ANALYSIS THE EFFECT OF INDONESIA'S FIRST COVID-19 CASE ANNOUNCEMENT ON ABNORMAL RETURN AND TRADING VOLUME ACTIVITY

(Study at stock listed in LQ 45)

UNDERGRADUATE THESIS

Submitted as a Prerequisite for Bachelor Degree at the Faculty of Administration Brawijaya University

KRISTIN DWI YANTI

NIM. 175030207141010

BRAWIJAYA UNIVERSITY

FACULTY OF ADMINISTRATIVE SCIENCE

BUSINESS ADMINISTRATION DEPARTMENT

MALANG

2021

repository.ub.ac.id

MOTTO

Just Do It and Surrender to Jesus

"I can do all things through Christ which strengtheneth me."

-Phillippians 4: 13

UNIVERSITAS BRAWIJAYA

ub.ac.id Universitas Brawijaya Universitas Brawijaya Universitas Brawijaya Universitas Brawijaya Universitas Brawijaya

APPROVAL SHEET

Title	:	Analysis The Affect Of Indonesia's First Covid-19 Case Announcement on Abnormal Return And Trading Volume Activity (Study At Stock Listed In LQ-45)
Arranged By	:	Kristin Dwi Yanti
NIM	:	175030207141010
Faculty	:	Administratice Science
Major	:	Bussiness Administration Science

Malang, 24 April 2021

Supervisor,

Nur Imamah, Dr. SAB., MAB., Ph.D

NIP. 198205272008012013

Universitas Brawijaya Universitas Brawijaya Universitas Brawijaya Universitas Brawijaya Universitas Brawijaya

VALIDATION SHEET

This is to certify that the undergraduate thesis which belongs to Kristin Dwi Yanti has been examined and approved by the board of examiners as a form of prerequisite of Bachelor Degree of Business Administration, on:

Day : Tuesday

Date : 6 Mei 2021

Time : 10.00 – 11.00 WIB

Title : **Analysis The Effect Of Indonesia's First Covid-19 Case Announcement On Abnormal Return And Trading Volume Activity (Study at stock listed in LQ 45)**.

Board of Examiners

Leader

Nur Imamah, Dr. SAB., M.AB., Ph.D
NIP. 198205272008012013

Member,

Nila Firdausi Nuzula, Ph.D.
NIP. 197305302003122001

Member,

Sri Sulasmiyati, S.Sos., MAP.
NIP. 197704202005022001

repository.ub.ac.id

ORIGINALITY STATEMENT

I state honestly based on my understanding, this undergraduate thesis does not contain the research which was ever submitted by othe parties to achieves creation or assumption which was ever written or published by other parties, except in write is cited in this document and is mentioned in cititation and references.

If in this undergraduate thesis can be proved that there is plagiarism element, I agree this undergraduate thesis is being undermined and academin degree that had been received (S-1) is being canceled, also be processed according to applicable law (UU No 20 year 2003, article 25 No 2 and article 70)

Malang, 26 April 2021

Kristin Dwi Yanti
NIM. 175030207141010

UNIVERSITAS BRAWIJAYA

repository.ub.ac.id

SUMMARY

Kristin Dwi Yanti, 2021. **Analysis The Effect Of Indonesia's First Covid-19 Case Announcement On Abnormal Return And Trading Volume Activity (Study at stock listed in LQ 45)**. Nur Imamah, Dr. SAB., M.AB.,Ph.D. **155 Pages**+xiv.

The Covid-19 pandemic is a disease outbreak that spreads over a wide area, between cities, islands, countries and even the whole world. Due to the very fast transmission of the corona virus, the World Health Organization (WHO) declared the corona virus a pandemic on March 11, 2020. The status of a pandemic or global epidemic indicates that the spread of COVID-19 is taking place so fast that almost no country in the world can ensure that it is spared. of the corona virus.

The first time Indonesia announced a Covid-19 case that infected 2 Indonesian citizens, namely on March 2, 2020. Jokowidodo as President of the Republic of Indonesia made the announcement (CNN Indonesia, 2020). The impact of the spread of the Covid-19 virus certainly affects people's lives, both economically, socially and in food.

This Research analyze the impact of the announcement of the first Covid-19 case in Indonesia on the reaction of the most liquid index in the Indonesian capital market, the LQ-45 index. The reactions that occur can be measured by the Abnormal Return and Trading Volume Activity. This research uses a quantitative approach and uses the event study method. The research period in this study used 11 days of data in the observation period, in 5 days before, 1 day at the time in the anouncement and 5 days after the announcement. The data is obtained from the official website of the Indonesian capital market, namely www.idx.co.id. This study uses purposive sampling technique to determine the sample to be test. The results of the determination of the sample obtained 40 companies that did not take corporate action during the observation period.

The test used in this research is a different test which includes one sample t-test and paired sample t-test. In the event study method, the results of the one sample t-test found significant abnormal returns at t-5, t-1 and t0 and the existence significant of trading volume activity on each observation day. However, the paired sample t-test results did not find any significant differences in abnormal returns and trading volume activity between before and after the announcement of the first case of Covid-19 in Indonesia.

Keywords: Covid-19, Abnormal Return, Trading Volume Activity, Event Study

repository.ub.ac.id

RINGKASAN

Kristin Dwi Yanti, 2021. **Analysis The Effect Of Indonesia's First Covid-19 Case Announcement On Abnormal Return And Trading Volume Activity (Study at stock listed in LQ 45).** Nur Imamah, Dr. SAB., M.AB., Ph.D. **155 Pages**+xiv.

Pandemi Covid-19 adalah suatu keadaan wabah penyakit yang menyebar di wilayah yang luas, antar kota, pulau, negara bahkan seluruh dunia. Karena penularan virus corona yang sangat cepat inilah Organisasi Kesehatan Dunia (WHO) menetapkan virus corona sebagai pandemi pada 11 Maret 2020. Status pandemi atau epidemi global menandakan bahwa penyebaran COVID-19 berlangsung sangat cepat hingga hampir tak ada negara di dunia yang dapat memastikan diri terhindar dari virus corona.

Pertama kali Indonesia mengumumkan adanya kasus Covid-19 yang menginfeksi 2 warga negara indonesia yaitu pada tanggal 2 maret 2020. Jokowidodo selaku Presiden Republik Indonesia yang memberikan pengumuman tersebut (CNN Indonesia, 2020). Dampak dari penyebaran virus Covid-19 ini tentu mempengaruhi kehidupan masyarakat, baik secara ekonomi, sosial, dan pangan.

Penelitian ini menganalisis dampak dari pengumuman kasus pertama Covid-19 di Indonesia terhadap reaksi indeks yang paling likuid dalam pasar modal Indonesia, yaitu indeks LQ-45. Reaksi yang terjadi tersebut dapat diukur dengan *Abnormal Return* dan T*rading Volume Activity*. Penelitian ini menggunakan pendekatan kuantitatif dan menggunakan metode *event study*. Periode penelitian dalam penelitian ini menggunakan data 11 hari dalam periode pengamatan yaitu 5 hari sebelum, 1 hari saat kejadian dan 5 hari setelah kejadian. Data diperoleh dari situs resmi pasar modal Indonesia yaitu www.idx.co.id. Penelitian ini menggunakan teknik *purposive sampling* untuk menentukan sampel yang akan diuji. Hasil dari penentuan sampel diperoleh 40 perusahaan yang tidak melakukan aksi korporasi selama periode pengamatan.

Pengujian yang digunakan dalam penelitian ini adalah uji beda yang meliputi one sample t-test dan paired sample t-test. Dalam metode event study, hasil dari uji one sample t-test mendapati adanya abnormal return yang signifikan pada t-5, , t-1 dan t0 dan adanya trading volume activity yang significant pada tiap hari pengamatan. Akan tetapi, hasil uji paired sample t-test tidak menemukan adanya perbedaan yang signifikan pada abnormal return dan trading volume activity antara sebelum dan setelah terjadinya pengumumuman kasus pertama Covid-19 di Indonesia. **Kata Kunci : Covid-19, Abnormal Return, Trading Volume Activity, Event Study**

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

I.1 Background

Every country will always strive to achieve optimal economic growth to bring its people to a more prosperous life because the country's welfare level can be seen from the country's economic growth. The state will make various efforts to strengthen the country's economy, such as increasing exports, opening new jobs, and increasing investment. The country's economic growth is directly proportional to every company's development in that country, and companies are affected by the investors who invest in the company.

When an entrepreneur or individual invests, there is a certain amount of capital invested. This capital will be managed into goods or services by a company. Based on the investment cycle, it can reduce unemployment and increase people's income. Therefore, investment for a country is vital for the country's economic growth. The state has made many efforts to attract people and foreign investors to invest in the Indonesian capital market. Through Indonesian financial institutions, the government is making these efforts,

The capital market is a meeting between investors and issuers, where issuers need capital to carry out their business activities, and investors will help channel their funds with dividend wages. According to (Tandelilin, 2001: 13), the capital market is a meeting between parties with excess funds and those

who need funds by trading securities. In Indonesia, the Indonesia Stock Exchange acts as a place where securities' buying and selling occurs. An efficient capital market is capable of showing the actual stock price and guarantee the truth of the economic condition being displayed.

If an announcement contains information, the market will receive an abnormal return, and vice versa if an event does not contain information, the market will not receive an abnormal return. In addition to observing abnormal returns, market reactions can also be monitored through stock trading volume activity as seen from the value of trading volume (Trading Volume Activity). Investors can observe trading volume information with the price of a share. Stocks with high trading volume will generate high stock returns.

The corona pandemic's occurrence resulted in the emergence of much information, making the market experience an abnormal return. According to the (Kompas, 2020) this corona pandemic originated in Wuhan, China. For the first time, China reported the existence of this new disease on December 31, 2019. Because of the Corona virus's rapid transmission, the World Health Organization (WHO) declared the coronavirus a pandemic on March 11th, 2020. The status of a pandemic or global epidemic indicates that the spread of COVID-19 is progressing so fast that almost no country in the world can ensure that it is protected from the coronavirus (Widiyani, 2019).

The corona has a significant impact on trading volume worldwide, and this statement is supported by research from (Chiah and Zhong, 2020). In Indonesia, the

first positive case was announced directly by the President of Indonesia, namely Joko Widodo, on March 2nd, 2020 (CNN Indonesia, 2020). The capital market reacted due to this information. As evident, Jakarta Stock Exchange Composite Index/ IDX Composite (JKSE) dropped within the announcement date (March 2nd, 2020). The following figure is the Jakarta Stock Exchange Composite Index/ IDX Composite (JKSE) chart for around March 2nd, 2020.

Figure 1. 1 Indonesia Stock Market chart around March 2nd, 2020

Source: Yahoo Finance 2020

As seen in Figure 1.1, before the announcement on March 2nd, 2020, JKSE moved in a fluctuating manner, apparently experiencing a sharp decline. After the announcement, JKSE responded by increasing for two consecutive days, then decreasing again on March 5th. In the same period, the 45 leading stock groups or the LQ-45 index also experienced things that were not much different from JKSE.

The following is the closing price of the LQ-45 index at the time of the event:

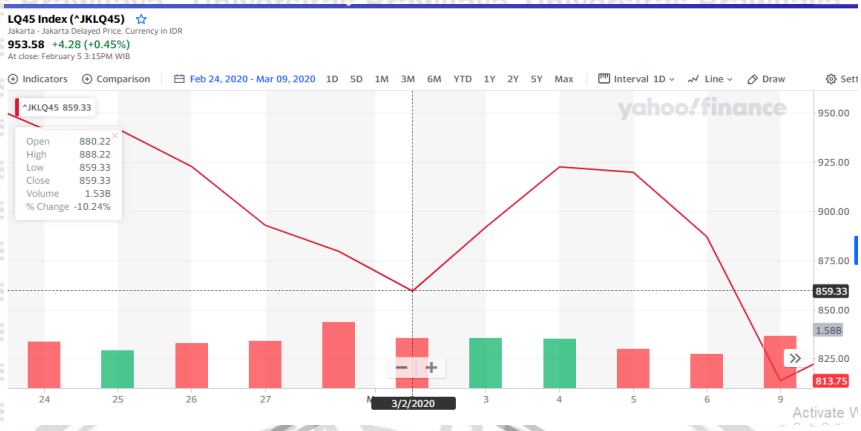

Figure 1.2 Closing Price Index LQ-45 chart around March 2nd, 2020

Source: Yahoo Finance, 2020

As seen in Figure 1.2, the LQ-45 the movement of the LQ-45 index closing stock price also fluctuates. It seems to have experienced a sharp decline before the announcement of the first case of Covid, then strengthened for two days after the announcement, then weakened again on March 5th, 2020.

The information content of an event can be measured using its return as the value of price changes. Abnormal return is an indicator that can be used to measure the amount of stock reaction. Abnormal return is the difference between returns that occurs and normal returns (Hartono, 2017, p. 667). To determine the capital market's reaction more thoroughly, it is also necessary to measure the capital market's stock trading activity. The calculation that is commonly used is trading volume activity.

Trading volume activity is the ratio between the number of shares traded at a particular time to the number of outstanding shares at a specific time (Firmansyah, 2016). In other words, trading volume activity involves every buying and selling transactions activities on the stock exchange. This trading volume activity

influenced stock price volatility because the higher the share transactions, the higher the stock liquidity, which also caused the stock to be more attractive to investors. During this condition, the law of supply and demand applies, the company's share price will increase, and affecting the Jakarta Stock Exchange Composite Index / IDX Composite (JKSE).

Based on the background described, the author decided to study "Analysis of the Influence of the First Covid-19 Case Announcement in Indonesia on Abnormal Return and Trading Volume Activity (Study at stock listed in LQ 45)". The author conducted this research intending to make the results of this study a guide and a consideration for investors to invest when given future announcements are expected to create a market anomaly.

I.2 Research Problem

1. Is there significant Abnormal Return around the date of the announcement of the first Covid-19 case in Indonesia (March 2nd, 2020)?
2. Is there significant Trading Volume Activity around the date of the announcement of the first Covid-19 case in Indonesia (March 2nd, 2020)?
3. Does Abnormal Return significantly change on the LQ-45 Index before and after the announcement of the first Covid-19 case in Indonesia (March 2nd, 2020)?
4. Does Trading Volume Activity significantly change on the LQ-45 Index before and after the announcement of the first Covid-19 case in Indonesia (March 2nd, 2020)?

I.3 Objectives and Benefits of Research

1. To find out the difference in Abnormal Return on the LQ 45 index before and after the announcement of the first Covid-19 case in Indonesia.
2. To find out the difference in Trading Volume Activity on the LQ 45 Index before and after the announcement of the first Covid-19 case in Indonesia.

I.4 Research Contribution

This research is expected to provide benefits to many parties, including:

1. Practical Contribution
   a. This research can provide information that can be taken into consideration by investors and potential investors in making stock investment decisions.
   b. For the Business Administration Study Program, it is hoped that this research can provide insight into the impact of an event on the stock market.
2. Academic Contribution
   a. For researchers, it is hoped that it can be used as a learning material in analyzing the impact of an event on Abnormal Return and Trading Volume Activity.
   b. For educational institutions and researchers alike in the future, it is hoped that this research can become a reference and input for future researchers.

I.5 Research Systematics

In this study, to provide a clear and comprehensive picture, the following is an overview of each chapter:

CHAPTER I : INTRODUCTION

This chapter suggests a theoretical, empirical, and normative written background supported by the formulation of the problems raised in this study, research objectives, research contributions, and systematic research writing.

CHAPTER II: LITERATURE REVIEW

This chapter describes the theoretical basics and previous research related to the research theme raised by the researcher.

CHAPTER III: RESEARCH METHOD

This chapter explains the answers to the formulation that has been formulated in this study which consists of the type of research, research location, research variables, population and sample, data collection techniques, and analysis techniques used in this study.

CHAPTER IV: RESULTS AND DISCUSSION

This chapter describes the data processing listed in chapter III and discusses several problem formulations that have been compiled as answers in this study.

CHAPTER II

LITERATURE REVIEW

II.1 Previous Research

This research is inseparable from previous studies that provide insight and direction for researchers to continue the research on Abnormal Return and Trading Volume Activity in different events. Previous researches that were used as guidelines for researchers to conduct this research were:

II.1.1 A'immah (2015)

A'immah studied a research entitled, "Reactions of Abnormal Return and Trading Volume Activity Against the Ramadan Effect (Study on Food and Beverages Companies Listed on the Indonesia Stock Exchange for the 2013-2014 Period) ". This research aims to test the reaction of Abnormal Return (AR) and Trading Volume Activity (TVA) to the Ramadhan Effect on the Indonesia Stock Exchange. This study uses Abnormal Return and Trading Volume Activity as research variables. This study indicates that AR during Ramadan is not significantly different from AR during Sha'ban and Shawwal, but TVA during Ramadan is significantly different. The results showed that TVA reacted to the Ramadan Effect. This study also found that AR and TVA Sya'ban were higher than those of Shawwal and Ramadan.

II.1.2 Lestari (2018)

Lestari conducted research entitled "The Impact of Britain Exit on Abnormal Return and Trading Volume Activity on the LQ-45 Index. This study

aimed to investigates the impact of the Brexit event on the reaction of the most liquid index at IDX, namely the LQ-45 index with abnormal returns and trading volume activity as a measure of reaction. The test used is the one-sample difference test and the two-sample difference test in pairs. Furthermore, the robustness test is added to test the strength of the event study method measurement. A series of test results shown that the Brexit event contains information that can make the market react. However, the information content is not great enough to form a significant difference in value between before and after the event.

II.1.3 Wulan (2018)

"Analysis of Abnormal Return and Trading Volume Activity Against Unusual Market Activity Announcement" is the title of research conducted by Wulan. This study aims to determine whether there is a significant AR reaction around the UMA announcement date. The study analyzed the data using the normality test then used the Paired Sample T-Test, Wilcoxon Signed Rank Test and One-Sample T-Test. The results of this study indicate that Trading Volume Activity (TVA) and Abnormal Activity (AR) react to the Announcement of Unusual Market Activity.

II.1.4 Yuhendri (2019)

Yuhendri conducted research entitled "Analysis of Differences in Trading Volume Activity and Abnormal Return Before and After Stock Split." This study aims to determine whether there is a difference between trading volume activity and abnormal returns before and after the stock split announcement. This study used a one-sample Kolmogorov Smirnov Test and the hypothesis test using Paired Sample

T-Test and Wilcoxon Signed Rank. The statistical analysis results using the Wilcoxon Signed Rank Test showed no significant difference between before and after the stock split announcement. The statistical analysis results using the Wilcoxon Signed Rank Test from this study indicate a significant difference between before and after stock split announcement. This research shows that there is no significant difference in trading volume activity before and after the announcement of the stock split, and there is a significant difference in abnormal returns before and after the announcement of the stock split.

II.1.5 Puspita (2019)

This study entitled "Analysis of Abnormal Return and Price Reversal in the 2018 American-China Trade War (Study on Shares Listed in the LQ45 Index for the period of February 2018-January 2019)". This research aimed to determine whether the United States-China Trade War event in 2018 affects the Indonesian capital market by looking at the Abnormal Return and Price Reversal in the Capital Market. Puspita research also used the LQ45 Index as the population and 21 companies as the sample. The results of this study stated that there is no abnormal return in both winner and loser stocks. The study also states that price reversal only occurs in loser stock samples. This indicates that the price reversal only occurs in the loser stocks sample.

II.1.6 Putra (2020)

Putra researched in 2020 with the title "Difference Test *Abnormal Return* and Trading Volume due to the 2018 Jakarta-Palembang Asian Games (Study on Companies Listed in the LQ-45 Index on the IDX 2018)". Researchers used

Abnormal Return and Trading Volume Activity as the variables in research. The research was conducted to determine whether there is a difference in the average abnormal return and trading volume activity before and after the opening and closing ceremonies of the 2018 Asian Games. This research used the event study method. Data analysis used the Paired Sample T-Test and Wilcoxon Signed Rank Test. This study indicates no significant difference in the average abnormal return and trading volume activity in the period before and after the 2018 Asian Games opening ceremony. However, there are significant differences in the average abnormal return and trading volume activity in the period before and after the closing ceremony of the 2018 Asian Games.

II.1.7 Kumari (2020)

Kumari conducted research entitled, "Event Study on the Reaction of the Developed and emerging stock markets to the 2019-nCov outbreak". This paper was aimed to examine the impacts of the 2019-nCoV outbreak on the global stock markets. The study concluded that the 2019-nCoV epidemic has significantly impacted the global stock markets. The Asian stock markets were knocked the hardest. Furthermore, the study also analyzed the impacts of lockdowns/restrictions imposed by the economies on the 2019-nCoV outbreak. This study used the t-test and Wilcoxon's Signed Rank test.

II.1.8 Chiah and Zhong (2020)

Chiah and Zhong conducted research entitled "Trading from home: The impact of COVID-19 on trading volume around the world". This paper examines the impact of COVID-19 on trading volume in stock markets around the world. The

study concluded that the turnover during COVID-19 is higher than the pre-COVID-19 level. The differences are mostly statistically significant. This finding provides preliminary evidence that there are more intense trading activities during the pandemics. This study used a baseline model, and the panel regressions are estimated using robust standard errors.

Table 2.1 Summary of previous research

No.	Researcher	Title	Variables	Result	Similarity	Difference
1.	A'immah (2015)	Reactions of Abnormal Return and Trading Volume Activity Against the Ramadan Effect. (Study on Food and Beverages Companies Listed on the Indonesia Stock Exchange for the Period 2013-2014).	Dependent: 1. Ramadan Effect Independent: 1. Abnormal Return 2. Trading volume Activity.	1. AR during Ramadan is not significantly different from AR during Sha'ban and Shawwal. 2. TVA during Ramadan is significantly different. 3. TVA reacts to the Ramadan Effect. 4. AR and TVA Sha'ban is higher than Syawal and Ramadan.	The independent variables used are the Abnormal Return and Trading Volume Activity.	The Previous research was conducted during the Ramadhan Effect market period.
2.	Lestari (2018)	Impact of Britain Exit on Abnormal Return and Trading Volume Activity on the LQ-45 Index	Dependent: 1. Britain Exit Independent: 1. Abnormal Return 2. Trading volume Activity.	1. There is a significant difference in the abnormal return using the one-sample t-test. 2. There is a significant difference in trading volume activity using the one-sample t-test.	The independent variables used are the Abnormal Return and Trading Volume Activity.	The Previous research was conducted during the Britain Exit market period.

Table 1.1 (continued)

No.	Researcher	Title	Variables	Result	Similarity	Difference
3.	Wulan (2018)	Analysis of Abnormal Return and Trading Volume Activity on Unusual Market. Activity Announcement	Dependent: 1. Unusual Market Independent: 1. Abnormal Return 2. Trading volume Activity.	1. Trading Volume Activity (TVA) reacts to the announcement of unusual Market Activity. 2. Abnormal Activity (AR) reacts to the Announcement of Unusual Market Activity.	The independent variables used are the Abnormal Return and Trading Volume Activity.	The Previous research was conducted during the Unusual market period.
4.	Yuhendri (2019)	Analysis of Differences in Trading Volume Activity and Abnormal Return Before and After Stock Split.	Dependent: 1. Before After stock split Independent: 1. Abnormal Return 2. Trading volume Activity.	1. There is no significant difference in trading volume activity before and after the stock split announcement. 2. There is a significant difference in abnormal returns before and after the announcement. 3. There is no significant difference between abnormal returns and trading volume activity using the paired sample test.	The independent variables used are the Abnormal Return and Trading Volume Activity.	The Previous research was conducted during the Stock Split market period.

Table 1.1 (continued)

No.	Researcher	Title	Variables	Result	Similarity	Difference
5.	Puspita (2019)	Analysis of Abnormal Return and Price Reversal in the 2018 American-China Trade War	Dependent: 1.American-China Trade War 2018 Independent: 1. Abnormal Return 2. Price Reversal	1. There is no abnormal return in both winner and loser stocks. **2.** This study also states that price reversal only occurs in the sample loser stock.	The Previous Research used was the Abnormal Return as the independent variable.	1. The Previous research was conducted during the American-China Trade War market period. 2. The Previous research uses Price Reversal as an independent variable
6.	Putra (2020)	Different Test of Abnormal Return and Trading Volume Activity Due to the 2018 Jakarta-Palembang Asian Games (Study on Companies Listed in the LQ-45 Index on the IDX 2018)	Dependent: 1. Jakarta-Palembang Asian Games 2018 Independent: 1. Abnormal Return 2. Trading volume Activity.	1. There is no significant difference in the average abnormal return and trading volume activity in the period before and after the 2018 Asian Games opening. 2. There is a significant difference in the average abnormal return and trading volume activity in the period before and after the 2018 Asian Games closing ceremony.	The independent variables used are the Abnormal Return and Trading Volume Activity.	The Previous research was conducted during the Jakarta-Palembang Asian Games 2018 market period.

Table 1.1 (continued)

No.	Researcher	Title	Variables	Result	Similarity	Difference
7.	Kumari (2020)	Event Study on the Reaction of the Developed and emerging stock markets to the 2019-nCov outbreak	Dependent: 1. the Developed and emerging stock markets to the 2019-nCov outbreak Independent: 1. Abnormal Return	The event has significantly impacted the returns in the developed as well as emerging markets in the world.	The independent variable used was Abnormal Return.	1. The Previous research was conducted using stock exchanges data which is the leading index from the developed and emerging markets in the world 2. The Previous research not uses Trading volume activity as an independent variable
8.	Chiah and Zhong (2020)	Trading from home: The impact of COVID-19 on trading volume around the world	Dependent: 1. Covid-19 Independent: 1. Trading volume Activity.	The differences are mostly statistically significant.	The independent variables used was Trading Volume Activity	The Previous research does not use Abnormal Returns as an independent variable.

Source: processed by author (2020)

The similarities that appear from these several previous studies conducted by researchers are the use of Abnormal Return and Trading Volume Activity as the variables. This research uses an analytical method with the paired sample t-test. Researchers also used the LQ45 index as the object of research. The difference from several previous studies with research conducted by the author of this study is the observation period. This study uses the January - June 2020 observation period and uses the announcement of the first Covid-19 case in Indonesia as the basis of the research problem.

II.2 Capital market

The capital market is where investors and stock issuers meet. Stock issuers/companies need capital to carry out their business activities, and investors will help by channeling funds owned with expected in turn for dividend. According to (Tandelilin E, 2001, p. 13), the capital market is a meeting between parties with excess funds and parties who need funds by trading securities. In Indonesia, the Indonesia Stock Exchange acts as a place where the securities' buying and selling occurs. The capital market is divided into several types (Sunariyah, 2006, p. 13), namely:

II.2.1 Primary Market

The primary market is: "An offering of shares from companies that issue shares (issuers) to investors during the time determined by the party before the shares are traded on the secondary market." This definition shows that the primary market is a capital market that trades shares or other securities sold for the first time

(public offering) before the shares are listed on the market. The price of shares in the primary market is determined by the underwriter and the company that will go public, based on the relevant fundamental analysis.

II.2.2 Secondary Market

The secondary markets are things beyond the company's ability or beyond the capacity of management to control. For example, the emergence of political turmoil in a country, monetary policy changes, and high inflation rates. Secondary market trading, when compared to primary market trading, has a much larger trading volume. So, it can be concluded that the secondary market is a market that trades shares after passing through the primary market. Therefore, the sale of shares here usually does not stay in the company's capital but also enters the cash of the concerned shareholders. Compared to primary market trading, it has a much larger trading volume.

II.2.3 Third Market

A third market is a place for trading stocks or other securities outside the stock exchange (over-the-counter market). Parallel exchange is a system of organized securities trading outside the official stock exchange, in the form of a secondary market regulated and implemented by the Money and Securities Trading Association under the supervision of the Capital Market Supervisory Agency. This third market does not have a central trading location or usually called the trading floor. The operation that exists in the third market is centralized information called "trading information." The information provided in this market includes share prices, number of transactions, and other information regarding the securities

concerned. In this trading system, a broker can act as a securities trader or intermediary for traders in Indonesia. Parallel exchanges have been eliminated for efficiency because shares traded on parallel exchanges can already be traded on the SSX (Surabaya Stock Exchange). The Netherlands has a similar market, named the "parallel market, while the United States is called the NASDAQ (National Association of Securities Dealer Quotation) system.

II.2.4 Fourth Market

A fourth market is a form of securities trading between investors or, in other words, the transfer of shares from one shareholder to another without going through a securities broker. This form of transaction in trading is usually carried out in large quantities (block sale). For example, PT NUSAMBA took over ownership of PT ASTRA International's shares from several other shareholders, thus controlling 15% of the outstanding shares. Although the share transfer transaction occurs directly between one investor and another, the working mechanism in the capital market requires reporting of block sale transactions to the Jakarta stock exchange in an open manner. So, in the end, the inter-model transactions must also be listed on the stock exchange.

Capital markets are inseparable from some economic and non-economic components of a country. Kumari (2020) studied the impact of macroeconomic news announcements on the stock markets. Chiah & Zhong (2020) studied that turnover during COVID-19 is higher than the pre-COVID-19 level.

II.3 Stock

Shares are the security of ownership of a company that claims the company's income and assets. A stock (also known as equity) is a security that represents the ownership of a fraction of a corporation. This entitles the stock owner to a proportion of the corporation's assets and profits equal to how much stock they own. Units of stock are called "shares." (Investopedia, 2020). According to (Jogiyanto, 2017, p.189), there are several types of stocks, namely:

II.3.1 Preferred Stock

Stocks have a hybrid nature between bonds and common stocks. Like bonds paying interest on loans, the preferred stock also provides a fixed yield in the form of preferred dividends. Like common stock, in the case of liquidation, the preferred shareholder's claim is below the bondholder's claim. Compared to common stock, preferred stock has several rights, namely the right to fixed dividends and the right to advance payment in the event of liquidation. Therefore, the preferred shares are considered to have the characteristics of the middle between the bond and common stock.

II.3.2 Common Stock

If the company issued one share class, it is usually in the form of common stock. Shareholders are the owners of the company who represent management to carry out the company's operations.

II.3.3 Treasury Stock

Treasury Stock is a share owned by a company that has been issued and circulated, which are then brought back or repurchased by the company so that they are not retired but are kept as a treasury.

II.4 The Composite Stock Price Index

The composite stock price index (IHSG) is the average movement of all stocks in Indonesia. The Composite Stock Price Index (IHSG) on the IDX includes price movements for common stock and preferred stock. The JCI began to be recognized for the first time on April 1, 1983, using the baseline on August 10, 1983 (Hartono, 2017, p. 167). The following is the JCI formula according to:

$$IHSG_t = \frac{Market\ Value}{Base\ Value} \text{ X } 100$$

Source: (Hartono, 2017, p. 168).

Descriptions:

IHSGt = day t composite stock price index

Market value = weighted average market value (the number of shares listed on the stock exchange multiplied by the market price per share) of common shares and preferred stock on day t

Basic Value = same as the market value but starting from August 10, 1982

II.5 LQ45 Index

IHSG (Composite Stock Price Index), which includes all listed shares (most of them inactive stocks), is considered inappropriate to be used as an indicator of

capital market activity. Therefore, on February 24, 1997, another alternative index was introduced, namely the Liquid-45 Index (LQ-45). According to (Karamoy, 2017), the LQ45 index is an index of a collection of stocks with a good level of liquidity. It can be a good reference for investors, traders, brokers, and stock analysts to see the development of stocks and the market. The LQ-45 index started on July 13, 1994, and this date is the base day of the index with an initial value of 100. This index is formed from only the 45 most actively traded stocks. The considerations that underlie the selection of shares included in the LQ-45 are liquidity and market capitalization with the following criteria (Hartono, 2017):

1. During the last 12 months, average stock transactions were among the 60 largest of total stock transactions on the regular market.
2. Over the past 12 months, its average market capitalization value is in the top 60 on the regular market.
3. Has been listed on the IDX for at least 3 months. The LQ-45 index is updated every 6 months, namely at the beginning of February and August.

From the description above, it can be concluded that the LQ45 Index is a list of the 45 most actively traded companies in the Capital Market, which represents all shares in the capital market as an indicator of capital market activity.

II.6 Investment

Investment is an effort or action taken by someone in managing the funds they have in the long term with the hope of obtaining a return in the future.

According to (Tandelilin E, 2001, p. 3). Investment is a commitment to several funds or other resources carried out at this time to obtain several benefits in the future. Investment can also be said as an investment for one or more assets owned and usually has a long-term benefit in the future. (Sunariyah, 2006, p. 2). Here are some reasons someone invests according to (Tandelilin E, 2001, p. 4) :

1. To get a more decent life in the future. A wise person will think about improving his standard of living from time to time or at least try how to keep his current level of income from decreasing in the future.
2. Reducing inflationary pressure. Through investment in companies' ownership, a person can avoid the risk of decreasing the value of his assets or property due to the influence of inflation.
3. The drive to save taxes. Several countries in the world carry out many policies that encourage investment growth by providing tax facilities to people investing in specific business fields.

II.7 Return

Basically, the Investor's goal is to obtain a return on the investment made by maximizing profits and minimizing the risks faced. According to (Hartono, 2017, p. 283), the definition of stock return is the result obtained from an investment. Return can be in the form of a realized return that has occurred or an expected return that has not occurred, but it is expected in the future. Besides that, according to (Tandelilin E, 2001, p. 47), stock return is one factor that motivates

investors to invest and is also a reward for the investor's courage to bear the risk of the investment made.

From some of the definitions above, it can be concluded that stock return is the level of profit or return on investment that investors have made. Returns can be positive or profit or negative or loss. If the return is positive, it is called a capital gain, and if the return is negative, it is called a capital loss. Stock returns can attract investors to invest in the capital market.

Sources of investment return consist of two main components, namely yield and capital gain/loss (Tandelilin E, 2010). Yield is a periodic cash flow or income obtained from an investment. When investing in stocks, the yield is the number of dividends earned. Meanwhile, capital gain/loss is an increase or decrease in the price of securities that can provide benefits or losses for investors.

Types of Return:

1) Realized Return

Realized return is the return that has occurred. Realized returns are calculated using historical data (Hartono, 2017, p. 283)

Here is the actual Return formula:

$$Ri_tR = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Source: (Hartono, 2017: 284)

Description:

R_{it} : actual stock return i in period t

P_{it} : the share price in the t-event period

P_{it-1} : share price in event period t-1

2) Return Expectations

The Return Expectation is the return expected by investors in the future. According to (Hartono, 2017, p. 300), expected return is the return used for investment decision making. The expected return can be calculated in the following ways (Hartono, 2017, p. 300):

1) Based on the expected future value
2) Based on historical return values
3) Based on the existing expected return market model

The expected return with market adjusted model formula is as follows:

E [Ri.t] = Rm.t

Source: (Jogiyanto, 2010:76)

Description:

E [Ri.t]: *Return* the expectations of the i security in the event period t

Rm.t : Market return, which is calculated by the formula $\frac{LQ-45\ Index_{i.t}-LQ-45\ Index_{it-1}}{LQ-45\ Index_{it-1}}$

II.8 Abnormal Return

Abnormal return is the advantage of return that occurs on normal return. Normal return is the expected return, and then Abnormal return is the difference between the actual return and the expected return. The event studied analyzes the abnormal returns of security that may occur around the event's announcement (Hartono, 2017, p. 667). It can be concluded that Abnormal Return occurs because it is triggered by specific circumstances, for example, national holidays, political atmosphere, extraordinary events, stock splits, initial offers, suspends, and others.

The calculation of the abnormal return can be done with the formula:

$$RTNi, t = Ri, t - E [Ri, t]$$

Source: Hartono, 2017, p. 668

Description:

RTNi, t = Abnormal return of the i security in the t-event period
Ri, t = The return on the realization that occurred for security at event t
E [Ri, t] = Expected return of the security i for the event period t

II.9 Trading Volume Activity

Trading Volume Activity is data from the number of shares transactions when the stock market is opened. The more investors who buy and sell the existing shares, the more liquid the shares will be traded. Trading Volume Activity is also an indicator used to see the liquidity of a stock. According to (Meyers, 1992), trading volume activity is considered a measure of the strength or weakness of the market.

Trading volume activity influences stock price movements. The higher trading volume on the stock exchange shows that the market will improve. An increase in trading volume linked with an increase in prices is an increasingly vital symptom of improving conditions. According to Firmansyah (2016), Trading volume activity is the ratio between the number of shares traded to the number of shares outstanding at a certain time. The TVA calculation is formulated as follows:

$$TVAi.t = \frac{\Sigma \text{ shares of the company i traded at the time t}}{\Sigma \text{ shares of the company i outstanding at the time}}$$

Source: Gede in Yuhendri (2019)

Descriptions:
TVAi.t = Trading Volume i at time t
i = company name
t = time

II.10 The First Covid-19 Announcement in Indonesia

Pandemic and epidemic occur worldwide or over an extensive area, crossing international boundaries; and usually affecting a large number of people. (Dictionary of Epidemiology). Coronaviruses (CoV) is a part of viruses' family that cause illnesses ranging from the flu to more serious illnesses. For example, Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). The disease caused by the coronavirus, otherwise known as COVID-19, is a new type of virus was discovered in 2019, and that has never been identified as attacking humans before (World Health Organization, 2019).

The Corona pandemic is a disease outbreak that spreads over a wide area, between cities, islands, countries, and even the whole world. According to the newspaper Kompas 2020, this corona pandemic originated from the city of Wuhan, China. Moreover, for the first time, China reported this new disease on December 31, 2019. Because of the coronavirus's high-speed transmission, the World Health Organization (WHO) determined the coronavirus as a pandemic on March 11th, 2020. The status of a pandemic or global epidemic indicates that the spread of COVID-19 is progressing so fast that almost no country worldwide can ensure that it is protected from the coronavirus. (DetikNews, 2020).

The first time Indonesia announced a Covid-19 case that infected 2 Indonesian citizens, on March 2nd, 2020. Joko Widodo, as President of the Republic of Indonesia, made the announcement (CNN Indonesia, 2020). The spread of the coronavirus (covid-19) certainly affects people's lives, both economically, socially, and in food. The application of large-scale social borders (PSBB) has been regulated in Government Regulation (PP) Number 21 of 2020, signed by the President of the Republic of Indonesia, Joko Widodo, on Tuesday, March 31st, 2020. Furthermore, with the RI Minister of Health Regulation (Permenkes) Number 9 of 2020 concerning Guidelines for Large-Scale Social Restrictions in the Context of Accelerating Handling of Corona Virus Disease 2019 (Covid-19), to be able to overcome the spreading of covid-19. In addition to that, several regions have also decided on the existence of a Large-Scale Sausal Restriction (PSBB) policy, such as in Jakarta (Decree of the Minister of Health of the Republic of Indonesia, No. Hk.01.07 / Menkes / 239/2020) which has been implemented starting April 7, 2020.

II.11 Efficient Market

An efficient market is a market in which all traded securities' prices reflect all available information (Tandelilin E, 2001, p. 112). The available information may include both past information (for example, the company's last year's profit) and current information (for example, the planned dividend increases this year), as well as information that is a rational opinion/opinion circulating in the market affect price changes (for example, if many investors in the market believe that the stock price will rise, this information will later be reflected in changes in stock prices which tend to rise). This concept implies a process of adjusting the price of a

security to a new equilibrium price in response to further information entering the market. Although the price adjustment process does not have to run perfectly, what is essential is that the price formed is not biased.

Thus, at certain times the market can be over-adjusted or unadjusted when reacting to new information. The new price formed may not be a price that reflects the security's intrinsic value. Therefore, the important thing from an efficient market mechanism is that the price formed is not biased by the estimated equilibrium price. The equilibrium price will be formed once the investor has fully assessed this information's impact (Tandelilin E, 2001, p. 112). Several conditions must be met in order to achieve an efficient market (Tandelilin E, 2001, p. 113), namely:

a. Many investors are rational and trying to maximize profits. These investors actively participate in the market by analyzing, valuing, and trading stocks. Besides, they are also price takers, so a single investor's actions will not be able to influence the price of a security.
b. All market participants can get information at the same time cheaply and easily.
c. The information that occurs is random.
d. Investors react quickly to new information so that the security price will change according to changes in real value due to that information.

If these conditions are met, a market will be formed where investors can quickly react to adjusting the price of securities when there is new information on

the market (this information occurs randomly). The prices of securities in that market will realize all the available information. Because the information affecting the price of the security occurs randomly, the price changes that occur will be independent of one another and move randomly. This means that today's price does not depend on the price changes that occurred in the past because the new price is based on a reaction to new information that occurs randomly. (Tandelilin E, 2001, p. 114). From the description above, it can be concluded that an efficient market is a condition in which stock prices can be in line or according to the information available.

II.12 Event Study

An event study is an investigation that studies market reactions to an event whose information is published as an announcement (Hartono, 2017, p. 643). Event studies are used to test the information content of an announcement. It can be used to test the efficiency of a semi-strong market. Market reaction is indicated by a change in the price of the security concerned. This reaction can be measured using return as the value of price changes or as the value of price changes or by using abnormal returns (Hartono, 2017, p. 644).

From the description above, it can be concluded that an event study is a study that examines the effect of an event or information on market reactions that abnormal returns can measure. The event study of this research is to analyze the impact of the announcement of the Covid-19 case in Indonesia on market reactions through abnormal returns and trading volume activity.

II.13 Research Framework

The research framework is a concept of how theory relates to various factors that have been identified as important problems (Sekaran, 1992 in Sugiyono, 2017, p. 91), *Different* the following is the framework for thinking from this research:

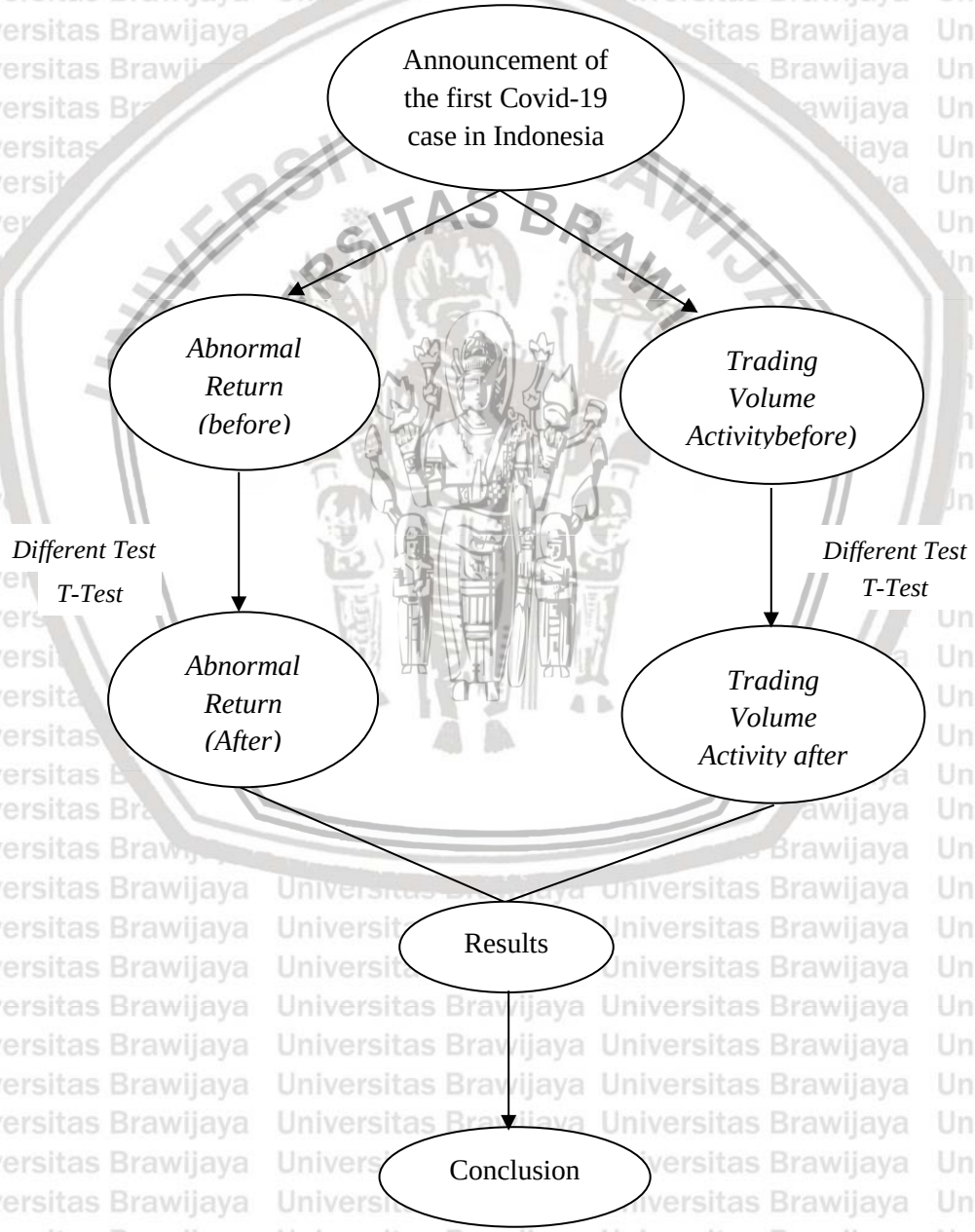

Figure 2.1 Research Model

Source: processed by author

II.14 Hypothesis

A hypothesis is a temporary answer to a presumptive nature problem because the problem still has to be proven. According to (Sugiyono, 2017, p. 95), the hypothesis is a temporary answer to the formulation of the research problem. The formulation of the research problem has been stated in the form of a question sentence. In this study, the tested hypotheses are as follows:

H_1 : There is significant Abnormal Return around the date of the announcement of the first Covid-19 case in Indonesia

H_2 : There is significant Trading Volume Activity around the date of the announcement of the first Covid-19 case in Indonesia

H_3 : The announcement of the first case of Covid-19 in Indonesia has a significant effect on Abnormal Return (AR) which is shown by a significant difference in the study period.

H_4 : The announcement of the first case of Covid-19 in Indonesia has a significant effect on Trading Volume Activity (TVA) which is shown by a significant difference in the study period

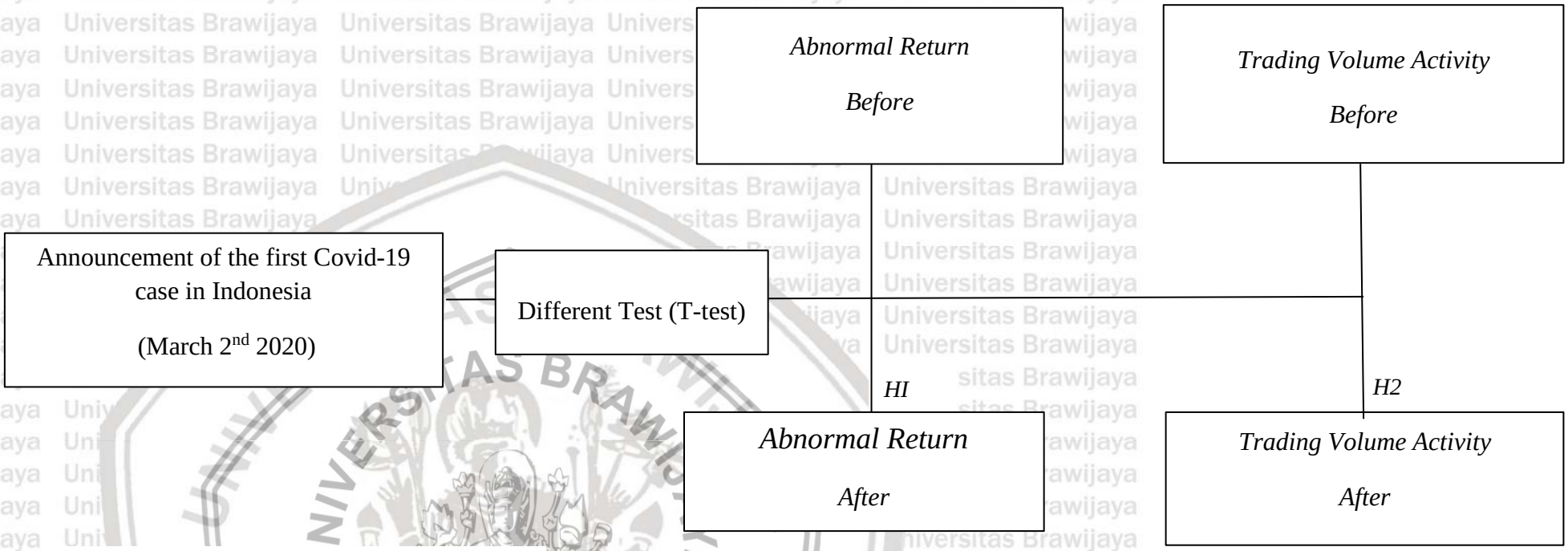

Figure 2.2 Hypothesis Model

Source: processed by author

CHAPTER III

RESEARCH METHODS

III.1 Types Of Research

This research is an event study research using a quantitative approach. Event studies study the market's reaction upon an event, and the reaction can be positive or negative reaction. According to (Hartono, 2017, p. 643), event studies can be used to test an information content of an announcement and can test the efficiency of a semi-strong market. The quantitative approach can be interpreted as an approach based on the philosophy of positivism. This approach is used to examine specific populations and samples. Sampling techniques are generally carried out randomly. Data collection uses research instruments and statistical analysis to test predetermined hypotheses (Sugiyono, 2017, p. 14)

III.2 Research Sites

The research data was obtained from the Indonesia Stock Exchange (BEI) through its official website, namely www.idx.co.id. The researcher chose the website as the location for data search because it has valid data needed on the problem being studied, such as data on stock prices, volume, and listed shares. Therefore, the research can be carried out without going directly to the Indonesia Stock Exchange Investment Gallery.

III.3 Research Variable

Research variables are anything that is determined by the researcher to be studied to obtain information about it, then conclude (Sugiyono, 2017, p. 60). The variables of this study can be described as follows:

III.3.1 Abnormal Return

The calculation of the abnormal return can be done with the formula:

$$RTNi, t = Ri, t - E [Ri, t]$$

Source: Hartono, 2017

Information:

RTNi, t = Abnormal return of the i security in the t-event period

Ri, t = Return realization that occurred for the security at event t

E [Ri, t]=The expected return of the i security for the event period t

III.3.2 Trading Volume Activity

The TVA calculation is formulated as follows:

$$TVA = \frac{\Sigma \text{ shares of the company i traded at the time t}}{\Sigma \text{ shares of the company i outstanding at the time}}$$

Source: Gede in Yuhendri (2019)

Information:

TVAit = Trading Volume i at time t

i = company name

t = time

Below is a summary table of the variables used for this study

Table 3.1 Operational Definition of Variables

Variable	Variable Definitions	Formula
Trading Volume Activity	Trading volume activity is the ratio between the number of shares traded to the number of shares outstanding at a certain time at Firmansyah, 2016.	$TVA = \frac{\Sigma \text{ shares of the company i traded at the time t}}{\Sigma \text{ shares of the company i outstanding at the time}}$ Source: Yuhendri, 2019
Abnormal Return	Abnormal return is the advantage of return that occurs on norm return. Normal return is the expected return, so abnormal return is the difference between the actual return and the expected return at Hartono, 2017.	$RTNi, t = Ri, t - E [Ri, t]$ Source: Hartono, 2017

III.4 Population and Sample

III.4.1 Population

The population is a generalization area consisting of objects with specific qualities and characteristics determined by the researcher to be studied and then conclude (Sugiyono, 2017, p. 117). The population of this study is companies listed on the LQ45 Index in February 2020-August 2020.

Table 3.2 List of Population

No.	Code	Share Name
1	ACES	Ace Hardware Indonesia Tbk.
2	ADRO	Adaro Energy Tbk.
3	AKRA	AKR Corporindo Tbk.
4	ANTM	Aneka Tambang Tbk.
5	ASII	Astra International Tbk.
6	BBCA	Bank Central Asia Tbk.
7	BBNI	Bank Negara Indonesia (Persero) Tbk.
8	BBRI	Bank Rakyat Indonesia (Persero) Tbk.
9	BBTN	Bank Tabungan Negara (Persero) Tbk.
10	BMRI	Bank Mandiri (Persero) Tbk.
11	BRPT	Barito Pacific Tbk.
12	BSDE	Bumi Serpong Damai Tbk.
13	BTPS	Bank Tabungan Pensiunan Nasional Syariah Tbk.
14	CPIN	Charoen Pokphand Indonesia Tbk

Table 3.2 (continued)

No.	Code	Share Name
15	CTRA	Ciputra Development Tbk.
16	ERAA	Erajaya Swasembada Tbk.
17	EXCL	XL Axiata Tbk.
18	GGRM	Gudang Garam Tbk.
19	HMSP	HM Sampoerna Tbk.
20	ICBP	Indofood CBP Sukses Makmur Tbk.
21	INCO	Vale Indonesia Tbk.
22	INDF	Indofood Sukses Makmur Tbk.
23	INKP	Indah Kiat Pulp & Paper Tbk.
24	INTP	Indocement Tunggal Prakarsa Tbk.
25	ITMG	Indo Tambangraya Megah Tbk.
26	JPFA	Japfa Comfeed Indonesia Tbk.
27	JSMR	Jasa Marga (Persero) Tbk.
28	KLBF	Kalbe Farma Tbk.
29	LPPF	Matahari Department Store Tbk.
30	MNCN	Media Nusantara Citra Tbk.
31	PGAS	Perusahaan Gas Negara Tbk.
32	PTBA	Bukit Asam Tbk.
33	PTPP	PP (Persero) Tbk.

Table 3.2 (continued)

No.	Code	Share Name
34	PWON	Pakuwon Jati Tbk.
35	SCMA	Surya Citra Media Tbk.
36	SMGR	Semen Indonesia (Persero) Tbk.
37	SRIL	Sri Rejeki Isman Tbk.
38	TBIG	Tower Bersama Infrastructure Tbk.
39	TKIM	Tjiwi Kimia Paper Factory Tbk.
40	TLKM	Telekomunikasi Indonesia (Persero) Tbk.
41	TOWR	Sarana Menara Nusantara Tbk.
42	UNTR	United Tractors Tbk.
43	UNVR	Unilever Indonesia Tbk.
44	WIKA	Wijaya Karya (Persero) Tbk.
45	WSKT	Waskita Karya (Persero) Tbk.

Source: www.IDX.co.id (2020)

III.4.2 Sample

The sample is part of the population's number and characteristics (Sugiyono, 2017, p. 118). The sampling technique used in this study is the Purposive Sampling method. According to (Sugiyono, 2017, p. 124). Purposive sampling is a technique of determining a sample with specific consideration. The following are the criteria for determining this sample:

1) Shares are listed in the LQ45 index for the period February 2020- August 2020
2) Was not any corporate actions such as dividend distribution, stock split, or stock buyback during the research period. (Lestari, 2018)

Researchers determined the criteria that companies that conduct corporate action within the event window period will not be used as research samples. The purpose is to avoid biased information because there is a potential for the entry of other events into the market (Lestari, 2018). Lestari's research also used these criteria in 2018. This stage resulted in 40 sample companies meeting the sampling criteria.

Table 3.3 Information of Criteria Sample

No.	Information	amount
1.	Shares are listed in the LQ45 index for the period February 2020- August 2020	45
2.	Companies that take corporate action during the research period.	5
Number of Samples		**40**

Source: Secondary Data Processed by Author (2020)

The following is a list of companies listed in the LQ-45 index and not taking corporate action in the observation period February 24th - March 9th , 2020.

Table 3.4 List of Sample Research

No.	Code	Company	Criteria		Sample
			1	2	
1	ACES	Ace Hardware Indonesia Tbk.			1
2	ADRO	Adaro Energy Tbk.	√	√	2
3	AKRA	AKR Corporindo Tbk.	√	√	3
4	ANTM	Aneka Tambang Tbk.	√	√	4
5	ASII	Astra International Tbk.	√	√	5
6	BBCA	Bank Central Asia Tbk.	√	√	6
7	BBNI	Bank Negara Indonesia (Persero) Tbk.	√	*x*	Not Selected
8	BBRI	Bank Rakyat Indonesia (Persero) Tbk.	√	√	7
9	BBTN	Bank Tabungan Negara (Persero) Tbk.	√	*x*	Not Selected
10	BMRI	Bank Mandiri (Persero) Tbk.	√	*x*	Not Selected
11	BRPT	Barito Pacific Tbk.	√	√	8
12	BSDE	Bumi Serpong Damai Tbk.	√	√	9
13	BTPS	Bank Tabungan Pensiunan Nasional Syariah Tbk.	√	√	10
14	CPIN	Charoen Pokphand Indonesia Tbk	√	√	11
15	CTRA	Ciputra Development Tbk.	√	√	12

Table 3.4 (continued)

No.	Code	Company	Criteria		Sample
			1	2	
16	ERAA	Erajaya Swasembada Tbk.	√	√	13
17	EXCL	XL Axiata Tbk.	√	*x*	Not Selected
18	GGRM	Gudang Garam Tbk.	√	√	14
19	HMSP	HM Sampoerna Tbk.	√	√	15
20	ICBP	Indofood CBP Sukses Makmur Tbk.	√	√	16
21	INCO	Vale Indonesia Tbk.	√	√	17
22	INDF	Indofood Sukses Makmur Tbk.	√	√	18
23	INKP	Indah Kiat Pulp & Paper Tbk.	√	√	19
24	INTP	Indocement Tunggal Prakarsa Tbk.	√	√	20
25	ITMG	Indo Tambangraya Megah Tbk.	√	√	21
26	JPFA	Japfa Comfeed Indonesia Tbk.	√	√	22
27	JSMR	Jasa Marga (Persero) Tbk.	√	√	23
28	KLBF	Kalbe Farma Tbk.	√	√	28
29	LPPF	Matahari Department Store Tbk.	√	√	29
30	MNCN	Media Nusantara Citra Tbk.	√	√	30

Table 3.4 (continued)

No.	Code	Company	Criteria		Sample
			1	2	
31	PGAS	Perusahaan Gas Negara Tbk.	√	√	27
32	PTBA	Bukit Asam Tbk.	√	√	28
33	PTPP	PP (Persero) Tbk.	√	*x*	Not Selected
34	PWON	Pakuwon Jati Tbk.	√	√	29
35	SCMA	Surya Citra Media Tbk.	√	√	30
36	SMGR	Semen Indonesia (Persero) Tbk.	√	√	31
37	SRIL	Sri Rejeki Isman Tbk.	√	√	32
38	TBIG	Tower Bersama Infrastructure Tbk.	√	√	33
39	TKIM	Tjiwi Kimia Paper Factory Tbk.	√	√	34
40	TLKM	Telekomunikasi Indonesia (Persero) Tbk.	√	√	35
41	TOWR	Sarana Menara Nusantara Tbk.	√	√	36
42	UNTR	United Tractors Tbk.	√	√	37
43	UNVR	Unilever Indonesia Tbk.	√	√	38
44	WIKA	Wijaya Karya (Persero) Tbk.	√	√	39
45	WSKT	Waskita Karya (Persero) Tbk.	√	√	40

Source: Data Processed by Author (2020)

III.5 Observation Period

The observation period carried out starts from February 24th – March 9th 2020. The research observation was conducted during 11 stock exchange working days around the announcement of the first Covid-19 case in Indonesia. These days consist of five days before the announcement, one day at the time of the announcement was announced by the president of Jokowidodo (CNN Indonesia, 2020), then 5 days after the announcement. The 11-day observation period is used as the research period by considering the 5-day change in the stock price, reflecting the announcement of the first Covid-19 case. According to Hartono (2017: 669), the length of commonly used windows ranges from 3 days to 121 for daily data. This period is taken to minimize the confounding effect of other events, such as stock splits, dividends, rights issues, IPOs, etc. which will cause stock returns and TVA to change. Some studies also use an 11 day observation period, there is Wulan (2018) dan Lestari (2018).

Announcement of the first Covid-19 case in Indonesia

(March 2nd 2020)

5 days before	5 days after
Before	After
1. Abnormal Return	1. Abnormal Return
2. Trading Volume Activity	2. Trading Volume Activity

III.6 Types and Sources of Data

The type of data used in this study is secondary data. Secondary data is a set of data where the researcher does not get it directly from the source. Secondary data

are usually in the form of historical records or reports organized into archives either published or not published, according to (Sugiyono, 2017, p. 193). Secondary sources are sources that do not directly provide data to data collectors, for example, through other people or documents.

Secondary data was obtained by researchers from the Indonesia Stock Exchange website, namely www.idx.co.id and the website id.investing.com. The data sources used in this study are as follows:

1. Composite stock price data (IHSG) within the observation period
2. LQ45 share price data
3. The number of shares traded during the study period data
4. The number of outstanding shares during the observation period data

III.7 Data Collection Technique

Data collection can be done in various settings, multiple sources, and various ways (Sugiyono, 2017, p. 193). The technique of data collection in this research is using the documentation method. The intended data is data obtained indirectly from the company which is used as the unit of analysis. Secondary data is in the form of share prices, number of shares transacted, number of outstanding shares, LQ-45 Index, and the Composite Stock Price Index (IHSG).

III.8 Data analysis technique

Quantitative research data analysis is an activity after data from all respondents or other data sources have been collected. According to (Sugiyono,

2013, p. 147), data analysis activity is grouping data based on variables and respondent type, tabulating data based on variables from all respondents, presenting data of each variable studied, doing calculations to test the hypothesis that has been submitted. Descriptive analysis, event study, and robustness test are used in this study. The focus of data analysis in this research is event study. Meanwhile, descriptive analysis is a technique used to support the results of the analysis in the event study. Furthermore, the robustness test is a technique used to confirm the analysis results of this study. The following is a further explanation of each of these analytical techniques.

III.8.1 Descriptive Analysis

Descriptive statistics used to analyze data by describing or describing the data collected as it is without intending to make general conclusions or generalizations. (Sugiyono, 2017, p. 207). Based on the descriptive analysis, it can be seen the description of each variable:

1.1 Calculating trading volume activity can be measured by:

a. Calculating the trading volume of individual stocks on day t using the formula:

$$TVA_{it} = \frac{\Sigma \text{ shares of the company i traded at the around 2nd March 2020}}{\Sigma \text{ shares of the company i outstanding at the around 2nd March 2020}}$$

Source: Gede in Yuhendri (2019)

Information:

TVAi.t = Trading Volume i at the around 2nd March 2020
i = company name
t = time

b. Calculate the average Trading Volume Activity 5 days before and 5 days after the first announcement of the Covid-19 case in Indonesia.

$$TVA_{it}\text{Before} = \frac{\Sigma\, TVA_{i.t}\ 24\ \text{feb until 1 march}}{n}$$

Source: Yuhendri, 2019

$$TVA_{it}\text{After} = \frac{\Sigma\, TVA_{i.t}\ 2\ \text{march until 9 march}}{n}$$

Source: Yuhendri, 2019

2.1 Changes in abnormal returns can be measured by:

a. Calculate individual stock realize returns on day t using the formula:

$$Ri_t = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Source: (Hartono, 2017: 284)

Information:

R_{it} : actual stock returns it-i in period t

P_{it} : the closing price of the shares in the event period t

P_{it-1} : stock closing price in event period t-1

Use the formula above to calculate the company's stock return without adding dividends. Thus, companies that make dividend payments during the observation period are eliminated

when determining the research sample and are not the samples in this study.

b. Calculate the expected return using the formula:

$$E[Ri.t] = Rm.t$$

Source : (Jogiyanto, 2010:76)

Information:

E [Ri.t] : The expected return of the i security in the event period t

Rm.t : market return, which is calculated by the formula

$$\frac{LQ{-}45\ Index_{i.t} - LQ{-}45\ Index_{it-1}}{LQ{-}45\ Index_{it-1}}$$

Market adjustment model is used to calculate the return of a security.Through this model, researchers no longer need to calculate expected returns using the estimated period because the return of the securities to be estimated will be the same as the market return index (Jogiyanto 2010; p. 79).

c. Calculating the abnormal return of each share during the observation period with the formula:

$$RTNi, t = Ri, t - E[Ri, t]$$

Source: Hartono, 2017, p. 668

Information:

RTNi, t = Abnormal return of the i security in the t-event period

Ri, t = Return realization that occurred for the security at event t

E [Ri, t] = Expected return of the security i for the event period

d. Calculate the average Abnormal Return 5 days before and 5 days after the announcement of the first Covid-19 in Indonesia

$$AR_{it}\ \text{Before} = \frac{\Sigma\ AR_{i.t}\ 24\ \text{feb until 1 march}}{n}$$

Source: Yuhendri (2019)

$$AR_{it}\text{after} = \frac{\Sigma\ AR_{i.t}\ 2\ \text{march until 9 march}}{n}$$

Source: Yuhendri (2019)

III.8.2 Event Study

The event study is part of a semi-strong market efficiency test that studies the impact of information on capital market reactions. This reaction is observed through changes in share prices and share trading volume. Both are measured using abnormal return and trading volume activity, respectively.

The normal return is the return that investors expect when no new information comes into the market, so investors will respond positively if the information is considered good news and negatively responds if the information is considered as bad news. This response will influence the decision to buy or sell shares in a certain period. Furthermore, trading volume activity shows the ratio of the number of traded shares to the number of shares outstanding in a certain period. When new information enters the market, the market will react and cause investors to trade differently from their normal trades (when there is no new information).

The method of event study analysis in this study was carried out in several stages. The first stage was collecting a list of 45 companies included in the LQ-45 index from February 2020 to July 2020. This period was taken due to the announcement of the first Covid-19 case that occurred during that period. Next, identifying the correct date regarding the announcement of the first Covid-19 case, which was March 2nd, 2020. The date of the event was used as a limit to define the event window in the study. The event window used is in 11 days. These are divided into 5 days before the announcement of the first Covid-19 case (t-5), at the time of the announcement of the first Covid-19 case (t0), and 5 days after the first Covid case announcement event occurred (t + 5).

To determine the companies used as research samples, companies that carry out corporate actions within the event window will not be used as research samples. It is done to avoid biased information due to the potential for other events to enter the market. Through this sample selection process, 40 companies had met the sampling criteria and are used as samples.

After determining the sample, data collection related to daily stock prices, number of outstanding shares, daily stock trading volume, and daily index LQ-45 for all sample companies was carried out. This data is used to calculate abnormal returns and trading volume activity. Furthermore, the results of this calculation will be used to analyze the impact of the announcement of the first Covid-19 case. The analysis tool used is the paired T-test.

The paired T-test is a part of statistical testing carried out with the help of the Statistical Product and Service Solution (SPSS) program version 21. According to Ghozali (2018) in Lestari (2018), SPSS is software that analyzes data and tests hypotheses using parametric and non-parametric statistical statistics.

III.8.3 Normality test

The normality test is used to determine whether the data samples taken are normally distributed or not (Sugiyono, 2015: 321). The normality test can be carried out by using the Kolmogorov-Smirnov test. From the normality test, it can be seen whether the data obtained has a normal distribution or not. Therefore, this test tool can be used to determined hypothesis testing. The normal distribution of data can then be continued to be processed using parametric statistical analysis. The appropriate analysis tool in this study is the paired sample T-test.

III.8.4 Different Test (T-Test)

This reaserch used the T-test to find out how significant the differences between groups are, in other words it can give conclusion if those differences (measured in means) could have happened by chance. This reaserch used two T-test method, that is:

A. One-sample T-test

The one-sample t-test is a part of statistical testing namely the difference of one sample, which compares the average population value with a predetermined value (Lestari (2010). In the event study research, one-sample t-test was tested. This test is crucial to be executed. It is because, this

test can be used to determine the significance level of changes in abnormal return and trading volume activity affected by the announcement of the first Covid-19 case on each day during the event window. The criteria used in the one-sample t-test is that if the significant value > 0.05, then H_0 is accepted. Meanwhile, if the significant value < 0.05, then H_0 is rejected. There are two null hypotheses that can be formed in this test.

H_1 : There is significant Abnormal Return around the date of the announcement of the first Covid-19 case in Indonesia

H_2 : There is significant Trading Volume Activity around the date of the announcement of the first Covid-19 case in Indonesia

B. Paired Sample T-Test

The paired sample t-test is a two paired-sample difference test that is used to test the applied hypothesis. It is a test conducted to determine whether two paired samples have different mean values (Uyanto, 2009: 117 and Ghozali, 2013: 64). It is functioned to define the significant difference in abnormal returns and trading volume activity before and after the event of the announcement of the first Covid-19 case. The assessment criteria used in the paired sample t-test are if the significance value > 0.05, then H_0 will be accepted, whereas if the significance value <0.05, then H_0 will be rejected. There are two null hypotheses that can be formed in this test.

H_3 : Significant Abnormal return reaction on the day around the announcement of the first Covid-19 case in Indonesia.

H_4 : Significant trading volume activity reaction on the day around the announcement of the first Covid-19 case in Indonesia.

III.9 Hypothesis Test

According to (Sugiyono, 2017, p. 96), The hypothesis is a temporary answer to the formulation of the research problem, where the formulation of the research problem has been stated in the form of a question sentence. According to Ghozali, (2016, p. 64), the different t-test is used to determine whether two unrelated samples have different mean values. Calculations were performed using Statistical Product and Service Solution (SPSS) 21.

a. First Hypothesis Testing

The first hypothesis in this study is related to the there is significant Abnormal Return around the date of the announcement of the first Covid-19 case in Indonesia.

H_0 : There is no significant Abnormal Return around the date of the announcement of the first Covid-19 case in Indonesia

H_1 : There is significant Abnormal Return around the date of the announcement of the first Covid-19 case in Indonesia

b. Second Hypothesis Testing

The second hypothesis in this study is related to the there is significant Trading Volume activity around the date of the announcement of the first Covid-19 case in Indonesia.

H_0 : There is no significant Trading Volume Activity around the date of the announcement of the first Covid-19 case in Indonesia

H_1 : There is significant Trading Volume Activity around the date of the announcement of the first Covid-19 case in Indonesia

c. Third Hypothesis Testing

The third hypothesis in this study is related to the difference significant in abnormal returns between before and after the t-event. The hypothesis that can be formed is as follows:

H_0 : There is no significant difference between abnormal returns before and after the announcement the of the first Covid-19 case.

H_1 : There is a significant difference between abnormal returns before and after the announcement of the first Covid-19 case.

The testing phase for first hypothesis was preceded by calculating the abnormal return before (t-5 to t-1) and the abnormal return after the event (t+1 to t+5) for each sample company. Suppose the calculation results with total sample of 40 companies have been calculated, the process can be continued with the paired sample t-test.

d. Fourth Hypothesis Testing

Second hypothesis in this study is related to differences in trading volume activity between before and after the announcement of the first Covid-19 case. The hypothesis that can be formed is as follows:

H_0 : There is no significant difference between trading volume activity before and after the announcement of the first Covid-19 case.

H_1 : There is a significant difference between trading volume activity before and after the announcement of the first Covid-19 case.

Second hypothesis testing requires the calculation of trading volume activity before (t-5 to t-1) and trading volume activity after the event (t+1 to t+5) for each sampled company. If the calculation results of all total sample of 40 companies have been calculated, data is the processed using the paired sample t-test.

CHAPTER IV

RESULTS AND DISCUSSIONS

IV.1 General Descriptions of Research Locations

IV.1.1 Short History of Indonesian Stock Exchange

The capital market or stock exchange has existed since the Dutch colonial era, around 1912 in Batavia. The Dutch East Indies government established the capital market for the benefit of the colonial government or VOC.

Although the capital market has existed since 1912, the development and growth of the capital market did not go as expected. Several time the capital market activity experienced vacuum. This is due to several factors. Such as, the world war which requires the Stock Exchange to be closed. Including in 1914-1918 the Stock Exchange was closed due to World War I.

The Indonesian Stock Exchange was re-started in 1925-1942, but due to political issues, namely World War II, the Semarang, and Surabaya Stock Exchanges had to be closed again in early 1939 and continued with the closing of the Jakarta Stock Exchange in 1942-1952. The transfer of power from the colonial government to the government of the Republic of Indonesia, and various conditions that caused stock exchange operations not to run properly. In 1956-1977, trading on the Stock Exchange had to be vacuum.

The Government of the Republic of Indonesia reactivated the capital market in 1977. President Soeharto inaugurated the Stock Exchange on August 10, 1977. The JSE runs under BAPEPAM (Capital Market Implementing Agency). The

reactivation of the capital market was also marked by going public by PT Semen Cibinong as the first stock issuer.

However, in 1977-1987 trading on the Stock Exchange was very sluggish. The number of issuers until 1987 only reached 24 issuers. At that time, people preferred banking instruments to capital market instruments. Finally, in 1987, there was a deregulation of the Stock Exchange by presenting the December 1987 Package (PAKDES 87). This makes it easy for companies to conduct Public Offerings and foreign investors to invest in Indonesia. Stock Exchange trading activities also increased in 1988-1990 after the banking sector's deregulation package and the capital market was launched. JSX doors are open to foreigners.

The Indonesian Parallel Exchange (BPI) began operating and managed by the Money and Securities Trading Union (PPUE) in 1988. Its organization consisted of brokers and dealers. In addition, in the same year, the Government issued the December 88 Package (PAKDES 88), making it easier for companies to go public and several other favorable capital market growth policies. The Surabaya Stock Exchange (SSE) began operating in 1989 and is managed by a private limited company, namely the Surabaya Stock Exchange.

On July 12, 1992, designated as the anniversary of the JSE, BEJ officially became a private company (privatization). BAPEPAM changed to the Capital Market Supervisory Agency (formerly; Capital Market Implementing Agency). On December 21, 1993, PT Pemeringkat Efek Indonesia (PEFINDO) was established one year later. On May 22, 1995, the Jakarta Stock Exchange launched a trading Automation System implemented with the JATS (Jakarta Automated Trading

Systems) computer system. In the same year, on November 10, the Government of Indonesia issued Law Number 8 of 1995 concerning the Capital Market.

This law came into effect in January 1996. The Indonesian Parallel Exchange then merged with the Surabaya Stock Exchange. On August 6, 1996, the Indonesian Clearing and Guarantee Corporation (KPEI) was established one year later. This was followed by establishing the Indonesian Central Securities Depository (KSEI) the following year, December 23, 1997. The scriptless trading system (trading system without warrants and settlement of transactions is carried out by book-entry) in 2000 began to be applied in the Indonesian capital market, and in 2002 the JSE began to apply a remote trading system. In the same year, the transaction change from T + 4 to T + 3 was completed. In 2004, the Stock Exchange released the Stock Option.

On November 30, 2007, the Surabaya Stock Exchange (BES) and the Jakarta Stock Exchange (BEJ) were finally merged and changed their name to the Indonesia Stock Exchange (IDX). After the IDX's birth, the trading suspension was imposed in 2008, and the Indonesian Stock Price Appraisal (PHEI) was formed in 2009. Besides, in 2009, PT Bursa Efek Indonesia changed the old trading system (JATS). It launched a new trading system used by IDX until now, namely JATS-NextG. Several other bodies were also established to increase trading activities, such as establishing PT Indonesian Capital Market Electronic Library (ICaMEL) in August 2011. The Financial Services Authority (OJK) in January 2012. At the end of 2012, the Securities Investor Protection Fund (SIPF), Sharia Principles, and Sharia Trading Mechanisms were also launched. The IDX also made several

updates. On January 2, 2013, trading hours were updated. The following year the Lot Size and Tick Price have adjusted again, and in 2015 TICMI joined ICaMEL.

The Indonesia Stock Exchange has also created a campaign called “Yuk Nabung Saham” which is aimed at all Indonesian people to want to start investing in the capital market. The IDX introduced the campaign for the first time on 12 November 2015, and this campaign is still being implemented today. In the same year, the LQ-45 Index Futures was inaugurated. In 2016, the Tick Size and Autorejection limit were adjusted again. The IDX Channel was launched. The IDX this year participated in the Tax Amnesty activity's success and inaugurated the Go Public Information Center. In 2017, the IDX Incubator was inaugurated, relaxation of margins, and the Indonesia Securities Fund's inauguration. In 2018, the trading system and new data center were updated, launching the t + 2 (t + 2 settlement) transaction settlement and the addition of a special notation information display to the listed company code.

1. Vision and Mission of Indonesia Stock Exchange

- Vision

To become an acknowledged and credible world-class Exchange

- Mission

Creating a trusted and credible financial market infrastructure to deliver fair, orderly and efficient market, accessible to all stakeholders through innovative products and services

IV.2 Company Sample

1. Ace Hardware Indonesia Tbk. (ACES)

PT Ace Hardware Indonesia Tbk is an Indonesia-based company primarily engaged in the retail industry's home improvement and lifestyle products. Its home improvement products include household hardware, home appliances, cleaning supplies, gardening tools, plumbing supplies and fixtures, lighting, and building materials. The lifestyle products it offers include automotive accessories, furniture, housewares, sporting goods, pet supplies, and HORECA (hotel, restaurant and cafe) supplies. Through its subsidiary, PT Toys Game Indonesia, it is also engaged in the toys retail industry. It operates its home improvement and lifestyle products retail stores under the brand name Ace, while those of its toys business under the name Toys Kingdom. The network of its Ace stores includes major cities in Indonesia, such as Jakarta, Bandung, Semarang, Surabaya, Medan, Balikpapan, Pontianak, Manado and Makassar. Its Toys Kingdom stores are available in Jakarta, Surabaya, Bandung, and Semarang, and other cities in Indonesia.

2. Adaro Energy Tbk (ADRO)

PT Adaro Energy Tbk is an Indonesian-based company engaged in integrated coal mining through its subsidiaries. Its business activities include mining, barging, ship-loading, dredging, port services, marketing and power generation. It produces thermal coal from its mining sites located in Kalimantan Selatan, Indonesia. Its coal is marketed under the brand name Envirocoal. Its subsidiaries include PT Alam Tri Abadi and PT Saptaindra Sejati.

3. PT AKR Corporindo Tbk (AKRA)

PT AKR Corporindo Tbk is an Indonesian-based company primarily engaged in petroleum trading and distribution. Its business is classified into five segments: trading and distribution, logistics services, manufacturing, coal mining and trading and industrial estate. Its trading and distribution business includes the distribution of petroleum and basic chemicals, such as caustic soda. The services that its logistics business offers include storage tank and warehouse rental, packing and crating, stevedoring, petroleum and chemical transportation as well as operation of ports in Guigang, China. Its manufacturing sector comprises sorbitol and adhesive material manufacturing; the plants are located in Surabaya, Indonesia and Liuzhou, China. Through its subsidiaries, the Company owns coal mines in Barito Utara, Indonesia. Its industrial estate segment includes its investment in Java Integrated Industrial and Ports Estate (JIIPE), an integrated industrial estate in Gresik, Indonesia.

4. PT Aneka Tambang Tbk

PT Aneka Tambang Tbk is an Indonesia-based vertically integrated and diversified mining and metals company. It is engaged in exploring, exploiting, processing, refining and marketing of nickel ore, ferronickel, gold, silver, bauxite, coal and other precious metals. Its business segment is classified into nickel, gold and refinery and others operating segmentation. The commodities under its nickel segment include ferronickel and nickel ores, while those under its gold and refinery segment are gold, silver, platinum and palladium. Its others operating segment is

comprised of bauxite and coal. Its subsidiaries include Asia Pacific Nickel Pty Ltd, PT Indonesia Coal Resources, PT Antam Resourcindo, PT Mega Citra Utama and PT International Mineral Capital.

5. PT Astra International Tbk

PT Astra International Tbk is an Indonesia-based company with seven major business segments: Automotive; Financial Services; Heavy Equipment and Mining; Agribusiness; Infrastructure and Logistics; Information Technology (IT), and Property. Its Automotive segment includes the wholesale of cars, trucks and motorcycles, after-sales services, and the manufacture of automotive components. Its Financial Services segment comprises automotive financing and insurance businesses. Its Heavy Equipment and Mining segment covers heavy machinery distribution and mining operations. Its Agribusiness focuses on the sale of crude palm oil and palm olein. Its Infrastructure and Logistics segment includes the development and operation of toll roads and water utility systems. Its IT segment comprises document information and communication technology solutions, and the distribution of office equipment. Its Property segment develops residential and commercial properties.

6. PT Bank Central Asia

PT Bank Central Asia Tbk is an Indonesia-based company primarily engaged in the banking sector. The bank operates under the name Bank BCA. Besides it is a conventional bank, it also offers Shariah-compliant banking services through its subsidiary, PT Bank BCA Syariah. Its other subsidiaries such as PT

BCA Finance is engaged in financing business; PT BCA Sekuritas provides securities underwriting and brokering services; PT BCA Asuransi Umumprovides general insurance, and BCA Finance Ltd, which is engaged in money lending business.

7. PT Bank Rakyat Indonesia (Persero) Tbk

PT Bank Rakyat Indonesia (Persero) Tbk is an Indonesia-based company primarily engaged in the banking sector. It operates under the name Bank BRI. Its products include saving accounts, current accounts and fixed deposits. It also offers various loans, such as working capital loan, and investment loan. Besides conventional banking, it also offers Shariah-compliant banking services through its subsidiary, PT Bank BRI Syariah. Its other subsidiaries include PT Bank Rakyat Indonesia Agroniaga Tbk which is engaged in banking sector, and BRI Remittance Co Ltd which offers money remittance services.

8. PT Barito Pacific Tbk

PT Barito Pacific Tbk is an Indonesia-based company primarily engaged in the petrochemicals industry. The Company's business activities are grouped into four segments, namely petrochemical, wood manufacturing, property, and plantations. Through its subsidiaries, the Company produces petroleum, ethylene, propylene, Crude C4 and Pyrolysis Gasoline (Py-gas), engages in logging and timber operations, manufactures wood products as well as develops and manages high-rise buildings.

9. PT Bumi Serpong Damai Tbk

PT Bumi Serpong Damai Tbk is an Indonesia-based real estate developer. The Company is engaged in planning and developing a new city, a planned and integrated residential area with amenities/infrastructure, environmental facilities and parks, designed to become a self-sufficient city called BSD City. Its business segments consisting of land, industrial building, house, shop house, office space, education center, industrial building and hotel. The Company's projects under the name Bumi Serpong Damai and located in Serpong District, Legok District, Cisauk District and Pagedangan District in Tangerang Regency, Banten Province. It has four direct subsidiaries, namely PT Duta Pertiwi Tbk, PT Sinar Mas Wisesa, PT Sinar Mas Teladan and PT Bumi Paramudita Mas. On January 24, 2014, it establishes subsidiaries, namely PT Transbsd Balaraja and PT Duta Mitra Mas. On February 11, 2014, it acquired Rasuna Epicentrum commercial district from PT Bakrie Swastika Utama.

10. PT Bank BTPN Syariah Tbk (BTPS)

PT Bank BTPN Syariah Tbk, formerly PT Bank Tabungan Pensiunan Nasional Syariah, is an Indonesian bank primarily engaged in providing Shariah banking services. The bank serves the low-income segment, such as small and medium enterprises and retired individuals.

11. PT Charoen Pokphand Indonesia Tbk (CPIN)

PT Charoen Pokphand Indonesia Tbk is an Indonesia-based company primarily engaged in manufacturing animal feeds, including poultry feeds and pig

feeds. Some major brands of its animal feeds are HI-PRO, HI-PRO-VITE, BINTANG, BONAVITE, ROYAL FEED, TURBO FEED and TIJI. The Company also manufactured day-old chicks (DOC) and processed food, primarily chicken meat. The processed food being marketed under several brand names, namely Golden Fiesta, Fiesta, Champ and Okey. The Company owns several manufacturing facilities in several cities in Indonesia, such as Sidoarjo, Medan, Tangerang and Mojokerto. It also has several breeding facilities located across multiple areas in Indonesia, such as Riau, Bali and Sumatera Utara.

12. PT Ciputra Development Tbk

PT Ciputra Development Tbk is an Indonesian-based company primarily engaged in residential property development and management. It classifies its business into two groups: residential property and commercial property. Its residential property portfolio includes CitraGarden City Jakarta, CitraRaya Tangerang, CitraIndah Jonggol, CitraLand Surabaya, CitraLand Bagya City Medan and Vida View Apartment Makassar. Its commercial property portfolio includes shopping centers, hotels, apartments, offices and golf courses, such as Somerset Grand Citra Jakarta, Ciputra Mall & Hotel Jakarta, Ciputra Mall & Hotel Semarang, Ciputra World Surabaya, Ciputra World Jakarta, Ciputra Hospital Tangerang and CitraDream Hotel Yogyakarta. Its properties are located various areas in Indonesia, such as Jabodetabek (Jakarta, Bogor, Depok, Tangerang and Bekasi) and Surabaya. Its subsidiaries include PT Ciputra Surya Tbk, PT Ciputra Property Tbk, PT Ciputra Residence, PT Citraland Graha Realty and PT Ciputra Indah.

13. PT Erajaya Swasembada Tbk

PT Erajaya Swasembada Tbk is an Indonesia-based company primarily engaged in mobile phones and tablets distribution and retail business. Some mobile phone brands that it distributes and retails are Apple, BlackBerry, HTC, Huawei, LG, Motorola, Nokia, Samsung and Sony. It also distributes and retails prepaid top-up cards, subscriber identity module (SIM) cards, computers and other gadgets and mobile phone accessories. It operates its retail stores under various brands, such as Erafone Megastore, Erafone Gadget Store, iBox which retails Apple products exclusively, and AndroidNation, which retails Android products exclusively. Its subsidiaries include PT Teletama Artha Mandiri, PT Erafone Artha Retailindo, PT Sinar Eka Selaras and PT Data Citra Mandiri.

14. PT Gudang Garam Tbk

PT Gudang Garam Tbk is an Indonesian-based company primarily engaged in manufacturing clove cigarettes, locally known as kretek. Its business classified into three operating segments: cigarettes, paperboards and others. The company produces a range of kretek, including traditional hand-rolled kretek, machine-made kretek and low-tar, low-nicotine variants. Some of its major brands are Gudang Garam International, Gudang Garam Merah, Surya, Surya Pro Mild, Surya Professional and GG Mild. Its manufacturing facilities located in several cities in Indonesia, namely Kediri, Gempol, Karanganyar and Sumenep. It also has representative offices in Jakarta and Surabaya, Indonesia. Its subsidiaries include PT Surya Pamenang, producing paperboards used for the packaging of the

Company's products, and PT Surya Madistrindo, the sole distributor of the Company's products.

15. PT Hanjaya Mandala Sampoerna Tbk (Sampoerna)

PT Hanjaya Mandala Sampoerna Tbk (Sampoerna) is an Indonesia-based company primarily engaged in the manufacture and trading of clove cigarettes, locally known as kretek. The Company produces both hand-rolled kretek and machine-rolled kretek, utilizing its manufacturing facilities in Pasuruan, Karawang, Surabaya, Malang and Probolinggo, Indonesia. The Company markets its products under the brand names of Dji Sam Soe, A Mild, Sampoerna Kretek and U Mild. Besides its own products, the Company also distributes Marlboro white cigarettes produced by PT Philip Morris Indonesia. Sampoerna's subsidiaries include PT Perusahaan Dagang dan Industri Panamas, a cigarette distributor; PT Harapan Maju Sentosa, a cigarette manufacturer and trader, and PT Taman Dayu, a property developer.

16. PT Indofood CBP Sukses Makmur Tbk

PT Indofood CBP Sukses Makmur Tbk is an Indonesian-based company primarily operates in manufacturing of packaged instant noodles. It also manufactures dairy products; snacks; biscuits; food seasonings; beverages, nutrition and special foods, which comprises foods for infants, babies, and expectant and lactating mothers. The Company is also engaged in packaging business as a supporting division, which offers flexible and corrugated packaging. Its major brands include Indomie, Supermi, Sarimi, Indomilk, Cap Enaak,

Indofood, Piring Lombok, Chitato, Qtela, Lays, Cheetos, Promina and SUN. Some of its subsidiaries are Indofood (M) Food Industries Sdn. Bhd., PT Indolakto, PT Indofood Fritolay Makmur, PT Indofood Asahi Sukses Beverage and PT Surya Rengo Containers

17. PT Vale Indonesia Tbk (INCO)

PT Vale Indonesia Tbk is an Indonesian-based company primarily engaged in nickel mining and production. It has nickel mining concessions in several areas in Sulawesi, Indonesia, including Kolonodale, Bahodopi, Sorowako-Towuti, Matano, Pomalaa and Suasua. The Company produces nickel in matte from lateritic ores at its integrated mining and processing facilities near Sorowako, Indonesia.

18. PT Indofood Sukses Makmur Tbk (INDF)

PT Indofood Sukses Makmur Tbk is an Indonesian-based company primarily engaged in food processing industry. It classifies its business into five segments: consumer branded products, Bogasari, agribusiness, distribution as well as vegetable cultivation and processing.

19. PT Indah Kiat Pulp & Paper Tbk (INKP)

PT Indah Kiat Pulp & Paper Tbk is an Indonesia-based company operating in the pulp and paper industry. The Company's major business activities are categorized into two segments, namely Paper and pulp products and packaging products. The paper and pulp products segment consist of generic paper products and pulp, while the Packaging products segment comprises liner board, corrugating

medium, corrugated shipping containers and boxboards, together with related chemical byproducts. The company operates production facilities in Perawang in Riau Province, and in Serang and Tangerang in Banten Province, Indonesia. Its products are distributed in both domestic and various foreign markets in Asia, Europe, the Middle East, America, Africa and Australia. PT Indah Kiat Pulp & Paper Tbk's subsidiaries are PT Graha Kemasindo Indah, PT Paramitra Abadimas Cemerlang, PT Paramitra Gunakarya Cemerlang and PT Indah Kiat Global Ventura.

20. PT Indocement Tunggal Prakarsa Tbk (INTP)

PT Indocement Tunggal Prakarsa Tbk is an Indonesia-based company primarily engaged in the cement industry. The Company's major business activities are classified into three segments: cement, ready-mix concrete (RMC) and aggregates. Its cement segment includes the manufacture and trading of different types of cement under the brand Tiga Roda, including Portland Composite Cement, Ordinary Portland Cement, Oil Well Cement and White Cement. Its ready-mix concrete segment, operated by its subsidiary's PT Indomix Perkasa and PT Pionirbeton Industri, comprises the production and distribution of ready-mix concrete products. Through its subsidiaries, namely PT Mandiri Sentra Sejahtera, PT Tarabatuh Manunggal, PT Terang Prakasa Cipta and PT Sahabat Muliasakti, the Company also runs its aggregate and trass quarrying business.

21. PT Indo Tambangraya Megah Tbk (ITMG)

PT Indo Tambangraya Megah Tbk is an Indonesia-based company primarily engaged in coal mining. Through its subsidiaries, such as PT Indominco Mandiri, PT Trubaindo Coal Mining, PT Bharinto Ekatama, PT Kitadin and PT Jorong Barutama Greston, it operates a number of coal mining concessions in Kalimantan Timur, Kalimantan Tengah and Kalimantan Selatan, Indonesia. PT Indominco Mandiri also operates a coal terminal, used for stockpiling, blending, and ship loading, and a power plant that supply electricity to its port and coal processing plants. Its coal terminal and power plant are located in Bontang, Indonesia. Its other subsidiaries are PT ITM Indonesia, which is engaged in coal trading, and PT Tambang Raya Usaha Tama, which is engaged in provisioning mining services

22. PT Japfa Comfeed Indonesia Tbk (JPFA)

PT Japfa Comfeed Indonesia Tbk is an Indonesia-based company primarily engaged in manufacturing animal feed. Its business is classified into four divisions: poultry, aquaculture, beef cattle, as well as trade and other services. Its poultry division comprises three units, namely poultry feed unit, poultry breeding unit, and commercial farming and consumer product unit. Its aquaculture division's business activities include fish and shrimp feed manufacturing together with fish and shrimp farming. Its beef cattle division includes vertically integrated businesses, such as beef cattle breeding, fattening and slaughtering, and value-added meat production. The business of the trade and other services division includes woven plastic bags

production, copra pellet processing, container depot, as well as animal vaccines and health products manufacturing.

23. PT Jasa Marga (Persero) Tbk (JSMR)

PT Jasa Marga (Persero) Tbk is an Indonesian-based company primarily engaged in managing, maintaining and developing of toll roads. Its major business activities include conducting technical planning, construction, operation and/or maintenance of toll roads and acquiring land in toll area (Rumijatol) and in the Rumijatol border area for rest area and service, along with facilities and other businesses. It classifies its business into two segments: Toll Business and Other Business. Its Toll Business segment includes the development and operation of toll roads such as Jagorawi Branch, Jakarta-Cikampek Branch and Cawang-Tomang-Cengkareng Branch, among others. Its Other Business segment includes the provision of toll road operation services through its subsidiary, PT Jasa Layanan Operasi (JLO), and the provision of toll road construction and maintenance services through its subsidiary PT Jasa Layanan Pemeliharaan (JLP), among others

24. PT Kalbe Farma Tbk (KLBF)

PT Kalbe Farma Tbk is an Indonesia-based company primarily engaged in manufacturing health and nutritional as well as pharmaceutical products. Its business is classified into four segments: prescription drugs, health products, nutritional products and distribution and logistics. Its prescription drugs segment manufactures unbranded generic, branded generic and patented drugs. Its health products segment offers over-the-counter (OTC) therapeutic drugs, consumer

health products and energy and health drinks; some major brands under the segment are Woods, Procold, Extra Joss and Hydro Coco. Its nutritional products segment manufactures a range of products for infants, toddlers, children, teenagers, adults, expectant and lactating mothers as well as elderly; some of major brands under the segment are Prenagen, Milna, Diabetasol and Entrasol. The distribution and logistics segment is operated through its subsidiary, PT Enseval Putera Megatrading Tbk.

25. PT Matahari Department Store Tbk (LPPF)

PT Matahari Department Store Tbk is an Indonesia-based company engaged in operating Matahari Department Store, a department store chain, in Indonesia. It offers various fashion items for men, women and kids, including clothing, bags, shoes and accessories; cosmetics, and household appliances. Its outlets are located in various cities in Indonesia, including Medan, Padang, Jakarta, Yogyakarta, Bandung, Bogor, Banjarmasin, Kendari, Ambon and Jayapura.

26. PT Media Nusantara Citra Tbk

PT Media Nusantara Citra Tbk is an Indonesian-based company engaged in content and advertisement-based media industry primarily television channels broadcasting. Through its subsidiaries, the Company operates free-to-air (FTA) television channels, such as RCTI, MNCTV and GlobalTV, and television channels broadcasted on pay televisions. It is also engaged in other businesses, comprising radio, print and online media, talent management and production house. Its subsidiaries include PT Rajawali Citra Televisi Indonesia, PT Global Informasi

Bermutu, PT Cipta Televisi Pendidikan Indonesia, PT MNC Networks, PT Okezone Indonesia, PT MNC Pictures and PT Star Media Nusantara.

27. PT Perusahaan Gas Negara Tbk (PGAS)

PT Perusahaan Gas Negara Tbk, formerly known as PT Perusahaan Gas Negara (Persero) Tbk is an Indonesia-based company primarily engaged in the transportation and trading of natural gas. It classifies its business into four segments: Transmission/Transportation, Distribution/Commerce, Oil and Gas and Other. Its Transmission/Transportation segment transports natural gas owned by shipper to the delivery point through high-pressure transmission pipelines. Its Distribution/Commerce segment distributes natural gas to commercial, industrial and household users. Its Oil and Gas segment consists of activities and investments in oil and gas upstream sector. The Company is also engaged in telecommunication services, construction and maintenance of pipeline networks, building management and financial lease.

28. PT Bukit Asam Tbk (PTBA)

PT Bukit Asam Tbk is an Indonesia-based company primarily engaged in the coal mining industry. Its business activities include conducting coal mining operation, including research, exploration, exploitation, processing, purifying, transporting and trading; managing and operating ports and jetties for coal, either for internal or external use; managing and operating thermal power plants, either for internal or external use, and providing coal mining and production-related consultation and engineering services. The Company has coal mining concessions

in several areas in Indonesia, including Tanjung Enim, Peranap, Palaran and Ombilin. It is also engaged in briquette manufacturing. Its briquette manufacturing plants located in Tanjung Enim, Indonesia, which produces carbonated briquettes, and Natar and Gresik, Indonesia, which produce non-carbonated briquettes.

29. PT Pakuwon Jati Tbk (PWON)

PT Pakuwon Jati Tbk is an Indonesian-based company primarily engaged in property development. It derives its revenue from development revenue and recurring revenue. Its development revenue comprises revenue from condominiums, office premises, apartments, land lots and landed houses that it has developed. It has developed a number of superblocks and a township in Indonesia, such as Superblock Tunjungan City, Superblock Kota Kasablanka, Superblock Gandaria City and Pakuwon City. Its recurring revenue comprises revenue from the leases of its commercial and office premises as well as hotels. Its subsidiaries include PT Artisan Wahyu, PT Pakuwon Regency, PT Elite Prima Hutama, PT Pakuwon Sentra Wisata and PT Grama Pramesi Siddhi.

30. PT Surya Citra Media Tbk (SCMA)

PT Surya Citra Media Tbk is an Indonesian-based company primarily engaged in free-to-air (FTA) television channel broadcasting through its subsidiaries, PT Surya Citra Televisi and PT Indosiar Visual Mandiri. PT Surya Citra Televisi and PT Indosiar Visual Mandiri manage local free-to-air (FTA) television channels under SCTV and Indosiar, respectively. The Company is also

engaged in producing drama series and movies for television through its subsidiary, PT Screeplay Produksi.

31. PT Semen Indonesia (Persero) (SMGR)

PT Semen Indonesia (Persero) Tbk is an Indonesian-based holding company primarily engaged in cement manufacturing. The Company classifies its business into two segments: cement production and non-cement production. It operates its cement production business through its subsidiaries, namely PT Semen Padang, PT Semen Tonasa, PT Semen Gresik, Thang Long Cement JSC, Thang Long Cement JSC 2 and An Phu Cement JSC. The cement types it produces include Ordinary Portland Cement; Portland Cement, including Type II, Type III and Type V; Special Blended Cement; Portland Pozzolan Cement; Portland Composite Cement, and Super Masonry Cement. Its cement manufacturing facilities are located in Indarung, Tuban and Pangkep, Indonesia and Quang Ninh, Vietnam. Its non-cement production business comprises coal, limestone and clay mining, cement sack manufacturing, ready-mix concrete manufacturing, industrial area leasing and information and communication technology (ICT) provisioning.

32. PT Sri Rejeki Isman Tbk (SRIL)

PT Sri Rejeki Isman Tbk is an Indonesian-based company primarily engaged in the integrated textile and garment industry. Its business activities are spinning, weaving, greige dyeing, bleaching and printing and garment manufacturing. Its products include yarn, comprising rayon, cotton and polyester

yarn; greige; finished fabric, and garments. Its manufacturing plants are located in Sukoharjo and Semarang, Indonesia.

33. PT Tower Bersama Infrastructure Tbk (TBIG)

PT Tower Bersama Infrastructure Tbk is an Indonesian-based company engaged in provisioning telecommunication infrastructure solution and services. The Company's principal business and its subsidiaries are leasing space for antennas and other equipment for wireless signal transmission at tower sites and shelter-only sites under long-term lease agreements with telecommunication operators. It also provides telecommunication operators with access to its Distributed Antenna System (DAS) networks in shopping malls and office buildings in major urban areas. Its telecommunication sites, which are comprised of telecommunication towers, shelter-only sites and DAS networks, are primarily located in Java Island and Bali Island, Indonesia. Some of its subsidiaries are PT Telenet Internusa, PT United Towerindo, PT Tower Bersama, PT Tower One, PT Triaka Bersama, PT Metric Solusi Integrasi, PT Solusi Menara Indonesia, TBG Global Pte Ltd and PT Menara Bersama Terpadu.

34. Tjiwi Kimia Paper Factory Tbk. (TKIM)

PT Pabrik Kertas Tjiwi Kimia Tbk is an Indonesia-based company primarily engaged in manufacturing paper. The business is classified into two segments: paper products, including paper printing, writing paper and other paper-related products, and packaging products, including cardboard boxes and the sales of chemical by-products. It operates a manufacturing facility in Mojokerto, Indonesia.

Its subsidiaries include PT Mega Kertas Pratama, PT Sumalindo Hutani Jaya, Tjiwi Kimia Trading III (BVI) Limited and Tjiwi Kimia Finance Mauritius Limited.

35. PT Telkom Indonesia (Persero) Tbk (TLKM)

PT Telkom Indonesia (Persero) Tbk, formerly Telekomunikasi Indonesia (Persero) Tbk PT, is a telecommunication company. The Company operates through five segments: mobile segment, consumer segment, enterprise segment, wholesale and international business segment and another segment. The mobile segment comprises of mobile broadband services and mobile digital services. The consumer segment comprises fixed voice services, fixed broadband services and related consumer digital services. Enterprise segment mainly comprises information and communications technology (ICT) and digital platform that covers enterprise-grade connectivity services. The wholesale and international business segment consist of wholesale telecommunication carrier services, international business, tower business, infrastructure, and network management services. The other segment comprises digital services and property management.

36. PT Sarana Menara Nusantara Tbk (TOWR)

PT Sarana Menara Nusantara Tbk is an Indonesian-based investment company focusing on investing in operating companies that specialized in owning and operating telecommunication towers and leasing them for wireless operators. It runs its business through its subsidiary, PT Profesional Telekomunikasi Indonesia (Protelindo). Besides leasing telecommunication towers, Protelindo also leases repeaters. Protelindo's tower sites are located in various areas across Indonesia.

37. PT United Tractors Tbk (UNTR)

PT United Tractors Tbk is an Indonesian-based company primarily engaged in the provision of mining contracts. The company's primary business activities and its subsidiaries are categorized into four construction machinery, mining contracting, coal mining and construction industry. The construction machinery segment includes the sale and leasing of heavy equipment, as well as after-sales services. The Mining contracting segment provides mining concession holders with various mining services, including mine design, exploration, extraction, hauling, barging and transporting commodities. The Coal mining segment focuses on the mining and selling of coal. The Construction industry segment provides construction services, such as foundation works, structural works, demolition and infrastructure development. The Company's subsidiaries include PT Pamapersada Nusantara, PT Karya Supra Perkasa, PT United Tractors Pandu Engineering, PT Bina Pertiw, and UT Heavy Industry (S) Pte Ltd.

38. PT Unilever Indonesia Tbk (UNVR)

PT Unilever Indonesia Tbk is an Indonesian-based company primarily engaged in manufacturing, marketing, and distributing fast-moving consumer goods (FMCG). The company's major business activities are classified into two operating segments: Home and personal care, which includes cosmetic products, as well as household and personal cleaning products, such as detergents, soaps, shampoos, toothpaste, deodorants, and Foods and Refreshments, which includes food and beverage products, such as ice creams, teabags, soy sauce, fruit juice,

seasonings, and margarine. Major brands for its home and personal care products are such as Rinso, Lifebuoy, Clear, Pepsodent, Rexona and Pond's, among others; those for its food and beverage products are Wall's, Sari Wangi, Bango, Buavita, Royco and Blue Band, among others.

39. PT Wijaya Karya (Persero) Tbk (WIKA)

PT Wijaya Karya (Persero) Tbk is an Indonesian-based company primarily engaged in provisioning construction services. Its primary business activity is classified into five segments: construction, mechanical and electrical, industry, real estate and mining. Its construction segment consist of civil construction, including road, bridge, airport, seaport and barrage, and building construction, including residential and commercial building. Its mechanical and electrical segment comprises two business units: energy, which comprises engineering, procurement and construction (EPC) services provisioning and investment in power plant, and industrial plant. Its industry segment comprises industrial precast concrete manufacturing and steel fabrication. Its real estate segment includes residential and commercial building development, property management and construction services provisioning. Its mining segment is operated through PT Sarana Karya, which is engaged in asphalt mining in Buton Island, Indonesia.

40. PT Waskita Karya (Persero) Tbk (WSKT)

PT Waskita Karya (Persero) Tbk is an Indonesia-based company engaged in the construction industry. The company's business is divided into several construction classification including construction and other related services, such as design and

build; management consulting services; building management; fabrication of materials and building components; precast concrete factories are in Cibitung, Pasuruan, Benoa, Sadang and Palembang; realty, which involves in the construction of office buildings, hotels, apartments and condominiums; energy relating to operation of mini hydro power plant in West Sumatera, and investment in toll roads. On June 23rd 2014, the company announced that it has established a new subsidiary, namely PT Waskita Toll Road to manage future toll road projects.

IV.3 Descriptive Statistical Analysis

The descriptive statistics in this chapter aim to provide an overview of the average Abnormal Return (AR) and the average Trading Volume Activity (TVA). The effect of the announcement of the first Covid-19 case in Indonesia on March 2nd, 2020 is measured using the difference in the calculated results of the average Abnormal Return and Trading Volume Activity between before and after the announcement. To determine the average Abnormal Return, the researcher first calculates the realization return and the expected return. The following is an example of calculating Abnormal Return and the trading volume of a company:

1. Abnormal Return

The abnormal return test was carried out every day during the observation period of 5 days before and five days after the announcement of the first case of Covid-19. Data and calculations are attached (see attachment 1). The following is an example of calculating the return on realization at t-5, namely by knowing the daily share price of PT. Ace Hardware Indonesia Tbk. (ACES) :

$$R_{it} = \frac{p_{t-5} - p_{t-6}}{p_{t-6}}$$

Source: (Hartono, 2017: 284)

Information:

R_{it} : actual stock returns it-i in period t-5

P_{it} : the closing price of the shares in the event period t-6

P_{it-1} : stock closing price in event period t-6

The following is the calculation of the return on the realization of the ACES company at t-5:

Rit= $\frac{1510-1555}{1555}$ = - 0.02894

The calculation above is also used to count Realized Return from ACES on t-4 to t-1 and t+1 to t+5. The method of calculating the expected return is by using the LQ-45 price at t-6 of Rp. 5,882.25 and t-5 of Rp. 5,807.05. To calculate :

$$E[Ri.t] = Rm.t$$

Source: Jogiyanto (2010) in Yuhendri (2019)

Information:

E [Ri.t] : The expected return of the i security in the event period t

Rm.t : market return, which is calculated by the formula $\frac{LQ-45\ Index_{i.t} - LQ-45\ Index_{it-1}}{LQ-45\ Index_{it-1}}$

The following is a calculation of expected return at t-5 for ACES company :

$$\text{Rm.t} = \frac{LQ-45\ Index_{t-5} - LQ-45\ Index_{t-6}}{LQ-45\ Index_{t-6}}$$

$$\text{Rm.t} = \frac{941{,}52 - 957{,}37}{957{,}37} = -0{,}01656$$

The above calculation is also used to calculate the expected return of ACES at t-4 to t-1 and t+1 to t+5. After the realized returns and expected returns have been calculated, AR is then calculated at t-5, that is:

ARit= (- 0.02894) – (-0,01656) = -0,01238

This calculation were used to determine the Abnormal Return of ACES for the period before, on the day and after the announcement were made. The following results from the average Abnormal Return value of 40 sample companies (see attachment 2). From the results of the data that the researcher have processed, the calculation of the average abnormal return (AR) before and after the announcement of Covid-19 on March 2, 2021 is generated.

Table 4.1 Data on Final Results of Average Abnormal Returns Before and After the Announcement of Covid-19.

No.	Code	AAR before	AAR after
1	ACES	0,011768	0,002631
2	ADRO	-0,007819	-0,007715
3	AKRA	-0,010859	-0,012822

Table 4.1 (continued)

4	ANTM	-0,021771	0,000544
5	ASII	-0,005580	-0,013442
6	BBCA	0,006775	0,000638
7	BBRI	0,002712	-0,001356
8	BRPT	-0,015128	-0,010197
9	BSDE	-0,002059	0,006866
10	BTPS	-0,010710	0,019552
11	CPIN	-0,011160	0,018449
12	CTRA	0,011896	-0,013549
13	ERAA	-0,010156	0,009192
14	GGRM	-0,001551	-0,007991
15	HMSP	-0,007220	-0,003755
16	ICBP	0,004197	0,015053
17	INCO	-0,026236	-0,010245
18	INDF	-0,003233	0,001884
19	INKP	-0,007471	0,004438
20	INTP	-0,003917	-0,001567
21	ITMG	0,030227	-0,015215
22	JPFA	-0,004015	-0,004900
23	JSMR	0,003833	0,001219
24	KLBF	-0,005351	0,002003
25	LPPF	-0,002778	-0,023081

Table 4.1 (continued)

No.	Code	AARbefore	AARafter
26	MNCN	-0,005259	-0,001846
27	PGAS	-0,016982	-0,007035
28	PTBA	0,002441	0,012471
29	PWON	0,001002	0,000733
30	SCMA	-0,004707	-0,020938
31	SMGR	-0,003362	-0,005880
32	SRIL	-0,001516	-0,008940
33	TBIG	0,007412	-0,000134
34	TKIM	-0,033766	0,032742
35	TLKM	0,005721	0,014348
36	TOWR	0,003768	0,001888
37	UNTR	-0,001442	0,000597
38	UNVR	-0,001696	0,014003
39	WIKA	0,003005	-0,025637
40	WSKT	-0,015448	-0,018468
AVERAGE		-0,00366	-0,00139
MIN		-0,03377	-0,02564
MAX		0,030227	0,032742

Source: Data Processed (2021)

Descriptions: Lowest Average Score

Maximal average score

repository.ub.ac.id
UNIVERSITAS BRAWIJAYA

Based on table 4.1, TKIM has the lowest average abnormal return value before the announcement of the first Covid-19 case by -0,033766. Meanwhile, ITMG has the highest average abnormal return value before the announcement of the first Covid-19 case of 0,030227. WIKA has the lowest average abnormal return value after the announcement of the first Covid-19 case in Indonesia with a value of -0,025637. At the same time, TKIM encounters the highest average abnormal return value after the announcement of the first Covid-19 case in Indonesia with a score of 0,032742.

The following is the descriptive test output that explains the descriptive calculation results in the form of average (mean), minimum, maximum, and standard deviation for the average abnormal return during the observation period.

Table 4.0.2 Descriptive Statistics of the Average Abnormal Returns During the Observation Period.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AR_BEFORE	40	-0,033766	0,030227	-0,00366089	0,011016447
AR_AFTER	40	-0,025637	0,032742	-0,00138649	0,012347680
Valid N (listwise)	40				

Source: SPSS 25th version (Processed data, 2021)

Descriptions:

AR_Before = Abnormal Return before the announcement of the first Covid-19 case in Indonesia

AR_After = Abnormal Return after the announcement of the first Covid-19 case in Indonesia

Based on the descriptive analysis results in Table 6.2, N or the number of companies studied for abnormal returns of 40 companies. The table explained that the abnormal returns before and after the announcement of the first Covid-19 case in Indonesia have an average negative value. According to the descriptive statistical analysis results, the Average Abnormal Return of 40 companies before the announcement of the first Covid-19 case in Indonesia was (-0,00366089) with a standard deviation of 0,011016447. The average abnormal return before the announcement of the first Covid-19 case in Indonesia was smaller than the standard deviation. This means that data on abnormal returns before the announcement of the first Covid-19 case in Indonesia were unevenly distributed because they had a high difference from one value to another.

Meanwhile, after the announcement of the first Covid-19 case in Indonesia, the descriptive analysis results showed that the average abnormal return of 40 companies was -0,00138649 with a standard deviation of 0,012347680. The average abnormal return after the announcement of the first Covid-19 case in Indonesia is smaller than the standard deviation. This indicates a deviation from the average value, where the abnormal return data is unevenly distributed. Standard

deviation reflects the variation or difference in data that is relatively large from the average.

The following is the formula for calculating the average abnormal return of shares per day. The calculation of the average abnormal return of shares per day can be seen in **Appendix 1**.

Average Abnormal Return per day = $\sum \frac{AR_t}{n}$

Descriptions:

AR_t = The number of Abnormal Returns of all companies on day t

N = Number of companies

Table 4.3Average of Abnormal Return Per Day During the Study Period

Period	Day	Abnormal Return
Before	t-5	-0,0079576
	t-4	0,00150826
	t-3	-0,0056409
	t-2	0,00355397
	t-1	-0,0097681
the Day	t 0	0,00944489
After	t+1	0,00263956
	t+2	0,00062129
	t+3	-0,0045598
	t+4	0,00325184
	t+5	-0,0088853

Source: Data Processed (2021)

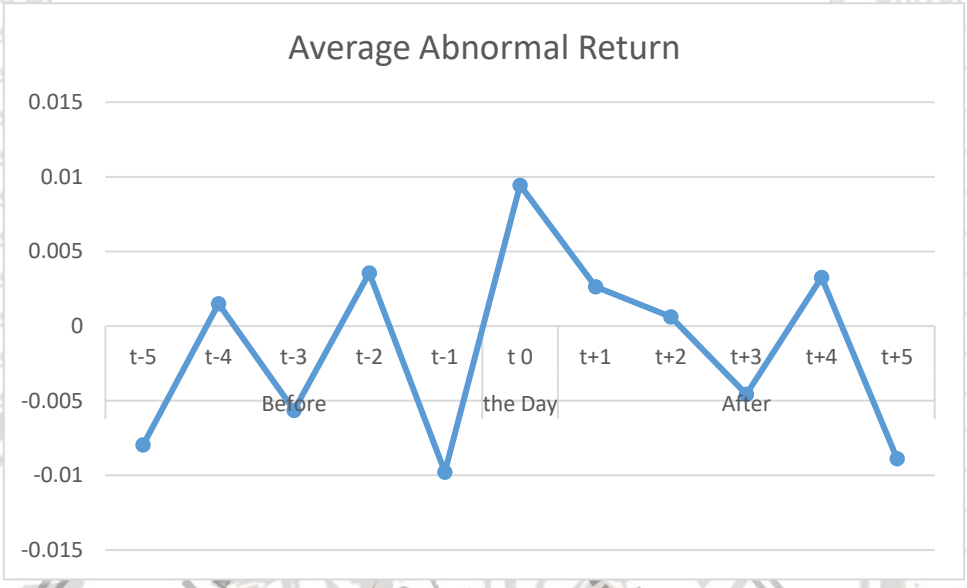

Figure 4.1 Line Graph of the Average Abnormal Return throughout the study period.

Source: Data Processed (2021)

Based on the tables and graphs above, it is obvious that the average abnormal return per day during the observation period shows an increase and decrease. The graph above shows a moderate fluctuating movement in the observation period before the announcing of the first Covid-19 case in Indonesia (t-5 to t0). The line graph movement was assumed due to the spread of news about Covid-19 in other countries since December 2019. Meanwhile, on the day the first case of Covid-19 in Indonesia was announced at t+1 up to t+3, there was an increase in the average abnormal return. However, it did not last long because t+3 to t+4 of the graphs shows a very drastic decline and return incrreas in t+5. This describes a decreased abnormal return, meaning that the actual return is smaller than investors' expected return. seen from the graph, it can be seen that the market reacted negatively to the announcement

2. Trading Volume Activity

The Trading Volume Activity test was carried out every day during the observation period of 5 days before and 5 days after the announcement of the first Covid-19 case in Indonesia. The following is an example calculation of Trading Volume Activity for a sample company, namely PT Ace Hardware Indonesia Tbk. (ACES) in 2016. The total volume and number of listed shares are attached in the appendix (**Appendix 3 and 4**).

$$TVA_{it} = \frac{\Sigma \text{ shares of the company } i \text{ traded at the time } t}{\Sigma \text{ shares of the company } i \text{ outstanding at the time}}$$

$$TVA_{it} = \frac{9370900}{17150000000}$$

$$TVA_{it} = 0{,}000546$$

Average of Trading Volume Activity

$$\text{TVA}_{it} \text{ before} = \sum \frac{TVA\ before}{n}$$

$$= \frac{0{,}000546+0{,}000526+0{,}000714+0{,}001115+0{,}00121}{5}$$

$$= 0{,}000822$$

$$\text{TVA}_{it} \text{ after} = \sum \frac{TVA\ after}{n}$$

$$= \frac{0{,}000819+0{,}000502+0{,}000501+0{,}000309+0{,}00126}{5}$$

$$= 0{,}0006798$$

Based on the calculation example for the sample of PT. Ace Hardware Tbk. (ACES). The following is a recapitulation of the company's trading volume activity (TVA) before and after the announcement of the first Covid-19 case in Indonesia. The total calculation of the 40 sample companies can be seen in Appendix 5.

Table 4.4 Data on Final Results of Average Trading Volume Activity Before and After the Announcement of the First Covid-19 Case in Indonesia During the Observation Period

No	Stock Code	Company's Name	Tva Average Before	Tva Average After
1	ACES	Ace Hardware Indonesia Tbk.	0,000822	0,000680
2	ADRO	Adaro Energy Tbk.	0,001465	0,002245
3	AKRA	AKR Corporindo Tbk.	0,001319	0,002125
4	ANTM	Aneka Tambang Tbk.	0,004172	0,003357
5	ASII	Astra International Tbk.	0,001259	0,001270
6	BBCA	Bank Central Asia Tbk.	0,000923	0,000810
7	BBRI	Bank Rakyat Indonesia (Persero) Tbk.	0,001253	0,001239
8	BRPT	Barito Pacific Tbk.	0,000613	0,000758
9	BSDE	Bumi Serpong Damai Tbk.	0,000794	0,000562
10	BTPS	Bank Tabungan Pensiunan Nasional Syariah Tbk.	0,001038	0,001434
11	CPIN	Charoen Pokphand Indonesia Tbk	0,000447	0,000441
12	CTRA	Ciputra Development Tbk.	0,000731	0,000564
13	ERAA	Erajaya Swasembada Tbk.	0,004465	0,004498
14	GGRM	Gudang Garam Tbk.	0,000651	0,000574
15	HMSP	H.M. Sampoerna Tbk.	0,000518	0,000385
16	ICBP	Indofood CBP Sukses Makmur Tbk.	0,000481	0,000488

Table 4.4 (continued)

No	Stock Code	Company's Name	Tva Average Before	Tva Average After
17	INCO	Vale Indonesia Tbk.	0,001045	0,001160
18	INDF	Indofood Sukses Makmur Tbk.	0,000940	0,000871
19	INKP	Indah Kiat Pulp & Paper Tbk.	0,001282	0,001597
20	INTP	Indocement Tunggal Prakarsa Tbk.	0,000585	0,000722
21	ITMG	Indo Tambangraya Megah Tbk.	0,002662	0,002096
22	JPFA	Japfa Comfeed Indonesia Tbk.	0,001231	0,000638
23	JSMR	Jasa Marga (Persero) Tbk.	0,000673	0,000739
24	KLBF	Kalbe Farma Tbk.	0,000750	0,000756
25	LPPF	Matahari Department Store Tbk.	0,002211	0,005199
26	MNCN	Media Nusantara Citra Tbk.	0,002527	0,002952
27	PGAS	Perusahaan Gas Negara Tbk.	0,003139	0,003201
28	PTBA	Bukit Asam Tbk.	0,002366	0,002609
29	PWON	Pakuwon Jati Tbk.	0,000848	0,000710
30	SCMA	Surya Citra Media Tbk.	0,002154	0,001871
31	SMGR	Semen Indonesia (Persero) Tbk.	0,000798	0,000780
32	SRIL	Sri Rejeki Isman Tbk.	0,006385	0,000696
33	TBIG	Tower Bersama Infrastructure Tbk.	0,000808	0,000711
34	TKIM	Pabrik Kertas Tjiwi Kimia Tbk.	0,000831	0,001091
35	TLKM	Telekomunikasi Indonesia (Persero) Tbk.	0,001050	0,001106

Table 4.4 (continued)

No	Stock Code	Company's Name	Tva Average Before	Tva Average After
36	TOWR	Sarana Menara Nusantara Tbk.	0,001617	0,001911
37	UNTR	United Tractors Tbk.	0,001418	0,001144
38	UNVR	Unilever Indonesia Tbk.	0,000444	0,000466
39	WIKA	Wijaya Karya (Persero) Tbk.	0,001313	0,001804
40	WSKT	Waskita Karya (Persero) Tbk.	0,002810	0,002994
Minimum			0,000444	0,000385
Maximum			0,006385	0,005199
Mean			0,00152092	0,00148131

Source: Processed (2021)

Based on **Table 4.4**, PT. Unilever Indonesia Tbk (UNVR) has the lowest average value of trading volume activity before the announcement of the first case of Covid-19 in Indonesia by 0.000444. Meanwhile, PT. Sri Rejeki Isman Tbk amounting to 0.006385 considered the highest average value before the announcement of the first case of Covid-19 in Indonesia. PT. HM Sampoerna Tbk has the lowest average value of trading volume activity after announcing the first Covid-19 case in Indonesia by 0.000385 and PT. Matahari Department Store Tbk was the highest average value after Covid-19 by amounting to 0.005199.

The following is the descriptive test output, which explains the descriptive calculation results in the form of mean, minimum, maximum, and standard deviation for the average trading volume activity during the observation period.

Table 4.5 Descriptive Statistics for the Average Trading Volume Activity During the Observation Period

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
average TVA before	40	0,000444	0,006385	0,00152092	0,001251524
average TVA After	40	0,000385	0,005199	0,00148131	0,001143911
Valid N (listwise)	40				

Source: SPSS 25 (Processed Data, 2021)

Average TVA before = Trading Volume Activity before the announcement of the first Covid-19 case in Indonesia

Average TVA After = Trading Volume Activity after the announcement of the first Covid-19 case in Indonesia

Based on the descriptive statistical analysis results in **table 4.5**, the number of companies studied for Trading Volume Activity was 40 companies. The Trading Volume Activity before and after the announcement of the first Covid-19 case in Indonesia has an average positive value. The descriptive statistical analysis results shown that the average trading volume activity before the announcement of the first Covid-19 case in Indonesia is 0.00152092 with a standard deviation of 0.001251524. The Average Trading Volume Activity is greater than the standard deviation. Thus, the average value of Trading Volume Activity data before the announcement is evenly distributed.

After the announcement of the first case of Covid-19 in Indonesia, descriptive statistical analysis showed that the average volume of activity for 40 companies was 0.00148131 with a standard deviation of 0.001143911. The average Trading Volume Activity is greater than the standard deviation. Thus, the Trading Volume Activity data after the announcement of the first Covid-19 case in

Indonesia, the average value is evenly distributed. Standard deviation reflects the variation or difference in data that is relatively large from the average value.

The following is a formula for calculating the average trading volume of stock activity per day. The calculation of the average trading volume of stock activity each day can be seen in **Appendix 5**.

Average Trading Volume Activity per day = $\sum \frac{TVA_t}{n}$

Descriptions:

TVA_t = Number of Trading Volume Activity in all companies on day t

N = Number of companies

Table 4.6 Average Trading Volume Activity (TVA) of Shares Per Day During the Observation Period

Period	Day	Trading Volume Activity
Before	t-4	0,0011943
	t-3	0,0012913
	t-2	0,0014367
	t-1	0,0020976
The Day	t-0	0,0015635
After	t+1	0,0015655
	t+2	0,0015596
	t+3	0,0014355
	t+4	0,0011164
	t+5	0,0017296

Source: Processed Data (2021)(Appendix 5)

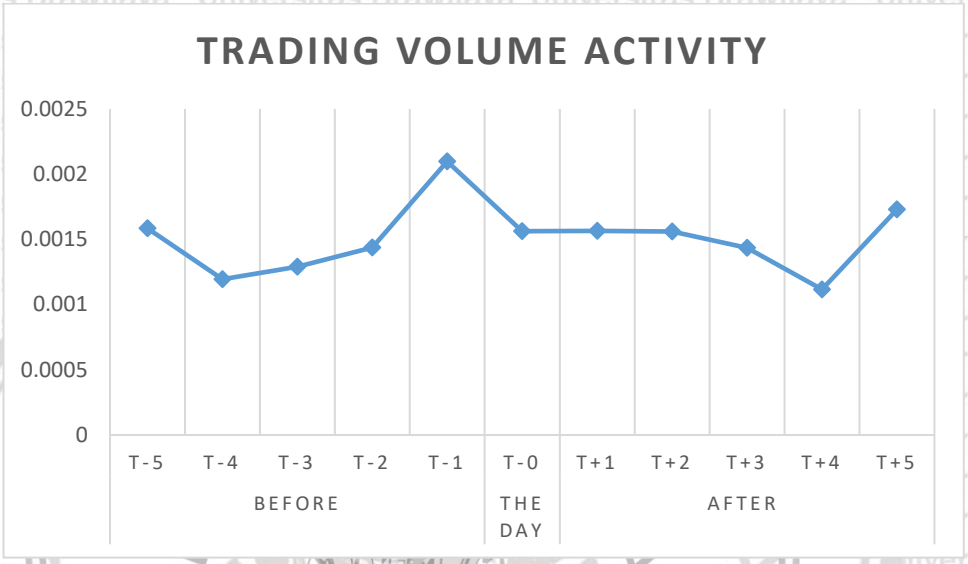

Figure 4.2 The Movement of Trading Volume of Stock Activity Per Day During the Observation Period

Source: Processed Data (2021)

Based on **table 4.6** and **Figure 4.2**, the average Trading Volume Activity of stock per day during the observation period shows an increase and decrease. The decline in the average Trading Volume Activity occurs at t-5 to t-4 then increases to t-1, after enters t0 again, it decreases. After the announcement of the first case of Covid-19, the average Trading Volume Activity experienced an insignificant decrease, then bounced back at t + 4 to t + 5. Overall, there was an insignificant increase in the average Trading Volume Activity before the announcement of the first Covid-19 case in Indonesia and an insignificant decrease in the average Trading Volume Activity after the announcement of the first Covid-19 case in Indonesia.

IV.4 Normality Test

The normality test used to determine whether the data from the sample used in the study is normally distributed or not. The results can be used to determine the research method at the hypothesis testing stage. The normality test for both variables used the IBS Statistical Package of Social Science (SPSS) 25 computer program. The test instrument used was the One-Sample Kolmogorov Smirnov Test. If the data is normally distributed, the hypothesis test used is the paired-sample t-test. Meanwhile, the data were not normally distributed using the non-parametric Wilcoxon Signed Rank Test. In **table 4.7**, a summary of the normality test results for the average abnormal return and a summary of the results of the average normality test for trading volume activity with the IBS Statistical Package of Social Science (SPSS) program 25 is presented.

1. Normality Test for Abnormal Return Data

Table 4.7 Normality Test Results Abnormal Data Return

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
AAR_Before	0,106	40	0,200
AAR_After	0,122	40	0,134

Sumber : SPSS 25. (Processed Data)

The normality test results for the abnormal return variable in table 4.7, the significant value for the abnormal return variable before and after the announcement of the first case of Covid-19 has a value greater than the significance value of 0.05, namely 0.200 and 0.134 respectively. The data for the abnormal return variable is normally distributed. Based on the results of the normality test,

which is normally distributed. Normally distributed data can be continued to parametric statistical testing. The relevant parametric statistical measurement tool to determine the significance of abnormal returns each day during the event window is the one-sample t-test. Furthermore, to determine the difference between Trading Volume Activity before and after the announcement of the first Covid-19 case in Indonesia, the paired sample t-test was used.

2. Normality Test Results on Trading Volume Activity

Table 4.8 Normality Test Results on Trading Volume Activity

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
TVAbefore	0,100	40	0,200
TVAafter	0,133	40	0,074

Source: SPSS 25 (Processed Data)

Table 4.8 shown the results of the normality test of the Trading Volume Activity variable. The significant value for the Abnormal Return variable before and after the announcement of the first case of Covid-19 has a value greater than the significance value of 0.05, that is each of 0.200 and 0.074 respectively. From the test result, can be concluded that data for Trading Volume Activity variable are normally distributed.

Based on the results of the normality test, data is normally distributed. This data can then be processed to parametric statistical testing. The relevant parametric statistical measurement tool to determine the significance of abnormal returns on each day during the event window is the one sample t-test. Furthermore, to determine the difference between trading volume activity before and after the

announcement of the first Covid-19 case in Indonesia, a paired sample t-test was used.

IV.6 Different Test (T-test)

This reaserch used the T-test to find out how significant the differences between groups are, in other words it can give conclusion if those differences (measured in means) could have happened by chance. This reaserch used two T-test method, that is:

IV.6.1 One-Sample T-Test

The one-sample t-test is part of a statistical test used to test the average value of a population against a specific value. The one-sample t-test in this study is used as an additional test to determine the significance of Abnormal Returns and Trading Volume Activity affected by the announcement of the first Covid-19 case in Indonesia. Here is a further explanation of the one-sample t-test on Abnormal Returns and Trading Volume Activity.

1. Hypotesis Abnormal Return

These observations will determine on what day the information affects the market. The hypothesis are as follows:

H_0 : There is no significant Abnormal Return around the date of the announcement of the first Covid-19 case in Indonesia

H_1 : There is significant Abnormal Return around the date of the announcement of the first Covid-19 case in Indonesia

The assessment criteria for the one-sample t-test used in this study are as follows:

a. If significance value > 0,05, H_0 will be accepted. This means that there is no significant average reaction to Abnormal Returns around the date of the announcement of the first Covid-19 case in Indonesia.

b. If significance value < 0,05, H_0 rejected. This means that there is a significant average reaction to abnormal returns around the date of the announcement of the first Covid-19 case in Indonesia.

The data used in this test is the Abnormal Return data of each company on each day during the event window, which can be seen in **Appendix 2**. The results of the tests carried out can be seen in **Table 4.10.**

Table 4.9 Test Results Of One Sample T-Test Abnormal Return

Period	Day	Average Abnormal Return	Sig. (2-tailed)	Conclusion
Before	t-5	-0,0080	0,020	significant
	t-4	0,0015	0,612	no significant
	t-3	-0,0056	0,094	no significant
	t-2	0,0036	0,318	no significant
	t-1	-0,0098	0,038	significant
The Day	t 0	0,0094	0,016	significant
After	t+1	0,0026	0,637	no significant
	t+2	0,0006	0,883	no significant
	t+3	-0,0046	0,159	no significant
	t+4	0,0033	0,286	no significant
	t+5	-0,0089	0,065	no significant

Source: SPSS 25 (Processed Data, 2021)

Based on **Table 4.10**, the average Abnormal Return is positive at t-4,t-2, t0 to t + 2 and t+4. However, the average Abnormal Return also shows negative values at t-5, t-3 to t-1 and t + 3 to t + 5. Furthermore, the one-sample t-test on the average Abnormal Return during the event window shows significant results at t-5, , t-1 and t0. The significant average Abnormal Return can be seen through a significant value less than 0.05. This test results show that there is a significant Abnormal Return reaction around the date of the announcement of the first Covid-19 case in Indonesia.

2. Trading Volume Activity

These observations will determine on what day the information affects the market. As for the hypothesis

H_0 : There is no significant Trading Volume Activity around the date of the announcement of the first Covid-19 case in Indonesia

H_1 : There is significant Trading Volume Activity around the date of the announcement of the first Covid-19 case in Indonesia

The assessment criteria for the one-sample t-test used in this study are as follows:

a. If significance value > 0,05, H_0 will be accepted. This means that there is no significant average reaction to Trading Volume Activity around the announcement date of the first Covid-19 case in Indonesia.

b. If significance value < 0,05 H_0 will be rejected. This means that there is a significant average reaction to Trading Volume

Activity around the date of the announcement of the first Covid-19 case in Indonesia.

The data used in this test is the Trading Volume Activity data of each company on each day during the event window, which can be seen in **Appendix 5.** The results of the tests carried out can be seen in **Table 10.2.**

Table 4.10 Test Results Of One Sample T-Test Trading Volume Activity

Period	Day	Trading Volume Activity	Sig. (2-tailed)
Before	t-5	0,001584697	0,000
	t-4	0,001194334	0,000
	t-3	0,001291268	0,000
	t-2	0,001436721	0,000
	t-1	0,002097575	0,000
The Day	t-0	0,001563544	0,000
After	t+1	0,001565487	0,000
	t+2	0,00155957	0,000
	t+3	0,001435492	0,000
	t+4	0,001116445	0,000
	t+5	0,001729582	0,000

Source: SPSS 25 (Processed Data, 2021)

Based on **Table 4.11,** the average Trading Volume Activity is positive on each day during the study period. Furthermore, the one-sample t-test on the average Trading Volume Activity during the event window shows the significant results of all days during the study period. The significant average Trading volume activity can be seen through a significant value less than 0.05. The results of this test show that there is a significant Trading Volume Activity reaction around the date of the announcement of the first Covid-19 case in Indonesia.

IV.6.2 Paired Sample T-test

Data on Abnormal Return and Trading Volume Activity was normally distributed and have no autocorrelation found, therefore, it can be further analyzed using the paired sample t-test. The paired sample t-test is a part of statistical testing that aims to compare the means of two related samples. The paired sample t-test in this study was used to test the null hypothesis (H_0) with an error level of 0,05.

The hypothesis in this study consists of hypothesis that is 1 and 2. Hypothesis 1 is related to Abnormal Returns before and after the announcement of the first case of Covid-19 in Indonesia. Meanwhile, hypothesis 2 is related to Trading Volume Activity before and after the announcement of the first Covid-19 case in Indonesia.

A. Abnormal Return

Based on the normality test results, the data are normally distributed and therefore, the hypothesis are tested using the paired sample t-test. This study uses a significance level of 5% or (α) = 0.05, which means that the reliance level reaches 95%. The following are the results of the Paired Sample T-Test. Following are the results of the paired sample t-test on Abnormal Returns before and after the announcement of the first Covid-19 case in Indonesia.

Table 4.11 The Results Of The Paired Sample T-Test Abnormal Return

Variable	T	Sig. (2-tailed)	Conclusion
AR_Before - AR_After	-0,796	0,431	no significant different

The results of different tests with the Paired Sample T-Test method can prove a significant difference in abnormal returns between before and after the announcement of the first covid-19 case in Indonesia. Table 11.1 shows that the significance is 0.431> 0.05, which means that H0 is accepted and H1 is rejected. These results prove H0 has no significant difference between before and after the announcement of the first Covid-19 case in Indonesia can be accepted.

B. Trading Volume Activity

Based on the normality test of trading volume activity normally distributed, the hypothesis testing uses the paired sample t-test. This study uses a significance level of 5% or (α) = 0.05, which means that the confidence level reaches 95%. Following are the results of the paired sample t-test on trading volume activity before and after the announcement of the first Covid-19 case in Indonesia.

Table 4.12 The Results Of The Paired Sample T-Test Trading Volume Activity

Variable	T	Sig. (2-tailed)	Conclusion
TVA_Before - TVA_After	0,463	0,646	No significant different

The results of different tests with the Paired Sample T-Test method can prove that there is a significant difference in Abnormal Returns between before and after the announcement of the first covid-19 case in Indonesia. The table explained that the significance of 0.646> 0.05, and in other words,

H0 is accepted and H1 is rejected. These results prove that H0, which states that there is no significant difference in trading volume activity between before and after the announcement of the first Covid-19 case in Indonesia, can be accepted.

IV.7 Discussions

This study uses an event study method to analyze the impact of the announcement of the first Covid-19 case in Indonesia. The number of samples used in this study was 40 companies (**Table 3.3**) with criteria have not carry out corporate actions during the research period. In order to fulfil the research objectives, this study uses an 11-day event window which is divided into 5 days before (t-5 to t-1), a day when the announcement of the first case of Covid-19 in Indonesia took place, namely March 2nd, 2020 (t0), and 5 days after the announcement (t + 1 to t + 5). The study period was chosen to reduce bias that may occur due to the potential for information content to be mixed up from announcements or other events. The timeframes for this research period is based on previous research by Lestari (2018), Yuhendri (2019), and Wulan (2018).

The impact of the announcement of the first case of Covid-19 in Indonesia can be seen through changes in stock prices and Trading Volume. Changes in stock prices are measured using abnormal returns, while stock trading volume changes are measured using Trading Volume Activity. Regarding abnormal returns, the calculation of expected returns is calculated using the market adjusted model

method, which assumes that the best estimate for calculating expected returns is the market index return at that time (Jogiyanto 2010:76).

Furthermore, statistical testing is carried out to ensure the significance of the impact of the announcement of the first Covid-19 case in Indonesia on abnormal returns and trading volume activity. The statistical test used is the one-sample t-test to determine the significance of abnormal returns and trading volume activity on each day during the observation period. Besides, this study also uses a paired sample t-test to test the research hypothesis by analyzing the significance of abnormal returns and trading volume activity before and after the announcement of the first case of Covid-19 in Indonesia.

Before entering the one-sample t-test and paired sample t-test, the data used must pass the normality test. That tests are carried out to minimize the error rate and avoid the correlation of the observed variables with changes in time. The test shows that the abnormal return data and trading volume activity are normally distributed (tables 4.7 and 4.8).

Based on the results of the one-sample t-test on abnormal return (table 4.10), it is known that the significant mean abnormal returns are just found at t-5, t-1 and t0. This one-sample t-test shows that there is a no significant abnormal return reaction around the announcement date of the first Covid-19 case in Indonesia. The results of the paired sample t-test on the abnormal return show the sig value. (2-tailed), namely 0.431, this means that the significance value is greater than the predetermined significance level of 5% (0.05), which means that there is no

significant difference in the average abnormal return in the period before and after the announcement of the first case of Covid-19 in Indonesia.

The results of this study are in accordance with the results of research from Putra (2020), Puspita (2019) which discusses the event study. In the study it was stated that there was no significant difference between abnormal return before and after the event. In addition, the results of this study are not in accordance with Kumari (2020), this is because in Kumari (2020) using the population of U.K Firms on London Stock Exchange (LSE) and the result that research is that market player respond that announcement, which mean the Indonesian capital market is inefficient in absorbing information.. The absence of a significant difference in abnormal returns before and after the announcement was possible due to investors or market players implementing a wait and see approach or becoming more alert and calculate every possibility. This statement can be proven by the decreasing average abnormal return at t+2 to t+5 **(Graph 4.1).**

The one-sample t-test on the trading volume activity shows the significant results of all days during the study period. The significant average trading volume activity can be seen through a significant value of 0.00, which means less than 0.05. This test shows that there is a significant trading volume reaction around the date of the announcement of the first Covid-19 case in Indonesia. However, the results of the paired sample t-test on the trading volume activity show the sig value. (2-tailed), with a value of 0.646, this means that the significance value is greater than the predetermined significance level of 5% (0.05), which means that there is no

significant difference in the average trading volume activity in the period before and after the announcement of the first case covid-19 in Indonesia.

The results of this study not support Chiah and Zhong (2020) result which have the same independent variables but with the share price population of each country. In this case researchers have limitations in terms of population sampling. The absence of a significant difference in average trading volume activity reflects that market players or investors have not immediately anticipated the announcement of the first case of Covid-19 in Indonesia. This statement supports News "Perjalanan IHSG sejak RI Positif Virus Corona" in DetikFinance, April 10nd 2020.

CHAPTER V

CLOSING

V.1 Conclusion

Based on the analysis results that have been carried out in this study, the research aimed to analyze the differences in abnormal returns and trading volume activity between before and after the announcement of the first case of Covid-19 in Indonesia on March 2nd, 2020 resulted in the following conclusions.

1. Based on the results of the one-sample t-test on abnormal returns (table 4.10), it is known that the significant mean abnormal returns are found at t-5 , t-1 and t0. This one-sample t-test shows that there is a significant abnormal return reaction around the announcement date of the first Covid-19 case in Indonesia. However, seen from market efficiency, this reflects that the Indonesian capital market is inefficient in absorbing information.
2. The results of the paired sample t-test on the abnormal return show the sig value. (2-tailed), precisely 0.431, this means that the significance value is greater than the predetermined significance level of 5% (0.05), which means that there is no significant difference in the average abnormal return in the period before and after the announcement of the first case of Covid-19 in Indonesia. The absence of a significant difference in abnormal returns before and after the announcement was possible due to market players still taking a wait-and-see attitude or being more alert and calculates every

possibility. This statement can be proven by the decreasing average abnormal return at t+2 to t+5.

3. Based on the one-sample t-test on the trading volume activity, it shows significant results for all days during the study period. The significant average trading volume activity can be seen through the significant daily value of 0.00, which means less than 0.05. This test shows that there is a significant trading volume reaction around the date of the announcement of the first Covid-19 case in Indonesia. This reflects that the Indonesian capital market has been efficient in absorbing information.

4. The results of the paired sample t-test on the trading volume activity show the sig value. (2-tailed), namely 0.646, this means that the significance value is greater than the predetermined significance level of 5% (0.05), which means that there is no significant difference in the average trading volume activity in the period before and after the announcement of the first case of covid-19 in Indonesia. The absence of a significant difference in average trading volume activity reflects that market players or investors have not immediately anticipated the announcement of the first case of Covid-19 in Indonesia.

V.2 Reaseach Limitation

This study only used an observation period of 11 days, namely 5 days before, 1 day of the announcement of the first Covid-19 case in Indonesia and 5 days after the announcement. This causes the changes that occur over a long period are less visible in more detail.

V.3 Suggestion

This rearcesh is still far from perfect, therefor, the following suggestions are given:

1. For Investors

   Investors in estimating stock prices and making investment decisions, and using investment analysis models based on scientific theories such as fundamental and technical analysis should also pay attention to information scattered in the environment so that the information obtained can be used in considering the actions to be taken.

2. For future researchers

   This study uses the market adjustment model method in determining the expected return. Future research is expected to use other models, such as the mean adjusted model and the market model, or use all three models at once. The results of these calculations can be compared to determine their impact on the results of the study.

References

IDX. (2020, October 30). *Indonesia stock exchange*. Retrieved from www.idx.co.id: https://www.idx.co.id/data-pasar/data-saham/indeks-saham/

Hartono, J. (2017). *Portfolio Theory and Investment Analysis.* Yogyakarta: BPPFE.

Jogiyanto, H.M. (2010). *Portfolio Theory and Investment.* Yogyakarta: BPPFE, 7st Edition.

Meyers, TA (1992). *The Technical Analysis Course: A Winning Program for Stock and Futures Traders and Investors. Tokyo: Toppan Company Ltd.*

Sugiyono. (2013). *Business Research Methodology*. Bandung: Alfabeta.

Sugiyono. (2017). *Educational Research Methods*. Bandung: Alfabeta.

Sunariyah. (2006). *Capital Market Knowledge*. Yogyakarta: UPP STIM YKPN.

Tandelilin, E. (2001). *Portfolio Analysis and Management*. Yogyakarta: BPFE.

Tandelilin, E. (2010). *Investment Analysis and Portfolio Management*. Yogyakarta: BPPFE.

DetikNews. (2019). *Corona Virus Background*. Retrieved from DetikNews: www.detik.com/berita/d-4943950/latar-belakang-virus-corona-perkembangan-to-isu-terkini

Kompas. (2020, March 3). Fakta Lengkap Kasus Pertama Virus Corona di Indonesia Rerieved from kompas.com): nasional.kompas.com/read/2020/03/03/06314981/fakta-lengkap-kasus-pertama-virus-corona-di-indonesia. Acces in febuary 3, 2021

DetikFinance. (2020, April 10). Perjalanan IHSG Sejak RI Positif Virus Corona. Retrieved from https://finance.detik.com/bursa-dan-valas/d-4972595/perjalanan-ihsg-sejak-ri-positif-virus-corona

Journals

A'immah, S. (2015). *Reaksi Abnormal Return dan Trading Volume Activity terhadap Ramadhan Effect. Jurnal Administrasi Bisnis (JAB)*.Vol. 27 No. 1

Chen, M., Jang, S., & Kim, W. G. (2007). *The impact of the SARS outbreak on Taiwanese hotel stock performance: An event-study approach*. Hospital Management, 26, 200–212. Retrieved from https://doi.org/10.1016/j.ijhm.2005.11.004.

Firli, A dan Rahadian, D (2020). *Analysis Of The Impact Of Terrorist Bombing Acts on Abnormal Return and Trading Volume Activity: Study Of Terrorist Bombings Worldwide. International Symposia in Economic Theory and Econometrics*, Volume 27, 13–26

Firmansyah, AD (2016). *Comparative Analysis of Trading Volume Activity and Abnormal Return Before and After Stock Split. Journal of Management* Science and Research: Volume 5, No 5, May 2016.

Karamoy, H. (2017). *The Role of Stock Existence in LQ45 on Company Profitability Performance.*

Kumari, Vineeta. (2020). *Event Study on the Reactio of the Developed and emerging stock markets to the 2019-nCov outbreak*. India. *International Economics and finance 71*, 467-483

Lestari, D. (2018). *Impact of Britain Exit (BREXIT) on Abnormal Return and Trading Volume Activity on LQ-45 Index. Jurnal Administrasi Bisnis (JAB)*, Vol. 55 No. 3

Puspita, A. (2019). *Analisis Abnormal Return dan Price Reversal pada Trade War Amerika-China 2018.* Thesis

Putra, R. (2020). *Abnormal Return and Trading Volume Activity Different Test due to the Events of Asian Games 2018 Jakarta-Palembang. Journal of Business Administration* (JAB), Vol. 78 No.1

Wulan, D. (2018). *Abnormal Return Analysis and Trading Volume Activity on Unusual Market Activity Announcements. Jurnal Administrasi Bisnis (JAB)*, Vol. 61 No. 1

Yuhendri, VI (2019). *Analysis of Differences in Trading Volume Activity and Abnormal Return Before and After Stock Split.* Thesis

APPENDIX

Appendix 1 Processed data on Abnormal Return

ACE					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1555		
Feb 24, 2020,	941,52	-0,01656	1510	-0,02894	-0,01238
Feb 25, 2020,	941,68	0,00017	1550	0,02649	0,02632
Feb 26, 2020,	922,66	-0,02020	1525	-0,01613	0,00407
Feb 27, 2020,	892,76	-0,03241	1500	-0,01639	0,01601
Feb 28, 2020,	879,53	-0,01482	1515	0,01	0,02482
Mar 02, 2020,	859,33	-0,02297	1450	-0,0429	-0,01994
Mar 03, 2020,	891,94	0,03795	1465	0,010345	-0,02760
Mar 04, 2020,	922,51	0,03427	1535	0,047782	0,01351
Mar 05, 2020,	919,69	-0,00306	1485	-0,03257	-0,02952
Mar 06, 2020,	887,03	-0,03551	1460	-0,01684	0,01868
Mar 09, 2020,	813,75	-0,08261	1395	-0,04452	0,03809
ADRO					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1310		
Feb 24, 2020,	941,52	-0,0165558	1285	-0,01908	-0,00252822
Feb 25, 2020,	941,68	0,00016991	1285	0	-0,00016991
Feb 26, 2020,	922,66	-0,020198	1250	-0,02724	-0,00703939
Feb 27, 2020,	892,76	-0,0324063	1165	-0,068	-0,03559374
Feb 28, 2020,	879,53	-0,0148192	1155	-0,00858	0,0062355
Mar 02, 2020,	859,33	-0,0229668	1115	-0,03463	-0,01166521
Mar 03, 2020,	891,94	0,03794815	1140	0,022422	-0,01552663
Mar 04, 2020,	922,51	0,03427361	1205	0,057018	0,022743929
Mar 05, 2020,	919,69	-0,0030569	1175	-0,0249	-0,02183938
Mar 06, 2020,	887,03	-0,0355119	1160	-0,01277	0,022745979
Mar 09, 2020,	813,75	-0,0826128	1010	-0,12931	-0,04669755

AKRA					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		3050		
Feb 24, 2020,	941,52	-0,0165558	2990	-0,01967	-0,00311638
Feb 25, 2020,	941,68	0,00016991	2970	-0,00669	-0,00685887
Feb 26, 2020,	922,66	-0,020198	2890	-0,02694	-0,00673806
Feb 27, 2020,	892,76	-0,0324063	2750	-0,04844	-0,01603664
Feb 28, 2020,	879,53	-0,0148192	2650	-0,03636	-0,02154445
Mar 02, 2020,	859,33	-0,0229668	2550	-0,03774	-0,01476902
Mar 03, 2020,	891,94	0,03794815	2550	0	-0,03794815
Mar 04, 2020,	922,51	0,03427361	2540	-0,00392	-0,03819518
Mar 05, 2020,	919,69	-0,0030569	2540	0	0,003056886
Mar 06, 2020,	887,03	-0,0355119	2430	-0,04331	-0,00779515
Mar 09, 2020,	813,75	-0,0826128	2270	-0,06584	0,016769173
ANTM					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		700		
Feb 24, 2020,	941,52	-0,0165558	685	-0,02143	-0,00487282
Feb 25, 2020,	941,68	0,00016991	660	-0,0365	-0,03666626
Feb 26, 2020,	922,66	-0,020198	630	-0,04545	-0,02525658
Feb 27, 2020,	892,76	-0,0324063	600	-0,04762	-0,01521278
Feb 28, 2020,	879,53	-0,0148192	575	-0,04167	-0,02684748
Mar 02, 2020,	859,33	-0,0229668	585	0,017391	0,040358129
Mar 03, 2020,	891,94	0,03794815	615	0,051282	0,013333901
Mar 04, 2020,	922,51	0,03427361	630	0,02439	-0,00988337
Mar 05, 2020,	919,69	-0,0030569	630	0	0,003056886
Mar 06, 2020,	887,03	-0,0355119	610	-0,03175	0,003765905
Mar 09, 2020,	813,75	-0,0826128	555	-0,09016	-0,00755114

ASII					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		6200		
Feb 24, 2020,	941,52	-0,0165558	6100	-0,01613	0,000426719
Feb 25, 2020,	941,68	0,00016991	6225	0,020492	0,020321894
Feb 26, 2020,	922,66	-0,020198	6050	-0,02811	-0,00791448
Feb 27, 2020,	892,76	-0,0324063	5950	-0,01653	0,015877339
Feb 28, 2020,	879,53	-0,0148192	5525	-0,07143	-0,05660938
Mar 02, 2020,	859,33	-0,0229668	5700	0,031674	0,054641033
Mar 03, 2020,	891,94	0,03794815	5900	0,035088	-0,00286043
Mar 04, 2020,	922,51	0,03427361	5975	0,012712	-0,02156175
Mar 05, 2020,	919,69	-0,0030569	6050	0,012552	0,015609187
Mar 06, 2020,	887,03	-0,0355119	5675	-0,06198	-0,02647153
Mar 09, 2020,	813,75	-0,0826128	5025	-0,11454	-0,03192465
BBCA					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		33075		
Feb 24, 2020,	941,52	-0,0165558	32625	-0,01361	0,00295031
Feb 25, 2020,	941,68	0,00016991	32650	0,000766	0,000596374
Feb 26, 2020,	922,66	-0,020198	32100	-0,01685	0,003352636
Feb 27, 2020,	892,76	-0,0324063	31450	-0,02025	0,012157043
Feb 28, 2020,	879,53	-0,0148192	31450	0	0,014819191
Mar 02, 2020,	859,33	-0,0229668	30400	-0,03339	-0,0104195
Mar 03, 2020,	891,94	0,03794815	31600	0,039474	0,001525533
Mar 04, 2020,	922,51	0,03427361	32200	0,018987	-0,01528627
Mar 05, 2020,	919,69	-0,0030569	32175	-0,00078	0,002280489
Mar 06, 2020,	887,03	-0,0355119	31000	-0,03652	-0,0010071
Mar 09, 2020,	813,75	-0,0826128	28925	-0,06694	0,01567731

BBRI					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	RTNi, t = Ri, t - E [Ri, t]
Feb 21, 2020,	957,37		4510		
Feb 24, 2020,	941,52	-0,0165558	4490	-0,00443	0,012121162
Feb 25, 2020,	941,68	0,00016991	4500	0,002227	0,002057262
Feb 26, 2020,	922,66	-0,020198	4480	-0,00444	0,015753521
Feb 27, 2020,	892,76	-0,0324063	4130	-0,07813	-0,04571874
Feb 28, 2020,	879,53	-0,0148192	4190	0,014528	0,029347036
Mar 02, 2020,	859,33	-0,0229668	3980	-0,05012	-0,02715251
Mar 03, 2020,	891,94	0,03794815	4100	0,030151	-0,0077974
Mar 04, 2020,	922,51	0,03427361	4220	0,029268	-0,00500532
Mar 05, 2020,	919,69	-0,0030569	4150	-0,01659	-0,01353079
Mar 06, 2020,	887,03	-0,0355119	4010	-0,03373	0,001776997
Mar 09, 2020,	813,75	-0,0826128	3750	-0,06484	0,017774889
BRPT					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1160		
Feb 24, 2020,	941,52	-0,0165558	1110	-0,0431	-0,0265477
Feb 25, 2020,	941,68	0,00016991	1095	-0,01351	-0,01368342
Feb 26, 2020,	922,66	-0,020198	1035	-0,05479	-0,03459656
Feb 27, 2020,	892,76	-0,0324063	980	-0,05314	-0,02073383
Feb 28, 2020,	879,53	-0,0148192	985	0,005102	0,019921232
Mar 02, 2020,	859,33	-0,0229668	945	-0,04061	-0,01764231
Mar 03, 2020,	891,94	0,03794815	965	0,021164	-0,01678413
Mar 04, 2020,	922,51	0,03427361	1020	0,056995	0,022721204
Mar 05, 2020,	919,69	-0,0030569	1015	-0,0049	-0,00184507
Mar 06, 2020,	887,03	-0,0355119	970	-0,04433	-0,00882304
Mar 09, 2020,	813,75	-0,0826128	845	-0,12887	-0,04625319
BSDE					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1100		
Feb 24, 2020,	941,52	-0,01656	1085	-0,01364	0,00292
Feb 25, 2020,	941,68	0,00017	1085	0	-0,00017

Feb 26, 2020,	922,66	-0,02020	1060	-0,02304	-0,00284
Feb 27, 2020,	892,76	-0,03241	1030	-0,0283	0,00410
Feb 28, 2020,	879,53	-0,01482	1000	-0,02913	-0,01431
Mar 02, 2020,	859,33	-0,02297	965	-0,035	-0,01203
Mar 03, 2020,	891,94	0,03795	1050	0,088083	0,05013
Mar 04, 2020,	922,51	0,03427	1115	0,061905	0,02763
Mar 05, 2020,	919,69	-0,00306	1100	-0,01345	-0,01040
Mar 06, 2020,	887,03	-0,03551	1015	-0,07727	-0,04176
Mar 09, 2020,	813,75	-0,08261	940	-0,07389	0,00872
BTPS					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		4330		
Feb 24, 2020,	941,52	-0,0165558	4250	-0,01848	-0,00192
Feb 25, 2020,	941,68	0,00016991	4150	-0,02353	-0,02369932
Feb 26, 2020,	922,66	-0,020198	4200	0,012048	0,032246158
Feb 27, 2020,	892,76	-0,0324063	4040	-0,0381	-0,00568897
Feb 28, 2020,	879,53	-0,0148192	3760	-0,06931	-0,05448774
Mar 02, 2020,	859,33	-0,0229668	3620	-0,03723	-0,01426722
Mar 03, 2020,	891,94	0,03794815	3830	0,058011	0,020062899
Mar 04, 2020,	922,51	0,03427361	3960	0,033943	-0,00033106
Mar 05, 2020,	919,69	-0,0030569	4060	0,025253	0,028309411
Mar 06, 2020,	887,03	-0,0355119	4090	0,007389	0,042901099
Mar 09, 2020,	813,75	-0,0826128	3780	-0,07579	0,006818173
CPIN					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		6575		
Feb 24, 2020,	941,52	-0,0165558	6450	-0,01901	-0,00245566
Feb 25, 2020,	941,68	0,00016991	6375	-0,01163	-0,01179782
Feb 26, 2020,	922,66	-0,020198	5950	-0,06667	-0,0464687
Feb 27, 2020,	892,76	-0,0324063	5900	-0,0084	0,024002903
Feb 28, 2020,	879,53	-0,0148192	5700	-0,0339	-0,01907911
Mar 02, 2020,	859,33	-0,0229668	5600	-0,01754	0,005422965
Mar 03, 2020,	891,94	0,03794815	6025	0,075893	0,037944706
Mar 04, 2020,	922,51	0,03427361	6425	0,06639	0,032116427
Mar 05, 2020,	919,69	-0,0030569	6500	0,011673	0,014730038
Mar 06, 2020,	887,03	-0,0355119	6200	-0,04615	-0,01064191

Mar 09, 2020,	813,75	-0,0826128	5800	-0,06452	0,018096665
CTRA					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		970		
Feb 24, 2020,	941,52	-0,0165558	940	-0,03093	-0,01437208
Feb 25, 2020,	941,68	0,00016991	970	0,031915	0,031744984
Feb 26, 2020,	922,66	-0,020198	945	-0,02577	-0,00557523
Feb 27, 2020,	892,76	-0,0324063	925	-0,02116	0,011242243
Feb 28, 2020,	879,53	-0,0148192	945	0,021622	0,036440813
Mar 02, 2020,	859,33	-0,0229668	905	-0,04233	-0,01936122
Mar 03, 2020,	891,94	0,03794815	915	0,01105	-0,02689843
Mar 04, 2020,	922,51	0,03427361	945	0,032787	-0,00148673
Mar 05, 2020,	919,69	-0,0030569	920	-0,02646	-0,02339814
Mar 06, 2020,	887,03	-0,0355119	885	-0,03804	-0,00253154
Mar 09, 2020,	813,75	-0,0826128	800	-0,09605	-0,0134324
ERAA					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1860		
Feb 24, 2020,	941,52	-0,0165558	1740	-0,06452	-0,04796038
Feb 25, 2020,	941,68	0,00016991	1760	0,011494	0,011324344
Feb 26, 2020,	922,66	-0,020198	1705	-0,03125	-0,01105203
Feb 27, 2020,	892,76	-0,0324063	1640	-0,03812	-0,0057169
Feb 28, 2020,	879,53	-0,0148192	1620	-0,0122	0,002624069
Mar 02, 2020,	859,33	-0,0229668	1590	-0,01852	0,004448306
Mar 03, 2020,	891,94	0,03794815	1740	0,09434	0,056391472
Mar 04, 2020,	922,51	0,03427361	1785	0,025862	-0,00841155
Mar 05, 2020,	919,69	-0,0030569	1790	0,002801	0,005858007
Mar 06, 2020,	887,03	-0,0355119	1730	-0,03352	0,001992383
Mar 09, 2020,	813,75	-0,0826128	1570	-0,09249	-0,00987276
GGRM					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		55975		
Feb 24, 2020,	941,52	-0,0165558	55250	-0,01295	0,003603541

Feb 25, 2020,	941,68	0,00016991	55200	-0,0009	-0,00107489
Feb 26, 2020,	922,66	-0,020198	55000	-0,00362	0,016574777
Feb 27, 2020,	892,76	-0,0324063	53175	-0,03318	-0,00077555
Feb 28, 2020,	879,53	-0,0148192	51000	-0,0409	-0,02608349
Mar 02, 2020,	859,33	-0,0229668	49500	-0,02941	-0,00644494
Mar 03, 2020,	891,94	0,03794815	50775	0,025758	-0,01219057
Mar 04, 2020,	922,51	0,03427361	51775	0,019695	-0,01457888
Mar 05, 2020,	919,69	-0,0030569	50950	-0,01593	-0,01287745
Mar 06, 2020,	887,03	-0,0355119	50400	-0,01079	0,02471704
Mar 09, 2020,	813,75	-0,0826128	44975	-0,10764	-0,02502609
HMSP					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1920		
Feb 24, 2020,	941,52	-0,0165558	1905	-0,00781	0,008743252
Feb 25, 2020,	941,68	0,00016991	1860	-0,02362	-0,02379196
Feb 26, 2020,	922,66	-0,020198	1785	-0,04032	-0,02012462
Feb 27, 2020,	892,76	-0,0324063	1730	-0,03081	0,001593939
Feb 28, 2020,	879,53	-0,0148192	1700	-0,01734	-0,00252185
Mar 02, 2020,	859,33	-0,0229668	1675	-0,01471	0,008260942
Mar 03, 2020,	891,94	0,03794815	1750	0,044776	0,006827969
Mar 04, 2020,	922,51	0,03427361	1785	0,02	-0,01427361
Mar 05, 2020,	919,69	-0,0030569	1785	0	0,003056886
Mar 06, 2020,	887,03	-0,0355119	1715	-0,03922	-0,00370375
Mar 09, 2020,	813,75	-0,0826128	1555	-0,09329	-0,01068167
ICBP					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		10950		
Feb 24, 2020,	941,52	-0,0165558	11025	0,006849	0,023405067
Feb 25, 2020,	941,68	0,00016991	10975	-0,00454	-0,00470506
Feb 26, 2020,	922,66	-0,020198	10825	-0,01367	0,00653054
Feb 27, 2020,	892,76	-0,0324063	10550	-0,0254	0,007002107
Feb 28, 2020,	879,53	-0,0148192	10275	-0,02607	-0,01124716
Mar 02, 2020,	859,33	-0,0229668	10150	-0,01217	0,010801375
Mar 03, 2020,	891,94	0,03794815	10950	0,078818	0,040869583
Mar 04, 2020,	922,51	0,03427361	10950	0	-0,03427361
Mar 05, 2020,	919,69	-0,0030569	10950	0	0,003056886

Mar 06, 2020,	887,03	-0,0355119	10950	0	0,035511937
Mar 09, 2020,	813,75	-0,0826128	10375	-0,05251	0,030101378
INCO					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		3060		
Feb 24, 2020,	941,52	-0,0165558	3010	-0,01634	0,000215882
Feb 25, 2020,	941,68	0,00016991	3000	-0,00332	-0,00349217
Feb 26, 2020,	922,66	-0,020198	2870	-0,04333	-0,02313537
Feb 27, 2020,	892,76	-0,0324063	2620	-0,08711	-0,05470175
Feb 28, 2020,	879,53	-0,0148192	2450	-0,06489	-0,05006631
Mar 02, 2020,	859,33	-0,0229668	2500	0,020408	0,043374988
Mar 03, 2020,	891,94	0,03794815	2720	0,088	0,050051849
Mar 04, 2020,	922,51	0,03427361	2710	-0,00368	-0,03795009
Mar 05, 2020,	919,69	-0,0030569	2670	-0,01476	-0,01170326
Mar 06, 2020,	887,03	-0,0355119	2570	-0,03745	-0,00194125
Mar 09, 2020,	813,75	-0,0826128	2230	-0,1323	-0,04968293
INDF					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		7200		
Feb 24, 2020,	941,52	-0,0165558	7200	0	0,016555752
Feb 25, 2020,	941,68	0,00016991	7225	0,003472	0,003302313
Feb 26, 2020,	922,66	-0,020198	7025	-0,02768	-0,0074837
Feb 27, 2020,	892,76	-0,0324063	6900	-0,01779	0,01461267
Feb 28, 2020,	879,53	-0,0148192	6500	-0,05797	-0,04315182
Mar 02, 2020,	859,33	-0,0229668	6675	0,026923	0,049889902
Mar 03, 2020,	891,94	0,03794815	7125	0,067416	0,02946758
Mar 04, 2020,	922,51	0,03427361	7175	0,007018	-0,02725607
Mar 05, 2020,	919,69	-0,0030569	7200	0,003484	0,006541207
Mar 06, 2020,	887,03	-0,0355119	6950	-0,03472	0,000789714
Mar 09, 2020,	813,75	-0,0826128	6375	-0,08273	-0,00012102
INKP					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		6375		

Feb 24, 2020,	941,52	-0,0165558	6100	-0,04314	-0,0265815
Feb 25, 2020,	941,68	0,00016991	6300	0,032787	0,032616976
Feb 26, 2020,	922,66	-0,020198	6100	-0,03175	-0,01154807
Feb 27, 2020,	892,76	-0,0324063	5975	-0,02049	0,011914461
Feb 28, 2020,	879,53	-0,0148192	5625	-0,05858	-0,04375821
Mar 02, 2020,	859,33	-0,0229668	5500	-0,02222	0,000744602
Mar 03, 2020,	891,94	0,03794815	6075	0,104545	0,066597304
Mar 04, 2020,	922,51	0,03427361	6350	0,045267	0,010993875
Mar 05, 2020,	919,69	-0,0030569	6250	-0,01575	-0,01269115
Mar 06, 2020,	887,03	-0,0355119	6000	-0,04	-0,00448806
Mar 09, 2020,	813,75	-0,0826128	5275	-0,12083	-0,03822054
INTP					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		16575		
Feb 24, 2020,	941,52	-0,0165558	15900	-0,04072	-0,02416823
Feb 25, 2020,	941,68	0,00016991	15700	-0,01258	-0,01274853
Feb 26, 2020,	922,66	-0,020198	15325	-0,02389	-0,00368738
Feb 27, 2020,	892,76	-0,0324063	15250	-0,00489	0,0275123
Feb 28, 2020,	879,53	-0,0148192	14925	-0,02131	-0,00649228
Mar 02, 2020,	859,33	-0,0229668	14600	-0,02178	0,00119128
Mar 03, 2020,	891,94	0,03794815	14050	-0,03767	-0,07561938
Mar 04, 2020,	922,51	0,03427361	15525	0,104982	0,070708592
Mar 05, 2020,	919,69	-0,0030569	15000	-0,03382	-0,03075954
Mar 06, 2020,	887,03	-0,0355119	14950	-0,00333	0,032178603
Mar 09, 2020,	813,75	-0,0826128	13650	-0,08696	-0,00434373
ITMG					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		10575		
Feb 24, 2020,	941,52	-0,0165558	10650	0,007092	0,02364795
Feb 25, 2020,	941,68	0,00016991	11000	0,032864	0,03269394
Feb 26, 2020,	922,66	-0,020198	11150	0,013636	0,033834329
Feb 27, 2020,	892,76	-0,0324063	11025	-0,01121	0,021195502
Feb 28, 2020,	879,53	-0,0148192	11300	0,024943	0,039762502
Mar 02, 2020,	859,33	-0,0229668	10875	-0,03761	-0,01464379
Mar 03, 2020,	891,94	0,03794815	11050	0,016092	-0,0218562
Mar 04, 2020,	922,51	0,03427361	10950	-0,00905	-0,04332339

Mar 05, 2020,	919,69	-0,0030569	10900	-0,00457	-0,00150932
Mar 06, 2020,	887,03	-0,0355119	10425	-0,04358	-0,00806605
Mar 09, 2020,	813,75	-0,0826128	9550	-0,08393	-0,00132006
JPFA					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1555		
Feb 24, 2020,	941,52	-0,0165558	1525	-0,01929	-0,00273685
Feb 25, 2020,	941,68	0,00016991	1495	-0,01967	-0,01984204
Feb 26, 2020,	922,66	-0,020198	1455	-0,02676	-0,00655789
Feb 27, 2020,	892,76	-0,0324063	1425	-0,02062	0,011787708
Feb 28, 2020,	879,53	-0,0148192	1400	-0,01754	-0,00272467
Mar 02, 2020,	859,33	-0,0229668	1460	0,042857	0,065823968
Mar 03, 2020,	891,94	0,03794815	1495	0,023973	-0,01397555
Mar 04, 2020,	922,51	0,03427361	1520	0,016722	-0,01755121
Mar 05, 2020,	919,69	-0,0030569	1520	0	0,003056886
Mar 06, 2020,	887,03	-0,0355119	1480	-0,02632	0,009196147
Mar 09, 2020,	813,75	-0,0826128	1350	-0,08784	-0,00522504
JSMR					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		5000		
Feb 24, 2020,	941,52	-0,0165558	4960	-0,008	0,008555752
Feb 25, 2020,	941,68	0,00016991	5000	0,008065	0,007894607
Feb 26, 2020,	922,66	-0,020198	4770	-0,046	-0,02580203
Feb 27, 2020,	892,76	-0,0324063	4800	0,006289	0,038695573
Feb 28, 2020,	879,53	-0,0148192	4680	-0,025	-0,01018081
Mar 02, 2020,	859,33	-0,0229668	4620	-0,01282	0,010146312
Mar 03, 2020,	891,94	0,03794815	4760	0,030303	-0,00764512
Mar 04, 2020,	922,51	0,03427361	4820	0,012605	-0,02166857
Mar 05, 2020,	919,69	-0,0030569	4890	0,014523	0,017579708
Mar 06, 2020,	887,03	-0,0355119	4740	-0,03067	0,00483709
Mar 09, 2020,	813,75	-0,0826128	4410	-0,06962	0,012992541
KLBF					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*

Feb 21, 2020,	957,37		1365		
Feb 24, 2020,	941,52	-0,0165558	1355	-0,00733	0,009229744
Feb 25, 2020,	941,68	0,00016991	1295	-0,04428	-0,04445035
Feb 26, 2020,	922,66	-0,020198	1285	-0,00772	0,012475958
Feb 27, 2020,	892,76	-0,0324063	1250	-0,02724	0,00516891
Feb 28, 2020,	879,53	-0,0148192	1220	-0,024	-0,00918081
Mar 02, 2020,	859,33	-0,0229668	1195	-0,02049	0,002475021
Mar 03, 2020,	891,94	0,03794815	1210	0,012552	-0,02539585
Mar 04, 2020,	922,51	0,03427361	1275	0,053719	0,019445394
Mar 05, 2020,	919,69	-0,0030569	1330	0,043137	0,046194141
Mar 06, 2020,	887,03	-0,0355119	1235	-0,07143	-0,03591663
Mar 09, 2020,	813,75	-0,0826128	1140	-0,07692	0,005689717
LPPF					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		3470		
Feb 24, 2020,	941,52	-0,0165558	3300	-0,04899	-0,0324356
Feb 25, 2020,	941,68	0,00016991	3210	-0,02727	-0,02744264
Feb 26, 2020,	922,66	-0,020198	3150	-0,01869	0,001506377
Feb 27, 2020,	892,76	-0,0324063	3080	-0,02222	0,010184042
Feb 28, 2020,	879,53	-0,0148192	3140	0,019481	0,03429971
Mar 02, 2020,	859,33	-0,0229668	3090	-0,01592	0,007043258
Mar 03, 2020,	891,94	0,03794815	3190	0,032362	-0,00558569
Mar 04, 2020,	922,51	0,03427361	3210	0,00627	-0,02800402
Mar 05, 2020,	919,69	-0,0030569	2980	-0,07165	-0,0685942
Mar 06, 2020,	887,03	-0,0355119	2850	-0,04362	-0,00811222
Mar 09, 2020,	813,75	-0,0826128	2600	-0,08772	-0,0051065
MNCN					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1440		
Feb 24, 2020,	941,52	-0,0165558	1355	-0,05903	-0,04247203
Feb 25, 2020,	941,68	0,00016991	1350	-0,00369	-0,00385995
Feb 26, 2020,	922,66	-0,020198	1270	-0,05926	-0,03906129
Feb 27, 2020,	892,76	-0,0324063	1290	0,015748	0,048154296
Feb 28, 2020,	879,53	-0,0148192	1285	-0,00388	0,010943222
Mar 02, 2020,	859,33	-0,0229668	1295	0,007782	0,030748926
Mar 03, 2020,	891,94	0,03794815	1305	0,007722	-0,03022614

Mar 04, 2020,	922,51	0,03427361	1395	0,068966	0,034691903
Mar 05, 2020,	919,69	-0,0030569	1340	-0,03943	-0,03636964
Mar 06, 2020,	887,03	-0,0355119	1290	-0,03731	-0,0018015
Mar 09, 2020,	813,75	-0,0826128	1215	-0,05814	0,024473259
PGAS					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1525		
Feb 24, 2020,	941,52	-0,0165558	1480	-0,02951	-0,01295245
Feb 25, 2020,	941,68	0,00016991	1500	0,013514	0,013343604
Feb 26, 2020,	922,66	-0,020198	1495	-0,00333	0,016864632
Feb 27, 2020,	892,76	-0,0324063	1385	-0,07358	-0,04117233
Feb 28, 2020,	879,53	-0,0148192	1280	-0,07581	-0,06099308
Mar 02, 2020,	859,33	-0,0229668	1290	0,007813	0,030779325
Mar 03, 2020,	891,94	0,03794815	1345	0,042636	0,004687508
Mar 04, 2020,	922,51	0,03427361	1425	0,05948	0,025205939
Mar 05, 2020,	919,69	-0,0030569	1425	0	0,003056886
Mar 06, 2020,	887,03	-0,0355119	1345	-0,05614	-0,02062841
Mar 09, 2020,	813,75	-0,0826128	1170	-0,13011	-0,04749873
PTBA					
Date	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		2410		
Feb 24, 2020,	941,52	-0,0165558	2350	-0,0249	-0,00834051
Feb 25, 2020,	941,68	0,00016991	2410	0,025532	0,025362006
Feb 26, 2020,	922,66	-0,020198	2360	-0,02075	-0,00054892
Feb 27, 2020,	892,76	-0,0324063	2290	-0,02966	0,002745247
Feb 28, 2020,	879,53	-0,0148192	2240	-0,02183	-0,00701487
Mar 02, 2020,	859,33	-0,0229668	2200	-0,01786	0,005109682
Mar 03, 2020,	891,94	0,03794815	2370	0,077273	0,039324577
Mar 04, 2020,	922,51	0,03427361	2470	0,042194	0,007920478
Mar 05, 2020,	919,69	-0,0030569	2460	-0,00405	-0,0009917
Mar 06, 2020,	887,03	-0,0355119	2450	-0,00407	0,031446896
Mar 09, 2020,	813,75	-0,0826128	2210	-0,09796	-0,01534639
PWON					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE	Rit	*RTNi, t = Ri, t - E [Ri, t]*

			PER SHARE		
Feb 21, 2020,	957,37		575		
Feb 24, 2020,	941,52	-0,0165558	540	-0,06087	-0,04431381
Feb 25, 2020,	941,68	0,00016991	555	0,027778	0,027607868
Feb 26, 2020,	922,66	-0,020198	550	-0,00901	0,011188956
Feb 27, 2020,	892,76	-0,0324063	540	-0,01818	0,014224446
Feb 28, 2020,	879,53	-0,0148192	530	-0,01852	-0,00369933
Mar 02, 2020,	859,33	-0,0229668	525	-0,00943	0,013532862
Mar 03, 2020,	891,94	0,03794815	545	0,038095	0,000147087
Mar 04, 2020,	922,51	0,03427361	560	0,027523	-0,00675068
Mar 05, 2020,	919,69	-0,0030569	545	-0,02679	-0,02372883
Mar 06, 2020,	887,03	-0,0355119	530	-0,02752	0,007989001
Mar 09, 2020,	813,75	-0,0826128	500	-0,0566	0,02600902
SCMA					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1250		
Feb 24, 2020,	941,52	-0,0165558	1205	-0,036	-0,01944425
Feb 25, 2020,	941,68	0,00016991	1225	0,016598	0,016427601
Feb 26, 2020,	922,66	-0,020198	1165	-0,04898	-0,02878163
Feb 27, 2020,	892,76	-0,0324063	1150	-0,01288	0,019530728
Feb 28, 2020,	879,53	-0,0148192	1120	-0,02609	-0,01126777
Mar 02, 2020,	859,33	-0,0229668	1115	-0,00446	0,018502539
Mar 03, 2020,	891,94	0,03794815	1135	0,017937	-0,02001093
Mar 04, 2020,	922,51	0,03427361	1175	0,035242	0,000968676
Mar 05, 2020,	919,69	-0,0030569	1150	-0,02128	-0,01821971
Mar 06, 2020,	887,03	-0,0355119	1085	-0,05652	-0,0210098
Mar 09, 2020,	813,75	-0,0826128	945	-0,12903	-0,04641946
SMGR					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		11600		
Feb 24, 2020,	941,52	-0,0165558	11250	-0,03017	-0,01361666
Feb 25, 2020,	941,68	0,00016991	11200	-0,00444	-0,00461435
Feb 26, 2020,	922,66	-0,020198	11000	-0,01786	0,002340823
Feb 27, 2020,	892,76	-0,0324063	10875	-0,01136	0,021042628
Feb 28, 2020,	879,53	-0,0148192	10475	-0,03678	-0,02196242

Mar 02, 2020,	859,33	-0,0229668	10400	-0,00716	0,01580692
Mar 03, 2020,	891,94	0,03794815	10925	0,050481	0,012532619
Mar 04, 2020,	922,51	0,03427361	11200	0,025172	-0,00910199
Mar 05, 2020,	919,69	-0,0030569	11100	-0,00893	-0,00587169
Mar 06, 2020,	887,03	-0,0355119	10800	-0,02703	0,00848491
Mar 09, 2020,	813,75	-0,0826128	9525	-0,11806	-0,03544276
SRIL					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		220		
Feb 24, 2020,	941,52	-0,0165558	210	-0,04545	-0,02889879
Feb 25, 2020,	941,68	0,00016991	210	0	-0,00016991
Feb 26, 2020,	922,66	-0,020198	202	-0,0381	-0,01789727
Feb 27, 2020,	892,76	-0,0324063	192	-0,0495	-0,01709869
Feb 28, 2020,	879,53	-0,0148192	200	0,041667	0,056485858
Mar 02, 2020,	859,33	-0,0229668	206	0,03	0,052966825
Mar 03, 2020,	891,94	0,03794815	204	-0,00971	-0,04765689
Mar 04, 2020,	922,51	0,03427361	206	0,009804	-0,02446969
Mar 05, 2020,	919,69	-0,0030569	208	0,009709	0,012765624
Mar 06, 2020,	887,03	-0,0355119	200	-0,03846	-0,0029496
Mar 09, 2020,	813,75	-0,0826128	187	-0,065	0,017612794
TBIG					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1160		
Feb 24, 2020,	941,52	-0,0165558	1180	0,017241	0,033797131
Feb 25, 2020,	941,68	0,00016991	1195	0,012712	0,012541955
Feb 26, 2020,	922,66	-0,020198	1195	0	0,020197965
Feb 27, 2020,	892,76	-0,0324063	1160	-0,02929	0,003117561
Feb 28, 2020,	879,53	-0,0148192	1105	-0,04741	-0,0325946
Mar 02, 2020,	859,33	-0,0229668	1060	-0,04072	-0,01775716
Mar 03, 2020,	891,94	0,03794815	1085	0,023585	-0,01436325
Mar 04, 2020,	922,51	0,03427361	1110	0,023041	-0,01123214
Mar 05, 2020,	919,69	-0,0030569	1110	0	0,003056886
Mar 06, 2020,	887,03	-0,0355119	1085	-0,02252	0,012989414
Mar 09, 2020,	813,75	-0,0826128	1005	-0,07373	0,008880075
TKIM					

Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		7800		
Feb 24, 2020,	941,52	-0,0165558	7325	-0,0609	-0,04434168
Feb 25, 2020,	941,68	0,00016991	7425	0,013652	0,013481968
Feb 26, 2020,	922,66	-0,020198	6775	-0,08754	-0,06734412
Feb 27, 2020,	892,76	-0,0324063	6400	-0,05535	-0,02294429
Feb 28, 2020,	879,53	-0,0148192	6000	-0,0625	-0,04768081
Mar 02, 2020,	859,33	-0,0229668	5850	-0,025	-0,00203318
Mar 03, 2020,	891,94	0,03794815	6725	0,149573	0,111624499
Mar 04, 2020,	922,51	0,03427361	7450	0,107807	0,073533077
Mar 05, 2020,	919,69	-0,0030569	7600	0,020134	0,023191114
Mar 06, 2020,	887,03	-0,0355119	7300	-0,03947	-0,00396175
Mar 09, 2020,	813,75	-0,0826128	6400	-0,12329	-0,04067488
TLKM					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		3690		
Feb 24, 2020,	941,52	-0,0165558	3640	-0,01355	0,003005616
Feb 25, 2020,	941,68	0,00016991	3590	-0,01374	-0,01390617
Feb 26, 2020,	922,66	-0,020198	3510	-0,02228	-0,00208616
Feb 27, 2020,	892,76	-0,0324063	3470	-0,0114	0,021010253
Feb 28, 2020,	879,53	-0,0148192	3490	0,005764	0,02058288
Mar 02, 2020,	859,33	-0,0229668	3440	-0,01433	0,008640177
Mar 03, 2020,	891,94	0,03794815	3620	0,052326	0,014377431
Mar 04, 2020,	922,51	0,03427361	3830	0,058011	0,023737435
Mar 05, 2020,	919,69	-0,0030569	3830	0	0,003056886
Mar 06, 2020,	887,03	-0,0355119	3750	-0,02089	0,014624208
Mar 09, 2020,	813,75	-0,0826128	3500	-0,06667	0,015946127
TOWR					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		860		
Feb 24, 2020,	941,52	-0,0165558	865	0,005814	0,022369705
Feb 25, 2020,	941,68	0,00016991	870	0,00578	0,005610438
Feb 26, 2020,	922,66	-0,020198	855	-0,01724	0,002956586
Feb 27, 2020,	892,76	-0,0324063	835	-0,02339	0,009014451
Feb 28, 2020,	879,53	-0,0148192	805	-0,03593	-0,02110895

Mar 02, 2020,	859,33	-0,0229668	805	0	0,022966825
Mar 03, 2020,	891,94	0,03794815	835	0,037267	-0,00068107
Mar 04, 2020,	922,51	0,03427361	855	0,023952	-0,01032152
Mar 05, 2020,	919,69	-0,0030569	860	0,005848	0,008904839
Mar 06, 2020,	887,03	-0,0355119	840	-0,02326	0,012256123
Mar 09, 2020,	813,75	-0,0826128	770	-0,08333	-0,00072054
UNTR					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		18225		
Feb 24, 2020,	941,52	-0,0165558	17900	-0,01783	-0,0012769
Feb 25, 2020,	941,68	0,00016991	18275	0,02095	0,020779811
Feb 26, 2020,	922,66	-0,020198	18000	-0,01505	0,005150086
Feb 27, 2020,	892,76	-0,0324063	17575	-0,02361	0,008795153
Feb 28, 2020,	879,53	-0,0148192	16600	-0,05548	-0,04065734
Mar 02, 2020,	859,33	-0,0229668	16675	0,004518	0,027484897
Mar 03, 2020,	891,94	0,03794815	17650	0,058471	0,020522614
Mar 04, 2020,	922,51	0,03427361	18500	0,048159	0,013885025
Mar 05, 2020,	919,69	-0,0030569	18025	-0,02568	-0,02261879
Mar 06, 2020,	887,03	-0,0355119	17300	-0,04022	-0,00470998
Mar 09, 2020,	813,75	-0,0826128	15800	-0,08671	-0,00409241
UNVR					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		7500		
Feb 24, 2020,	941,52	-0,0165558	7225	-0,03667	-0,02011091
Feb 25, 2020,	941,68	0,00016991	7300	0,010381	0,010210714
Feb 26, 2020,	922,66	-0,020198	7300	0	0,020197965
Feb 27, 2020,	892,76	-0,0324063	7150	-0,02055	0,011858319
Feb 28, 2020,	879,53	-0,0148192	6825	-0,04545	-0,03063535
Mar 02, 2020,	859,33	-0,0229668	6900	0,010989	0,033955836
Mar 03, 2020,	891,94	0,03794815	7125	0,032609	-0,00533946
Mar 04, 2020,	922,51	0,03427361	7425	0,042105	0,007831648
Mar 05, 2020,	919,69	-0,0030569	7400	-0,00337	-0,00031012
Mar 06, 2020,	887,03	-0,0355119	7450	0,006757	0,042268693
Mar 09, 2020,	813,75	-0,0826128	7025	-0,05705	0,025565814
WIKA					

Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		2010		
Feb 24, 2020,	941,52	-0,0165558	1970	-0,0199	-0,00334475
Feb 25, 2020,	941,68	0,00016991	1960	-0,00508	-0,00524605
Feb 26, 2020,	922,66	-0,020198	1905	-0,02806	-0,00786326
Feb 27, 2020,	892,76	-0,0324063	1905	0	0,032406264
Feb 28, 2020,	879,53	-0,0148192	1875	-0,01575	-0,00092884
Mar 02, 2020,	859,33	-0,0229668	1800	-0,04	-0,01703318
Mar 03, 2020,	891,94	0,03794815	1810	0,005556	-0,0323926
Mar 04, 2020,	922,51	0,03427361	1875	0,035912	0,001637987
Mar 05, 2020,	919,69	-0,0030569	1830	-0,024	-0,02094311
Mar 06, 2020,	887,03	-0,0355119	1795	-0,01913	0,016386253
Mar 09, 2020,	813,75	-0,0826128	1480	-0,17549	-0,09287467
WSKT					
Date,	LQ45 Index	E [Ri.t] = Rm.t	CLOSING PRICE PER SHARE	Rit	*RTNi, t = Ri, t - E [Ri, t]*
Feb 21, 2020,	957,37		1150		
Feb 24, 2020,	941,52	-0,0165558	1075	-0,06522	-0,04866164
Feb 25, 2020,	941,68	0,00016991	1080	0,004651	0,004481253
Feb 26, 2020,	922,66	-0,020198	1035	-0,04167	-0,0214687
Feb 27, 2020,	892,76	-0,0324063	1000	-0,03382	-0,00141016
Feb 28, 2020,	879,53	-0,0148192	975	-0,025	-0,01018081
Mar 02, 2020,	859,33	-0,0229668	970	-0,00513	0,01783862
Mar 03, 2020,	891,94	0,03794815	985	0,015464	-0,02248423
Mar 04, 2020,	922,51	0,03427361	1035	0,050761	0,016487807
Mar 05, 2020,	919,69	-0,0030569	1010	-0,02415	-0,0210977
Mar 06, 2020,	887,03	-0,0355119	975	-0,03465	0,000858471
Mar 09, 2020,	813,75	-0,0826128	830	-0,14872	-0,06610515

Appendix 2 Abnormal Return

No.	Code	ABNORMAL RETURN										
		t-5	t-4	t-3	t-2	t-1	t0	t+1	t+2	t+3	t+4	t+5
1	ACES	-0,0124	0,0263	0,0041	0,0160	0,0248	-0,0199	-0,0276	0,0135	-0,0295	0,0187	0,0381
2	ADRO	-0,0025	-0,0002	-0,0070	-0,0356	0,0062	-0,0117	-0,0155	0,0227	-0,0218	0,0227	-0,0467
3	AKRA	-0,0031	-0,0069	-0,0067	-0,0160	-0,0215	-0,0148	-0,0379	-0,0382	0,0031	-0,0078	0,0168
4	ANTM	-0,0049	-0,0367	-0,0253	-0,0152	-0,0268	0,0404	0,0133	-0,0099	0,0031	0,0038	-0,0076
5	ASII	0,0004	0,0203	-0,0079	0,0159	-0,0566	0,0546	-0,0029	-0,0216	0,0156	-0,0265	-0,0319
6	BBCA	0,0030	0,0006	0,0034	0,0122	0,0148	-0,0104	0,0015	-0,0153	0,0023	-0,0010	0,0157
7	BBRI	0,0121	0,0021	0,0158	-0,0457	0,0293	-0,0272	-0,0078	-0,0050	-0,0135	0,0018	0,0178
8	BRPT	-0,0265	-0,0137	-0,0346	-0,0207	0,0199	-0,0176	-0,0168	0,0227	-0,0018	-0,0088	-0,0463
9	BSDE	0,0029	-0,0002	-0,0028	0,0041	-0,0143	-0,0120	0,0501	0,0276	-0,0104	-0,0418	0,0087
10	BTPS	-0,0019	-0,0237	0,0322	-0,0057	-0,0545	-0,0143	0,0201	-0,0003	0,0283	0,0429	0,0068
11	CPIN	-0,0025	-0,0118	-0,0465	0,0240	-0,0191	0,0054	0,0379	0,0321	0,0147	-0,0106	0,0181
12	CTRA	-0,0144	0,0317	-0,0056	0,0112	0,0364	-0,0194	-0,0269	-0,0015	-0,0234	-0,0025	-0,0134
13	ERAA	-0,0480	0,0113	-0,0111	-0,0057	0,0026	0,0044	0,0564	-0,0084	0,0059	0,0020	-0,0099
14	GGRM	0,0036	-0,0011	0,0166	-0,0008	-0,0261	-0,0064	-0,0122	-0,0146	-0,0129	0,0247	-0,0250
15	HMSP	0,0087	-0,0238	-0,0201	0,0016	-0,0025	0,0083	0,0068	-0,0143	0,0031	-0,0037	-0,0107
16	ICBP	0,0234	-0,0047	0,0065	0,0070	-0,0112	0,0108	0,0409	-0,0343	0,0031	0,0355	0,0301
17	INCO	0,0002	-0,0035	-0,0231	-0,0547	-0,0501	0,0434	0,0501	-0,0380	-0,0117	-0,0019	-0,0497
18	INDF	0,0166	0,0033	-0,0075	0,0146	-0,0432	0,0499	0,0295	-0,0273	0,0065	0,0008	-0,0001
19	INKP	-0,0266	0,0326	-0,0115	0,0119	-0,0438	0,0007	0,0666	0,0110	-0,0127	-0,0045	-0,0382
20	INTP	-0,0242	-0,0127	-0,0037	0,0275	-0,0065	0,0012	-0,0756	0,0707	-0,0308	0,0322	-0,0043

133

21	ITMG	0,0236	0,0327	0,0338	0,0212	0,0398	-0,0146	-0,0219	-0,0433	-0,0015	-0,0081	-0,0013
22	JPFA	-0,0027	-0,0198	-0,0066	0,0118	-0,0027	0,0658	-0,0140	-0,0176	0,0031	0,0092	-0,0052
23	JSMR	0,0086	0,0079	-0,0258	0,0387	-0,0102	0,0101	-0,0076	-0,0217	0,0176	0,0048	0,0130
24	KLBF	0,0092	-0,0445	0,0125	0,0052	-0,0092	0,0025	-0,0254	0,0194	0,0462	-0,0359	0,0057
25	LPPF	-0,0324	-0,0274	0,0015	0,0102	0,0343	0,0070	-0,0056	-0,0280	-0,0686	-0,0081	-0,0051
26	MNCN	-0,0425	-0,0039	-0,0391	0,0482	0,0109	0,0307	-0,0302	0,0347	-0,0364	-0,0018	0,0245
27	PGAS	-0,0130	0,0133	0,0169	-0,0412	-0,0610	0,0308	0,0047	0,0252	0,0031	-0,0206	-0,0475
28	PTBA	-0,0083	0,0254	-0,0005	0,0027	-0,0070	0,0051	0,0393	0,0079	-0,0010	0,0314	-0,0153
29	PWON	-0,0443	0,0276	0,0112	0,0142	-0,0037	0,0135	0,0001	-0,0068	-0,0237	0,0080	0,0260
30	SCMA	-0,0194	0,0164	-0,0288	0,0195	-0,0113	0,0185	-0,0200	0,0010	-0,0182	-0,0210	-0,0464
31	SMGR	-0,0136	-0,0046	0,0023	0,0210	-0,0220	0,0158	0,0125	-0,0091	-0,0059	0,0085	-0,0354
32	SRIL	-0,0289	-0,0002	-0,0179	-0,0171	0,0565	0,0530	-0,0477	-0,0245	0,0128	-0,0029	0,0176
33	TBIG	0,0338	0,0125	0,0202	0,0031	-0,0326	-0,0178	-0,0144	-0,0112	0,0031	0,0130	0,0089
34	TKIM	-0,0443	0,0135	-0,0673	-0,0229	-0,0477	-0,0020	0,1116	0,0735	0,0232	-0,0040	-0,0407
35	TLKM	0,0030	-0,0139	-0,0021	0,0210	0,0206	0,0086	0,0144	0,0237	0,0031	0,0146	0,0159
36	TOWR	0,0224	0,0056	0,0030	0,0090	-0,0211	0,0230	-0,0007	-0,0103	0,0089	0,0123	-0,0007
37	UNTR	-0,0013	0,0208	0,0052	0,0088	-0,0407	0,0275	0,0205	0,0139	-0,0226	-0,0047	-0,0041
38	UNVR	-0,0201	0,0102	0,0202	0,0119	-0,0306	0,0340	-0,0053	0,0078	-0,0003	0,0423	0,0256
39	WIKA	-0,0033	-0,0052	-0,0079	0,0324	-0,0009	-0,0170	-0,0324	0,0016	-0,0209	0,0164	-0,0929
40	WSKT	-0,0487	0,0045	-0,0215	-0,0014	-0,0102	0,0178	-0,0225	0,0165	-0,0211	0,0009	-0,0661

Appendix 3. Volume per share

VOLUME												
No	**Kode Saham**	**T-5**	**T-4**	**T-3**	**T-2**	**T-1**	**T-0**	**T+1**	**T+2**	**T+3**	**T+4**	**T+5**
1	ACES	9370900	9023000	12253600	19117200	20747200	20061500	14059400	8613400	8597300	5306100	21716900
2	ADRO	37626300	31970000	38644500	62491000	63533800	41125400	90994700	85031200	63958800	33637700	85414300
3	AKRA	5936800	2812200	5193400	6914300	5628100	4207300	7506900	11182500	10267400	5043200	8659800
4	ANTM	67340700	97963600	93935900	104666900	137409800	117769700	101217900	93281500	53646700	49754200	105445200
5	ASII	34190600	40723200	34453700	44801100	100693900	63765800	53817300	43566600	40537300	31282500	87904100
6	BBCA	16982000	17289300	18564900	25850900	33989300	28974300	22932700	16605000	15516600	15567100	28177900
7	BBRI	102908000	113929600	149197600	207157400	191962700	187659200	198413400	116305200	133588200	159391900	149028700
8	BRPT	37203600	53744400	63769400	47336400	70603100	39157000	61020800	115191800	62317800	49405300	49240300
9	BSDE	16823200	11337400	10536000	14338200	23327400	14023400	14594600	12499400	5595100	8941600	12439000
10	BTPS	6741900	5438300	6763700	9309400	11319300	9654800	10306700	6734400	16232500	13924100	7471200
11	CPIN	4098800	6062200	9996000	6026400	10463800	9557300	9358000	6662800	5925500	5373300	8806100

12	CTRA	10407200	12930800	13348800	9949700	21155300	13570600	5533100	13215900	5447300	7746500	20401800
13	ERAA	19491400	10605800	11102000	9934500	20083300	11637100	21483600	14730700	9784500	10032800	15716000
14	GGRM	749500	864300	2033700	1216800	1393800	1839800	1200300	990400	653500	977800	1702500
15	HMSP	41923600	47663400	83594900	50097400	78234200	50530300	59575000	37626400	28202000	33544500	64983400
16	ICBP	2871700	3213600	4142700	5781400	12019600	6373100	7187600	4640300	6386500	5805700	4459700
17	INCO	5082600	3277800	10357500	16618700	16567700	12477900	18538700	9474100	10288500	6116600	13198500
18	INDF	6967200	6131700	9428000	5442100	13279200	14024800	8924900	8989200	4037100	5741200	10550500
19	INKP	5019700	7104800	7058700	5565300	10308700	9738900	12110200	11096300	6768700	4927000	8792900
20	INTP	1768400	1649500	3438300	1378400	2534800	1624800	3981600	3146000	1676100	1759400	2725400
21	ITMG	1927500	3497200	2552400	3220000	3843400	2510300	2895600	2944300	1200100	2154300	2647400
22	JPFA	13597400	8834300	14145900	20543500	15071200	21223500	10727600	10477200	6249300	2938100	6989600
23	JSMR	4171100	5452200	4633000	5382400	4772200	5167000	5895600	3556800	6140600	5842400	5376600
24	KLBF	21385300	23418400	47271500	39329700	44307700	31720700	34175900	30659400	38274500	25366200	48812000
25	LPPF	3967700	4098300	2987600	13133400	6827800	5864100	2408700	3594200	34784700	17458400	14671000
26	MNCN	34517700	25959300	37417800	34364900	48112900	15911300	41607600	43387800	35569500	43763400	46360500

27	PGAS	51143600	54574200	42886300	80697700	151189200	88138900	90612800	88812700	64954800	56318300	87316700
28	PTBA	17784200	23201800	26455900	26832100	42001000	39002300	30483600	33038400	29850800	18529800	38358000
29	PWON	46693500	36617200	29188200	33206500	58413500	40923600	30440800	37877300	29078900	16555500	56924500
30	SCMA	30997300	19989100	27729600	26279900	54148000	20782000	31229100	37911800	11035000	10943700	47125600
31	SMGR	4493800	2501500	3946400	4957000	7767200	5128300	3641300	6562000	4816000	3818900	4296000
32	SRIL	341780600	117089700	53449200	28622600	112018400	139201800	11578300	18185900	13540200	8943700	18912500
33	TBIG	22341500	10537800	17562100	17222000	23839500	16934900	8208400	28966100	8305100	12620400	22403900
34	TKIM	1464000	1504500	3816300	2457300	3700500	3757200	4235300	3945800	4163800	1789000	2851000
35	TLKM	72610600	73990700	133449900	88389400	151751800	96802900	114698200	136081000	101235000	86476000	109347300
36	TOWR	91610300	68709500	80639300	80444400	91048400	98564100	127074600	118679700	90968300	88758700	62027000
37	UNTR	5410800	3711100	3229400	3341900	10754000	5773400	3573400	5058200	3297800	3360600	6040500
38	UNVR	11614600	14739700	10567900	13251400	34476300	20747600	27945100	16142200	12512400	10982200	21278700
39	WIKA	8697000	11915200	13072100	10712400	14492200	11082600	18019600	18762800	11077900	6329400	26706900
40	WSKT	48552700	26622400	28599200	35471100	51464400	34912500	33639700	57378300	41226000	27791300	43167900

Appendix 4. Listed share

LISTED SHARE												
No	**Kode Saham**	**24/02/2020**	**25/02/2020**	**26/02/2020**	**27/02/2020**	**28/02/2020**	**02/03/2020**	**03/03/2020**	**04/03/2020**	**05/03/2020**	**06/03/2020**	**09/03/2020**
1	ACES	17150000000	17150000000	17150000000	17150000000	17150000000	17150000000	17150000000	17150000000	17150000000	17150000000	17150000000
2	ADRO	31985962000	31985962000	31985962000	31985962000	31985962000	31985962000	31985962000	31985962000	31985962000	31985962000	31985962000
3	AKRA	4014694920	4014694920	4014694920	4014694920	4014694920	4014694920	4014694920	4014694920	4014694920	4014694920	4014694920
4	ANTM	24030764725	24030764725	24030764725	24030764725	24030764725	24030764725	24030764725	24030764725	24030764725	24030764725	24030764725
5	ASII	40483553140	40483553140	40483553140	40483553140	40483553140	40483553140	40483553140	40483553140	40483553140	40483553140	40483553140
6	BBCA	24408459900	24408459900	24408459900	24408459900	24408459900	24408459900	24408459900	24408459900	24408459900	24408459900	24408459900
7	BBRI	122112351900	122112351900	122112351900	122112351900	122112351900	122112351900	122112351900	122112351900	122112351900	122112351900	122112351900
8	BRPT	89016549820	89016549820	89016568820	89016568820	89016568820	89016568820	89016568820	89016609820	89016609820	89016609820	89016609820
9	BSDE	19246696192	19246696192	19246696192	19246696192	19246696192	19246696192	19246696192	19246696192	19246696192	19246696192	19246696192
10	BTPS	7626663000	7626663000	7626663000	7626663000	7626663000	7626663000	7626663000	7626663000	7626663000	7626663000	7626663000
11	CPIN	16398000000	16398000000	16398000000	16398000000	16398000000	16398000000	16398000000	16398000000	16398000000	16398000000	16398000000
12	CTRA	18560303397	18560303397	18560303397	18560303397	18560303397	18560303397	18560303397	18560303397	18560303397	18560303397	18560303397
13	ERAA	3190000000	3190000000	3190000000	3190000000	3190000000	3190000000	3190000000	3190000000	3190000000	3190000000	3190000000

14	GGRM	1924088000	1924088000	1924088000	1924088000	1924088000	1924088000	1924088000	1924088000	1924088000	1924088000	1924088000
15	HMSP	116318076900	116318076900	116318076900	116318076900	116318076900	116318076900	116318076900	116318076900	116318076900	116318076900	116318076900
16	ICBP	11661908000	11661908000	11661908000	11661908000	11661908000	11661908000	11661908000	11661908000	11661908000	11661908000	11661908000
17	INCO	9936338720	9936338720	9936338720	9936338720	9936338720	9936338720	9936338720	9936338720	9936338720	9936338720	9936338720
18	INDF	8780426500	8780426500	8780426500	8780426500	8780426500	8780426500	8780426500	8780426500	8780426500	8780426500	8780426500
19	INKP	5470982941	5470982941	5470982941	5470982941	5470982941	5470982941	5470982941	5470982941	5470982941	5470982941	5470982941
20	INTP	3681231699	3681231699	3681231699	3681231699	3681231699	3681231699	3681231699	3681231699	3681231699	3681231699	3681231699
21	ITMG	1129925000	1129925000	1129925000	1129925000	1129925000	1129925000	1129925000	1129925000	1129925000	1129925000	1129925000
22	JPFA	11726575201	11726575201	11726575201	11726575201	11726575201	11726575201	11726575201	11726575201	11726575201	11726575201	11726575201
23	JSMR	7257871200	7257871200	7257871200	7257871200	7257871200	7257871200	7257871200	7257871200	7257871200	7257871200	7257871200
24	KLBF	46875122110	46875122110	46875122110	46875122110	46875122110	46875122110	46875122110	46875122110	46875122110	46875122110	46875122110
25	LPPF	2804883280	2804883280	2804883280	2804883280	2804883280	2804883280	2804883280	2804883280	2804883280	2804883280	2804883280
26	MNCN	14276103500	14276103500	14276103500	14276103500	14276103500	14276103500	14276103500	14276103500	14276103500	14276103500	14276103500
27	PGAS	24241508196	24241508196	24241508196	24241508196	24241508196	24241508196	24241508196	24241508196	24241508196	24241508196	24241508196
28	PTBA	11520659250	11520659250	11520659250	11520659250	11520659250	11520659250	11520659250	11520659250	11520659250	11520659250	11520659250
29	PWON	48159602400	48159602400	48159602400	48159602400	48159602400	48159602400	48159602400	48159602400	48159602400	48159602400	48159602400
30	SCMA	14774672301	14774672301	14774672301	14774672301	14774672301	14774672301	14774672301	14774672301	14774672301	14774672301	14774672301

31	SMGR	5931520000	5931520000	5931520000	5931520000	5931520000	5931520000	5931520000	5931520000	5931520000	5931520000	5931520000
32	SRIL	20452176844	20452176844	20452176844	20452176844	20452176844	20452176844	20452176844	20452176844	20452176844	20452176844	20452176844
33	TBIG	22656999445	22656999445	22656999445	22656999445	22656999445	22656999445	22656999445	22656999445	22656999445	22656999445	22656999445
34	TKIM	3113223570	3113223570	3113223570	3113223570	3113223570	3113223570	3113223570	3113223570	3113223570	3113223570	3113223570
35	TLKM	99062216600	99062216600	99062216600	99062216600	99062216600	99062216600	99062216600	99062216600	99062216600	99062216600	99062216600
36	TOWR	51014625000	51014625000	51014625000	51014625000	51014625000	51014625000	51014625000	51014625000	51014625000	51014625000	51014625000
37	UNTR	3730135136	3730135136	3730135136	3730135136	3730135136	3730135136	3730135136	3730135136	3730135136	3730135136	3730135136
38	UNVR	38150000000	38150000000	38150000000	38150000000	38150000000	8969951372	38150000000	38150000000	38150000000	38150000000	38150000000
39	WIKA	8969951372	8969951372	8969951372	8969951372	8969951372	51014625000	8969951372	8969951372	8969951372	8969951372	8969951372
40	WSKT	13573951000	13573951000	13573951000	13573951000	13573951000	38150000000	13573951000	13573951000	13573951000	13573951000	13573951000

Appendix 5. Trading Volume Activity

No	Kode Saham	T-5	T-4	T-3	T-2	T-1	T-0	T+1	T+2	T+3	T+4	T+5	TVA AVERAGE BEFORE	TVA AVERAGE AFTER
1	ACES	0,00055	0,00053	0,00071	0,00111	0,00121	0,00117	0,00082	0,00050	0,00050	0,00031	0,00127	0,00082	0,00068
2	ADRO	0,00118	0,00100	0,00121	0,00195	0,00199	0,00129	0,00284	0,00266	0,00200	0,00105	0,00267	0,00146	0,00224
3	AKRA	0,00148	0,00070	0,00129	0,00172	0,00140	0,00105	0,00187	0,00279	0,00256	0,00126	0,00216	0,00132	0,00213
4	ANTM	0,00280	0,00408	0,00391	0,00436	0,00572	0,00490	0,00421	0,00388	0,00223	0,00207	0,00439	0,00417	0,00336
5	ASII	0,00084	0,00101	0,00085	0,00111	0,00249	0,00158	0,00133	0,00108	0,00100	0,00077	0,00217	0,00126	0,00127
6	BBCA	0,00070	0,00071	0,00076	0,00106	0,00139	0,00119	0,00094	0,00068	0,00064	0,00064	0,00115	0,00092	0,00081
7	BBRI	0,00084	0,00093	0,00122	0,00170	0,00157	0,00154	0,00162	0,00095	0,00109	0,00131	0,00122	0,00125	0,00124
8	BRPT	0,00042	0,00060	0,00072	0,00053	0,00079	0,00044	0,00069	0,00129	0,00070	0,00056	0,00055	0,00061	0,00076
9	BSDE	0,00087	0,00059	0,00055	0,00074	0,00121	0,00073	0,00076	0,00065	0,00029	0,00046	0,00065	0,00079	0,00056
10	BTPS	0,00088	0,00071	0,00089	0,00122	0,00148	0,00127	0,00135	0,00088	0,00213	0,00183	0,00098	0,00104	0,00143
11	CPIN	0,00025	0,00037	0,00061	0,00037	0,00064	0,00058	0,00057	0,00041	0,00036	0,00033	0,00054	0,00045	0,00044
12	CTRA	0,00056	0,00070	0,00072	0,00054	0,00114	0,00073	0,00030	0,00071	0,00029	0,00042	0,00110	0,00073	0,00056
13	ERAA	0,00611	0,00332	0,00348	0,00311	0,00630	0,00365	0,00673	0,00462	0,00307	0,00315	0,00493	0,00447	0,00450
14	GGRM	0,00039	0,00045	0,00106	0,00063	0,00072	0,00096	0,00062	0,00051	0,00034	0,00051	0,00088	0,00065	0,00057
15	HMSP	0,00036	0,00041	0,00072	0,00043	0,00067	0,00043	0,00051	0,00032	0,00024	0,00029	0,00056	0,00052	0,00039
16	ICBP	0,00025	0,00028	0,00036	0,00050	0,00103	0,00055	0,00062	0,00040	0,00055	0,00050	0,00038	0,00048	0,00049
17	INCO	0,00051	0,00033	0,00104	0,00167	0,00167	0,00126	0,00187	0,00095	0,00104	0,00062	0,00133	0,00104	0,00116
18	INDF	0,00079	0,00070	0,00107	0,00062	0,00151	0,00160	0,00102	0,00102	0,00046	0,00065	0,00120	0,00094	0,00087
19	INKP	0,00092	0,00130	0,00129	0,00102	0,00188	0,00178	0,00221	0,00203	0,00124	0,00090	0,00161	0,00128	0,00160
20	INTP	0,00048	0,00045	0,00093	0,00037	0,00069	0,00044	0,00108	0,00085	0,00046	0,00048	0,00074	0,00059	0,00072
21	ITMG	0,00171	0,00310	0,00226	0,00285	0,00340	0,00222	0,00256	0,00261	0,00106	0,00191	0,00234	0,00266	0,00210

repository.ub.ac.id
Universitas Brawijaya

22	JPFA	0,00116	0,00075	0,00121	0,00175	0,00129	0,00181	0,00091	0,00089	0,00053	0,00025	0,00060	0,00123	0,00064
23	JSMR	0,00057	0,00075	0,00064	0,00074	0,00066	0,00071	0,00081	0,00049	0,00085	0,00080	0,00074	0,00067	0,00074
24	KLBF	0,00046	0,00050	0,00101	0,00084	0,00095	0,00068	0,00073	0,00065	0,00082	0,00054	0,00104	0,00075	0,00076
25	LPPF	0,00141	0,00146	0,00107	0,00468	0,00243	0,00209	0,00086	0,00128	0,01240	0,00622	0,00523	0,00221	0,00520
26	MNCN	0,00242	0,00182	0,00262	0,00241	0,00337	0,00111	0,00291	0,00304	0,00249	0,00307	0,00325	0,00253	0,00295
27	PGAS	0,00211	0,00225	0,00177	0,00333	0,00624	0,00364	0,00374	0,00366	0,00268	0,00232	0,00360	0,00314	0,00320
28	PTBA	0,00154	0,00201	0,00230	0,00233	0,00365	0,00339	0,00265	0,00287	0,00259	0,00161	0,00333	0,00237	0,00261
29	PWON	0,00097	0,00076	0,00061	0,00069	0,00121	0,00085	0,00063	0,00079	0,00060	0,00034	0,00118	0,00085	0,00071
30	SCMA	0,00210	0,00135	0,00188	0,00178	0,00366	0,00141	0,00211	0,00257	0,00075	0,00074	0,00319	0,00215	0,00187
31	SMGR	0,00076	0,00042	0,00067	0,00084	0,00131	0,00086	0,00061	0,00111	0,00081	0,00064	0,00072	0,00080	0,00078
32	SRIL	0,01671	0,00573	0,00261	0,00140	0,00548	0,00681	0,00057	0,00089	0,00066	0,00044	0,00092	0,00639	0,00070
33	TBIG	0,00099	0,00047	0,00078	0,00076	0,00105	0,00075	0,00036	0,00128	0,00037	0,00056	0,00099	0,00081	0,00071
34	TKIM	0,00047	0,00048	0,00123	0,00079	0,00119	0,00121	0,00136	0,00127	0,00134	0,00057	0,00092	0,00083	0,00109
35	TLKM	0,00073	0,00075	0,00135	0,00089	0,00153	0,00098	0,00116	0,00137	0,00102	0,00087	0,00110	0,00105	0,00111
36	TOWR	0,00180	0,00135	0,00158	0,00158	0,00178	0,00193	0,00249	0,00233	0,00178	0,00174	0,00122	0,00162	0,00191
37	UNTR	0,00145	0,00099	0,00087	0,00090	0,00288	0,00155	0,00096	0,00136	0,00088	0,00090	0,00162	0,00142	0,00114
38	UNVR	0,00030	0,00039	0,00028	0,00035	0,00090	0,00231	0,00073	0,00042	0,00033	0,00029	0,00056	0,00044	0,00047
39	WIKA	0,00097	0,00133	0,00146	0,00119	0,00162	0,00022	0,00201	0,00209	0,00124	0,00071	0,00298	0,00131	0,00180
40	WSKT	0,00358	0,00196	0,00211	0,00261	0,00379	0,00092	0,00248	0,00423	0,00304	0,00205	0,00318	0,00281	0,00299