conditions and investor sentiment could have been more dominant in influencing market reactions during that period. *TVA* did not show any significant difference before and after the second peak of the Covid-19 surge in stock market reactions during the Covid-19 pandemic. This explains that higher or lower investment or trading activity does not always have a significant impact on market reactions, especially in extraordinary conditions such as the Covid-19 pandemic.

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