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Comparison Analysis of Abnormal Return, Cumulative Abnormal Return, Trading Volume Activity, and Bid-Ask Spread of Shares: Event Study of Announcement of COVID-19 Virus, Delta Variant, and Omicron Variant

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ABSTRACT

The spread of the COVID-19 virus has caused panic and affected the economy, including the Indonesia's capital market. This study aims to analyze the reaction of the Indonesian capital market and its implications for efficient market theory at 3 events, namely the announcement of COVID-19, the Delta variant, and the Omicron variant by the Indonesian Government. This capital market reaction is seen through abnormal returns, cumulative abnormal returns, trading volume activity, and bid-ask spreads in the 5 days before and after the announcement. The study population was all tourism and healthcare sector companies listed on the IDX, with a total sample of 15 companies from the healthcare sector and 13 companies from the tourism sector. The results showed no significant differences in abnormal returns, cumulative abnormal returns, trading volume activity, and bid-ask spreads in the tourism sector at all three events. For the healthcare sector, there were significant differences in abnormal returns and cumulative abnormal returns in the announcement of COVID-19 and the Omicron variant but not in the announcement of the Delta variant. Furthermore, there was no significant difference in trading volume activity and bid-ask spread on all events. Indonesia's capital market shows a semi-strong form of efficient market.

Keywords: Abnormal Return, Bid-Ask Spread, COVID-19, Trading Volume Activity.

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I. Introduction

The capital market is a place for companies and governments to raise long-term funds by selling stocks or bonds. The capital market plays an important role in the Indonesian economy, and the presence of the COVID-19 pandemic has become a threat to the performance of the Indonesian capital market. Various industrial sectors have felt the impact of social activity restrictions due to COVID-19 (Merdeka, 2020). COVID-19 is one of the events that can affect a capital market, especially in Indonesia.

The impact generated from this event can be studied using the event study method, in a company that has listed on the capital market, it can be seen from the stock price and its transaction volume. The Indonesian export and import sectors are disrupted, as well as the trade sector from tax revenues also experiencing a decrease. This has a very serious impact because in the tax revenues of the trade sector, it has a large contribution in boosting government revenue, specifically ranked second largest (Sugarda & Rifky, 2017).

According to data from Kontan (2020), the Indonesian Stock Exchange Authority has imposed seven trading halts during the COVID-19 pandemic (Fig. 1). This is early evidence that the Indonesian capital market can be affected by external events that indirectly impact the economy. According to Iswari and Muharir (2021), the impact of the COVID-19 pandemic caused a low investor sentiment towards the market, which in turn caused the market to become negative. The stock market can react to events, shown by changes in stock prices and can occur suddenly causing abnormal returns. Changes in stock prices can also be accompanied by changes in trading volume and demand and supply of a stock.

Fig. 1. The stock prices in the IHSG during the time period of January to December 2020 (TradingView, 2022).

Some research on abnormal returns on the Indonesian Stock Exchange (BEI) during the pandemic has been conducted. Gunistiyo *et al*. (2021) observed investor behavior on the Indonesian Stock Exchange (BEI) before and during (early) the COVID-19 pandemic with a sample of stocks included in the Liquid Index (LQ) 45 and a 76-day trading window before and after the first case was officially announced by authorities in Indonesia. Data analysis results show that there is no difference in abnormal return, but there is a significant difference in trading volume. Auda and Azib (2022) conducted a study of 10 companies in the healthcare sector and concluded that there is no significant difference in bid-ask spread and volatility before and during the COVID-19 pandemic in the March-October 2020 period.

In the tourism sector, Herdiyansyah (2022) conducted a study of 16 companies with a 24-day event window. Based on the analyzed data, a significant difference in AR was found before and during the COVID-19 pandemic event. However, no significant difference was found in the TVA test. Another study using the COVID-19 event was conducted by Herninta and Rahayu (2021) with a 12-month event window and a sample of 52 companies operating in the consumer goods industry. The result was that the average stock price in the consumer goods industry decreased.

Furthermore, Saputra *et al.* (2021) state that there is a significant difference in abnormal return before and after COVID-19 in the food and beverage sector. The sample used 20 companies and the research period was 28 days. In addition to Indonesia, the COVID-19 event also affected the abnormal return of 364 company stocks in Vietnam and the level of influence varied from each stage of COVID-19 prevention actions, according to research by Ngoc and Van (2021).

Based on the background, the research will focus on analyzing the stock reaction of companies listed on the Indonesian stock exchange and in the healthcare sector and the tourism sector, to the announcement of COVID-19 and its subsequent variants. The choice of these indices is to provide investors with a clearer picture of how the stock prices of companies in these highly related sectors are affected by the effects of COVID-19. This research will use 3 events as references for the event study, more than previous studies, because the announcement of the latest variant can also cause panic in the community.

II. Literature Review

A. The Efficient Market Theory

The concept of efficient market was first proposed by Fama (1970) in the context of capital and money markets. A market is said to be efficient if no one, whether an individual investor or institutional investor, can earn abnormal returns, adjusted for risk, using existing trading strategies. This means that prices formed in the market reflect existing information. The form of an efficient market can be grouped into three, known as the efficient market hypothesis where each wealth of information reflects the level of efficiency of a market. The three forms of efficient market in question are weak form efficient market, semi-strong form, and strong form.

B. Event Study

According to MacKinlay (1997), an event study is one of several research methodologies that uses financial market data to measure the impact of a specific event on a company's value. Tandelilin (2010) says that an event study describes an empirical financial research technique that can assess the impact of an event on a stock price. In general, this impact will be reflected in the stock price and its trading volume.

The event study method is widely used in financial and accounting research with a wide range of events, such as initial public offerings, mergers/acquisitions, dividend announcements, new debt or equity issuances, and so on. An event study can also be said to be a method for studying the market reaction to an event whose information is published as an announcement. Available data can be used to test the information content of an announcement and can also be used to test the efficiency of the semi-strong form market (Hartono, 2003).

C. Abnormal Return (AR)

According to Hartono (2017), AR is the difference between actual return and expected return. Actual return is the return that has already occurred and is calculated based on historical data, while expected return or normal return is the return expected by investors in the future without a specific event and has not yet happened. To calculate the normal return value, it can be done with several models, namely Mean-Adjusted Model, Market Model, and Market-Adjusted Model.

D. Cumulative Abnormal Return (CAR)

CAR is the sum of the abnormal returns of each security for the days prior to the event period (Hartono, 2017). By comparing the CAR of the period before the event and the CAR after the event, the impact of an event on stock prices over a period can be seen and analyzed.

E. Trading Volume Activity (TVA)

According to Sutrisno (2000), TVA is an indicator that can be used to see how the market reacts to information given through the stock market volume parameter. Trading volume can also be said to be the ratio of the number of shares that can be traded in a certain period, usually the number of shares traded per day (Beaver, 1968). TVA is often used to measure stock liquidity. If the volume of traded shares is greater than the volume of issued shares, then the shares are more liquid. This makes trading volume activity increase.

F. Bid-Ask Spread (BAS)

The bid price is the price offered by a buyer of the stock, while the ask price is the price offered by a seller of the stock. If there is a match between the bid price and the ask price, a buy-sell transaction (matched) will occur (Darmadji & Fakhruddin, 2012).

G. Research Hypotheses

This research is an extension of previous research that uses event study methodology and analysis of abnormal return, cumulative abnormal return, trading volume activity, and bid-ask spread to examine the significance of the effect produced. According to Tandelilin (2010), bad news will have a negative impact on the market, whereas the market will

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respond positively to good news. This response can be reflected in the abnormal return (positive/negative).

Hindayani (2020) stated that significant abnormal return was found in the Indonesian capital market before and after the announcement of the first COVID-19. This is also supported by Lee and Setiawati (2021) and Saputra *et al.* (2021) through their research. Therefore, this study will test the hypothesis using abnormal return.

H1: There is a significant difference before and after the announcement of the virus news a) COVID-19, b) Delta variant, and c) Omicron variant.

H2: There is a significant difference in the Cumulative Abnormal Return before and after the announcement of the virus news a) COVID-19, b) Delta variant, and c) Omicron variant.

On the other hand, trading volume can also reflect the reaction of the capital market to news or events taking place. Sudden increases in volume have two important meanings. If the volume increase is due to an increase in demand from market participants, then it is a positive response to the news. Conversely, if the volume of transactions increases because market participants are selling massively, then it indicates that the market participants are responding negatively to the news and have a negative impact.

According to Lee and Setiawati (2021), there was a significant trading volume of LQ-45 company shares in the Indonesia Stock Exchange after the announcement of the first COVID-19 case. Kinasih and Laduny (2021) conducted research on the arrival of Sinovac vaccine in Indonesia, but no significance was found. This study will test hypotheses related to trading volume.

H3: There is a significant difference in the Trading Volume Activity before and after the announcement of the virus news a) COVID-19, b) Delta variant, and c) Omicron variant.

This study will also analyze the bid-ask spread, which is the difference between the bid price and the ask price and is also an indicator of stock liquidity. The smaller the bid-ask spread, the more liquid the stock is (Sharpe *et al,* 2005). Currently, there is no study that analyzes the bid-ask spread caused by the first announcement of COVID-19 in Indonesia, so this study will discuss it.

H4: There is a significant difference in Bid-Ask Spread before and after the announcement of the virus news a) COVID-19, b) Delta Variant, and c) Omicron Variant.

III. Research Method

This research will use an event study methodology, comparing the abnormal return, cumulative abnormal return, trading volume activity, and bid-ask spread of events that contain information, namely the announcement of the first COVID-19 on March 2, 2020, the announcement of the Delta variant (second wave) on May 3, 2021, and the announcement of the Omicron variant (third wave) in Indonesia on December 13, 2021. The data sources used in this research are secondary sources, such as stock opening and closing prices, daily trading volume, the number of shares outstanding, and the number of bid-ask shares.

The time window used is 10 days (2 weeks of business days), 5 days before the announcement event and 5 days after the announcement event, in accordance with Peterson (1989) who stated that the time window for daily data ranges from 3-121 days. The use of this event window is expected to be in line with the reaction time of the market that occurs due to the event. The following is a picture of the event window used in this research (Fig. 2).

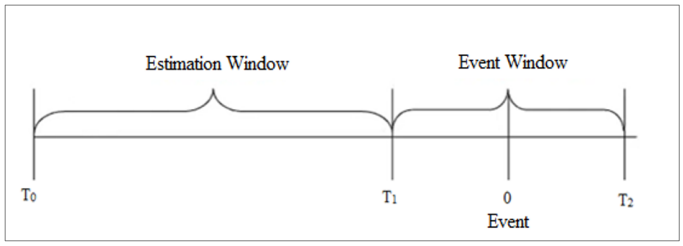

Fig. 2. Estimation window and event window of the research.

This study will also use purpose sampling from the research sample, which are companies operating in the healthcare sector and tourism sector and liquid traded stocks. The total sample of companies analyzed in the healthcare sector (Healthcare Facilities and Pharmacy) is 15 companies, while the total sample of companies analyzed in the tourism sector (Restaurants, Travel Agents, and Hotels) is 13 companies.

IV. Result And Discussion

A. Descriptive Analysis

In the Healthcare sector, as shown in Fig. 3, there is a significant decrease in AAR on t-1, however there is a sudden spike in AAR on the day of the COVID-19 announcement, followed by stagnation before finally dropping sharply on t+4 and t+5. However, there was no significant AAR spike during the announcements of the Delta and Omicron variants.

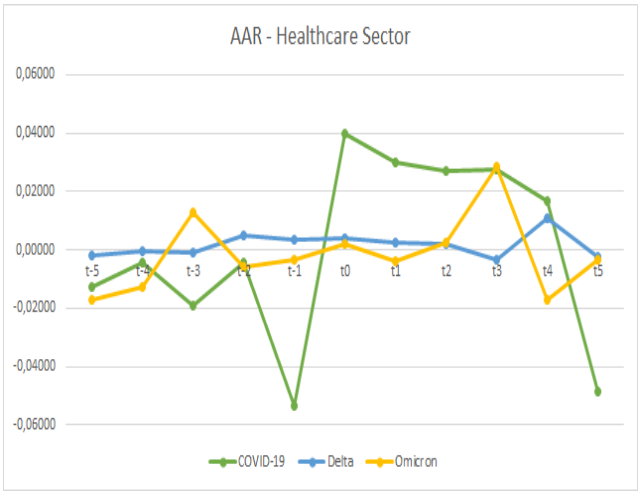

Fig. 3. AAR graph of the healthcare sector.

The CAAR graph (Fig. 4) shows that there was a positive trend in the healthcare sector from t-1 to t+4 during the announcement of COVID-19, but it was relatively stable during the announcement of the other two variants.

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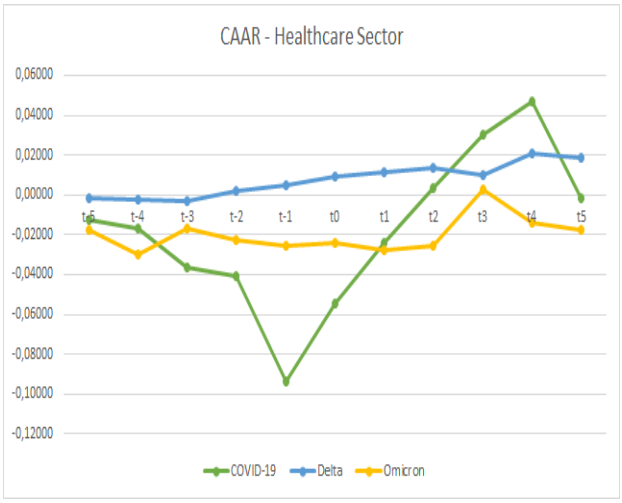

Fig. 4. CAAR graph of the healthcare sector.

Next, for the TVA graph can be seen in Fig. 5 which is the stock transaction volume in the tourism sector during the announcement of COVID-19 is lower and there are no fluctuations compared to the transaction volume during the announcement of the Delta and Omicron variants.

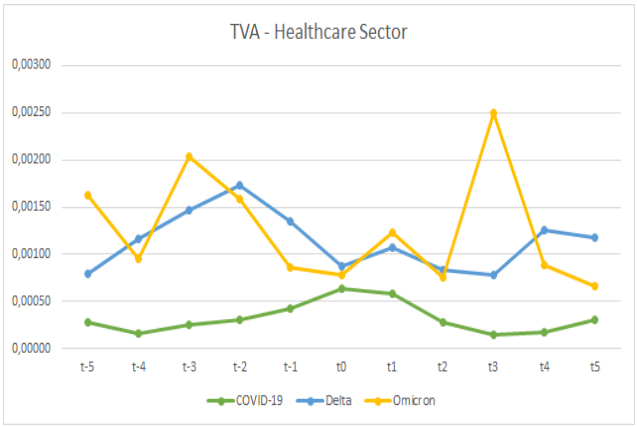

Fig. 5. TVA graph of the healthcare sector.

For the Bid-Ask Spread (BAS), is shown in Fig. 6. The BAS graph of the healthcare sector's shows a significant difference, with the range of values for the three events being different. The average value of the BAS during the announcement of the Omicron variant was the lowest, as the prices of stocks in the healthcare sector have been steadily increasing since the first appearance of COVID-19.

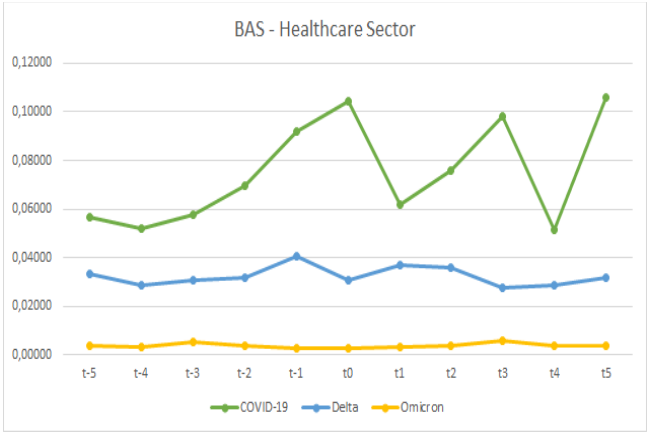

Fig. 6. BAS graph of the healthcare sector.

In the tourism sector, Fig. 7 shows that there was a surge in AAR on t-2 before the announcement of the Delta variant, then it returns to a range of 0.02 to -0.02 for all events. No further surge can be seen.

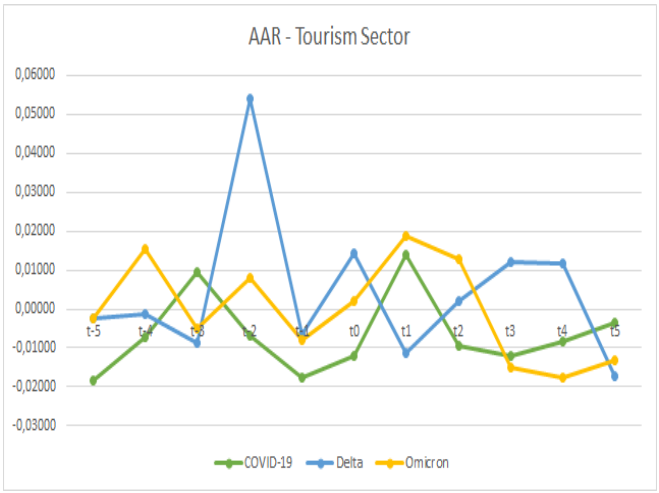

Fig. 7. AAR graph of the tourism sector.

However, in Fig. 8, there is a difference in CAAR where at the announcement of COVID-19, the AAR in the tourism sector continuously decreased and had a negative value.

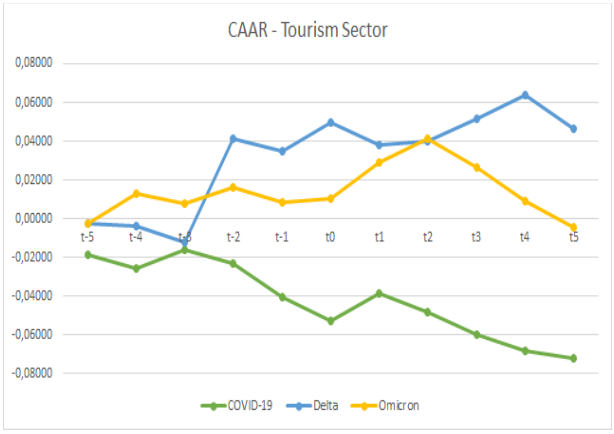

Fig. 8. CAAR graph of the tourism sector.

On the other hand, during the announcement of the Delta and Omicron variants, the CAAR value showed positive numbers. However, at t+5, the CAAR value continues to decrease, which means the AAR value has been decreasing since the announcement of the two variants.

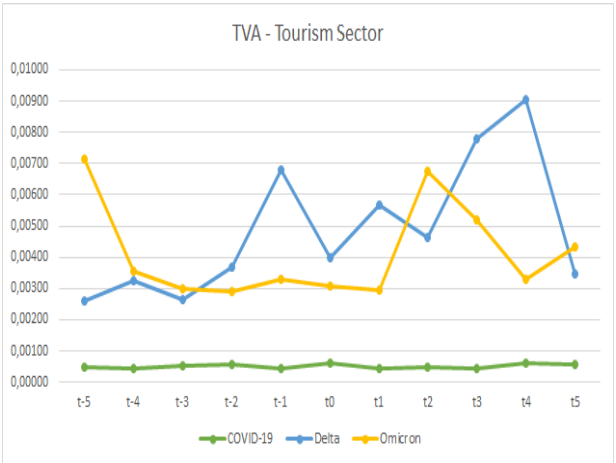

Fig. 9. TVA graph of the tourism sector.

Next, the TVA indicator can be seen in Fig. 9. The TVA graph clearly shows that when the COVID-19 announcement was made, the stock transaction volume in the tourism sector was very low and there was no volatility at all. This is possible due to the predictions of investors who see the tourism sector as being significantly impacted by the spread of COVID-19. Then the transaction volume happened to be considerable and moving up and down on the days around the announcement of the Delta and Omicron variants.

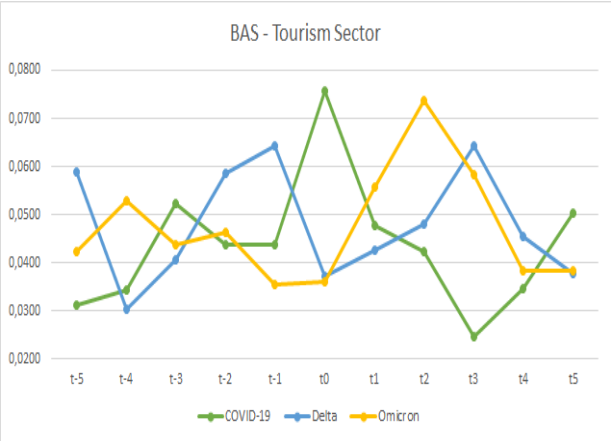

Fig. 10. BAS graph of the tourism sector.

In Fig. 10, the BAS graph for the tourism sector does not show significant differences, where the range of BAS values for the three events ranges from 0.02 to 0.08.

B. Abnormal Return Analysis

In the healthcare sector (Table I), statistically, with significance tests for each day around the COVID-19 announcement, there is significance on t-3, t-1, and t+5. Furthermore, if we look at the difference test results, the value of Sig. 0.017 indicates that there is a significant abnormal return before and after the COVID-19 announcement.

TABLE I: AR SIGNIFICANCE TESTS OF THE HEALTHCARE SECTOR

	Abnormal Return	
COVID-19	0.017	There is a significant difference in the AR
Delta	1,000	There is no significant difference in the AR
Omicron	0,0261	There is a significant difference in the AR

The arrival of COVID-19 in Indonesia has made people quite panicked because it is bad news including for investors and other stock market participants. However, it is something interesting for the healthcare sector. According to CNBC Indonesia (2020), COVID-19 cases are driving healthcare-related stocks, especially pharmaceuticals. The movement of pharmaceutical stock shares reap euphoria from optimism about the discovery of COVID-19 vaccines and making pharmaceutical issuers able to strengthen by hundreds of percent in the last 6 months.

On the Delta variant announcement, abnormal return only shows 1 day where there is significance, which is on t+4. The difference test produced a Sig. 1 value, so it is concluded that there is no significant abnormal return. This can be caused by the ongoing COVID-19 pandemic and symptoms that are becoming more varied due to the entry of new variants. In accordance with Herninta and Rahayu (2021), who stated that the pharmaceutical and healthcare sector does not experience a significant change in its stock prices within a 6-month period after the COVID-19 news entered Indonesia for the first time.

Furthermore, at the time of the Omicron variant announcement, there were 4 days when the significance test using SPSS showed a significant abnormal return, which were 2 days before (t-5 and t-4) and 2 days after (t+3 and t+4). Based on the difference test performed, the value of Sig. 0.0261 was found, so it was known that there was a significant difference in abnormal return between before and after the announcement. It can be determined if H1a is accepted, H1b is rejected, and H1c is accepted for the healthcare sector.

On the other hand, for the tourism sector, based on statistical analysis using SPSS with significance tests (Table II) only on t-5 and t-1, where there is a significant difference, while the other 9 days there is no significant abnormal return. Furthermore, from the difference test on the days before and after the COVID-19 announcement, the Sig value is 0.075, which can be concluded that there is no significant abnormal return.

TABLE II: AR SIGNIFICANCE TESTS OF THE TOURISM SECTOR

	Abnormal Return	
COVID-19	0.075	There is no significant difference in the AR
Delta	0,133	There is no significant difference in the AR
Omicron	0,972	There is no significant difference in the AR

On the days around the announcement of the Delta variant in Indonesia, significance tests showed that two days before the announcement had a significant abnormal return, and one day after the announcement. The other eight days still did not show significance, nor did the difference test, with a Sig value of 0.133, which means no significant abnormal return was found.

In the last event, the announcement of the Omicron variant by the Indonesian government, only 1 day was found to have a significant abnormal return on t+4. The rest of the days showed no significant abnormal return. The difference test also produced a Sig. value of 0.972, which concludes that there is no significant abnormal return.

In this tourism sector, there is no significant abnormal return on the three events of COVID-19 and other variants announcements. This is highly likely because at the time, there were no large-scale social restrictions (PSBB) that prevented people from carrying out tourism activities or traveling and staying. The first PSBB was announced by President Joko Widodo on March 31, 2020, to be followed by all areas in Indonesia, nearly a month after the first announcement of the COVID-19 case. Therefore, H1a, H1b, and H1c are rejected for the tourism sector.

C. Cumulative Abnormal Return Analysis

According to statistical analysis using SPSS (Table III), cumulative abnormal return in the healthcare shows the same result as abnormal return. On the first COVID-19 announcement, the difference test shows a Sig value of 0.02, indicating a significant difference in cumulative abnormal return.

TABLE III: CAR SIGNIFICANCE TESTS OF THE HEALTHCARE SECTOR

Cumulative Abnormal Return		
COVID-19	0.017	There is a significant difference in the CAR
Delta	1,000	There is no significant difference in the CAR
Omicron	0,032	There is a significant difference in the CAR

Further, when the first case of the Delta variant was announced in Indonesia, the cumulative abnormal return difference test showed no significant difference, consistent with the results of the abnormal return. However, on the announcement of the Omicron variant case, the Sig value of 0.0316 indicates a significant difference in cumulative abnormal return. Therefore, it can be concluded that H1a is accepted, H1b is rejected, and H1c is accepted for the healthcare sector.

On the days around the event in the tourism sector shows that the Sig value of CAR in the significance test (Table IV) the COVID-19 announcement event is 0.075, while the first case of the Delta variant announcement has a value of 1. The result shows that there is no difference in cumulative abnormal return in the two events, consistent with the results of the abnormal return test.

TABLE IV: CAR SIGNIFICANCE TESTS OF THE TOURISM SECTOR

Cumulative Abnormal Return		
COVID-19	0.075	There is no significant difference in the CAR
Delta	0,152	There is no significant difference in the CAR
Omicron	0,972	There is no significant difference in the CAR

Next, on the announcement of the Omicron variant, the Sig value of 0.972 and shows the same result as the previous events, which is no difference in cumulative abnormal return. Therefore, H1a, H1b, and H1c are rejected for the tourism sector**.**

D. Trading Volume Activity Analysis

In the healthcare sector (Table V), the TVA value experienced a significant increase at t0 and t+1 with values of 0.00064 and 0.00059 before finally decreasing back to 0.00028 at t+2. Based on the difference test, the Sig. value of 0.191 indicates no significant difference in TVA.

TABLE V: TVA SIGNIFICANCE TESTS OF THE HEALTHCARE SECTOR

Trading Volume Activity		
COVID-19	0,191	There is no significant difference in the TVA
Delta	1,000	There is no significant difference in the TVA
Omicron	0,363	There is no significant difference in the TVA

Next, on the day around the announcement of the Delta variant, the average TVA value for 5 days before and 5 days after the announcement of the Delta variant had a wide range of 0.0008 to 0.0001. The difference test showed a Sig. value of 1, while on the day around the announcement of the Omicron variant, the Sig. value was 0.173. Based on this value, there is no significant difference in TVA on the day around the announcement of the two variants.

This result is in line with the research of Auda and Azib (2022), where there is no significant difference in trading volume activity in the healthcare sector during the observation period from March to October 2020 after COVID-19. Therefore, H3a, H3b, and H3c are rejected for the healthcare sector.

Statistically, the movement of TVA in the tourism sector (Table VI) has a range of 0.0004 to 0.0006 and there is no significant surge in volume. The difference test shows a Sig. value of 0.65, indicating no significant difference in TVA before and after the announcement of COVID-19.

TABLE VI: TVA SIGNIFICANCE TESTS OF THE TOURISM SECTOR

Trading Volume Activity		
COVID-19	0,650	There is no significant difference in the TVA
Delta	0,173	There is no significant difference in the TVA
Omicron	0,055	There is no significant difference in the TVA

In the announcement of other COVID-19 variants, Delta and Omicron, the TVA also showed the same difference test, which is no significant difference in TVA with respective Sig. values of 0.055 and 0.363. This is in line with the results of Sucipto *et al.* (2022), where there is no significant difference in trading volume activity before and after the COVID-19 events in Indonesia in the tourism, restaurant, and hotel industries.

Herdiyansyah (2022) also conducted research on the TVA of the tourism sector in 2020, and the findings showed no significant difference in trading volume activity. This is possible because information about the spread of COVID-19 in the world had already occurred far before, so the capital market players had already anticipated this news. Therefore, H3a, H3b, and H3c are rejected.

E. Bid-Ask Spread Analysis

In the healthcare sector (Table VII), the BAS movement on the day around the announcement of COVID-19 was not significant and tended to remain sideways. The same is true for the announcement of the Delta and Omicron variants, where no spike or significant increase or decrease in the BAS value was observed.

TABLE VII: BAS SIGNIFICANCE TESTS OF THE HEALTHCARE SECTOR

Trading Volume Activity		
COVID-19	0,088	There is no significant difference in the BAS
Delta	0,955	There is no significant difference in the BAS
Omicron	0,256	There is no significant difference in the BAS

Based on the difference test, the following are the Sig values in order from the announcement of COVID-19, the Delta variant, and the first Omicron variant in Indonesia, which are 0.088, 0.955, and 0.256. This difference test result reflects that there was no significant difference between before and after the announcement.

Auda and Azib (2022) found consistent research results that there was no significant difference in bid-ask spread before and during the COVID-19 pandemic. This is likely because market participants are still taking a cautious approach amid an uncertain situation due to the spread of the COVID-19 virus. Therefore, it can be concluded that H4a, H4b, and H4c are rejected for the healthcare sector.

The bid-ask spread (BAS) in the tourism sector (Table VIII) showed a one-day jump at t0 with a value of 0.075, when the first announcement of COVID-19 in Indonesia was made. Subsequently, at the announcement of the first cases of the Delta and Omicron variants, there was not a high jump in the BAS, rather it remained sideways.

TABLE VIII: BAS SIGNIFICANCE TESTS OF THE TOURISM SECTOR

Trading Volume Activity		
COVID-19	0,650	There is no significant difference in the BAS
Delta	0,463	There is no significant difference in the BAS
Omicron	0,276	There is no significant difference in the BAS

Based on the difference test on the three events, each has a Sig value of 0.650, 0.463, and 0.276 respectively for the announcement of COVID-19, the Delta variant, and the Omicron variant. The overall result of the difference test shows the same result, that is, no significant difference in BAS. Therefore, it can be concluded that H4a, H4b, and H4c are rejected for the tourism sector.

F. Discussion

The stock market activity during the announcement of COVID-19 by the Indonesian government, be it the first COVID-19, the Delta variant, or the Omicron variant, does not show a significant difference in Trading Volume Activity and Bid-Ask Spread. This indicates that investors and market participants hold back from selling or buying, considering the situation around the date of the three events. If we see abnormal returns that change significantly, it is reasonable for investors to be cautious in making decisions. This is very important to minimize the risk of loss and to benefit from uncertain situations.

In addition, the abnormal returns that show a significant difference in the first announcement of COVID-19 in Indonesia, and the existence of the Omicron variant after the situation was stable for more than a year, show that information or news from the announcement has changed the return and the price drastically as well, leading to trading halt. In accordance with the semi-strong efficient market theory explained earlier, the Indonesian stock market is in the form of a semi-strong efficient market.

V. CONCLUSION

In the healthcare sector, the results of the analysis showed a significant difference in abnormal return 5 days before and after the announcement of COVID-19 and the first Omicron variant in Indonesia. However, no significant difference was found in the announcement of the first Delta variant. The calculation of cumulative abnormal return did not show a significant difference on the days around the announcement of the first Delta variant. However, there was a significant difference on the days around the announcement of COVID-19 and the first Omicron variant. The trading volume activity did not show a significant difference in all three events analyzed, leading to the rejection of H3a, H3b, and H3c. The analysis of the average Bid-Ask Spread value did not show a significant difference in the three events, leading to the rejection of H4a, H4b, and H4c.

For the tourism sector, the results of the analysis showed that there was no significant difference in abnormal return for the three events (COVID-19, Delta variant, and Omicron variant) in the Tourism sector. This led to the rejection of H1a, H1b, and H1c. The analysis of cumulative abnormal return also did not show a significant difference, leading to the rejection of H2a, H2b, and H2c. The analysis of trading volume activity showed no significant difference in all events, leading to the rejection of H3a, H3b, and H3c. The calculation and analysis of Bid-Ask Spread for the three events did not show a significant difference, leading to the rejection of H4a, H4b, and H4c.

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