STOCK PRICE VOLATILITY AND UNUSUAL MARKET ACTIVITY (COMPARATIVE STUDY BETWEEN COMPANIES IN SEVERAL SECTORS DURING COVID-19 PANDEMIC)

Undergraduate Thesis

By

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FACULTY OF ECONOMICS AND BUSINESS

UNIVERSITY OF LAMPUNG

BANDAR LAMPUNG

2021

ABSTRACT

Stock Price Volatility and Unusual Market Activity
(Comparative Study between Companies in Several Sectors During COVID-19 Pandemic)

By :

Vallen Natasa Quardo

In 2020, the whole world was affected by global pandemic called Covid-19. The outbreak and spread of COVID-19 disease across the world had seriously affected people's production and life in general. Economies around the world are presently facing severe challenges due to the COVID-19 outbreak, including the capital market. Since there was an uncertain economic condition during the Covid-19 pandemic, the volatility of the market became really high.

At first, all sectors got badly impacted from the pandemic, however after that, there were some sectors which price increases positively from the pandemic. The purpose of this research is to provide insight for the readers and investors regarding the condition of the capital market during pandemic using an event study with the top 10 companies of each sector in IDX as the sample.

The results found that although IHSG declined and many sectors' stock price declined severely during the pandemic, there are sectors that are resilient and even potential to invest during pandemic. The result also found that there are certain news regarding Covid-19 pandemic that gave a significant impact to the stock market as the results found that a positive abnormal and significant return is found on the day of the first Covid-19 outbreak announcement, a negative and significant abnormal return is found on the day after the first announcement of first PSBB, and also three days after the new normal policy announcement, and a positive and significant abnormal return is also found two days after the first Covid-19 vaccine injection. However there is also news that gave no significant impact to the capital market as well such as the second PSBB announcement in which there is no significant abnormal return found.

Keywords: *Market reaction; Stock Price Volatility; Abnormal Return; Covid-19 pandemic; Nine sectors of IDX; Emerging Markets; Indonesia Stock Market.*

ABSTRAK

Stock Price Volatility and Unusual Market Activity

(Comparative Study between Companies in Several Sectors During COVID-19 Pandemic)

Oleh :

Vallen Natasa Quardo

Pada tahun 2020, seluruh dunia dilanda pandemi global yang disebut dengan Covid-19. Wabah dan penyebaran penyakit COVID-19 di seluruh dunia telah sangat mempengaruhi produktivitas dan kehidupan masyarakat secara umum. Perekonomian di seluruh dunia saat ini menghadapi tantangan berat akibat wabah COVID-19, termasuk pasar modal. Karena kondisi ekonomi yang tidak menentu selama pandemi Covid-19, volatilitas pasar pun menjadi sangat tinggi.

Pada awalnya, semua sektor terkena dampak buruk dari pandemi, namun setelahnya, ada beberapa sektor yang terkena dampak secara positif dari pandemi. Tujuan dari penelitian ini adalah untuk memberikan wawasan kepada pembaca dan investor mengenai kondisi pasar modal selama pandemi dengan menggunakan event study dengan sampel 10 perusahaan teratas dari setiap sektor di BEI.

Hasil penelitian menemukan bahwa meskipun IHSG menurun dan banyak sektor yang terkena dampak parah selama pandemi, ada sektor yang tangguh dan bahkan sangat berpotensi untuk diinvestasikan selama pandemi. Hasil penelitian juga menemukan adanya berita-berita tertentu mengenai pandemi Covid-19 yang memberikan dampak yang signifikan terhadap pasar saham seperti ditemukan hasil bahwa ada abnormal return yang positif dan signifikan pada hari pertama pengumuman wabah Covid-19, abnormal return yang negatif dan signifikan ditemukan pada hari pertama setelah pengumuman PSBB pertama, dan juga tiga hari setelah pengumuman kebijakan new normal, dan abnormal return positif dan signifikan juga ditemukan dua hari setelah injeksi vaksin Covid-19 pertama. Namun ada juga berita yang tidak memberikan dampak signifikan terhadap pasar modal seperti pengumuman PSBB kedua yang mana tidak ditemukan abnormal return yang signifikan.

Kata kunci: *Reaksi pasar; Volatilitas Harga Saham; Abnormal Return; Pandemi covid 19; Sembilan sektor BEI; Emerging Market; Pasar Saham Indonesia*

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As One of The Requirements to Acquire
BACHELOR OF ACCOUNTING

In

Accounting Department
Faculty of Economic and Business University of Lampung

FACULTY OF ECONOMIC AND BUSINESS
UNIVERSITY OF LAMPUNG
BANDAR LAMPUNG
2021

Thesis Title	:	**STOCK PRICE VOLATILITY AND UNUSUAL MARKET ACTIVITY (COMPARATIVE STUDY BETWEEN COMPANIES IN SEVERAL SECTORS DURING COVID-19 PANDEMIC)**
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Hereby declare that the thesis entitled " Stock Price Volatility and Unusual Market Activity (Comparative Study between Companies in Several Sectors During COVID-19 Pandemic)" is truly my own work without taking, replacing, or claiming as mine on the whole or in part of other people's writings in the form of sentences or symbols that show ideas or opinions without giving recognition of the original author. If proven in the future that my statement is not true, then I am ready to receive sanctions in accordance with the applicable regulations.

Bandarlampung, November 11, 2021

Researcher,

Vallen Natasa Quardo

BIOGRAPHY

The researcher was born in Palembang, South Sumatera on May 29th 1999 to a loving family of Mr. Rusdiyanto and Mrs. Ani. The researcher is the last child and has an older brother named Rangga Quardo. The researcher started formal school at TK Immanuel Bandarlampung and finished in 2005. Researcher started elementary school at SD Immanuel Bandarlampung (2005-2011). Researcher continued to junior high school at SMP Xaverius Pahoman Bandarlampung (2011-2014) and senior high school at SMA Xaverius Pahoman Bandarlampung (2014-2017). Throughout senior high school, researcher was actively participating in several English and Dance competitions and was awarded by some trophies in Storytelling competition and also DBL dance competition.

The researcher was enrolled as student in Faculty of Economic and Business of University of Lampung through SNMPTN. The researcher was majoring in Accounting and concentrating on financial accounting and was a student of the International Class. During the study in the university, the researcher also listed as the member of HIMAKTA and Economic's English Club.

The researcher was honored to be appointed as the presidium of EEC as the Secretary of Education in the period 2020 for 1 year. The researcher also actively participating in regional, national, and international program. The researcher was 1st place of some Accounting Competitions like in IBI Darmajaya and University

of Bandarlampung accounting competition, 4th place of National Accounting Competition in Univerity of Bangka Belitung, 2nd place of Translating Competition in IBI Darmajaya, 2nd place of TOEFL Competition in Lampung English Festival, 1st place of TOEFL Competition in TOEFL Fiesta, and also won Best Presentation in International Paper Competition. The researcher was also a part of Short Course Program held in Aoyama Gakuin University in Tokyo, Japan as an exchange student in 2018.

DEDICATION

Alhamdulillahirabbil'alamin

All my gratitude and praises to the almighty Allah SWT for His mercy and blessings so that i can complete this thesis well. Shalawat and greetings are also always praised to our beloved Prophet Muhammad SAW.

With a humble heart and sincerity, I hereby present this thesis to:

My beloved parents, My dad Rusdiyanto and My Mom Ani who have given all the love and affection, support, and endless prayers for my success. Million words cannot express how grateful I am to have Papi and Mami caring, raising, and educating me tirelessly. May Allah protect you in this world and the hereafter, and May Allah give me the chance to make you happy and proud, Aamiin.

My beloved brother, Rangga Quardo who always give his endless support through my hard time, even if we're far apart however he still care for me and always defend me. I am always grateful to have you as my sibling and hopefully you will always be happy and successful.

All my big family, besties, and friends who always encourage and support me through everything. Thank you for being by my side.

My alma mater, University of Lampung

MOTTO

"*Love the life you live. Live the life you love.*"

Bob Marley

"What we should really fear is not failure but the heart that is no longer brave enough to take risks and embrace challenges."

GDragon

"*You only live once, but if you do it right, once is enough.*"

Mae West

SANWACANA

Bismillahirrahmanirrahim,

Alhamdulillah, all gratitude and praises to the almighty Allah SWT for His mercy and blessings so that the researcher can complete this thesis titled "Stock Price Volatility and Unusual Market Activity (Comparative Study between Companies in Several Sectors During COVID-19 Pandemic)" as one of the requirements to acquire Bachelor of Accounting in Faculty of Economic and Business, University of Lampung.

In writing her undergraduate thesis, the researcher recognize that this achievement could not be done by only herself, yet also supported by a lot of important people who have provided guidance, support and assistance during the preparation and completion of this thesis. Therefore, the researcher would like to express her sincere gratitude to:

1. Mr. Dr. Nairobi, S.E., M.Si. as Dean of Faculty of Economic and Business University of Lampung.
2. Mrs. Prof. Dr. Lindrianasari, S.E., M. Si., Akt. CA. as Head of Accounting Department Faculty of Economic and Business University of Lampung
3. Mrs. Dr. Reni Oktavia, S.E., M.Si., Akt. as Secretary of Accounting Department Faculty of Economic and Business University of Lampung, and also as first advisor who has provided and dedicated her time, advices, valuable knowledge, and a lot of patience to help and support the researcher in the process of completing this thesis

4. Mrs. Dewi Sukmasari , S.E., M.S.A., CA., Akt. as the second advisor who always helped the researcher to ease any confusion, motivated and support the researcher with her amazing knowledge and experience in the process of completing this thesis.
5. Mr. Dr. Fitra Dharma, S.E., M.Si. as Main Examiner of this thesis who has given his time, insights, criticism and suggestions to the researcher in completing this thesis so this thesis can be better with his wonderful insights through the process.
6. Mr. Drs A. Zubaidi Indra, M.M.CA.,CPA as academic supervisor who have been helping and giving the support to the researcher through the study process of the researcher in the university.
7. All lecturers and staffs of Faculty of Economic and Business University of Lampung who always provide knowledge, assistance, and direction to the researchers.
8. My beloved parents, Mr. Rusdiyanto and Mrs. Ani. Thank you for all the hard work while raising me, always taking care of me, loving me, and accompanying my steps with endless prayers. I will always love you and grateful to have great parents like you.
9. My brother, Rangga Quardo. Thank you for always giving me the support, thank you so much for your affection and care for me all this time, and also thank you for not pressuring me through the hard time and always defending me all this time. I'm really grateful to have such a great brother like you.
10. A special dedication and thanks for my beloved friends, Andika Ade Setiawan and Febryani Syahlim who unfortunately can not be here with me anymore.

Thank you so much for being part of my college life since the start of my college journey. Febry, the one who always accompanied me since we first became new student in FEB UNILA, the one who always sat beside me everytime, someone who is smart, beautiful, and hardworking and always help me in my college journey. Thank you so much for everything feb, we have so many memories together and I miss you so much.

Dika, my friend in EEC since we're newbie, I still remember what a great, kind, and friendly person you are. Someone who always liven up the mood, the one who is fun to be with, someone with a great passion in debating and making EEC to be better. Thank you so much for becoming part of my life since we are newbie, in international class, and even presidium in EEC. I miss you so much dik.

11. My Keluarga Bahagia group, Febry, Karin, Novi, Nuriel, Refi, Rifdah, Samuel, Shinta and Umi, thank you so much for being part of my college journey since the start. We've been through many things together, and sometimes falling apart due to many things, however we are always there for each other and support each other so much, I'm super grateful to have you guys as my friends during my four years journey in college.
12. My Gossip International Squad, Intan, Karin, Tata and Shinta, thank you so much for being there with me all the time, although we only meet and become close during our time in international class, however you guys become my close friends even until now and the one i go to everytime i need someone. I hope we will still be friends even after this.

13. My beloved EEC Presidium Members! Nanda, Ami, Tika, Redho, Vicki, Ardian, Renja, Dika, Bela, Shinta, Rully, Kevin, Intan, Arpan, Gusti, Zetta, Octa and Olin. I love you guys so so much. Thank you for being with me and always making me happy when i had a hard time. Thank you for always becoming a home for me, i appreciate it so much. I really hope for your success, your happiness, and please keep surviving and live long because i know we can do it together. See you on top!
14. The one who always accompany me whenever and wherever, Nanda and Vicki, i can't count how many times you guys accompany me when i'm working on my thesis, thank you for always be there for me and accept my invitation everytime i feel bored and frustrated, you guys are my number one to-go friends.
15. My AccounTeam, Redho and Febry. I can't express how much i love you guys! Thank you so much for asking me to join you guys in accounting and many other competitions, without you asking me i will never travelling to many places, exploring and experiencing many new things. I'm glad to have you guys as my team and made a lot of memories together.
16. Suratno squad, my japan explorer friends, Kak Almas, Kak Sisca, Kak Sirli, Intan, Karin, Tata and Shinta. Thank you for the memories in Japan, those fun two weeks that i will always remember. Especially to kakak-kakak who always help us during our thesis phases, giving us advices and other things.
17. The newbies, boards, experts, and demisioners of EEC. Thank you for being a part of my journey in college life. EEC has been a place for me to grow and

learn a lot, and for sure gaining a lot of good friends and experience. I'm really grateful for joining EEC and meet a lot of good people like you.

18. S1 Accounting 2017 friends who cannot be mentioned one by one. Thank you for the informations, help, cooperation, and support during the college life. I hope we all can meet in another time with a better version of ourselves
19. KKN Ulu Semong friends Kak G, Ojan, Asa, Nabillah, Julia and Eva. Thank you for amazing and fun 40 days in a really remoted village. Although there is nothing much we can do, but everything is fun with you guys.
20. All people as part of my journey whom I always be grateful for.

May Allah SWT repay all the kindness that has been given to the researcher and hopefully this thesis can be useful for many parties.

Bandarlampung, November 11th, 2021
Researcher,

Vallen Natasa Quardo

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I. INTRODUCTION

1.1 Background

The stock trading at Indonesia Stock Exchange (IDX) for 2020 was opened by the President of the Republic of Indonesia, Joko Widodo with great optimism that it will develop even further in this year, keep being clean and stay away from manipulative practices like stock price manipulation. It was expected to show great development, even though there are some concerns about the circulating news regarding "Fried stocks" or stocks with high volatility without great fundamental or sufficient information. Responding to that matter, Director of Transaction Supervision and Compliance, Kristian S. already took actions regarding the issue about fried stocks, giving a respond saying that IDX already made efforts to do socialization to carry out an orderly, fair and efficient stock trading in IDX, and also said that IDX will always do appropriate action to solve the problem, which is done by doing supervisory actions such as Unusual Market Activity announcements (UMA) that can be monitored by accessing the IDX website.

However despite the anticipation of "fried stocks" cases that disrupt the stock market, a more serious problem which affects not only the stock market, but also the whole world appeared. On March 2nd, the first case of Covid-19 happened in Indonesia. COVID-19 pandemic is not the only reason, even in the beginning of the year, the global economic condition had been weakened by the news of the possibility of World War III and the worsen condition of trading competition between China and United States. In addition, Covid-19 pandemic made many

countries had to restrict their daily and economic activities, affecting the whole export-import that resulted to negative impact on the business condition. The Jakarta Composite Index (IHSG) finally reached the lowest on March 24th 2020 by Rp3,937.63 from Rp6,283.58 on January 2nd 2020. This decrease was also experienced by all major stock exchanges in the world, and Indonesia experienced the second highest decline in ASEAN exchanges after Thailand. The decline is understandable, since the fear of corona virus prevented people from going outside and doing their daily activity, so the economic activities decreased greatly.

Covid-19 pandemic made everything can not run as usual, people will avoid to go out and buy things, and the purchasing power and the demand for goods will fall. Other than that, because the economy is getting worse, companies are forced to dismiss many of their workers to save the company, and it makes the unemployment rate increases quite drastically. Minister of National Development Planning, stated that in in Indonesia the number of unemployed people has increased by 3.7 million people due to the pandemic. Even, according to (BKPM, 2020) in the second quarter of 2020, the realization of investment in Indonesia experienced quite heavy pressure. The number decreased by 4.3% compared to the same period the previous year. Even when being compared to the first quarter of 2020, the decline reached 8.9%. Many investors withdrew their investment and choose not to invest in this uncertain economic situation, which only make it worse and even harder for the stock market condition and also company.

There are a lot of sectors that can not do their usual business due to the pandemic, for example like the tourism sector and transportation sector. The tourism sector loses their customers, since there is nobody who wanted to go when

the virus are out there, ready to infect them anytime. The same thing also happened to the transportation sector, since nobody want to go out, and the government also prohibit people to travel so the virus infection can be stopped. Many transportations like trains, airplanes, and even buses companies had to limit or even close their operation for some moment. This thing, for sure, affects their income, and also their contribution for the national economics.

However, the good thing is that not all sectors are affected badly by this pandemic situation. In fact, there are some sectors that get an enormous benefits from this situation. For example, the pharmacy sector. Since this pandemics affected the health, everyone went to buy vitamins, masks, hand sanitizers, and others things that will help them to prevent the virus. The demand is so high, meanwhile the supply can not fulfill it, thus the price became really expensive and it made them gain a lot of profits. So it is not surprising to see so many pharmacy companies' stocks price are getting so high, until it was considered abnormal by IDX. Three pharmacy companies' stocks had been increasing too high until IDX have to announce Unusual Market Activity for them (IDX, 2020). Other than pharmacy, telecommunication is also gaining a lot of profits from this situation, because everything is shifted into online-based, so people really need the internet. The demand for data plan will surely be high, so it is not surprising to see the stocks price for telecommunication companies are increasing drastically, like for example, PT Smartfren Telecom Tbk (FREN)'s stock price skyrocketed by 116% to Rp 108 per share. Not only that, other companies like PT XL Axiata Tbk (EXCL) experienced increase up to 81,56%, or PT Indosat Tbk (ISAT) increases 75,83% along this period and more other telecommunication companies also experienced

the same thing.

Figure 1.1 Sectors that are potential to win or lose in the short term
Source: dcodeefc.com/infographics

As you can see in the picture above, Dcode Economic & Financial Consulting published infographics regarding the sectors condition during the COVID-19 pandemic. The picture above explains that not all sectors are losing in this pandemic. Although the economy is getting weaker, but there are several sectors that are potential to win, and boost the economic condition. Like for example the Medical and Healthcare sector, E-commerce, Telecommunication sector, Agriculture sector, etc. Meanwhile, there are also some sectors that will be affected negatively in this condition. Like for example the Tourism sector, the Transportation sector, Property sector, Manufacture sector etc. There is even a probability that the sector might not be affected too much and stayed in between, like what it can be seen in the picture, Oil and Gas sector is placed in the middle of both.

It is interesting to see how the market of each sector reacts. The market activity and volatility might be various between all sectors, but the pandemic situation will surely make it become more volatile. Any kind of news might affect stock prices either positively or negatively. According to (Anas & Nugroho, 2017), unpredictable economic conditions push the stock price volatility issue become important among investors. So it's really important for the investors to pay attention to this volatility issue in this pandemic situation, where the economic condition is uncertain and unpredictable. Volatility is an indicator of the uncertainty of investing in stocks. According to (Zainudin et al., 2018) Stock price volatility is used to define the risk of a common stock, whereby, the greater the volatility of a common stock, the greater its risk. Understanding stock price volatility is really important for the investors, especially in determining their investments since stock price volatility can show the risk of a stock. The higher the level of volatility, the higher the level of uncertainty of the stock returns that can be obtained (Handayani & Suartana, 2015).

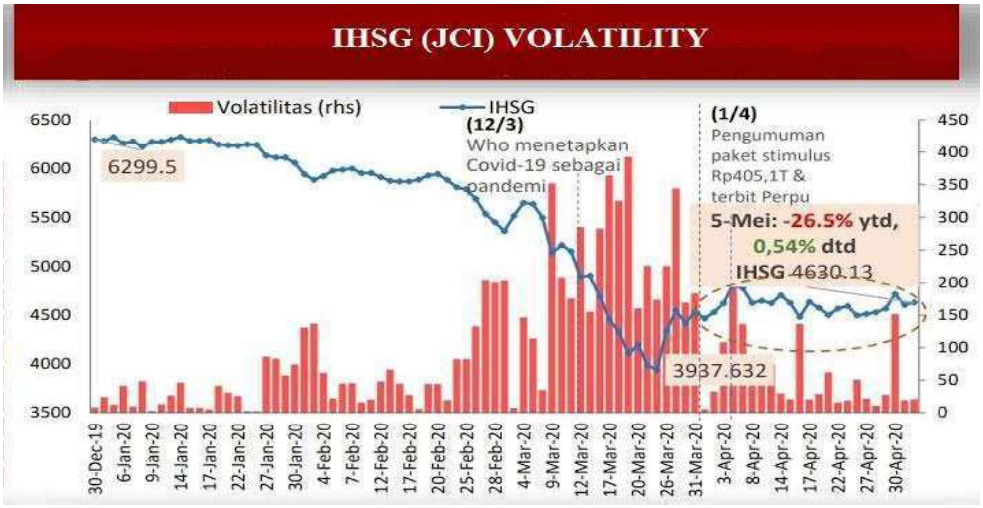


Figure 1.2 Jakarta Composite Index (IHSG)'s Volatility
Source : Marketbisnis.com

Research done by (Choi, 2020) reveal that EPU (Economic Policy Uncertainty) in terms of COVID-19 has influenced the sector volatility more than the global financial crisis (GFC) for all sectors. It can be seen from the figure above that JCI (IHSG) has experienced high volatility since the beginning of this year amid the Covid-19 pandemic. Based on Indopremier's data, the index touched its lowest on March 24, 2020. At that time, the JCI closed at 3,937.63 or corrected 37.49% compared to the end of the year. Meanwhile, the highest level occurred on January 14, 2020 at the level of 6,325.41 or strengthened 0.41% from the end of the year. During this first semester, the property sector experienced the most significant decline in the property sector at 36.09% at 322.04 level. This was followed by the agricultural sector, which fell 32.6% at the level of 1,027.52 and the miscellaneous industry sector which fell to 29.15% at the level of 867.12. Meanwhile, the stock sector with the lowest decline during the first semester was experienced by the consumer sector by 12.26% at the level of 1,800.9. This was followed by the manufacturing sector, which fell 19.62% at the level of 1,174 and the mining sector, which fell 20.97% at the level of 1,223.95. An investment manager from England, Eastspring Investments Indonesia, estimates that stock market volatility will still be high, especially in the short term. This is due to the uncertainty of economic condition and also the regulation made by government that might affect the market situation. Thus, stocks that have high volitality might have the probability to have abnormal return. Abnormal return is the difference between the actual and expected return. A high abnormal return that exceeds the price standard regulation will make the stock indicated in unusual market activity (UMA).

According to Indonesia Stock Exchange (IDX), Unusual Market Activity (UMA) is a trade activities and / or price movements of an unusual effect on a certain period of time which, according to the assessment on the Stock Exchange could potentially disrupt the holding of regular stock trading, fair and efficient. UMA is usually indicated by a high or low return that are considered abnormal, and the cause of this high or low drastic change in return is not apparent. From year to year, IDX uses UMA announcements as the way to supervise and control the stock market, in which if they assess that there are some unusual activity or abnormal return in a stock price, they will publish announcement to warn investors and also ask clarification from the company, so the investors can see and find out what causes the abnormal return, and reconsider their investment. It's important to see what factors causes the abnormal return or unusual market activity of a stock, if there's no a relevant and appropriate action, news, or informations that might spike the abnormality of the stock, then the investors must be cautious since stock price manipulation might be done, or that the stock can be a "fried stock". However, during Covid-19 pandemic where there are many uncertain economic condition, there are a lot of factors which might cause abnormal return and it can lead to a stock considered to be involved in Unusual Market Activity (UMA).

Stock price volatility, and Unusual Market Activity indicated by abnormal return are important for investors to pay attention to, especially during uncertain and unpredictable economic condition right now due to COVID-19 pandemic. It's really needed to pay attention to the news or information circulating in the market, so the investors can be aware of the current condition, what factors or reasons might affect the volatility, or the abnormality of the return. They have to see what is the

cause of the abnormality or volatility of the stock, and assess if it is still considered acceptable since there are some sectors that are affected easily by news during this pandemic. Since the stocks in each sector in IDX got affected differently by this situation, then it might be interesting to study further, see how the market reacts during Covid-19 pandemic and compare the market reaction of each sector's stocks. There are some events during the pandemic which will be investigated in this research, which are the first Covid-19 outbreak announcement, the first PSBB announcement, the new normal policy announcement, the second PSBB announcement and also the first Covid-19 vaccine injection in Indonesia to see how the stock market in Indonesia react to the news related to Covid-19.

Some researchers had done research regarding stock market reaction to COVID-19, for example (Liu et al., 2020) who conducted research to find short-term impact of the coronavirus outbreak on 21 leading stock market indices in major affected countries including Japan, Korea, Singapore, the USA, Germany, Italy, and the UK. They found out that the stock markets in major fell quickly after the virus outbreak and countries in Asia experienced more negative abnormal returns as compared to other countries. Another similar research had been done by (He et al., 2020) who examined the impact of COVID-19 virus on the stock price across different sectors in Chinese Stock Market. This research found that transportation, mining, electricity & heating, and environment industries have been adversely impacted by the pandemic. Meanwhile, manufacturing, information technology, education and health-care industries have been resilient to the pandemic.

Although there are some research regarding the market reaction during Covid-19 outbreak announcement, however, there is no research yet who analyze

and compare all sectors in Indonesia Stock Exchange and see how the COVID-19 impacts all sectors, regarding the abnormality of the return or the volatility. Therefore, based on the introduction described before, author will do this research with the title "Stock Price Volatility and Unusual Market Activity (Comparative Study between Companies in Several Sectors During COVID-19 Pandemic)"

1.2 Problem Formulation

Based on the background above, the problem formulation for this research is as follows:

1. Is the stock price volatility of the nine sectors in IDX significantly different from one another?
2. How is the market reaction of the sectors regarding the first Covid-19 outbreak announcement?
3. How is the market reaction of the sectors regarding the first PSBB announcement?
4. How is the market reaction of the sectors regarding the new normal policy announcement?
5. How is the market reaction of the sectors regarding the second PSBB announcement?
6. How is the market reaction of the sectors regarding the first vaccine injection in Indonesia?

1.3 Scope of Problem

Based on the background and problem identification explained above, author will limit the scope of problem in the research which will be regarding the stock price volatility and also abnormal return of companies of nine sectors in Indonesia Stock Exchange (IDX) during COVID-19 pandemic.

1.4 Research Objectives

1. To analyze and compare the stock price volatility of all nine sectors in IDX during COVID-19 pandemic.
2. To analyze and compare the abnormal return of all nine sectors in IDX during the announcement of first COVID-19 outbreak.
3. To analyze and compare the abnormal return of all nine sectors in IDX during the first PSBB announcement.
4. To analyze and compare the abnormal return of all nine sectors in IDX during the new normal policy announcement.
5. To analyze and compare the abnormal return of all nine sectors in IDX during the second Large-Scale social restriction implementation announcement.
6. To analyze and compare the abnormal return of all nine sectors in IDX during the first vaccine injection in Indonesia.

1.5 Research Benefits

1. Theoritical Benefit

   The result of this study is expected to add further references to the next research specifically related to stock price volatility, and unusual market activity in term of abnormal return.

2. Practical Benefit

   The result of the study is expected to provide some consideration for government for decision or policy making regarding the regulations in stock market, and also to help investors to understand more about stock price volatility, abnormal return and unusual market activity and help them in deciding their investment in the right sector during COVID-19 pandemic.

II. LITERATURE REVIEW

2.1 Theoritical Basis

2.1.1 Signalling Theory

Signalling theory was proposed by Spence (1973) who explained that the owner of information gives a signal in form of information that reflects the condition of a firm that will be beneficial for the investors. According to Brigham and Houston (2011), signalling theory explains about management's perception regarding the growth of company in the future in which will affect the investor's respond and decision towards the company. Signalling theory explains why companies have the urge to provide financial statement information to external parties. The encouragement from companies to provide information is because there is information asymmetry between the company and outside parties because the company knows more about the company and its future prospects than outsiders (investors and creditors). One way to reduce information asymmetry is by providing signals to outsiders. When the information is announced and all market participants have received the information, market players will first interpret and analyze the information as a good signal (good news) or a bad signal (bad news). If the announcement of this information is a good signal to investors, there will be a change in the trading volume of shares.

According to (Jogiyanto, 2013) information published as an announcement will give signal for the investors in determining investment decision. If the announcement covered positive things, then the market is expected to react by the time the announcement received by the market. In this current economic situation, signal from companies is really important and needed, so the stock price can reflect the realest condition of the company.

Signalling theory shows that asymmetric information problem occurring between companies and investors leads to the risk of adverse selection for investors. To avoid this situation, companies can give positive signals to the market by voluntarily publishing their information (Watts & Zimmerman, 1986). According to this theory, the larger the enterprises are, the greater the asymmetric information problem is. Moreover, businesses with higher profitability will tend to publish more information about their growth prospects in order to provide positive signals to investors, thereby having a positive impact on their stock prices (Inchausti, 1997).

2.1.2 Market Efficiency Theory

Market efficiency theory is a market where the prices of securities reflect all of the available information. According to (Fama, 1970) there are three types of market efficiency based on the form of information, they are:

1. Weak efficient market

   The market is considered to be a weak efficient market if the prices of securities are fully reflected from past information only.

2. Semi-strong efficient market

   The market is considered to be semi-strong efficient market if the prices of securities fully reflect all published information including information

contained in the company's financial reports.

3. Strong efficient market

The market is considered to be strong efficient market if the prices of securities fully reflect all available information, even including information that is not published.

It is really hard for the market to obtain all kind of information, both publish or unpublish information so that the price in the market can trully reflect the real condition. Not only that, but market efficiency will be a lot harder in pandemic situation, where the market and economics are really uncertain and there are so many news circulating and going out of control, so appropriate information regarding the situation of the company and the market are really needed.

2.1.3 Overreaction Hypothesis

Market overreaction is a form of reaction from the capital market or investors who are there who react to an event excessively. The founders of the overreaction hypothesis theory, (De Bondt & Thaler, 1985) stated that a market only uses the latest information related to stocks to project stocks in the future. In this hypothesis it is stated that stocks that increase in price will be assessed as stocks with good performance, and conversely stocks whose prices have decreased are considered to have poor performance. The phenomenon of overreaction is a manifestation of market inefficiency (Susiyanto, 1997). The market reacts too much on an information. This often causes the investors tend to overcharge stock prices for information that market participants consider good and contrarily, market participants tend to undercharge bad information. However, according to (Kusumawardani, 2001), generally the market overreacts more on the bad news

compared to the good news, where it might take some time to see the changes. This phenomenon can be seen clearly during this pandemic, when the first announcement of Covid-19 came to Indonesia, the stock market reacts drastically negative towards the news, which causes most of the stocks fell due to the fear. However, according to (Harjoto et al., 2021) the impact of COVID-19 on equity markets during the rising infection period (pre-April) is different from its impact during the stabilizing period (post-April). The market tends to overreact about COVID-19 and then resettle itself as it learns more about the pandemic.

2.1.4 Stock Volatility

(Jain, 2001) explains that volatility is the standard deviation used to calculate the daily price range for stock trading. (Jogiyanto, 2013) defines volatility as the fluctuation of the returns of a security or portfolio within a certain period. According to (Andersen et al., 2005), volatility means the fluctuations observed over a certain period of time and is the variability of the random time series data component.

Stock price volatility or volatility return is an indicator of an uncertainty or from an investment in stocks. So volatility is a risk in investing in stocks. According to (Handayani & Suartana, 2015), There are several causes of stock volatility, namely new information that comes randomly into the market regarding future stock returns and is due to very large stock transactions. Another factor is that investors do not receive adequate information which causes mispricing, when the information is overreacted by investors.

2.1.4.1 Stock Volatility Type

According to (Schwert, 1992), there are five types of volatility in financial markets, namely :

1. Future Volatility
2. Historical Volatility
3. Forecast Volatility
4. Implied Volatility
5. Seasonal Volatility

Historical volatility is volatility calculated based on past data. (Jain, 2001) explained that historical volatility is a measure stock price movements based on past or historical prices. Historical volatility measures how active the stock price is over a period of time.

Historical volatility is usually measured by taking the percentage change in the daily closing price of a stock and calculating the average over a period of time. This average is then expressed as an annual percentage. Historical volatility is often referred to as realized volatility.

There are three steps to calculate historical volatility, which are :

1. Measures the daily price change in the market, where Rt is the natural logarithm of today's stock price (Pt) and the previous day's stock price (Pt-1). The result of this calculation is in accordance with the percentage of the share price.

$$R_t = LN(\frac{Pt}{Pt-1})$$

2. After calculating the daily price change, the next step is to calculate the average daily price change (Ra) over a certain period (n).

$$R_a = \frac{\Sigma nRt}{n}$$

3. Then, next step is determining the average daily variation in price changes (standard deviation).

$$HV = \sqrt{\frac{\Sigma(Rt-Ra)^2}{n-1}}$$

2.1.5 Unusual Market Activity

Unusual Market Activity is situation where there's unusual trading activity or movement in the market, that has the potential to disrupt the regular, fair and efficient securities trading. Unusual Market Activity happened when there's a sudden drastic increase or decrease in the stock price or trading volume.

Indonesia Stock Exchange (IDX) always monitors the price movement and activity of stock market. Starting in April 2008, the Indonesian Stock Exchange (ISX) has occasionally issued Unusual Market Activity (UMA) announcements, so since then, IDX will immediately publish Unusual Market Activity Announcements (UMA) if a stock has unusual activity indication. However, IDX do not stated the indicators as how a stock can be categorized as UMA stock. When unusual trading events occur, the Exchange can provide early warning to investors and market participants. The purpose of the announcement of the UMA is to warn investors who carry out investment activities about the possibility of unfair trading activities of certain securities and also serves to remind investors to pay attention to the latest developments of listed companies, to be careful and investigate data (IOSCO, 2010). Therefore, UMA has an important role to maintain an orderly, fair and efficient market. Through the publication of UMA announcements, the market should respond to the information content contained in the UMA so that trading activities and / or price movements can return to normal. Therefore, it's really important for investors to pay attention to UMA announcements, since UMA has

an important role as one of the tools used to maintain orderly, fair and efficient trade through early warning mechanisms especially during uncertain economic condition (Mas et al., 2020).

2.1.6 Abnormal Return

According to (Tandelilin, 2010), return is one of the factors that motivates investors to invest and is also a reward for the courage of the investor to take the risk of his investment. Return can be in the form of actual return which is calculated based on historical data and expected return that has not happened yet but which is expected to occur in the future (expected return).

Abnormal return is the difference between a stock's actual return and its expected return. (Husnan, 2015) argues that abnormal return is the difference between the actual rate of profit and the expected rate of return. Meanwhile, according to Hartono (2017) abnormal return or excess return is an excess of return that actually occurs on normal return. Market reaction can be measured using abnormal returns. If the actual return is higher than the expected rate of return, it can be said that there is an abnormal return and a positive difference occurs, but if the opposite happens then there is a negative difference.

According to (Samsul, 2006), abnormal returns can be classified into 4 groups:

1. Abnormal return (AR)

   Abnormal returns occur every day for each type of stock, namely the difference between the actual return and the expected return that is calculated on a daily basis. Because it is calculated on a daily basis, in a window period the highest or lowest abnormal return can be seen, and it can also be seen on what day the strongest reaction occurs in each type of stock.

2. Average Abnormal return (AAR)

   Average abnormal return is the average abnormal return (AR) of all types of stocks that are being analyzed on a daily basis. AAR can show the strongest reaction, both positive and negative, of all types of stocks on certain days during the window period

3. Cummulative Abnormal return (CAR)

   Cummulative Abnormal return is daily cumulative AR from the first day to the following days for each stock type. So the CAR for the period before the event occurred will be compared with the CAR for the period after the event occurred.

4. Cumulative Average Abnormal return (CAAR)

   Cummulative Average Abnormal return is the daily cumulative AAR from the first day to the following days. From this daily CAAR chart, it can be seen that the trend of increase or decrease that occurs during the window period, so that the positive or negative impact of the event on all types of stocks studied can also be known.

2.1.7 Sectoral Index

Sectoral Index in Indonesia Stock Exchange is the sub-index of Jakarta Composite Index (JCI). It's firstly introduced in January 2nd 1996. All firms listed in IDX are clasified into nine sectors based on industry clasification that has been set by IDX, which is called JASICA (Jakarta Industrial Classification).

The nine sectors are :

Primary Sectors (Ekstractive), which consist of :

1. First Sector : Agriculture

2. Second Sector : Mining

Secondary Sectors (Processing industry or manufacture), which consist of :

3. Third Sector : Basic Industry and Chemicals

4. Fourth Sector : Miscillaneous Industry

5. Fifth Sector : Consumer goods industry

Tertiary Sectors (Service Industry or Non-manufacture), which consist of :

6. Sixth Sector : Property, real estate and building construction

7. Seventh Sector : Infrastructure, utilities and transportation

8. Eighth Sector : Finance

9. Ninth Sector : Trade, Service and investment

2.2 Previous Research

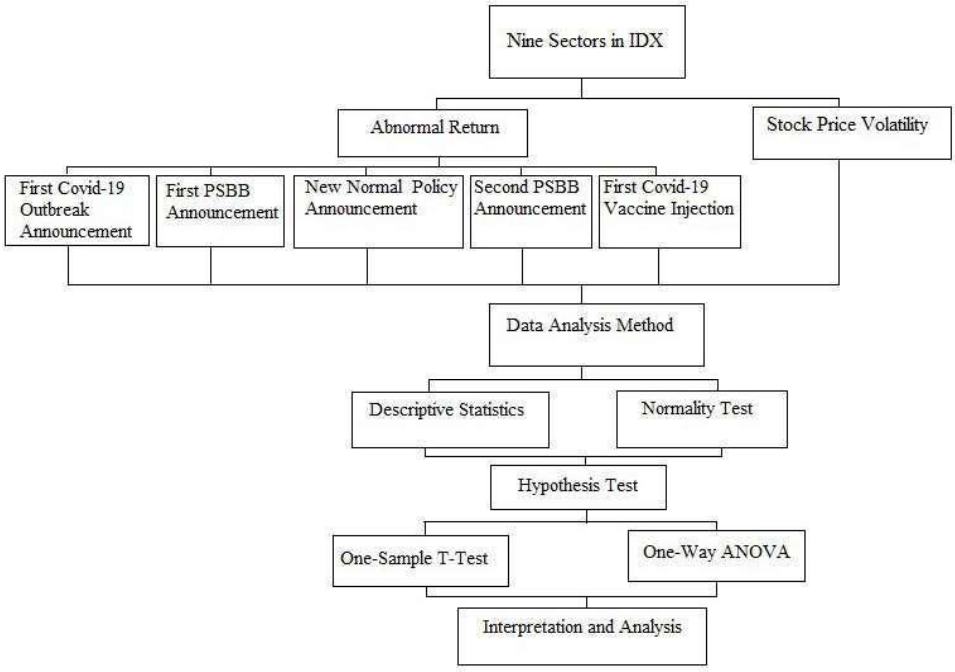
Table 2.1 Previous Research

No	Authors (Year)	Title	Result
1.	(He et al., 2020)	COVID–19's Impact on Stock Prices Across Different Sectors—An Event Study Based on the Chinese Stock Market	The study found that transportation, mining, electricity & heating, and environment industries have been adversely impacted by the pandemic. However, manufacturing, information technology, education and health-care industries have been resilient to the pandemic.
2.	(Liu et al., 2020)	The COVID-19 outbreak and affected countries stock markets response	The results indicate that the stock markets in major affected countries fell quickly, and even the countries in Asia experienced more negative abnormal return compared to other countries after the virus outbreak.
3.	(Ashraf, 2020)	Stock markets' reaction to COVID-19: Cases or fatalities?	The research find that stock markets responded negatively to the growth in COVID-19 confirmed cases. That is, stock market returns declined as the number of confirmed

			cases increased and also find that stock markets reacted more proactively to the growth in number of confirmed cases as compared to the growth in number of deaths
4.	(Choi, 2020)	Industry volatility and economic uncertainty due to the COVID-19 pandemic: Evidence from wavelet coherence analysis	COVID-19 has influenced the sector volatility more than the global financial crisis (GFC) for all sectors. Furthermore, EPU leads the volatility of all sectors during COVID-19 pandemic, while some sector's volatilities lead EPU during the GFC.
5.	(Baek et al., 2020)	COVID-19 and stock market volatility: An industry level analysis	Volatility is affected by specific economic indicators and is sensitive to COVID-19 news. Both negative and positive COVID-19 information is significant, though negative news is more impactful.
6.	(Adriatama & Rahadi, 2021)	Effect Of Governmental Announcement And Decisions During Covid-19 On Indonesian Sectoral Indexes	It is found that the impact of this pandemic differs from one sector to another, the one who suffers loss the most during this pandemic is the agricultural sector, property sector, and the mining sector while the sectors that gained positive abnormal returns during this period includes the basic industry sector, the manufacturing sector, the infrastructure sector, as well as the consumer goods sector.
7.	(Haroon & Rizvi, 2020)	COVID-19: Media coverage and financial markets behavior—A sectoral inquiry	The results for individual economic sectors demonstrate that panic-laden news contributed to a greater extent to volatility in the sectors perceived to be most affected by coronavirus outbreak..
8.	(Herwany et al., 2021)	The Influence of the COVID-19 Pandemic on Stock	Based on the result, the financial property, real estate, and construction sector

		Market Returns in Indonesia Stock Exchange	results show a decreased abnormal return value. The infrastructure, utilities, and transportation sectors also show an abnormal return value that tends to be constant, while the abnormal return value increases in other sectors.

2.3 Framework



2.4 Hypothesis

2.4.1 Stock Price Volatility Across The Sectors

Uncertain and unpredictable economic condition during COVID-19 pandemic might affect the volatility in stock market, since any good or bad news will be received and reacted by the market and investors. However according to (Amonlirdviman & Carvalho, 2010) a stronger reaction to negative shocks leads to an asymmetric price volatility that reduces the benefits of diversification. According to (Chaudhary et al., 2020), researchers have suggested that the

volatility of stock market returns is highly related to uncertainty in the market and hence is the key parameter in most investment decisions/portfolio management decisions. During Covid-19 pandemic, the uncertainty in the economic and market is really high. Moreover, there are nine sectors in sectoral index IDX, and all of them are affected negatively by the COVID-19 pandemic outbreaks when it first happened, as it can be seen from the drastic decline in the JCI (Jakarta Composite Index). However, after some time, the sectors impact were differently, some were getting beneficial from the COVID-19 pandemic, such as telecommunication companies or pharmacy companies, and some stock price became negative from the pandemic, such as service or travel companies. The uncertainty of the condition also made the stocks became really volatile, and there are many factors that can affect the volatility, both from interal or external. The uncertainty of economics and different effect of Covid-19 in some sectors made the sectors volatility differ from each other. Thus, based on that, the author conclude the following hypothesis:

H1 : The stock price volatility of the sectors is significantly different from each other.

2.4.2 Abnormal Return during First Covid-19 Outbreak Announcement

The volatility in the stocks during the COVID-19 will surely make the occurance of abnormal return. Abnormal return usually occurs when there is a good or bad news that will affect the stock, however the news about COVID-19 pandemic will surely affect the stocks negatively. The negative impact of Covid-19 on the stock market do not appeared only in US, but stock markets in Europe and Asia had also plummeted. FTSE dropped more than 10% on 12 March, and Japan stock market

had plummeted more than 20% from its highest position (Zhang et al., 2020) . In Indonesia, the effect can also be seen from the declining of our JCI (IHSG). Since the first COVID-19 case in Indonesia is publicly announced, a lot of business activities need to be halted and/or limited. The limitations of business activities make businesses suffering from losses. This continues to the declining of the economy. This condition is affecting the investors' behavior on IDX (Dian & Krisnawati, 2021). The impact of the Covid-19 outbreak announcement might reflect negatively on the stock market, which can be seen from the appearance in negative abnormal return. Thus, based on that, the author will conclude the following hypothesis :

H2 : There is a negative and significant abnormal return among the sectors during the announcement of the first Covid-19 case in Indonesia.

2.4.3 Abnormal Return during First PSBB Announcement

The capital market is very sensitive to events that occur in a country. Almost anything or events that occur can affect the capital market (Mailangkay et al., 2021). During Covid-19 pandemic, there are a lot of things that affect the capital market. In April 2020, the increasing number of cases in Indonesia made the government had to do Large-Scale Social Restriction or PSBB. The implementation of PSBB restrict so many economics activity, and thus affect the economic condition to become worse. This of course also has an impact on the company which is reflected in the decline in stock prices. Investors tend to withdraw their investments, because there is fear in investing. This condition reflects the uncertainty and financial instability of the company will also occur (Larasati et al., 2021). The worsening economic condition will surely impact the

stock market as well, and with the implementation of PSBB, investors are expected to accept the negative news and reflect them to a negative and significant abnormal return during the announcement of first PSBB. Thus, based on that the author conclude the following hypothesis :

H3 : There is a negative and significant abnormal return among the sectors during the announcement of First PSBB.

2.4.4 Abnormal Return during New Normal Policy Announcement

The limitation of people's activities affects Indonesia's economy, as evidenced by the contraction of Indonesia's Gross Domestic Product (GDP) in the second quarter of 2020 by 5.32%. The economic weakened from the pandemic and also the Large-Scale-Social Restriction regulation. The situation can not continue, thus with the weakening of the Indonesian economy, Indonesian President Joko Widodo, on May 15th, 2020, in a press statement regarding the new normal in Indonesia, said that people could return to their activities by requiring strict health protocols. The government hopes that implementing the new standard can encourage Indonesia's economy to weaken due to the COVID-19 pandemic and hope for the investors to respond positively to this announcement, even for a short term (Aqila Muthaharia & Yunita, 2021). New Normal Policy is expected to be able to make the market positive again, since the business operation can gradually be back to normal again. Investors might react positively to this news and reflected it to the stock price of the capital market. Thus, based on that, the author will conclude the following hypothesis :

H4 : There is a positive and significant abnormal return among the sectors during the announcement of New Normal policy.

2.4.5 Abnormal Return during Second PSBB Announcement

Pandemics can be described as a large-scale out-break of infectious disease with potential of increasing mortality rate everywhere around the affected area as well as causing economic, social, and political disruptions (Aqila Muthaharia & Yunita, 2021). Policies such as work-from-home policy may bear heavy implications to companies themselves as well as their employees, which ultimately translates to the whole economy itself. Due to the increase of positive Covid-19 cases, the government have to implement the second Large-Scale-Social-Restriction in Indonesia, and this time in a bigger scale than before. Since the issue of the implementation of second PSBB, various parties have begun to worry about the economic impact it could cause. This is because in the previous PSBB various economic activities were disrupted, even stopped (Syahadati et al., 2021). The implementation of PSBB is a signal that the condition is getting worse, and thus the bad news is expected to be reflected negatively in the stock market. The announcement of second PSBB might make the stock market decline and thus experienced a negative abnormal return from the announcement. Thus, based on that the author will conclude the following hypothesis :

H5 : There is a negative and significant abnormal return among the sectors during the announcement of the second Indonesia large-scale social restriction (PSBB).

2.4.6 Abnormal Return during First Covid-19 Vaccine Injection

The COVID-19 virus pandemic is a corona virus that is currently being faced by the world. Information or news related to the COVID-19 pandemic that can cause a reaction in the capital market in Indonesia (Alifah and Yunita, 2021). The discovery of the Covid-19 vaccine is surely a good news expected by everyone,

since the vaccine will give hope that the pandemic will be over. Even since the news that reportedly has been circulating that vaccines and drugs have been found to overcome the corona virus can trigger a fairly high stock price increase from the health sector, one of which is pharmaceutical stocks (Lathifah et al., 2021). Since there are many sentiment and skepticism about Covid-19 vaccine in Indonesia, the president of Indonesia, Mr. Joko Widodo willingly volunteer himself to be the first one getting injected by the Vaccine, to give an example and be a leading role so everyone will be willing to be vaccinated as well. The first vaccine injection to Mr. Joko Widodo was shown nationally and was discussed a lot. The stock market usually reacts to any kind of news related to Covid-19, thus the first vaccine injection is expected to reflect positively on the stock market. Based on that, the author will conclude the following hypothesis :

H6 : There is a positive and significant abnormal return among the sectors during the announcement of the first vaccine injection.

III. METHODOLOGY

3.1 Research Object and Type of Research

The object of research is basically a variable or what is going to be the point of attention of a study to get answers or a solution to the problem that occurred. The object of this research is the stock volatility and unusual market activity that is calculated using abnormal return in the nine sectors of IDX during COVID-19 pandemic.

To find out about the abnormal return and stock price volatility, event study will be used in the research. An event study is an empirical analysis that examines the impact of a certain event on the value of a security, such as company stock. Event studies can reveal important information about how a stock is likely to react to a given event. The event study will use the event window of eleven months for the stock price volatility, starting from the month of the first Covid-19 outbreak which is March 2020, until January 2021 which is the month for the last event researched in this research. Meanwhile, for the abnormal return for each event, the event window that will be used is seven days period which means it includes three days before the event, the day of the event, and three days after the event. Seven days period is used because according to Ryngaert and Netter (1990) in (Schwert, 1992), a short event window will be able to catch the significant effect of the event. Meanwhile, the longer the window period then it will be harder to catch the significancy of the event.

The events used in this research is the announcement of first Covid-19 outbreak on March 2, 2020, The first PSBB announcement on April 7th 2020, the announcement of New Normal policy on May 15, 2020, the announcement of Second PSBB on September 9, 2020 and the last is the first vaccine injection held in Indonesia on January 13, 2020.

After finding out the stock price volatility and abnormal return, then comparative research will be used to compare and analyze how different each sector reacts. Comparative research is research that compares the presence of one or more variables in two or more different samples or at different times (Sugiyono, 2006). The method of this research is descriptive comparative research with the purpose to know the comparison regarding stock volatility and unusual market activity in term of abnormal return between all of the nine sectors IDX. Descriptive comparative compares the same variables for different samples. Furthermore, according to (Hasan, 2002) comparative analysis is a statistical procedure to test the difference between two groups of data (variables) or more. This test depends on the type of data and the sample group being tested. The comparison between two independent samples is that these samples are strictly separated from each other where one sample member is not a member of the other sample.

3.2 Research Data

The data source that is used in this research is secondary data. Secondary data are data collected by researchers published in statistical and other journals, as well as information available from sources of publication or non-publication both inside and outside the organization that can be useful for researches (Sekaran & R. Bougie, 2011).

The secondary data will be taken from the official Indonesia Stock Exchange website, idx.co.id. also from yahoo finance to see the trading activity of the sectors.

3.3 Research Population and Sample

Population is a generalization area that consists of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions (Sugiyono, 2006). The population used in this study is all companies listed in Indonesia Stock Exchange. Whereas, Sample is part of the number and characteristics possessed by the population (Sugiyono, 2006). The sampling in this study is using a purposive sampling technique in which the researcher chooses samples based on several characteristics that are suitable to the research objectives.

The criteria for selecting samples in this study is:

1. Companies that are listed in IDX before March 1st 2020, and don't delisted along the research period (March 2020 – January 2021)
2. Companies that have the data and information needed for the calculation.
3. Companies that have high market cap in each sector so it can represent other companies in the sector.

   From the criteria above, then the author chooses top ten constituents from each sectors that are listed in the Sectoral Index and IDX based on IDX Stock Index Handbook 2019. The samples chosen were companies with the top ten highest market cap and index weight that are expected to be able to represent all other companies in the same sectors. The total sample for the research is 90 companies which are as follows :

Table 3.1 List of Samples

No	**AGRI Sector**	**MINE Sector**	**BIND Sector**	**MISC Sector**	**CONS Sector**	**PROP Sector**	**INFRA Sector**	**FINA Sector**	**TRADE Sector**
1.	AALI	BYAN	TPIA	ASII	UNVR	POLL	TLKM	BBCA	UNTR
2.	SMAR	ADRO	BRPT	SMSM	HMSP	PWON	PGAS	BBRI	DNET
3.	LSIP	INCO	CPIN	SLIS	ICBP	BSDE	TOWR	BMRI	MIKA
4.	SSMS	PTBA	SMGR	UCID	GGRM	MPRO	JSMR	BBNI	AMRT
5.	SIMP	MDKA	INTP	AUTO	KLBF	WSKT	EXCL	SMMA	EMTK
6.	BWPT	ANTM	INKP	SRIL	INDF	CTRA	TCPI	MAYA	ACES
7.	DSNG	MEDC	TKIM	BRAM	MYOR	WIKA	FREN	MEGA	MNCN
8.	SGRO	TINS	FASW	GMFI	MLBI	LPKR	TBIG	BDMN	SCMA
9.	ANJT	ITMG	JPFA	MASA	ULTJ	MKPI	POWR	BNLI	IPTV
10.	MGRO	DSSA	SMCB	ARKA	SIDO	SMRA	ISAT	BTPS	MAPI

3.4 Research Variables

According to (Sugiyono, 2006), research variables are basically anything that is determined by the researcher to study so that information is obtained about it, then conclusions are drawn. The variables for this research are Abnormal return and also Stock Price Volatility.

3.4.1 Abnormal Return

(Jogiyanto, 2013) stated that the expected return can be calculated by three models, namely the Mean Adjusted Model, Market Model, and Market Adjusted Model. This research will use Market Adjusted Model that will use the expected return from the market composite index or IHSG so all stocks will have the same expected Abnormal return that will be calculated through this following formula :

$$ARi,t = Ri,t - E(Ri,t)$$

Information:

ARi, t = abnormal return of stock i on day t.

Ri, t = actual return of stock i in event period t.

E(Ri,t) = i-th expected return in the event period t

3.4.2 Stock Price Volatility

The second research variable is Stock Volatility which will be calculated using historical volatility using following formula:

1. Measures the daily price change in the market, where Rt is the natural logarithm of today's stock price (Pt) and the previous day's stock price (Pt-1). The result of this calculation is in accordance with the percentage of the share price.

$$R_t = LN(\frac{Pt}{Pt-})$$

2. After calculating the daily price change, the next step is to calculate the average daily price change (Ra) over a certain period (n).

$$R_a = \frac{\Sigma nR}{n}$$

3. Then, next step is determining the average daily variation in price changes (standard deviation).

$$HV = \sqrt{\frac{\Sigma(Rt-Ra)^2}{n-1}}$$

3.5 Data Collection Method

The data collection method used in this research is the documentation method. Documentation method is the way of collecting data through written relics such as archives and books regarding opinions, theories or laws related to research problems (Wijaya, 2013). Documentation method is done by collecting secondary data obtained from the website (idx.co.id) and also stock prices in yahoo finance.

3.6 Research Instrument Test

3.6.1 Normality Test

The normality test aims to test whether in the regression model, the disturbing or residual variables have a normal distribution (Ghozali, 2011). This study will use Shapiro Wilk statistical analysis that will be done to test the normality of the data if the data is less than 30, and use Kolmogorov-Smirnov to test the normality of the data is more than 30.

This study uses a significance level of 5%, where if the significance value of the SW/KS value is > 5%, then the data used in the study is normally distributed, whereas if the significance value of the SW value is < 5%, then the data used in the study is not normally distributed (Ghozali, 2011).

3.7 Data Analysis Method

3.7.1 Descriptive Statistic

Descriptive statistics provide a description of data that is seen from the average value (mean), standard deviation, variance, maximum, minimum, sum, range, kurtosis, and skewness (Ghozali, 2011). With descriptive statistics the variables contained in the study will be explained. Using descriptive statictics, the author will explain the stock price volatility and the abnormal return in the nine sectors during the Covid-19 research period and the events involving it.

3.8 Hypothesis Test

3.8.1 T-Test

T-test is a test that measures the difference between two or several means between groups, by testing how the influence of each independent variable individually to the dependent variable. This test is done by comparing t arithmetic with t table, which if t arithmetic <t table then Ho is supported and Ha is not supported (Ghozali, 2011)

3.8.1.1 One-Sample T-Test

One sample t test is an analysis technique to compare one independent variable. This technique is used to test whether a certain value is significantly different from the average of a sample. The author will use one sample t-test to determine whether the sector is significantly different with other sectors, regarding the stock price volatility and whether there is a significant abnormal return or not after the event for the abnormal return variable. One Sample T-Test can be used if the data is normally distributed, if the data is not distributed normally then One Sample Wilcoxon Signed Rank Test will be used as an alternative test.

3.8.2 One-Way Anova

This research will use all nine sectors in IDX as the sample, thus the comparison test used will be One-Way Anova. Anova stands for "analysis of variants". Analysis of Variance is a comparative test used to test the difference in the mean (average) of data for more than two groups. If the P-Value is less than the significance level of 5%, or P-Value < 0.05, then H0 will be rejected, which means that there is a significant comparison or difference between all of the samples. One way Anova will be used to compare all the nine sectors together, to see whether there is a different between the sectors regarding the volatility and the abnormal return or not. If the data is not distributed normally, then One Way Anova cannot be used, so the alternative for this hypothesis test will be Kruskal Wallis test.

V. CONCLUSION AND SUGGESTIONS

5.1 Conclusion

The purpose of this research is to see how the sectors react to several positive and negative events during Covid-19 period. The variables in this research are Stock Price Volatility an Abnormal Return. The sample used in this research is top ten companies from each sectors that is expected to be able to represent the sector as the top ten company hold the largest market cap. According to the results, the author found these following points :

1. According to the hypothesis test, there is a significance difference in term of stock price volatility across the sectors during the research period. In other words, H1 is supported.
2. According to the hypothesis test, there is a significant abnormal return during the day of Covid-19 virus outbreak announcement across the sectors however the abnormal return found is positive, not negative. Thus, H2 is not supported.
3. According to the hypothesis test, there is a significant and negative abnormal return one day after the announcement of second PSBB. Thus, H3 is supported.
4. According to the hypothesis test, there is a significant abnormal return three days after the New Normal Policy announcement, however the significant abnormal return found is negative, not positive. In other words, H4 is not supported.

5. According to the hypothesis test, there is no significant abnormal return during the day of Second PSBB announcement. In other words, H5 is not supported.
6. According to the hypothesis test, there is a positive and significant abnormal return three days after the first vaccine injection. In other words, H6 is supported.

5.2 Research Limitations

There are several limitations in this research, these following are some of the limitations of this study :

1. The sample used in this research is only ten company from each sector, although the samples already weigh most of the sectors composition, a higher number of sample might produce more accurate and diverse data.
2. There are hypothesis test that is done using non-parametic test. Non-parametric statistics sometimes ignore certain information. The results of hypothesis testing with non-parametric statistics are not as sharp as parametric statistics.
3. This research is conducted during the period of COVID-19, when the pandemic is still ongoing, thus not all kind of market reactions due to the Covid-19 pandemic can be seen.
4. This research did not count for any possible confounding bias. This research sees an event as a single individual event that happened at one time, there might be influence from another event that might reflect on the result but is not covered.

5.3 Suggestions

Based on the results of this research, the suggestion that can be given by the author for the next research are as follow:

1. The next researcher can use more sample to the research so more companies will be covered and the result might be vary more.
2. The next researcher can try to investigate more about the factors that might affect the volatility of the sectors since this research doesn't cover that.
3. The next researcher can try to find any bias that might affect the research and find a way to eliminate that so the research will be more accurate.

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