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INDONESIA'S STOCK MARKET LIQUIDITY: THE IMPACT OF COVID-19 PANDEMIC AND SOCIAL DISTANCING

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ABSTRACT

The purpose of this study was to obtain empirical evidence regarding the effects of COVID-19 pandemic on Indonesia's Stock Market Liquidity. COVID-19 was observed with three variables (the growth of the total number of confirmed cases, the growth of the number of deaths, and stringency index). This study incorporated market capital, return of Jakarta Composite Index (JCI), and exchange rates of Rupiah against U.S. Dollar as control variables. The source of data of this research was from IHSG transactions, COVID-19 updates on WHO's website, and exchanges rate historical data from Bank Indonesia's website from March 2nd, 2020 to December 30th, 2020. Hypothesis testing is done by multiple regression analysis using EViews 12. The findings of this research indicate that COVID-19 did not correlate significantly to the liquidity by the depth measure. The implication of this study is to provide new insight regarding the effects of pandemic towards Indonesia's stock market liquidity, to become a reference to the future research because the result differs from one country to another one, to provide new insight such as knowledge regarding the higher return and the strengthening of Rupiah means the higher stock market illiquidity by its depth, in order to give guidance for investors' decision-making process and to give references for the next research.

Keywords: *The Growth of the Total Number of Confirmed Cases, The Growth of the Number of Deaths, Stringency Index, Liquidity*

1. INTRODUCTION

Stock market is one of the media for people to invest and become an investor, because it unites issuers and investors. Decades before, investing to a stock market was stereotyped as upper-middle class's transaction. It is because the stigma which assumes someone needs to be loaded with cash in order to be a stock market investor. Nevertheless, in accordance to the better education obtained by the society and the development of information technology, individuals with minimum wage nowadays start to learn how to invest. This is proven by the growth of Indonesia's stock market investor since 2019, which is dominated by rising generation, especially millennials and Gen-Zs, with the total of under 40 years old investor as much as 70% from the total investor. [1]

The number of investors will escalate as the time goes by. With so much social media content which educating people on how to invest and how to gain a high return, it is no wonder that more people become interested with investing in a stock market. Investing, however, does not mean that someone will constantly earn profit. The stock market does not guarantee an investor's capital gain due to its volatility.

Selecting a company to be our investee is challenging because it is not easy to choose the suitable firm. In order to get a maximum return with a certain risk, or to get a certain return with a minimum risk, an investor should be able to pick shares with a high liquidity [2].

Liquidity becomes a crucial consideration for individuals in stock market. Stock with a better liquidity will benefits investors due to its easiness to be transacted. Especially for trader such as scalper and swing trader, liquid stock will be their target. Their trading activity and trading plan will be hampered given that their investments are difficult to sell in a short time. Therefore, the higher the liquidity, the higher the probability of an investor to obtain a capital gain. Yet, stock's liquidity will be affected by negative sentiments.

Generally, negative sentiments such as the growth of positive cases and lockdown will affect USA's stock market negatively [3]. The effect of pandemic also hampered MENA's stock market liquidity [4]. COVID-19 is believed to bring adverse effects to liquidity [5] [6] [7]. Nevertheless, economics are not absolute, because what was happening in the other countries did not happen in Indonesia. In Indonesia, trading volume surprisingly skyrockets during pandemic. Based on the record from Yahoo Finance, the total of stock traded in Jakarta Composite Index (JCI) at the time of the announcement of the first COVID-19 case in Indonesia was 40,24 million shares, while at the end of 2020 the total shares traded was 170 million shares. Similarly, the number of single investor identification (SID) increased 56,21% throughout the year 2020 (KSEI). [1] The growth of the number of investors will simulate the growth of traded shares, so that it will increase stock market's liquidity. Therefore, there is a need to do some research in order to figure out whether or not the pandemic brings positive effects towards Indonesia's stock market liquidity.

Theories and Literature Review

Black Swan Theory

Nassim Nicholas Taleb released his book "The Black Swan: The Impact of The Highly Improbable" [8] which introduced a new concept called Black Swan. It describes the occurrence of an unpredicted event. That event is unpredictable but causes a strong aftermath, yet it seems to be possible to happen after it occurs. This concept is normally associated with phenomenon in economics, business, and investment.

Black swan has three characteristics. Firstly, it is an outlier, or in another word it is far from the general expectations. It occurred in the past, yet no strong evidence can ensure that it will happen in the future. Secondly, it brings out a strong impact towards people's daily activity, economics, and world's politics. Lastly, even though society never expect it's occurrence, they will start to normalize that phenomenon as something predictable to happen. Based on the description above, it can be concluded that COVID-19 pandemic is a black swan.

COVID-19 pandemic, its growth, and the deaths it caused were unpredicted event which caused a strong aftermath. These might lead to the more stringent the government policy was, and it hampered economics, business, and investment.

Efficient Market Hypothesis

Fama [9] proposed a concept called "Efficient Market Hypothesis" which stated that the current stock price is the reflection of every information regarding the market, both from the past, present, and the one from the insider. An efficient stock market means its stock price reflects all the information available in the market because all of the information is available to access without constrain. Therefore, in an efficient market, no investor will able to gain an abnormal return after he has done risk analysing with the most appropriate strategy.

In investing in a stock market, investors will analyse by the company's fundamental. They calculate the net present value of the future cash flow of the asset. Thus, when they access a new information that will probably change the fundamental value, they prefer to sell it on a higher price when the information is a positive sentiment and vice versa.

The more investor starting to invest in a stock market, the more efficient the stock market will be. This is the result of more people with more diverse information creates the price so that the shares will be traded at its fair value.

COVID-19 pandemic is an example for negative sentiment, because it caused business and economics slowdown. Thus, when investors got some bad news regarding the pandemic, they would done risk analysing and then the stock price would fluctuated as more information is available within the market.

Stock Market Liquidity

Kyle [10] defined market liquidity as the ability of an asset to be traded in a certain market with a short span of time and with a minimum degrade of value. Stock market liquidity measure how fast a financial asset to be converted into cash without experiencing loss [11]. Liquidity later categorized by its characteristics; depth, tightness, immediacy, and resiliency [12]. Market depth is an asset's ability to be traded in a certain volume without causing a strong impact to its value while market tightness means its ability to be transacted with the same price but a lower cost in the same time. Market immediacy is its efficiency, and market resiliency means how a policy can correct the imbalance of market. However, out of the four characteristics, immediacy and resiliency rarely used in researches. It is too difficult to obtain a highly accurate data regarding the two characteristics [13]. This research only uses market depth as the proxy of stock market liquidity.

Literature Review

Based on the description in the introduction, liquidity becomes a crucial aspect for investors in order to determine which company would be their investee. Stock market movement is affected by sentiments in society as the result of some events, especially from a black swan. The time a black swan occurs, investors surely will take into consider some information regarding the asset they invested in.

The COVID-19 pandemic, has given a strong impact on the stock market and its liquidity since it caused a significant economic slowdown [14]. As it is stated on the previous paragraph, research in USA showed that COVID-19 and lockdowns hampered stock market liquidity. In accordance to the result of research in USA, studies in Morocco, Tunisia, Egypt, Saudi Arabia, United Arab Emirates, and Qatar proved that stock market liquidity negatively affected by the pandemic. [4] The same result is shown by research in Vietnam regarding the impact of COVID-19 towards stock market liquidity [7].

Nevertheless, the trading volume in IHSG skyrocketed during the pandemic. Prior to the pandemic, the shares traded per day were as much as 40.24 million shares before the number escalated to 170 million shares per day at the end of 2020. The total number of single investor identification, too, increased 56.21% at the end of 2020 [1]. The growth of the number of investors in a stock market might lead to the growth of the trading volume. As the result, the

liquidity of the stock market had the potential to be higher in the period of pandemic. This phenomenon contradicts the result of researches stated above.

Hypothesis

Based on the description above, generally, a stock market will shock when a pandemic occurs. The announcement of the first case of COVID-19 in Indonesia definitely distressed investors. This might be a negative sentiment which will affect the movement of the stock market. In addition, this virus has a high transmission rate. The growth of the confirmed case brings disadvantages to investors because it will lead to fear. Thus, most of the investors will choose to "wait and see" in their trading activity or even will choose to sell their investment before the value drops. These action will might cause the decline of trading volume and as the result, the market will be more illiquid. Therefore, the purpose of this research is to examine the following hypotheses:
H1: *The growth of confirmed cases brings significant negative effect towards stock market liquidity.*

The fact that COVID-19 causes so much death made the condition even worse. Since the first case of COVID-19 in Indonesia, the number of deaths caused by COVID-19 was uncontrollable. It also became the negative sentiment towards stock market. Thus, no wonder why an investor might choose to sell their investment, choose to "wait and see", and it leads to the more illiquid market. Thus, the hypothesis would be:
H2: *The growth of deaths brings significant negative effect towards stock market liquidity.*

To control the number of confirmed cases and death cases, government creates some policy. This caused the higher stringency index. Due to the speed of the transmission, some policies such as social distancing and semi lockdown are suggested. By applying these policies, some business should be shut down and some activities should be stopped. As the result, some employees lost their job and it leads to the growth of the numbers of unemployment. Thus, recession is unavoidable. In that regard, generated hypothesis would be:
H3: *Stringency index brings significant negative effect towards stock market liquidity*.

2. RESEARCH METHOD

Data

This research uses the population of *Indeks Harga Saham Gabungan* transaction data [15], the update of COVID-19 statistics from WHO website [16], and the exchange of Rupiah towards Dollar from *Bank Indonesia* website [17] per day for the period of March 3rd – December 30th, 2020. This research uses multiple regression analysis by EViews 12.

Dependent Variables

The purpose of this research is to examine the impact of the COVID-19 pandemic on the liquidity of stock market. As it is stated above, illiquidity is measured market depth. Market depth is calculated by Amihud [18] formula which measures market illiquidity. It represents the fluctuation of stock price stimulated by a one-dollar volume. Therefore, the higher Amihud ratio means the higher its illiquidity.

$$\text{AMIHUD} = \frac{|_R|}{\ln(volume)}$$

The calculation is computed by dividing the daily absolute return with the per day trading volume. Daily absolute return is calculated by the natural logarithm of the closing price divided by the closing price at t-1, while trading volume is the result of volume times the closing price.

Independent Variables

This study includes three independent variables as the representative of COVID-19 pandemic, that is the growth of confirmed cases, the growth of death cases, and stringency index.

The Growth of Confirmed Cases

The growth of confirmed cases, denoted as CONFIRMED, is the first representative of the pandemic in this paper. It is the increase of the total confirmed cases per day. The higher number of confirmed cases is caused by the more positive result of a PCR test. The test results are input so that they are integrated with the app "Pedulilindungi".
This variable is calculated as the following formula.

CONFIRMED = The total of COVID-19 confirmed cases – The total of COVID-19 confirmed cases $_{(t-1)}$

The Growth of Death Cases

The growth of death cases, denoted as DEATHS, is the second representative of the pandemic in this paper. It is the increase of the total death cases per day. The growth is caused by several determinant such as congenital disease, high bed occupancy rate, and insufficient medical tools. This variable is calculated as the following formula.

DEATHS = The total of death cases – The total of death cases $_{(t-1)}$

Stringency Index

Stringency index [20], denoted as STRINGENCY, measures the strictness of government's policy in order to prevent the disease to spread wider. Nine indicators become the basis of this index computation, that is school closures, workplace closures, cancellation of public events, restriction on public gathering, closures of public transport, stay-at-home requirements, public information campaigns, restrictions on internal movements, and international travel controls.

This index is calculated by the average value of the ninth indicators above with the number within 0-100. The higher the index means the more stringent the government's action.

STRINGENCY = ln Stringency index

Control Variables

This study includes three control variables, that is market capitalization, return of Jakarta Composite Index (JCI), and the daily exchange rates of Rupiah against Dollar.

Market Capitalization

Market capitalization, denoted as MKT_CAP, is a reflection of the total share price of a company. In other word, it is the price for an investor to purchase a company as a whole. It can be calculated by the share price times the outstanding share. Market Capitalization is a firm level factor that may have an effect towards market liquidity. [4] This variable is calculated as the following formula.

MKT_CAP = ln (Closing Price x Outstanding Shares)

Return of JCI

Jakarta Composite Index (JCI) is an index which measures the performance of the composite index in Bursa Efek Indonesia (BEI) as it represents the movement of daily share closing price. The return of IHSG, denoted as RETURN, is a market level factor that may have an effect towards market liquidity. [4]

$$\text{RETURN} = \left| \frac{Closing\ Price - Closing\ Price\ (t-1)}{Closing\ Price\ (t-1)} \right|$$

Daily Exchange Rates of Rupiah Against Dollar

Exchange rates will never move constantly as it always fluctuates. This happens due to the constantly changing of economics, social, and politics. The return of IHSG is a macroeconomic level factor that may have an effect towards market liquidity. [4] This variable, which is denoted as EXCHANGE, is calculated as the following formula.

EXCHANGE = Exchange rates of Rupiah against Dollar each day

3. RESULT AND DISCUSSION

Research Framework

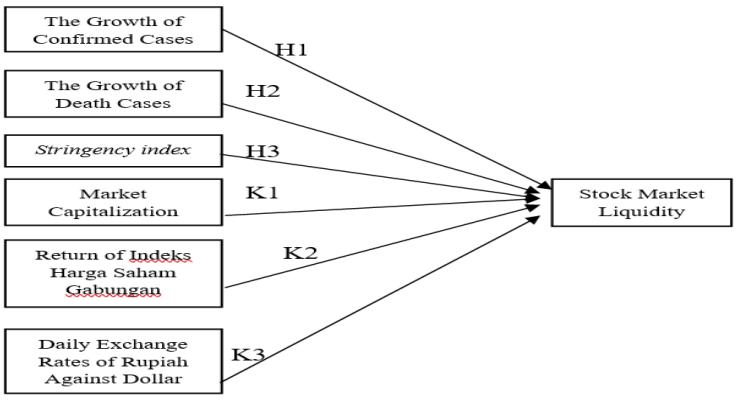

Figure 1. Regression Model

Regression Results

$AMIHUD = -0.000528 - 2.51612\ x_1 - 7.12594\ x_2 - 4.51215\ x_3 + 1.416187\ k_1 + 0.037148\ k_2 + 9.845236\ k_3 + Ɛ.$

The Prob (F-statistics) shows the result of 0.0000, which means that at least one independent variable is significantly affecting the dependent variable.

Table 1. t-Test Result

Variable	Prob
CONFIRMED	0.6383
DEATHS	0.3407
STRINGENCY	0.5132
MKT_CAP	0.6986
RETURN	0.0000
EXCHANGE	0.0294

From the t-test result, we can conclude that none of the independent variables significantly affecting stock market liquidity. In the contrary, two out of three control variables, return of IHSG and daily exchange rates of Rupiah against Dollar, shows hampered the market liquidity significantly.

The first hypothesis, which was rejected, the prob was 0.6383 (> 0.05) which means no significant effect of the growth of confirmed cases towards stock market liquidity.

The second hypothesis, which was also rejected, the prob was 0.3407 (> 0.05) which means no significant effect of the growth of death cases towards stock market liquidity.

The third hypothesis, which was rejected too, the prob was 0.5132 (> 0.05) which means no significant effect of the stringency index towards stock market liquidity.

Discussion

The Effects of the Growth of Confirmed Cases towards Stock Market Liquidity

Based on the findings above, the growth of confirmed cases did not bring a significant effect on liquidity. The value of Amihud illiquidity fluctuated in a sideways trend during 2020, while the growth of confirmed cases constantly increasing. All in all, the movement of the growth of confirmed case did not cause a drastic movement of Amihud illiquidity. This result contradicts the findings of Alaoui Mdaghri et al [4] and Nguyen et al [7] which stated that the growth of confirmed cases hampered stock market liquidity significantly.
While the theory of black swan stated that the occurrence of a “black swan” might jeopardize investments, this research showed that not all aspects of investments will be hampered. Liquidity of Indonesia’s stock market is not significantly affected by the growth of confirmed cases.

The Effects of the Growth of Death Cases towards Stock Market Liquidity

Based on the findings above, the growth of death cases also did not bring a significant effect on liquidity. The value of Amihud illiquidity fluctuated in a sideways trend during 2020, while the growth of confirmed cases was also constantly increasing. Thus, the movement of the growth of confirmed case did not cause a drastic movement of Amihud illiquidity. This result opposes the research by Alaoui Mdaghri et al [4] and Nguyen et al [7] which stated that the growth of death cases hampered stock market liquidity significantly. While the theory of black swan stated that the occurrence of a "black swan" might jeopardize investments, this research showed that not all aspects of investments will be hampered. Liquidity of Indonesia's stock market is not significantly affected by the growth of death cases.

The Effects of Stringency Index towards Stock Market Liquidity

As the same as the other two independent variables, stringency index did not bring a significant effect on liquidity. This is caused by the shock the investors experienced which leads to panic selling. Thus, both the return of IHSG and the trading volume increased. As the result, the value of Amihud was not affected by the strictness of government policy. This result opposes the research by Alaoui Mdaghri et al [4] which stated that stringency index hampered stock market liquidity significantly. Nevertheless, this result is in line with Nguyen et al's [7] and Priscilla et al's [21] paper. While the theory of black swan stated that the occurrence of a "black swan" might jeopardize investments, this research showed that not all aspects of investments will be hampered. Liquidity of Indonesia's stock market is not significantly affected by stringency index.

The Significant Effects of Control Variables towards Stock Market Liquidity

The result of the regression found that return of IHSG brings significant negative effect on stock market liquidity by its depth. It is in accordance with the formula of Amihud which is the return of IHSG divided by trading volume. Therefore, the higher the return means the higher the illiquidity.

Exchange rates of Rupiah against Dollar boosts the stock market liquidity. It is caused by the transaction by foreign investors. When Rupiah is depreciated, they gain the chance to purchase more shares in the same amount of Dollar. During the pandemic, Rupiah was constantly depreciated. This condition attracted foreign investors to invest more in Indonesia's stock market. Thus, the stock market become more liquid.

4. CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Based on researches, COVID-19 pandemic causes economics slowdown and lockdowns in several countries. Stock market liquidity is predicted to be hindered by the pandemic. At the same time, the number of investors in Indonesia stock market surprisingly skyrockets during this economic slowdown.

The current research analysing stock market liquidity by market depth, which is measured by Amihud. [18] We use the data of IHSG transaction, COVID-19 data update from WHO, and

daily exchange rates of Rupiah against Dollar from Bank Indonesia from 3rd March to 30th December, 2020.

The findings in this paper contradicts the past researches in another country, which surprisingly, none of the independent variable hampered the stock market liquidity significantly. This study finds that the impact of pandemic on stock market liquidity is positive insignificantly.

Market liquidity by its depth is calculated according to how much difference the value of IHSG by the trading volume. During the pandemic, the movement of IHSG fluctuated dramatically due to the sentiments, both good news and bad news. Good news, for instance, might be vaccination, higher chance for business in technological and medical sector, and higher chance of earning capital gain during a market crash. On the other hand, bad news such as new COVID-19 variance (delta), lockdowns, social distancing, and other restrictions caused a sudden drop to IHSG. These sentiments appeared one by one in a short time, so that IHSG became more volatile and investors gain a higher return, both positive and negative return.

At the same time, trading volume of IHSG increased steadily during the pandemic. Its movement is in accordance with the growth of confirmed cases, the growth of death cases, and stringency index. Therefore, instead of bringing negative impacts, pandemic brought positive effect towards trading volume of the stock market. Thus, after it is calculated with the return of IHSG, the pandemic showed no significant bad impact on Amihud.

By this finding, investors might be informed that stock market has a potential to be more liquid during a pandemic. Pandemic caused lockdowns, which leads to more people having more free time to do activities other than their routine ones. One of the activities might be investing in a stock market [1]. As the result, the trading volume increases so that the liquidity will not be hampered.

However, the higher the return of IHSG means the higher its illiquidity, given that it is not followed by the higher trading volume. It is also known that appreciation of Rupiah will lead to the lower liquidity. Thus, by this research, investors might gain new insight and know that they should take these two variables into consideration, because generally, the higher these variables are means the better the condition is, except for market liquidity.

Implication

The research has several findings of the effect of COVID-19 on stock market liquidity, which proposes some implications for investors and for the future researches. The result of this paper might help investor to gain new insights regarding the impact of pandemic towards the stock market liquidity. For instance, knowledge regarding the higher return and the strengthening of Rupiah means the higher stock market illiquidity by its depth.

This paper might also become a reference to the future research because the result differs from one country to another one. This research represents the condition of Indonesia's stock market liquidity in the time of pandemic.

Limitation

This paper has several limitations. It only uses three variables representing COVID-19 so that this research is limited to other COVID-19 factors that might affect stock market liquidity. This research illustrates Indonesia's stock market generally, not specifically studies the liquidity of each economic sector. In addition, this paper only studies the condition from March 2nd 2020 to December 30th 2020. Thus, it does not study the stock market condition after that period when vaccination, omicron, and stagflation start to appear.

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