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The Impact of COVID-19 Pandemic on Stock Prices: An Empirical Study of State-Owned Enterprises in Indonesia Stock Exchange*

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Abstract

This study explores the impact of the COVID-19 pandemic on the stock prices of state-owned enterprises listed on the Indonesia Stock exchange. The impact of the pandemic is analyzed based on different pandemic phases and the corresponding government pandemic interventions to curb the disease. This study analyzes 6 pandemic event dates, covering the time period from January 2020 to February 2021. A total of 20 state-owned enterprises are included as the sample of this study. Test of difference is employed to compare the stock prices of the state-owned enterprises before and after each pandemic event date. In general, this study confirms the adverse impact of the COVID-19 pandemic on the stock prices, especially the event in 2020. Although some variations do exist. The results of the study reveal a significant decrease in the stock prices of the state-owned enterprises after the announcement of the first confirmed COVID-19 cases, the announcement of COVID-19 as a global pandemic, the imposing of Large Scale Social Restriction (PSBB I and PSBB II). In contrast, the stock prices increase after the imposing of a new normal policy and the imposing of Public Activity Restriction (PPKM). This study also documents that the effect of the pandemic may vary based on the pandemic phase.

Keywords: COVID-19 Pandemic, Stock Prices, State-Owned Enterprises

JEL Classification Code: E44, G10, G14, G38, I10

1. Introduction

The outbreak of the coronavirus disease 2019 (COVID-19), a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is one

emergency event that has a massive impact not only on public physical and psychological health but also on the global financial market. COVID-19, which was declared as a pandemic on 11 March 2020 by the World Health Organization (WHO), has been equated to a 'black swan' event for financial markets by some academics due to the extraordinary shock of unexpected magnitude the pandemic has and its tremendous impact on the market (Yarovaya et al., 2022).

The COVID-19 pandemic has caused an unprecedented decrease in the stock market and it is suggested that no previous pandemics had as forceful an effect as the COVID-19 pandemic has on the market (Baker et al., 2020; Lyócsa et al., 2020). From 24 February to 28 February 2020 the largest one-week drop since the 2008 financial crisis was reported by stock markets around the world (Štifanić et al., 2020). The Standard & Poor's (S&P) 500 Index in the US fell significantly from about 3,386.15 on 19 February 2020 to about 2,237.40 on 23 March 2020 (Yilmazkuday, 2021). During the period between 20 February and 19 March 2020, the UK's FTSE 250 index dropped drastically by 41.3%, and the Nikkei in Japan also

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decreased considerably by 29% (Ozili & Arun, 2020). In Indonesia, a similar situation was also reported. Numerous stock indices in the ³Indonesia stock exchange (IDX) have declined since the announcement of the first confirmed cases of COVID-19 on 2 March 2020 and reached their lowest point on 23 March 2020, 21 days after the official announcement of the first COVID-19 confirmed cases (Utomo & Hanggraeni, 2021; Zainur ² al., 2021).

Following the massive impact the COVID-19 pandemic has on the stock market, a vast amount of research has been conducted to analyze how the stock market behaves during the pandemic (e.g. Al-Awadhi et al., 2020; Ashraf, 2020; Harjoto et al., 2021; Liu et al., 2020; Phan & Narayan, 2020). Although most of these studies suggest that the COVID-19 pandemic has negative impacts on the stock market, it can be argued that the severity of the pandemic may vary across countries (Alam et al., 2021; Capelle-Blancard & Desroziers, 2020; Fernandez-Perez et al., 2021; Harjoto et al., 20¹¹). Prior studies also have documented the time-varying impact of the COVID-19 pandemic on stock markets (Bissoondoyal-Bheenick et al., 2020; Phan & Narayan, 2020; Ramelli & Wagner, 2020; Topcu & Gulal, 2020). In addition, results from cross-industrial studies around the world also demonstrate different pandemic effects on different industries (Alam et al., 2021; Ellil, 2021; He et al., 2020; Herwany et al., 2021; Utomo & Hanggraeni, 2021).

Given the variations of the pandemic effect across countries ², time, and industries, research exploring the impact of the COVID-19 pandemic on different stock market settings remains necessary and ¹³relevant. Different from prior studies, the objective of this study is to specifically examine the effect of the COVID-19 pandemic on the stock prices of all state-owned enterprises (SOE ¹ listed in IDX. Previous works of literature that explore the reaction of the stock market to the COVID-19 pandemic in Indonesia mainly investigate the reaction on all companies listed in IDX (eg. Utomo & Hanggraeni, 2021; Zainuri et al., 2021), cross-industrial (Herwany et al., 2021; Putri, 2020; Utomo & Hanggraeni, 2021) or on the single company (Nurmasari, 2020; Mangindaan & Manossoh, 2020). This study extends the literature by conducting an examination of the impact of the COVID-19 pandemic on SOEs. Current studies that examine stock the effect of the pandemic on SOEs are limited to one sample firm (Mangindaan & Manossoh, 2020), firms within one sub-sector, or one COVID-19 pandemic phase. Furthermore, research that focuses on SOEs stock market reaction is a very interesting research topic because according to Law No. 19 2003, SOEs are established to assist in the advancement of the national economy of Indonesia ⁵. Due to this important role, it is then, considerably urgent to examine the impact of the COVID-19 pandemic on the stock prices of SOEs.

This study contributes not only by examining the effect of COVID-19 on stock prices of SOEs that are relatively underexplored but also contributes by measuring the heterogeneity in the reaction of the pandemic based on different pandemic event dates and the corresponding policies imposed by the government to curb the spreading of the disease. This study then provides novel empirical evidence both on the consequences of the pandemic and the governmental response to the pandemic into the stock market. Despite prior studies have shown that government interventions do affect international stock markets, further investigations into the stock market reaction to the government policies during the pandemic are still needed (Baker et al., 2020; Narayan et al., 2021; Zaremba et al., 2020). It is also expected that this research presents ² a more comprehensive knowledge about the impact of the COVID-19 on the stock market and further understanding of SOEs' stock prices' movements during the COVID-19 pandemic. This would help investors to make optimal investment decisions and the government to impose policies that are not only effective ¹⁸ to curb the disease but also mitigate the negative effect of the pandemic on the stock market to achieve better economic growth.

2. Literature Review

The COVID-19 pandemic ¹⁸ has opened up new research avenues that examine the effect of the pandemic on ⁴² the stock market. The works of literature concerning the stock market reaction to the COVID-19 pandemic, in general, suggest that stock markets react negatively to the pandemic. Ashraf (2020) documented that the stock market returns of numerous stock exchanges in 64 countries around the world decrease as the number of confirmed COVID-19 cases increases. Liu et al. (2020) documented a negative and significant effect of COVID-19 confirmed cases on 21 stock market indices across the globe, including Japan, Germany, France, and Korea. Furthermore, a study from 53 emerging and 23 developed countries finds that the stock market is adversely affected by the COVID-19 cases and deaths (Harjoto et al., 2021). In both Hang Seng ³ Index and Shanghai Stock Exchange Composite Index, the daily growth in total confirmed cases and the daily growth in total cases of death caused by COVID-19 also affect the stock returns negatively (Al-Awadhi et al., 2020).

Indonesia announced its first confirmed cases of COVID-19 on 2 March 2020. Since then, as of 31 January 2022, the disease has killed 144,320 people in Indonesia, with corresponding confirmed cases of COVID-19 of 4,353,370. The impact of these incidents of confirmed COVID-19 cases on the stock market in Indonesia was also staggering. A study by Zulfitri (2020) suggested a significant decrease in stock prices of the companies listed

on numerous indices in IDX, such as LQ45 Index, Consumer Goods Index, Manufacture Index, Finance Index in the early 13 days in April 2020 compared to the same period in 2019. Utomo and Hanggraeni (2021) confirmed the adverse effect of the increasing number of COVID-19 confirmed cases and deaths on daily stock returns.

Despite findings that conclude the adverse impact of the COVID-19 pandemic on the stock markets, some variations of the empirical results do exist. Harjoto et al. (2021) find that in emerging stock markets stock returns and volatility are affected by COVID-19 cases and deaths, whereas stock returns, volatility, and trading volume in developed markets are only affected by COVID-19 cases. In China stock market, while stock prices on the Shanghai Stock Exchange are negatively impacted by the pandemic, stock prices on the Shenzhen Stock Exchange are positively impacted by the pandemic. It is further revealed that Asian emerging stock markets have experienced the highest impact of the COVID-19 pandemic, while the impact of the pandemic has been the lowest in emerging markets in Europe. Fernandez-Perez et al. (2021) documented different national cultures will lead to different stock market responses to the COVID-19 pandemic.

Furthermore, some studies that explore the impact of the COVID-19 pandemic across different phases of the pandemic also document the time-varying effect of the pandemic on the stock market. By analyzing phases of the COVID-19 pandemic, Bissoondoyal-Bheenick et al. (2020) find COVID-19 pandemic has a time-varying effect of the pandemic on the stock return and volatility. Phan and Narayan (2020) document that in the early stage of the pandemic as the number of COVID-19 cases and deaths rises the stock markets tend to over-react and were in general negative, but as the time-lapses and countries reached 100,000 cases and 100 deaths, 50% of the stock markets reacted positively, possibly due to market rection. Ramelli and Wagner (2020) also found different effects of the COVID-19 pandemic on stock markets during the 3 different pandemic periods, namely the incubation (early January 2020), outbreak (January to February 2020), and feverish (February to March 2020). Harjoto et al. (2021) argue that the stock market reacts differently during the stabilizing infection period (post-April, 2020) from the rising cases and mortality rates of COVID-19 (pre-April 2020) and document a negative impact of COVID-19 on emerging stock markets during the period pre-April 2020, whereas COVID-19 affect the developed stock market negatively during the period the period post-April 2020. Topcu and Gulal (2020) also suggested that the negative impact of the COVID-19 pandemic has fallen and started to lessen by mid-April 2020.

Prior studies that analyze government policies during different pandemic stages demonstrate a significant effect of government interventions to COVID-19 on the stock market

volatility (Zaremba et al., 2020). Narayan et al. (2021), in contrast, found that country lockdowns, pandemic stimulus packages, and travel bans, on aggregate, had a positive effect on the stock market excess returns. Baker et al. (2020) suggest that the strong market reaction to the COVID-19 pandemic is due to the more powerful governmental responses to COVID-19 and call for further investigations into the role and importance of the government policies during the pandemic.

Works of literature that examine the impact of the COVID-19 pandemic on stock markets across industries concluded that the effect of the COVID-19 pandemic on the stock market varies from one industry to another. Stock prices of companies in transportation, mining, electricity & heating, and environment industries in the Chinese stock market have been negatively affected by the pandemic, whereas education manufacturing, information technology, and healthcare industries have been resilient to the COVID-19 pandemic as the stock prices of the companies in these industries have either increased or remained unaffected (He et al., 2020). Furthermore, findings from Ellil (2021) that examined the impact of the COVID-19 pandemic on Abu Dhabi Securities Exchange across industries categorize the impact into three categories, where banks, energy, industrial, investment and finance services, real estate, services, and transportation industries are negatively affected, insurance and telecommunication industries are the most resilient, and consumer staples industries are positively affected by the pandemic. Alam et al. (2021) also conclude that there is a great variation of the pandemic effect on the sectoral performance of the Australian stock market.

The cross-industrial research on Indonesia's stock market suggests that the stock prices of companies in the mining and manufacturing sectors are not significantly affected by the COVID-19 pandemic. Utomo and Hanggraeni (2021) also suggested that property, trade, service, and investment sectors have performed negatively during the COVID-19 pandemic, whereas basic industry, consumer goods, and mining sectors have performed significantly better. In addition, Putri (2020) documented a significant decrease the stock prices of companies in the banking sector during the COVID-19 pandemic. Herwany et al. (2021) further concluded that the most affected sector is financials, followed by the trade, service, and investment sectors, while consumer goods and mining industry sectors remain optimistic.

Among the works of literature concerning the impact of the COVID-19 pandemic on the stock market in Indonesia, studies that specifically investigate the impact of the pandemic on SOEs are still lacking. As mandated by the law, the establishment of SOE is aimed to support the government in boosting the national economy. Therefore, in the economic downturn during the COVID-19 pandemic, SOEs are expected to help improve the national economy,

including the performance of the stock market. However, studies that examine the effect of the COVID-19 pandemic on SOEs' stock performance are limited. Mangindaan and Manossoh (2020) concluded that in comparison to stock prices during the 30-day period before the announcement of the first confirmed COVID-19 cases, the stock prices of PT Garuda Indonesia, an SOE in the transportation sector, decreased during the 30 days after the announcement.

3. Research Methods

This study focuses on all SOEs publicly listed on IDX between 1 January 2020 and 28 February 2021. This sample period enables this study to compare the stock prices before and after the COVID-19 pandemic events in Indonesia more comprehensively. A total of 20 SOEs are included in the study. To provide more accurate measurement this study observes the effect of the COVID-19 pandemic on the daily stock prices of SOE. The daily closing prices of each SOE from January 2020 to February 2021 are then downloaded from the IDX website and Google finance.

There are 6 pandemic event dates examined in this study. These event dates represent the COVID-19 pandemic phases and the corresponding government policy responses to the pandemic. The first event date (ED1) is the announcement of the first confirmed COVID-19 cases in Indonesia on 2 March 2020. The second event date (ED2) is the announcement of COVID-19 as the global pandemic. The third event date (ED3) is the first government intervention to control the spreading of COVID-19 through the imposing of Large Scale Social Restriction (PSBB I) on 10 April 2020. The decision of the government to ease the restriction by imposing a new normal policy on 1 June 2020 is the fourth event date (ED4). The policy to revert to social distancing measure by imposing another Large Scale Social Restriction (PSBB II) on 14 September 2020 is the fifth event date (ED5). Lastly, the imposing of Public Activity Restrictions on 11 January 2021 is the sixth event date (ED6) in this study.

Two time periods of pre- and post-event date, i.e. 30-day and 5-day periods are used in this study. To analyze the effect of the COVID-19 pandemics on the stock prices of SOEs, the SOEs closing stock prices were recorded for each of the 30 and 5 consecutive trading days before (Pb) and after (Pa) each pandemic event. Day 0 is defined as the day the pandemic event takes place. This study then compares the average closing stock prices of all SOEs between the period of 30 days (P_{-30} to P_{-1}) and 5 days (P_{-5} to P_{-1}) pre-event date and 30 days (P_{+1} to P_{+30}) and 5 days (P_{+1} to P_{+5}) post-event date. Changes in SOEs stock prices before and after each event date capture the impact of the COVID-19 pandemic. To analyze the stock price differences between

the period pre-event date and the period post-event date, a difference test is used. To ensure the robustness of the results regardless of the dataset's distribution and for a comparative purpose, this study employs both parametric and non-parametric tests, i.e. paired sample *t*-test and Wilcoxon signed-rank test, despite Schminder et al. (2010) found that the application of ANOVA, hence including *t*-test, on abnormal data remain robust.

4. Results and Discussion

4.1. Descriptive Statistics

Table 1 presents the descriptive statistics of the daily closing stock prices of the 20 SOEs examined in this study. The table reports the value of mean, minimum, maximum, and standard deviation of the stock prices of SOEs for two time periods, i.e. 30-day period (Panel A) and 5 days (Panel B). For the 30-days period (Panel A), the total number of observations is 600 for ED1, ED2, ED3, and ED4, 598 for ED5, and 597 observations for ED6. For the 5-day period (Panel B), a total number of 100 observations for ED1, ED2, ED3, ED4, and ED5, and there were 98 observations for ED6.

Both Panel A and Panel B of Table 1 show that across the time period investigated in this study from January 2020 to February 2021, the mean value of SOEs stock prices in the 30-day period and 5-day period after the pandemic event dates (Pa30 and Pa5) tend to decrease in comparison to the mean value of stock prices in the period before the event date (Pb30 and Pb5), although variations do exist on certain event dates. In Panel A of Table 1, the mean value of the SOE stock prices during the 30-day period before the announcement of the first confirmed COVID-19 cases (ED1) was 2614. The number then decreased to 2145 during the 30-day period after the imposing of PSBB II (ED5). A different pattern, nonetheless, was seen in the period before and after the imposing of PPKM (ED6) in 2021. The average value of SOE stock prices exhibit an increasing pattern in 2021, reaching an average value of 3019 during the 30 days before the imposing of PPKM (ED6), and then increased again to 3171 during the 30-day period after ED6. Panel B of Table 1 shows a similar trend in the 5-day period pre and post- each COVID-19 event dates as in the 30-day period pre- and post-event dates were also shown in the average stock prices of SOE. The average value of the SOE stock prices in the 5-day period after ED5 was lower (i.e. 2134) than in the 5-day period before ED1 (i.e. 2460), whereas during the 5-day period after ED6 the average value of the SOE stock prices increased to 3531 from 3255 during the 5-day period before ED6.

Table 1: Descriptive Statistics

Panel A: 30-day Period Pre Versus Post									
Event Date	N	Mean		MIN		MAX		SD	
		Pb30	Pa30	Pb30	Pa30	Pb30	Pa30	Pb30	Pa30
2 Mar 2020 (ED1)	600	2614	1770	228	124	13050	11200	3057	2113
11 Mar 2020 (ED2)	600	2513	1618	208	124	12400	9075	2958	1854
10 Apr 2020 (ED3)	600	1838	1612	124	160	11200	9800	2224	1850
1 Jun 2020 (ED4)	600	1612	1943	160	192	9800	10150	1850	2254
14 Sep 2020 (ED5)	598	2274	2145	232	210	11000	9650	2368	2221
11 Jan 2021 (ED6)	597	3019	3171	378	290	12925	12650	2750	2570

Panel B: 5-day Period Pre Versus Post									
Event Date	N	Mean		MIN		MAX		SD	
		Pb5	Pa5	Pb5	Pa5	Pb5	Pa5	Pb5	Pa5
2 Mar 2020	100	2460	2349	228	208	11250	11200	2923	2794
11 Mar 2020	100	2305	1718	208	149	11200	8025	2732	2021
10 Apr 2020	100	1712	1633	166	170	8125	7700	1954	1759
1 Jun 2020	100	1704	1894	173	192	9800	10150	2112	2271
14 Sep 2020	100	2229	2134	232	230	10575	9625	2352	2235
11 Jan 2021	98	3255	3531	398	402	12575	12650	2764	2784

4.2. Impact of COVID-19 Pandemic on SOEs Stock Prices

The results from the difference test employed in this study are presented in Table 2 and Table 3. Table 2 presents the empirical results from the *t*-test paired sample, whereas empirical findings from the Wilcoxon-signed rank test are presented in Table 3. This study presents results from two types of difference tests due to the results of the test of normality for the study's dataset showing a non-normal data distribution. Although a study by Schmieder et al. (2010) has documented the application of ANOVA, hence including *t*-test, on abnormal data remain robust, it is still necessary to include the non-parametric test i.e. Wilcoxon signed-rank test. The alternative non-parametric is reported to ensure the results from both tests are not differ despite the abnormal dataset distribution.

Table 2 reports empirical evidence on the differences of the SOEs stock prices before and after the COVID-19 pandemic based on a *t*-test paired sample on the six COVID-19 pandemic event dates (i.e. ED1, ED2, ED3, E4, ED5, and ED6). Panel A of the table describes the results for 30 days pre-event versus post-event data while Panel B describes the results for 5 days pre-event versus post-event

date. The results from the *t*-test paired-sample presented in Table 2 indicate that there is a significant difference between the average of SOEs stock prices after the COVID-19 pandemic events and the average of SOEs stock prices before the event.

Table 2 specifically shows that the average of SOEs stock prices during both 30-day and 5-day period decreased significantly at 1% level after the following 4 event dates: (1) ED1, where the average SOE stock prices after the announcement of first confirmed COVID-19 cases in Indonesia decreased by 843 during the 30-day period and by 111 during the 5-day period; (2) ED2, where the average SOE stock prices after the announcement COVID-19 as the global pandemic decreased by 894 during the 30-day period and by 587 during the 5-day period; (3) ED3, where the average SOE stock prices after the imposing PSBB I decreased by 226 during the 30-day period and by 80 during the 5-day period; (4) ED5, where the average SOE stock prices after the imposing of PSBB II decreased by 129 during the 30-day period and by 95 during the 5-day period.

In contrast, Table 2 indicate that in comparison to before the pandemic event dates, the average stock prices of SOEs after the imposing of new normal policy (ED4) increased significantly at 1% level by 331 during the 30-day period

Table 2: Results of T-test Paired Sample on Stock Prices of SOEs Pre-Versus Post the COVID-19 Pandemic Event

Event Date	³⁹ Pair	Mean	Std. Dev.	Std Error Mean	t-statistic
Panel A: 30-day Period Pre-Versus Post-Event Date					
2-Mar-20 (ED1)	Pb1–Pa1	843	1161	47	17.801***
11-Mar-20 (ED2)	Pb2–Pa2	894	1221	50	17.943***
10-Apr-20 (ED3)	Pb3–Pa3	226	820	33	6.737***
1-Jun-20 (ED4)	Pb4–Pa4	–331	511	21	–15.885***
14-Sep-20 (ED5)	Pb5–Pa5	129	288	12	10.968***
11-Jan-21 (ED6)	Pb6–Pa6	–151	710	29	–5.211***
Panel B: 5-day Period Pre-Versus Post-Event Date					
2-Mar-20 (ED1)	Pb1–Pa1	111	241	24	4.609***
11-Mar-20 (ED2)	Pb2–Pa2	587	767	77	7.653***
10-Apr-20 (ED3)	Pb3–Pa3	80	266	27	2.999***
1-Jun-20 (ED4)	Pb4–Pa4	–190	251	25	–7.577***
14-Sep-20 (ED5)	Pb5–Pa5	95	167	17	5.712***
11-Jan-21 (ED6)	Pb6–Pa6	–310	495	50	–6.205***

Note: Pb1: The average SOEs stock price before event date 1; Pa1: The average SOEs stock price after event date 1; Pb2: The average SOEs stock price before event date 2; Pa2: The average SOEs stock price after event date 2; Pb3: The average SOEs stock price before event date 3; Pa3: The average SOEs stock price after event date 3; Pb4: The average SOEs stock price before event date 4; Pa4: The average SOEs stock price after event date 4; Pb5: The average SOEs stock price before event date 5; Pa5: The average SOEs stock price after event date 5; Pb6: The average SOEs stock price before event date 6; Pa6: The average SOEs stock price after event date 6; *** significant at 1% level.

and by 190 during the 5-day period, whereas the average of SOE stock prices after the imposing of PPKM (ED6) increased significantly at 1% level by 129 during the 30-day period and by 95 during the 5-day period.

Besides employing paired sample *t*-test as a method to compare the average SOE stock prices before and after the pandemic event, this study also occupies a non-parametric test i.e. Wilcoxon signed-rank test due to the fact that the data of this study is not normally distributed. Table 3 presents the results based on Wilcoxon signed-rank test that compares the SOEs' stock prices before and after the COVID-19 pandemic events.

Panel A of Table 3 presents the results for the 30-day period ($N = 600$ observation), while Panel B presents the results for the 5 days ($N = 100$ observations). In general, the results of the Wilcoxon signed-rank test in Table 3 are similar to the *t*-test paired sample results in Table 2. Table 3 indicates that the stock prices of SOE in the period before the pandemic event date are significantly different from the stock prices after the event. From the table, negative ranks indicate that stock prices of SOEs after the pandemic event dates are lower than the stock prices before the event, while positive ranks indicate the SOEs stock prices after the pandemic

event dates are higher than the stock prices before the event date. Ties show that the stock prices of SOEs before and after the event date are equal.

Results from Table 3 particularly indicate that from a total of 600 (100) observations, during the 30-day (15-day) period there are 564 (75) observations with negative ranks, 36 (19) observations with positive ranks, and 0 (6) observations are for ED1. Similar results are also seen in ED2, ED3, and ED5. Both during the 30 days and 5-day period after the announcement of COVID-19 as a global pandemic (ED2), the imposing of PSBB I (ED3), and the imposing of PSBB II (ED5), the number of observations with negative ranks are greater than the observations with positive ranks, suggesting a negative effect of the pandemic on the SOE stock prices. Consistent with the results from paired sample *t*-test reported previously, results from Table 3 indicate that there were a greater number of observations with positive ranks than observations with negative ranks in ED4 and ED6, indicating a positive effect of the events on the SOE stock prices. The results reported in Table 3 are significant at a 1% level for all event dates and both 30-day and 5-day period as indicated by the Z-statistics. The exception is that the result from ED3 during the 5-day period is significant at the 5% level.

Table 3: Results of Wilcoxon Signed Rank Test on Stock Prices of SOEs Pre-Versus Post the COVID-19 Pandemic Event

Event Date	Pair	Ranks	N	Mean Rank	Sum of Ranks	Z-statistic
Panel A: 30-day Period Pre-and Post-Event Date						
2-Mar-20 (ED1)	Pa1–Pb1	Negative ranks	564 ^a	303.53	171191.50	–19.078 ^{d***}
		Positive Ranks	36 ^b	253.01	9108.50	
		Ties	0 ^c			
		Total	600			
11-Mar-20 (ED2)	Pa2–Pb2	Negative ranks	553 ^a	304.81	168561.00	–18.459 ^{d***}
		Positive Ranks	47 ^b	249.77	11739.00	
		Ties	0 ^c			
		Total	600			
10-Apr-20 (ED3)	Pa3–Pb3	Negative ranks	345 ^a	326.10	112505.00	–5.600 ^{d***}
		Positive Ranks	251 ^b	260.56	65401.00	
		Ties	4 ^c			
		Total	600			
1-Jun-20 (ED4)	Pa4–Pb4	Negative ranks	60 ^a	181.86	10911.50	–18.508 ^{e***}
		Positive Ranks	534 ^b	310.49	165803.50	
		Ties	6 ^c			
		Total	600			
14-Sept-20 (ED5)	Pa5–Pb5	Negative ranks	452 ^a	307.23	138869.00	–12.275 ^{d***}
		Positive Ranks	140 ^b	261.85	36659.00	
		Ties	6 ^c			
		Total	598			
11-Jan-21 (ED6)	Pa6–Pb6	Negative ranks	246 ^a	257.90	63444.00	–5.898 ^{e***}
		Positive Ranks	347 ^b	324.72	112677.00	
		Ties	4 ^c			
		Total	597			
Panel B: 5-day Period Pre-and Post-Event Date						
2-Mar-20 (ED1)	Pa1–Pb1	Negative ranks	75 ^a	48.61	3646.00	–5.331 ^{d***}
		Positive Ranks	19 ^b	43.11	819.00	
		Ties	6 ^c			
		Total	100			
11-Mar-20 (ED2)	Pa2–Pb2	Negative ranks	100 ^a	50.50	5050.00	–8.682 ^{d***}
		Positive Ranks	0 ^b	0.00	0.00	
		Ties	0 ^c			
		Total	100			
10-Apr-20 (ED3)	Pa3–Pb3	Negative ranks	55 ^a	49.98	2749.00	–2.160 ^{d**}
		Positive Ranks	38 ^b	42.68	1622.00	
		Ties	7 ^c			
		Total	100			

Table 3: (Continued)

Event Date	Pair	Ranks	N	Mean Rank	Sum of Ranks	Z-statistic
Panel A: 30-day Period Pre-and Post-Event Date						
1-Jun-20 (ED4)	Pa4–Pb4	Negative ranks	8 ^a	17.25	138.00	–8.106 ^{e****}
		Positive Ranks	90 ^b	52.37	4713.00	
		Ties	2 ^c			
		Total	100			
14-Sept-20 (ED5)	Pa5–Pb5	Negative ranks	84 ^a	50.73	4261.50	–6.784 ^{d***}
		Positive Ranks	13 ^b	37.81	491.50	
		Ties	3 ^c			
		Total	100			
11-Jan-21 (ED6)	Pa6–Pb6	Negative ranks	12 ^a	33.13	397.50	–2.553 ^{e**}
		Positive Ranks	86 ^b	51.78	4453.50	
		Ties	0 ^c			
		Total	98			

Note: ^aSOE stock prices after event date < SOE stock prices after event date; ^bSOE stock prices after event date > SOE stock prices after event date; ^cSOE stock prices after event date = SOE stock prices after event date; ^dbased on positive ranks, ^ebased on negative ranks; *** significant at level 1%, ** significant at 5%

The empirical results reported in Tables 2 and 3 indicate that the SOEs stock prices generally decreased during the COVID-19 pandemic event date, where among 6 event dates, the SOE stock prices experienced a decline in 4 event dates, namely during the announcement of the first confirmed COVID-19 cases, the announcement of COVID-19 as a global pandemic, the imposing of PSBB I and the imposing of PSBB II. Both announcements of first confirmed COVID-19 cases and COVID-19 as global pandemic induce bad news to the market and in general bring negative movements to the stock market, which are translated into the reduction of SOEs stock prices during the period after the event dates. Under the efficient market hypothesis, the stock prices of SOE reflect all information available in the market. Therefore, the market participants perceive the COVID-19 pandemic as a shock and an unpredictable event that affects the SOE stock prices negatively. As Harjoto et al. (2021) argue that the adverse effect experienced by the stock market is due to the unprecedented adverse effect of the pandemic on real economic activities.

Unlike the study by Alam⁴¹ et al. (2020) and Narayan et al. (2021) who documented a positive impact of country lockdown on the stock market performance during the pandemic, the results of this study show that the implementation of PSBB I and PSBB II (a regional lockdown policy in Indonesia) create paralysis of economic activities that cause investors to withdraw their investments and be more careful in investing their money in the stock market,

and thus result in a decrease of stock prices. Government restrictions on economic activities to constrain the spreading of COVID-19 in PSBB I and II also disrupt the businesses' productivity, thereby, affecting the future cash flow of the companies and as a consequence negatively affecting the stock prices (Harjoto et al., 2021; Zaremba et al., 2020). This negative stock market reaction may further suggest a late governmental response in implementing the restriction because research shows that the severity effect of the COVID-19 pandemic is smaller in countries that implement the restriction policies promptly (Harjoto et al., 2021). The result of this study further lends support to Baker et al. (2020) who argued that the stringent government restrictions during pandemics result in great economic damage.

The imposing of a new normal policy, on the other hand, bring good news to the market participants as the policy to ease the restriction and shift to transition signifies economic recovery. Business operations start to resume and thus provide a stream of cash flow into the companies. This creates opportunities to generate future profit. The investors see this as a positive sentiment and therefore reflected in the increase of SOEs stock prices. Furthermore, an increase in the SOE stock prices after the imposing of PPKM supports Phan and Narayan's (2020) conjecture that as time lapses, more information is available to the market and thus the market is more likely to self correct. This result is also consistent with Harjoto et al. (2021) who suggested that the negative impact of the COVID-19 pandemic on the stock market has

gradually lessened during the stabilizing infection period. Different from the previous study (Harjoto et al., 2021), it appears that the stabilizing infection period in Indonesia occurred during January 2021 instead of April 2020.

This study, finally, provides further explanation on the importance of government policies to counter the repercussions of the COVID-19 pandemic on SOE stock prices. Empirical findings from this study indicate that the stock prices react differently to the pandemic depending on the phase of pandemics and the related governmental policies to curtail the pandemic.

5. Conclusion

The COVID-19 pandemic has affected the global stock market, including the Indonesian stock market. Numerous studies have investigated the impact of the COVID-19 pandemic on the stock market and concluded that the pandemic is negatively affected the stock market, despite some variations across countries, time and industries do exist.

This study examines the impact of the COVID-19 pandemic on the stock prices of SOE in Indonesia at different pandemic phases and the corresponding government interventions to curb the disease. Furthermore, this study addresses the important role of SOE in assisting the national economy, especially during the COVID-19 Pandemic, which is under-explored due to the lack of empirical studies on the COVID-19 pandemic that specifically focus on SOEs. By comparing the average stock prices between the period before and after the several COVID-19 event dates for 20 SOEs listed in IDX, this study concludes that the COVID-19 pandemic has a significant impact on the SOE stock prices. In general, the COVID-19 pandemic negatively affects SOE stock prices. Nevertheless, in line with a previous study (Phan & Narayan, 2020), the pandemic effect varies according to the phase of the pandemic and the related government pandemic policies. During the early pandemic event dates, i.e. the announcement of the first confirmed COVID-19 cases, the announcement of COVID-19 as a global pandemic, the imposing of PSBB I and PSBB II, the stock prices of SOEs decrease. However, during the imposing of PPKM in 2021, where the number confirmed COVID-19 reaching one million cases, the stock prices of SOEs increased.

In contrast, the result from this study shows that the implementation of a new normal policy creates positive sentiment to the investors that, in turn, increases the SOE stock prices. During the new normal, numerous economic activities are no longer restricted and many companies resume their operations. This results in the economy gradually recovering and therefore having a positive impact on the stock market.

One implication of this study is that investors should take precautionary action in making their investment decision during the COVID-19 pandemic to gain an optimal return. In addition, due to the adverse effect of lock-down policy and positive reaction on the implementation of new normal policy, the government as the policies maker should cautiously consider the timing to impose policies in restricting or relaxing economic activities during the COVID-19 pandemic.

As this study is limited to the Indonesian SOEs context, the generalization of the results of this study is also limited. Future studies may extend the study by examining the effect of different pandemic stages in a different/broader context or on a lengthier period with the corresponding COVID-19 government interventions to test whether similar results hold. Moreover, although this study examines the effect of different COVID-19 pandemic phases and the related governmental responses to the pandemic, the effectiveness of specific government policies does not become the focus of this study. Therefore, upcoming research may also explore this issue.

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