Reaction Analysis of LQ45, STI and KLCI Price Index Before and After COVID-19 Pandemic Events

Octojaya Abriyoso[1*], **Satriadi**[2], **Eka Kurnia Saputra**[3], **Charly Marlinda**[4*], **Masyitah As Sahara**[5]

[1, 2, 3] *Management / Economic, Sekolah Tinggi Ilmu Ekonomi (STIE) Pembangunan, Tanjungpinang*
[4, 5] *Accounting / Economic, Sekolah Tinggi Ilmu Ekonomi (STIE) Pembangunan, Tanjungpinang*

Author's email: octojaya@stie-pembangunan.ac.id; satriadi@stie-pembangunan.ac.id; ekakurnia@stie-pembangunan.ac.id
**Corresponding author: octojaya@stie-pembangunan.ac.id*

Abstract. *The purpose of this study was to see whether there was a difference in price index of 3 stock exchanges in 3 Asian countries, which are the price indexes of companies with the highest market capitalization rates in their respective countries: LQ4, Strait Times Index (STI) and KLCI, before the Covid-19 pandemic and after the Covid-19 pandemic. This research was done using the event study method. Also, this research was conducted with an observation window for 145 days before and 145 days after the event based on date of the first case reported. The type of data in this study is secondary data, which is obtained from the idx.co.id and Yahoo Finance sites. LQ45, STI, and KLCI data that shows the price index were observed by using paired t-test, to get know whether there is differences between two time frames, and before that, the normality test was carried out first. The results showed that there was a difference in the LQ45, STI, and KLCI price index before the Covid-19 pandemic and after the Covid-19 pandemic.*

Keywords*: Covid-19, event study, price index*

1. INTRODUCTION

The capital market is one of the important elements in the distribution of financial capital, which occurs between providers of capital or investors (creditors) and those who need capital (debtors). Investors expect to get profits (revenue) from the need for long-term capital for debtors.

In an organized stock exchange, which is also a secondary market, stocks are transacted, either buying or selling with the expectation to get maximum profit based on information that is considered to affect the movement of the value of the shares they own, or determine which shares they should buy. If there is new information that is relevant to the market relating to an asset, this information will be used to analyze and interpret the value of the asset concerned (Hartono, 2017).

One of the recent information that has greatly affected all aspects of human life is the spread of the Corona virus which was first reported to have occurred in Wuhan, a city in the People's Republic of China, precisely on December 31, 2019. After that, the virus, also known as Covid-19 spread to various countries, poses a health threat, and paralyzes various sectors that support the economy in that country, such as tourism, various types of industry, transportation, education, and other important sectors.

In Indonesia itself, the virus was announced for the first time to infect two Indonesian citizens on March 2nd, 2020 (Rifa'i, 2020) in Depok, one of the cities in West Java Province, then spread in various regions. Until October, there were approximately (+/-) 430 thousand cases of transmission and the death rate reached 14 thousand. This of course has an effect on decreasing economic activity because the process of activities itself requires interaction between various people or parties which, if carried out at a time like this, will seriously threaten their health.

Whereas in neighboring countries, namely Singapore, it was noted that the first case of transmission occurred on January 23rd, 2020, where the day before, Singapore had just formed a national committee to prevent the spread of Covid -19 and donated $ 500,000 to support the efforts of the World Health Organization (WHO) in dealing with Covid -19. Until 2 weeks in December, there have been 58,313 cases of spread, but this is accompanied by 58,197 patients fully recovered and 29 deaths counted in Singapore.

And then in Malaysia, it was known that the first human infection report occurred on January 25th, 2020, only two days from Singapore's first case of infection. The first case was known as being caused the disease that got carried from Chinese travellers that entered Johor from Singapore. Based on data, 83,475 cases have been recorded, but also accompanied the fact that there are 69,393 patients that have been recovered and also 415 deaths occurred in Malaysia.

The capital market itself is one of the sectors that is still trying to rise from the exposure of Covid-19. Various information related to the virus always affects the movement of the Price Index in Indonesia, Singapore and Malaysia. Even though in August-September 2020 there was news about the development of vaccines for Covid-19 correcting market movements, negative news related to the increase in the number of cases of transmission in various regions will also again make stock movements even more unpredictable.

Likewise, the news about the condition of the Indonesian economy, which will experience a recession due to Indonesia's negative economic growth in a row in the last two quarters. Companies with good performance, for example companies with high levels of liquidity, are also affected. In fact, shareholders are of course very concerned about company performance, one of the indicators is the liquidity of the public companies they invest in (Rura, 2010). Liquidity can even be used to measure or predict bankruptcy (Abriyoso, 2018).

Public companies with high liquidity ratios also do not guarantee that investors will feel safe owning their shares. On October 5th, 2020, there were 4 companies on the LQ45 stock index that experienced a deep decline. LQ45 is an index of publicly traded companies consisting of 45 companies that are considered the most liquid. This can even be seen from the beginning of October where declining was indicated in 44 companies since trading was opened. 7 months after Covid-19 case was first announced in Indonesia, it can be stated that the LQ45 movement is seen to be still carried out by information about Covid-19.

The Singapore Stock Exchange (Strait Time Index) and Malaysia (KLCI) were also affected by Covid-19. Bursa Malaysia shows that there has been a significant change in volatility during the pandemic (Engelhardt et al., 2020). And for the Singapore Stock Market, it is also affected by correction based on the systemic impact of the stock exchanges of neighboring countries in Asia during the Pandemic (Aslam et al., 2020).

There are many researches that focused on the impact of Covid-19 on stock market before. Namely (Anh & Gan, 2020), (Rifa'i, 2020). However, these papers focus on looking at the impact of Covid-19 on the capital market in just one country. Then there are those who focus on seeing changes in the capital market only in European countries and seeing less of the Asian market. In addition, there are also papers that focus only on index changes in major markets, and do not see the liquidity of listed companies.

Research conducted by (Heyden & Heyden, 2020) shows that the announcement of fiscal policies by the United States and European countries regarding the first death caused by Covid-19 resulted in a calm movement in the stock market. From this it can be concluded that the market does not react to policies.

In addition, there is also event study research by (Maneenop & Kotcharin, 2020) on go public companies in the aviation sector which shows that the aviation sector is the sector that has the fastest response to the Covid-19 pandemic. And the western side is the area that has a better responds, and most quick action to this pandemic outbreak in the aviation sector. This research only focuses on the field of aviation and also does not look at other sectors.

Furthermore, research conducted by (Kim et al., 2020) also uses the event study method, regarding how the financial condition in the restaurant or food and beverages sector shows that there is no significant difference between before and after the virus spread in certain locations, with the financial condition of the restaurant. And currently it is being sought for the impact of Covid-19 with the way of studying the stock market events in 3 geographically adjacent Southeast Asian countries, which is said to be a triangle growth on southeast Asia (Tantia, 2020). Therefore, this study meant to see whether in a longer timeframe, there is a reaction on the LQ45, STI, and KLCI Price Index, before and after Covid-19 pandemic.

2. LITERATURE REVIEW

2.1 Market Efficiency

In general, market efficiency is defined as the relationship between security prices and information. In detail, market efficiency can be defined in several kinds of definitions, namely: (1) the definition of market is based on the intrinsic value of the security, (2) the definition of market efficiency is based on the accuracy of the price of the security, (3) the definition of market efficiency is based on the distribution of the information and (4) the definition of market efficiency is based on a dynamic process as described in (Hartono, 2017). **The initial concept of market efficiency related to financial statement information originated from the practice of securities analysts trying to find securities with mispriced prices**. Securities that are inappropriately valued are securities whose price deviates from their intrinsic or fundamental value. For such a context, market efficiency is counted by how high the prices of securities ascend or decent from their intrinsic value (Hartono, 2017).

(Fama, 1991) defines an efficient market as follows. "A security market is said to be efficient if security prices" **fully reflect "the information available** (a security market is efficient if security prices" fully reflect "the information available)". The definition of this Fama emphasizes two aspects, namely "fully reflect" and "information available". This definition shows that the price of a security accurately reflects existing information. According to Fama's version, the market is said to be efficient. If you use the available information, investors can accurately expect the price of the securities concerned.

This definition of market efficiency raises much debate. (Hartono, 2017) states that this definition is unclear, non-operational and circular. For example, there is new information coming into the market which becomes available to all market participants and then it appears that the price of the security related to this information changes. Since the required information is available and prices change fully reflects this information, it can be said by definition that the market is efficient. This is what Hartono said was circular. Namely, of course the price change was due to the information available.

The previous definition of market efficiency which only emphasized price accuracy because the information available ignored the distribution of the information. (Hartono, 2017) provides a definition of market efficiency based on the distribution of information as follows: **The market is said to be efficient for an information**

system, if and only if securities prices act as if everyone is watching the information system. (the market is efficient with respect to some specified information system, if and only if security prices act as if everyone observes the information system).

This definition implicitly says that if everyone observes an information system that produces information, then everyone is considered to get the same information. Hartono argues that if securities prices have property as he defines them, then those prices are said to truly reflect available information. Hartono's definition means that the market is known to be corrected itself for a specific piece of data and knowledge (generated from an information system) if the value that formed after the information is received by market entrants is the same as the price that would formed if everyone received the same piece of data or knowledge. The price that occurs in this efficient market is called the "full information price".

The previous definition of market efficiency was based on a static efficient market environment. For example, Hartono's definition of market efficiency is formed by the spreading of information gathered by investors. According to Hartono's definition, the market is efficient if the prices of securities occur if everyone has the same information. This static definition of market efficiency does not consider the asymmetric distribution of information and the speed of the distribution process.

Information asymmetric or unbalanced information usually referred to as the private information that is only get known by informed investors. Information asymmetry can occur in the capital market or other markets. **The definition of market efficiency which is based on dynamic processes** considers the asymmetric distribution of information and explains how prices will adjust because of the asymmetric information. The definition based on this dynamic process emphasizes the speed of dissemination of information that is not symmetrical. The market is said to be efficient if the dissemination of this information is carried out quickly so that the information becomes symmetrical, that is, everyone is said to have this information.

2.2 Event Study

An event study is a study that examines market reactions to an event whose information is published as an announcement. Event studies are get done to test the information or knowledg of an announced news and can also be used to measuring the efficiency of a semi-strong market, as explained by Beaver in (Refiendy, 2009).

(Merton & Bodie, 1995) defines event study as a technique in empirical research in finance that can help researchers to determine the impact of a particular event on stock prices. Meanwhile (Dan et al., 2010) defines an event study as a method for measuring the relationship between events that affect a security and the return of that security. Event studies can be used in several events such as changes in regulations, events that can cause an economic crisis, or other events specific to securities such as changes in dividend policy or stock splits.

The steps in conducting an event study according to (Dan et al., 2010) are as follows:

1) Determine the event that will be the object of research. Events that will be the object of research can be in the form of corporate actions such as mergers and acquisitions, rights issues, earnings announcements, dividend announcements, stock splits, or other events such as elections, terrorist attacks, natural disasters, and others. While the event in this study is the event of dividend announcement.

2) Determine the research period in an event window. Based on the empirical research that has been conducted, researchers use different research periods. Getting longer the research period used, the more things that can be seen, however, the conclusions can be biased because they are influenced by other events such as corporate actions conducted by companies, economic or political events that can affect stock price movements.

2.3 Covid-19 Pandemic

Health studies show that a new type of corona virus has emerged in Wuhan Province, China. **The virus is then transmitted between humans through droplets of body respiration fluid through the hands or solid objects around**. Then, healthy people whose hands are contaminated can become infected if they contact their mouth, nose or eyes. Until finally, this new type of corona virus was also called Covid-19 by WHO.

In simpler terms, as reported by The Sun, Covid-19 stands for Corona (CO), Virus (VI) Disease (D) and 2019 (19), which is where the Covid-19 corona virus first appeared in in 2019. The World Health Organization (WHO) finally set Covid-19 to refer to the corona virus that is currently endemic throughout the world.

Until now, no vaccine has been found that one hundred percent can cure Covid-19, even though several countries in the world have conducted trials related to vaccines that have been created to fight this virus (Rifa'i, 2020).

3. RESEARCH METHODS/METHODOLOGY

This type of research is quantitative with the event study method. Event study is basically a research method in the field of finance, especially to examine the stock market reaction to an event or event in the past that could affect the market value.

When an event takes place over a period of time, market participants will revise the value or value of a security and cause changes in the return value of the security. Event studies are also useful for examining the content of an event. If an event is deemed to have content affecting the market, the market will react immediately to that event.

Calculating the LQ45 Stock Index according to (PT. Bursa Efek Indonesia, 2020) can be done through the following stages:

Figure 1. Calculating the LQ45 Stock Index

$$\text{Index} = \sum n\ i=1\ (\textit{Market Cap}\ i \times \text{Rasio}\ \textit{Free Float}\ i\ ) / \textit{Base Market Cap}$$

Figure 1. Source: (PT. Bursa Efek Indonesia, 2020)

Where :

Market Cap I = share price X the number of shares listed for shares i.

Free Float Ratio i = Free Float Ratio of Shares i (in percent).

Base Market Cap = Market Capitalization adjusted to Free Float on the base day (adjusted to corporate action if any) (PT. Bursa Efek Indonesia, 2020).

Likewise with the Singapore and Malaysia Exchanges which use the Market Capitalization Index which uses the market value of certain shares and weighs it against the percentage of these shares on the market share of the exchange. The data used in this study is secondary data consisting of data on all companies registered in LQ-45, STI and KLCI obtained from the IDX.co.id and Yahoo Finance sites.

The sample for this research was taken by purposive sampling method or the sample was selected based on the characteristics in accordance with the research needs. Therefore, a sample of the following characteristics were selected: Companies with the best performance in the index listed on the stock exchanges of each country, incorporated in LQ45, STI and KLCI, during the study period. These 3 countries were also chosen because they are often referred to as the Growth Triangle of cooperation for ASEAN economic growth (Tantia, 2020).

The analytical method used is the paired t-test, which is a sample with the

same type of object but the treatment or measurement is different. This data is processed using the assistance of the IBM SPSS 25 application and then analyzed. After obtaining the index data that you want to research, it is calculated as follows (Hartono, 2017):

1. Calculating the Price Index using a formula that takes into account the Free Float Ratio in its calculation.
2. Find the average value of the Price Index.
3. Finding the Variance with the formula:

$$s^2 = \frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}$$

4. Perform a normality test with the formula:

$$D_{m,n,\alpha} = c(\alpha)\sqrt{\frac{m+n}{mn}}$$

Where : the m is the first sample and n is the second sample.

4. Finding the Variance with the formula:

$$t = \frac{(x_1 - x_2)}{\sqrt{\frac{(s_1)^2}{n_1} + \frac{(s_2)^2}{n_2}}}$$

Hypothesis testing by analyzing the differences in each sample. Testing using paired sample t-test. The study was conducted within 145 days before the event, and 145 days after the Covid-19 pandemic event (t-145 and t + 145) without including transaction holidays on the respective countries exchange.

To test the hypothesis, a t-test or paired sample t-test is carried out based on the calculation results in order to know the accepted hypothesis. If the result of t count is greater than t table, then H0 or the null hypothesis is rejected. The hypotheses in this study are:

1. H0: There is no difference in the LQ45 Price Index between before and after the Covid-19 Pandemic.
   H1: There is a difference in the LQ45 Price Index between before and after the Covid-19 Pandemic.
2. H0: There is no difference in the STI Price Index between before and after the Covid-19 Pandemic.
   H1: There is a difference in the STI Price Index between before and after the Covid-19 Pandemic.
3. H0: There is no difference in the KLCI Price Index between before and after the Covid-19 Pandemic.
   H1: There is a difference in the KLCI Price Index between before and after the Covid-19 Pandemic.

This testing technique is carried out on three different market indices to test the hypothesis. To better understand, the framework in this study can be seen as follows:

Figure 2. Research Framework

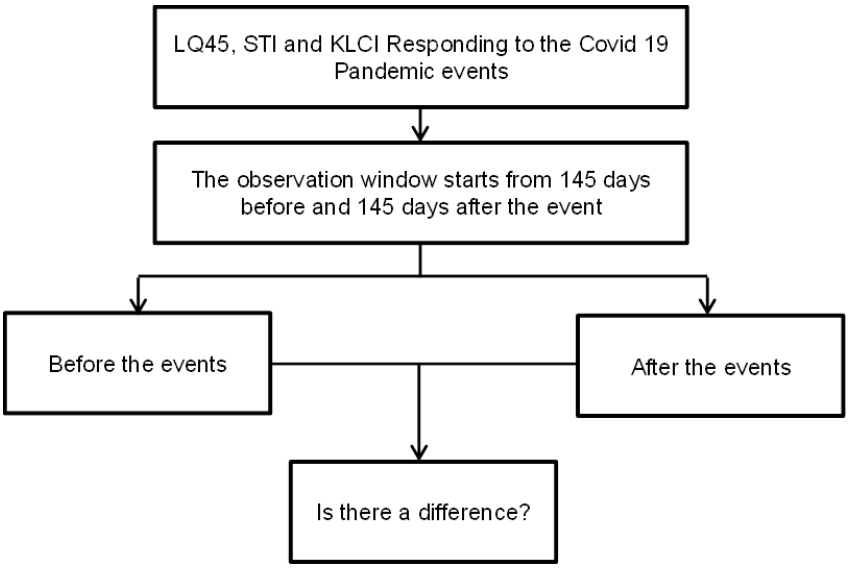

Figure 2. Source: Processed research results (2020)

5. RESULTS AND DISCUSSION

From the results of statistical calculations using the SPSS application, the average LQ45 price index before the pandemic was 9861.9515 and the average LQ45 price index after the pandemic was 7594.9687. This average value is obtained from a total of 145 data from before the pandemic on March 2, 2020 and 145 data after the pandemic by reducing transaction holidays on the Exchange. The calculation table also shows the standard deviation or standard deviation of 25.40419 before the pandemic and 60.28875 after the pandemic.

Furthermore, it was found that the average STI price index before the pandemic was 3212.8899 and the average STI price index after the pandemic was 2715.4945. This average value is get counted from a total of 145 piece of data both from before the pandemic on January 23, 2020 and 145 data after the pandemic and also not counting the transaction holidays on the Market. From the calculation table it is also obtained the standard deviation or standard deviation of 86.26431 at the time before the pandemic and 258.61644 after the pandemic event.

Lastly, the average KLCI price index before the pandemic was 1605.3809 and the average KLCI price index after the pandemic was 1479,9038. This average score is reached from a total of 145 data from the date before the pandemic on January 25, 2020 and 145 data after the pandemic by discounting the transaction holidays on the Stock Market. From the calculation table, it is also obtained the standard deviation or standard deviation of 35.77051 at the time before the pandemic and 99.28135 after the pandemic event. Details can be seen from the table presented below:

Table 1. Descriptive Statistic on 3 Indexes

LQ 45					
Time	**N**	**Minimum**	**Maximum**	**Mean**	**ST.D.**
Before	145	9226.60	1033.44	9861.9515	25.40419
After	145	5834.10	9225.10	7594.9687	60.28875
Valid N	145				
STI					
Time	**N**	**Minimum**	**Maximum**	**Mean**	**ST.D.**
Before	145	3058.71	3378.36	3212.8899	86.26431

After	145	2274.38	3271.56	2715.4945	258.61644
Valid N	145				
KLCI					
Time	**N**	**Minimum**	**Maximum**	**Mean**	**ST.D.**
Before	145	1550.70	1689.25	1605.3809	35.77051
After	145	1217.28	1614.02	1479.9038	99.28135
Valid N	145				

Table 1. Source: Processed Data of 3 Indexes (2020)

In addition, it can also be seen that before the pandemic, the minimum or minimum LQ45 price index was 9226.60 and the maximum or greatest value was 1033.44. After the pandemic, the minimum or minimum LQ45 price index is 5834.10 and the maximum or greatest value is 9225.10. For STIs before the pandemic, the minimum or smallest value is 3058.71 and the maximum or greatest value is 3378.36. After the pandemic, the minimum or minimum STI price index is 2274.38 and the maximum or greatest value is 3271.56. For the KLCI before the pandemic, the minimum or smallest value is 1550.70 and the maximum or greatest value is 1689.25. After the pandemic, the minimum or smallest KLCI price index is 1217.28 and the maximum or greatest value is 1614.02.

According to (Wang & Ngai, 2020) to carry out a paired t-test, the data being tested must be normally distributed. So after the normality test was carried out on the research data, the following results using IBM SPSS were obtained:

Table 2. Normality Test on 3 Indexes

One-Sample* Kolmogorov-Smirnov *Test				
LQ-45			**Before**	**After**
N			145	145
Monte Carlo Sig. (2-tailed)	Sig.		**.325**	**.064**
	95% Confidence Interval	Lower Bound	.252	.025
		Upper Bound	.398	.102
STI			**Before**	**After**
N			145	145
Monte Carlo Sig. (2-tailed)	Sig.		**.085**	**.247**
	95% Confidence Interval	Lower Bound	.437	.076
		Upper Bound	.231	.164
KLCI			**Before**	**After**
N			145	145
Monte Carlo Sig. (2-tailed)	Sig.		**.188**	**.133**
	95% Confidence Interval	Lower Bound	.311	.056
		Upper Bound	.190	.177

Table 2. Source: Processed Data of 3 Indexes (2020)

Based on the table above, it can be seen facts like the following:

1. For data before the pandemic event, from 145 data obtained the Kolmogorov-Smirnov statistical value and also a Monte Carlo significance value of 0.325 for LQ-45, 0.085 for STI, and 0.188 for KLCI. The data already has a normal distribution if a significance value is greater than 0.05 (5%) (Rifa'i, 2020). Because the significance values obtained are 0.325, 0.085, and 0.188 and the value is greater than 0.05, It can be concluded that the LQ45, STI and KLCI Price Index data before the pandemic event have a normal distribution.

2. For data after the pandemic event, from 145 data obtained the Kolmogorov-Smirnov statistical value and also the Monte Carlo significance value of 0.064 for LQ-45, 0.247 for STI, and 0.133 for KLCI. The data has a normal distribution if a significance value is greater than 0.05 (5%) (Rifa'i, 2020). Because the significance values obtained are 0.064, 0.247 and 0.133 and the value is greater than 0.05, it can

be concluded that the LQ45 Price Index data after the pandemic event has a normal distribution. Therefore, the paired t-test can be performed afterwards.

According to (Wong & Hooy, 2020) to test the t-test hypothesis, it is necessary to look at the results of the significance calculation first, by considering the form of the hypotheses that are formulated. Details can be seen in the following table:

Table 3. Paired Sample T-Test on 3 Indexes

Paired Samples Test								
	Paired Differences of LQ-45							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Before - After	22669.828025	6140.447918	490.061095	21701.816467	23637.839584	46.259	156	**.000**
	Paired Differences of STI							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Before - After	502.14878	194.51911	15.98937	470.55005	533.74751	31.405	147	**.000**
	Paired Differences of KLCI							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Before - After	125.47710	96.90622	8.04762	109.57037	141.38384	15.592	144	**.000**

Table 3. Source: Processed Data of 3 Indexes (2020)

From the table above, it can be seen that the values in the table of the LQ45, STI, and KLCI price indexes using the IBM SPSS between before and after the Covid-19 pandemic **all three have significance value of 0.000.** According to (Wong & Hooy, 2020) if the significance value of the t-test is greater than 0.05, then H0 is accepted and H1 is rejected. But if the t-test significance score is smaller than 0.05, then H0 is unacceptable and H1 is accepted. The significance value of the three exchanges contained in the table is 0,000 and the value is smaller than 0.05 (0,000 <Sig. 0.05), it can be concluded that the accepted H1 is the hypothesis which says there is a difference in Price Index, both from LQ45, STI, and KLCI between before and after the Covid-19 pandemic.

That is, by using the paired t-test calculation method, **it is evident that there is a significant difference between the LQ45, STI, and KLCI Price Indices before and after the Covid-19 pandemic**, which the first cases were announced respectively on March 2nd, 2020 in Indonesia, and 23rd January 2020 in Singapore and 25th January 2020 in Malaysia, as viewed from the observation window 145 days before and 145 days after the event.

This finding is in line with the results of research from (Rifa'i, 2020) which states that there is a significant difference between the Composite Stock Price Index (IHSG) between before and after the Covid-19 pandemic, where after the event, the Price Index dropped significantly. Likewise, research conducted by (Anh & Gan, 2020), the result is that the Covid-19 pandemic also affects the performance of stocks in Vietnam, where in that country, the sector most severely affected by the Covid-19 pandemic is the financial sector.

This is also in line with research by (Maneenop & Kotcharin, 2020) where in his research, it was found that go public companies in the aviation sector also showed significant differences and quick reactions to changes in their share prices. Likewise in

the tourism sector where there was an unusually fast decline in their profits compared to before the pandemic period, according to the results of research conducted by (Liew, 2020).

But a different research results is shown by research from (Kim et al., 2020) showing that there was not a very observed difference in restaurant income in America when a diseased outbreak happened. Likewise from (Heyden & Heyden, 2020) whose research results show that the market reacts negatively to the announcement of the first death events in America and European countries, although there are other strong factors that support this such as assets and liquidity.

CONCLUSION

Based on the results of this study, it can be concluded that there is a significant difference in the LQ45, STI, and KLCI price index between before and after the Covid-19 pandemic. This can be seen from the evidence of hypothesis 1 (H1), based on the assumption that the **t-table significance value of 0,000** is smaller than 0.05 (0.000 <0.05). It was found that market more likely always react on every aspects of news that spread, depend on how much the impact of the news. And still, in a more far time window period observed, the news about virus on high scale level that can affect every aspect of many countries, still have a significantly big movement on stock market, even on high profiling companies which have a good level of liquidity and assets. For further research, it is expected to reduce the time or period of observation, thereby reducing the possibility of other variables not being studied but also affecting the price index. Further research is also expected to examine other variables besides the price index, such as Abnormal Return, Trading Volume Activity, or other variables in the financial scope.

REFERENCES

Abriyoso, O. (2018). *KEBANGKRUTAN DENGAN PENDEKATAN MODEL DISKRIMINAN ALTMAN Z-SCORE PADA PT NIDEC INDONESIA BINTAN*. *1*(1), 1–7.

Anh, D. L. T., & Gan, C. (2020). The impact of the COVID-19 lockdown on stock market performance: evidence from Vietnam. *Journal of Economic Studies*. https://doi.org/10.1108/JES-06-2020-0312

Aslam, F., Mohmand, Y. T., Ferreira, P., Memon, B. A., Khan, M., & Khan, M. (2020). Network analysis of global stock markets at the beginning of the coronavirus disease (Covid-19) outbreak. *Borsa Istanbul Review*. https://doi.org/10.1016/j.bir.2020.09.003

Dan, S., Penawaran, S., & Isi, D. (2010). *Analisis reaksi harga saham pada masa sebelum dan sesudah penawaran obligasi retail indonesia (ori) seri 002*.

Engelhardt, N., Krause, M., Neukirchen, D., & Posch, P. N. (2020). Trust and stock market volatility during the COVID-19 crisis. *Finance Research Letters*, 101873. https://doi.org/10.1016/j.frl.2020.101873

Fama, E. F. (1991). Efficient Capital Markets: II. *The Journal of Finance*. https://doi.org/10.2307/2328565

Hartono, J. (2017). Teori portofolio dan analisis investasi (edisi Kesebelas). In *Yogyakarta: BPFE*.

Heyden, K. J., & Heyden, T. (2020). Market reactions to the arrival and containment of COVID-19: An event study. *Finance Research Letters*, 101745. https://doi.org/10.1016/j.frl.2020.101745

Kim, J., Kim, J., Lee, S. K., & Tang, L. (Rebecca). (2020). Effects of epidemic disease outbreaks on financial performance of restaurants: Event study method approach. *Journal of Hospitality and Tourism Management*, *43*(December 2019), 32–41. https://doi.org/10.1016/j.jhtm.2020.01.015

Liew, V. K. Sen. (2020). The effect of novel coronavirus pandemic on tourism share prices. *Journal of Tourism Futures*. https://doi.org/10.1108/JTF-03-2020-0045

Maneenop, S., & Kotcharin, S. (2020). The impacts of COVID-19 on the global airline industry: An event study approach. *Journal of Air Transport Management*, *89*(July), 101920. https://doi.org/10.1016/j.jairtraman.2020.101920

Merton, R. C., & Bodie, Z. (1995). A Conceptual Framework for Analyzing the Financial Environment. In *In The Global Financial System: A Functional Perspective*.

PT. Bursa Efek Indonesia. (2020). Indonesia Stock Exchange. *Stock Summary*, *July 1992*, 2019. https://www.idx.co.id/

Refiendy, T. E. (2009). *ANALISIS PERBEDAAN ABNORMAL RETURN DAN RISIKO SAHAM PERUSAHAAN SEBELUM DAN SESUDAH PENGUMUMAN PENETAPAN TERGABUNG DALAM KELOMPOK JAKARTA ISLAMIC INDEX DI BURSA EFEK INDONESIA PERIODE 2006-2008*.

Rifa'i. (2020). PENGARUH PERISTIWA PANDEMI COVID-19 TERHADAP INDEKS HARGA SAHAM GABUNGAN. *EJME*, *4*(3), 179–185. https://doi.org/10.1108/IJEFM-06-2013-0014

Rura, Y. (2010). Pengungkapan Pro Forma, Mendukung atau Menyesatkan Investor? *Jurnal Akuntansi Multiparadigma*, 383–400. https://doi.org/10.18202/jamal.2010.12.7099

Tantia, P. (2020). *Potensi indonesia-malaysia-singapura*.

Wang, Q., & Ngai, E. W. T. (2020). Event study methodology in business research: a bibliometric analysis. *Industrial Management and Data Systems*, *120*(10), 1863–1900. https://doi.org/10.1108/IMDS-12-2019-0671

Wong, W. Y., & Hooy, C. W. (2020). Market response towards different types of politically connected firms during political events: evidence from Malaysia. *International Journal of Managerial Finance*. https://doi.org/10.1108/IJMF-09-2019-0331