

Does Large-scale Social Restriction Affect Firms' Financial Performance?

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Abstract. To prevent the spread of the COVID-19 pandemic, the government has had some large-scale social restrictions (LSSR). As a side effect, many firms experienced a decrease in their revenues, which will decrease their financial performance. This research seeks to investigate how the COVID-19 pandemic affects financial performance of companies listed in the Indonesian stock exchange. To analyze the effect of the COVID-19 pandemic, an ordinary least square (OLS) regression is employed with a dummy variable of the period before and after the pandemic started. Furthermore, to examine the causal effect of LSSR, this study uses the difference-in-difference method with a dummy variable whether the businesses could still operate during the LSSR. The results show that COVID-19 pandemic has a significant negative effect on firms' financial performance represented by ROA. Secondly, by employing panel-data regression with difference-in-difference, it is found that the LSSR has an insignificant effect on firms' performance in affected firms. From the results, this research can contribute to the literature to see the effect of the large-scale social restrictions on firms' financial performance. This research also can be used as a consideration for the government in making future policies to prevent the spread of the COVID-19 pandemic.

Keywords: COVID-19 pandemic, difference-in-difference, firms' financial performance, large-scale social restrictions.

1. Introduction

The COVID-19 pandemic was believed to be started in Wuhan, the People's Republic of China on 31 December 2019. After more than one year, the COVID-19 pandemic has not been over yet. To prevent the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), Indonesia's government has had several large-scale social restrictions to limit public activity.

During the first large-scale social restrictions, the government only allowed several sectors to operate normally. Those sectors are health, food, energy, communication, finance, logistic, retail, and strategic industries (Anwar, 2020). As the effect of this large-scale social restriction, Hariyadi Sukamdani, Head of the Indonesian Hotel and Restaurant Association (*Perhimpunan Hotel dan Restoran Indonesia*), stated that the hospitality sector experienced a loss of around 85.7 trillion rupiahs (Wahyudi, 2020).

Several studies have been conducted regarding the effect of the COVID-19 pandemic on firm level. Hu and Zhang (2021) found that a firm's profitability has a negative relationship with the number of cumulative confirmed COVID-19 cases. On the other hand, Khatib and Nour (2021) found that firms' profitability during the COVID-19 pandemic is not significantly different compared to before the pandemic in Malaysia.

As the results of previous studies are still unclear, this research is aimed to explain firms' financial performance during the COVID-19 pandemic compared to before the pandemic. Current research also aimed to investigate the influencing factors of firms' financial performance as it is affected by government policy. This research will specifically analyze firms grouped by sectors whether they are allowed to operate as usual or not.

In this research, there are three research questions. First, how is the firms' financial performance during the COVID-19

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Received: August 24th, 2021; Revised: November 19th, 2021; Accepted: November 27th, 2021

Doi: <http://dx.doi.org/10.12695/ajtm.2021.14.3.4>

Print ISSN: 1978-6956; Online ISSN: 2089-791X.

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pandemic? Second, what is the effect of large-scale social restrictions on firms' financial performance? Third, what is the effect of large-scale social restriction on affected firms' financial performance? This research contributes to the literature by investigating the effect of large-scale social restrictions on firms' financial performance. As the LSSR policy might affect the business activities and hence affect the firms' financial performance. The practical implication of this research can be used by the government in designing future policies.

To answer the research questions, this research will use panel data regression difference-in-differences (DiD) method. This research will divide the period to before and after the first large-scale social restriction and the affected sectors as the treatment. The assumption underly this research is the parallel trends assumption which assumes that if the 'treatment' is absent, there will be a constant difference between the treatment group and the control group. The limitation of this research is that the COVID-19 pandemic has not been over yet. When the pandemic is over, future research may use the difference-in-difference-in-difference method.

2. Literature Study/ Hypotheses Development

The COVID-19 pandemic has been considered a global crisis. Based on WHO's data, as of 17 August 2021, the number of confirmed COVID-19 cases all around the world is 207,784,507. The current COVID-19 pandemic brings numerous effects on daily life, including the financial sector. Previously, the latest global financial crisis (GFC) occurred around 2008. Regarding the 2008 GFC, Atahau and Cronje (2021) found that the significance of the determinant of banks' profitability changes between the pre-crisis and post-crisis periods in Indonesia. While Erfani and Vasigh (2018) found that the GFC did not have significant effect on Islamic banks' profitability in several countries. While in construction companies, Lai et al. (2014)

found that the GFC has a direct impact on profitability reduction among Malaysian construction companies. Similar to the global financial crisis, the COVID-19 pandemic also has its effect on business level. Previous studies have been conducted to analyze the effect of the COVID-19 pandemic on firms' capital structure (Hotchkiss et al., 2020; Huang & Ye, 2021), the dividend policy in the state of the COVID-19 pandemic (Cejnek et al., 2020; Husain & Abdulla, 2020; Krieger et al., 2020; Pettenuzzo et al., 2021), and cash holding during the pandemic (Qin et al., 2020).

As for the stock returns, Alfaro et al. (2020) studied the effect of predicted COVID-19 cases toward stock returns. Similarly, Anh et al. (2021) investigated the effect of the COVID-19 cases on stock returns and took lockdown into account. This study will focus on the effect of the COVID-19 pandemic on firms' financial performance. Specifically, this research will analyze the effect of large-scale social restrictions on firms' financial performance.

Khatib and Nour (2021) found that there is a significant influence from the COVID-19 pandemic to firm performance, the structure of governance, dividend, liquidity ratio, and leverage ratio, but all the characteristics are not significantly different between before and after the COVID-19 pandemic exist. Cho and Saki (2021) also found that the COVID-19 bring adverse effect on textile firms in the United States. While Sharma et al. (2020) found that to NASDAQ 100 firms have to look beyond their profitability to ensure the wellbeing of both firms' employees and the employer. They also found that many firms are forced to lay off their employees as the effect of the COVID-19 pandemic.

This research is focused on the effect of the COVID-19 pandemic on firms' financial performance. The COVID-19 pandemic was found to have a negative influence on firms' performance in China. It is found that the negative influence of the COVID-19 pandemic is more likely to exist in firms with lower sales (Shen et al., 2020). While Rababah

et al. (2020) found that the COVID-19 pandemic mostly affected small- and medium-sized firms. They also found that the firms from the industries that have a serious impact from the COVID-19 pandemic severe sharper decline in the financial performance. As for finfish aquaculture industry, the COVID-19 pandemic is found to affect profit margins (Hasan et al., 2021). Clark et al. (2021) found the effect of the COVID-19 on hospitality industry and the results are consistent with medical recommendation. Their findings proved that any recommendations could have financial impact.

Through the large-scale social restrictions, the government tried to prevent the spread of the COVID-19 pandemic. To mitigate the spread of COVID-19, the government prohibits mass public activities. The government only allowed certain sectors to operate normally during large-scale social restrictions. The government also advised people to stay at home and avoid unnecessary activities outside their homes. The government also prohibited travel to other cities. As the effect of this policy, some firms even had to lay off their employees and resulting in an increase in Indonesia's unemployment rate. According to The World Bank, Indonesia's unemployment rate is increased from 3.6% in 2019 to 4.3% in 2020.

This phenomenon will decrease income for many people. As the result, people purchasing power will diminish. Hence, firms' revenue will be decreasing and will also decrease their financial performance. From a survey conducted by BPS (Badan Pusat Statistik, 2020), it is found that 84.2% of micro and small enterprises and 82.29% of medium and large enterprises experienced a decrease in revenues. From this explanation, the first hypothesis in this research is as follows:

H₁: Firms' financial performance during the COVID-19 pandemic is lower compared to before the pandemic.

From the large-scale social restrictions policy, the government allowed only several sectors to operate normally. For example, people were

prohibited to go on vacation during the first large-scale social restrictions. Hence, firms in the tourism sector will not operate normally because the number of visitors will be decreased. This condition will make firms in affected sectors experience more decrease in revenues and even decreases their financial performance compared to allowed sectors.

From the explanation, the second hypothesis is as follows:

H₂: Financial performance of firms in affected sectors after the large-scale social restrictions will be decreased more significantly than that of the firms from allowed sectors.

3. Methodology

This research uses secondary data from all listed companies in the Indonesia stock exchange (IDX). The data will be gathered from Refinitiv Eikon. The gathered data is annual data at the middle of the year (second quarter). This data selection was decided due to the new normal implementation in Indonesia that started around the second quarter of 2020. To answer the research questions, the data will be analyzed using the difference-in-difference method which compares before-after and treatment-control (Fredriksson & Oliveira, 2019).

The number of listed firms from 2018 to 2020 is 591 firms. In this research, we analyzed 414 firms due to data availability. The time frame in this research will be divided into two periods, before and during the COVID-19 pandemic. Besides the period, these firms that consist of twelve sectors will be divided into two groups control and treatment group. A control group is a group of firms from several sectors that are not affected by the large-scale social restriction policy. Those sectors are health, food, energy, communication, finance, logistic, and strategic industries. While the treatment group consists of firms from the affected sector. The number of control groups is 176 firms, while the rest 238 firms will be classified as the treatment group.

The basic Ordinary Least Square (OLS) model used in this research is adapted from Shen et al. (2020) with addition of liquidity ratio as an additional independent variable (Duan & Niu, 2020):

$$ROA = \beta_0 + \beta_1 SIZE_{it} + \beta_2 LEV_{it} + \beta_3 GROWTH_{it} + \beta_4 LIQ_{it} + \epsilon_{it} \quad (1)$$

To analyze the effect of the COVID-19 pandemic on firms' financial performance, this research will also use this model:

$$ROA_{it} = \beta_0 + \beta_1 After_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 GROWTH_{it} + \beta_5 LIQ_{it} + \epsilon_{it} \quad (2)$$

To analyze the causal effect of large-scale social restriction on firms' financial performance for the firms affected by the LSSR, panel data regression with the difference-in-difference method will be employed. The model is:

$$ROA_{it} = \beta_0 + \beta_1 Treated_i \times After_{it} + \beta_2 Treated_i + \beta_3 Period_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GROWTH_{it} + \beta_7 LIQ_{it} + \epsilon_{it} \quad (3)$$

Where:

ROA = the dependent variable representing the firms' financial performance.

β_1 = the coefficient of interest, that is the causal effect of the companies affected by the pandemic.

Treated = a dummy variable (1 = treatment group; 0 = control group).

After = a dummy variable (0 = Before the pandemic started; 1 = After the pandemic started). The pandemic is started on March 11, 2020.

SIZE = the natural logarithm of firms' assets.

LEV = the leverage represented by the debt-

to-assets ratio.

GROWTH = the growth of firms' operating income.

LIQ = the liquidity represented by current ratio, i.e., current assets divided by current liabilities.

In this research, to test Hypothesis 1, if the β_3 in the model is negative, we can conclude that COVID-19 has a negative influence on firms' financial performance. While to answer Hypothesis 2, β_1 is the coefficient of interest, with interaction variable treatment and after. If the β_1 in the model is negative, we can conclude that the COVID-19 pandemic through the large-scale social restriction worsens firms' financial performance more severely for the affected sectors.

Furthermore, to test the robustness of this research, in the model we will test the coefficients with the robust clustered standard errors where the cluster is the firm individual. We will also conduct a placebo test and faking the after and treated variables. We used the 2018 data as 'before' and 2019 data as 'after' to see that the effect only appears in the 'real' COVID-19 pandemic. We reverse the treated dummy variable and take the essential sector as treated, vice versa. Besides the robust standard errors and the placebo test, we also used the ROE to test the robustness of our results.

4. Finding and Discussion

Descriptive Statistics

From 828 observations, the descriptive statistics regarding the variables from 2019 until 2020 are shown in Table 1.

Table 1.
Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
ROA (%)	0.3249	4.4563	-97.7486	24.0317
Size (million Rp)	11,769,722.98	27,449,684.88	17,132.30	350,288,000.00
Leverage (%)	49.9667	22.9448	0.2051	167.2821
Growth (%)	-1.5180	2,357.1486	-24,733.1045	56,228.7610
Liquidity	9.8869	179.4595	0.0300	5,154.6500

Notes: The figures are calculated using pooled data

From Table 1, we can see that average, firms' performance to generate income by utilizing assets is about 0.32%. This low average is due to the mix of the data between before and during the COVID-19 pandemic. The average firm size is Rp11,769,722.98 million. As for the leverage, the average debt-to-assets ratio is

49.97%. As for operating income growth, the average growth is about -1.52%. The worst operating income growth is about a 24,733.10% decrease. In this research, the average of current ratio is 9.89. The current ratio represents firms' liquidity.

Table 2.
Descriptive statistics before the pandemic

Variable	Mean	Std. Dev.	Min	Max
ROA (%)	0.7995	2.7123	-15.5148	24.0317
Size (million Rp)	11,581,799.09	27,238,213.43	50,267.10	350,288,000.00
Leverage (%)	48.8745	21.4439	0.2137	102.4951
Growth (%)	-19.9265	289.3210	-2,549.2490	2,931.1972
Liquidity	3.2802	9.4927	0.0300	129.7900

Notes: The figures are calculated using data obtained from the second quarter of 2019 or before the pandemic

Table 3.
Descriptive statistics after the pandemic

Variable	Mean	Std. Dev.	Min	Max
ROA (%)	-0.1497	5.6531	-97.7486	17.4230
Size (million Rp)	11,957,646.86	27,691,221.46	17,132.30	343,674,000.00
Leverage (%)	51.0590	24.3304	0.2051	167.2821
Growth (%)	16.8904	3,322.8551	-24,733.1045	56,228.7610
Liquidity	16.4936	253.5977	0.0300	5,154.6500

Notes: The figures are calculated using data from the second quarter of 2020 or after the pandemic

From Table 2 and Table 3, we can see that the average ROA after the pandemic is lower compared to before the pandemic. After the pandemic, the average ROA even shows negative signs, which the average ROA is decreased after the pandemic. While the average size after the pandemic is higher compared to before the pandemic. On the other hand, both minimum and maximum total asset after the pandemic is lower compared to before the pandemic. As for the

leverage, the average debt-to-asset ratio (DAR) after the pandemic is higher compared to before the pandemic period. Some firms might increase their leverage in response to the COVID-19 pandemic. However, the liquidity ratio after the pandemic on average is higher compared to before the pandemic. This condition means that on average firms' ability to pay short-term liabilities after the pandemic is higher compared to before the pandemic. As for the operating income

growth, the minimum growth after the pandemic is lower compared to before the pandemic. This indicates some firms might

experience a sharp decrease in their operating income.

Table 4
Descriptive statistics for treatment group

Variable	Mean	Std. Dev.	Min	Max
ROA (%)	0.3801	3.1694	-15.5148	24.0317
Size (million Rp)	10,079,194.33	27,401,621.73	17,132.30	350,288,000.00
Leverage (%)	49.0954	22.6894	0.4946	114.2426
Growth (%)	47.3663	2,982.0740	-24,733.1045	56,228.7610
Liquidity	3.5610	9.0869	0.0300	96.3800

Table 5.
Regression results for the first model

Variables	Estimate		SE	p-Value
Constant	-11.1478	***	2.9021	0.0001
After	-0.8440	***	0.2729	0.0020
Size	0.4988	***	0.1027	0.0000
Leverage	-0.0496	***	0.0072	0.0000
Growth	0.0001	**	0.0001	0.0235
Liquidity	-0.0006		0.0008	0.4349
Adjusted R ²	0.0766			
p-Value	0.0000			

Note: SE are standard errors; ***' significant at 1% significance level; **' significant at 5% significance level; *' significant at 10% significance level.

Based on Table 4 and Table 5, we can see that in terms of average ROA, the difference between the control group and the treatment group is less than 1%. In terms of total assets, the control group's average is Rp14,055,778.76 million, and the treatment group's average is Rp10,079,194.33. This result shows that the control group contains firms with higher total assets on average. In terms of leverage, the difference between the control group's average and the treatment group's average is 2.05%. The control group's leverage is higher, which implies that the control group has a lower degree of financial flexibility compared to the treatment group on average. As for the growth of operating income, the highest decrease come from the

treatment group. This might be because of the pandemic. In terms of liquidity, the control group has a higher ability to pay their short-term liabilities than the treatment group on average.

Regression Analysis

To answer the first hypothesis, we ran the regression analysis where ROA became the dependent variable. To see the effect of the COVID-19 pandemic, we use a dummy variable where 1 is the period after the pandemic and 0 before the pandemic. We also added several control variables such as size, leverage, growth, and revenues. The result of the regression analysis is as follows:

Table 6.
Descriptive statistics for control group

Variable	Mean	Std. Dev.	Min	Max
ROA (%)	0.2503	5.7608	-97.7486	9.6447
Size (million Rp)	14,055,778.76	27,387,642.58	47,870.57	246,351,000.00
Leverage (%)	51.1451	23.2662	0.2051	167.2821
Growth (%)	-67.6230	1,024.2034	-17,575.5885	2,931.1972
Liquidity	18.4412	275.0297	0.0500	5,154.6500

As we can see from Table 6 above, the coefficient for the period dummy variable shows a negative sign which indicates that the COVID-19 pandemic affects the firms' performance in generating profit negatively. The COVID-19 pandemic period also shows a significant result up to a 1% significance level. This finding supports our first hypothesis which states that firms' financial performance during the COVID-19 pandemic is lower compared to before the pandemic. Our finding is supported by previous studies about firms' performance during the COVID-19 pandemic (Cho & Saki,

2021; Khatib & Nour, 2021; Shen et al., 2020).

To answer the second hypothesis, we ran the regression analysis where the ROA became the dependent variable. To test the effect of the LSSR, we use the dummy variable treated (1 = the sector is affected by the LSSR; 0 = the sector is not affected by the LSSR). We also add the 'After' dummy variable (1 = after the LSSR; 0 = before the LSSR) and calculate the treated $\times$ after to test the effect of the LSSR toward firms' financial performance. The regression result is as follows:

Table 4.
Regression results for the second model

Variables	Estimate		SE	p-Value
Constant	-11.5210	***	2.9638	0.0001
Treated $\times$ After	0.0337		0.5522	0.9514
Treated	0.2061		0.4315	0.6329
After	-0.8641	**	0.4191	0.0392
Size	0.5075	***	0.1036	0.0000
Leverage	-0.0495	***	0.0072	0.0000
Growth	0.0001	**	0.0001	0.0246
Liquidity	-0.0006		0.0008	0.4587
Adjusted R ²	0.0749			
p-Value	0.0000			

Note: SE are standard errors; ***' significant at 1% significance level; **' significant at 5% significance level; '*' significant at 10% significance level.

From Table 7, we can see that the coefficient for Treatment $\times$ After shows an insignificant coefficient. This result does not support the second hypothesis that the LSSR affects performance of the firms from the non-essential sectors more severely than other companies. These results indicate that due to the COVID-19 pandemic, both the essential sectors and the non-essential sectors experienced a decrease in their performances.

The LSSR could possibly decrease people's income. Besides, the LSSR could also interfere with some sectors' business processes. As a result, all sectors might experience a decrease in revenues which will decrease their performance in order to generate a profit by utilizing their assets.

Related to the government's policies to prevent the outbreak of the COVID-19, the

policy implication of this research is the government can focus on preventing the COVID-19 by imposing the required measures since both essential and non-essential sectors are affected by the COVID-19.

The pandemic became such a dilemma for the government. The government should be able to prevent the spread of the COVID-19, hence the pandemic becomes under control first. On the other hand, the government must

also implement measures to speed up economic recovery. The government even has loosened the 'lockdown' several times in order to recover the economy.

Robustness Test

To test the robustness of our research, we test the coefficient with the robust clustered standard errors. This research clustered the observation at firm level. The results of the tests are as follows:

Table 5.

Result of the clustered robust standard errors

Variables	Estimate		Robust SE	p-Value
Constant	-11.1478	***	2.8784	0.0001
After	-0.8440	***	0.2315	0.0003
Size	0.4988	***	0.1464	0.0007
Leverage	-0.0496		0.0324	0.1262
Growth	0.0001		0.0001	0.2502
Liquidity	-0.0006		0.0005	0.1832
Adjusted R ²	0.0766			
p-Value	0.0000			

Note: *** significant at 1% significance level; ** significant at 5% significance level; * significant at 10% significance level.

From the results above, we can see the effect of the COVID-19 pandemic in the first model shows a negative coefficient at a 1% significance level. This result shows that the

effects of the COVID-19 pandemic are proven to be existed even after clustering the standard errors to the firm level.

Table 6.

The placebo test result

Variables	Estimate		SE	p-Value
Constant	-6.2857	***	1.9984	0.0017
After	-0.0644		0.1276	0.6135
Size	0.2925	***	0.0709	0.0000
Leverage	-0.0257	***	0.0052	0.0000
Growth	0.0010	***	0.0002	0.0000
Liquidity	-0.0006		0.0081	0.9369
Adjusted R ²	0.0651			
p-Value	0.0000			

Note: *** significant at 1% significance level; ** significant at 5% significance level; * significant at 10% significance level.

From Table 9, we can see that the decrease in firms' financial performance is not significant with the 'fake' cut-off. This is also proof that the decrease in firms' financial performance in 2020 is due to the COVID-19 pandemic. Because in 2019 the pandemic has not been started yet. We also conducted the robustness test using the ROE become as the dependent variable. The result is as follows:

Table 7.
Regression result with ROE as the dependent variable

Variables	Estimate		SE	p-Value
Constant	-1.9314		19.7612	0.9221
Treated×After	2.5523		4.3415	0.5566
Treated	2.1214		3.0932	0.4928
After	-4.4056		3.2945	0.1811
Size	0.2731		0.6907	0.6925
Leverage	-0.0956	*	0.0489	0.0507
Growth	0.0021	***	0.0005	0.0000
Liquidity	-0.0009		0.0061	0.8867
Adjusted R ²	0.0271			
p-Value	0.0001			

Note: ***' significant at 1% significance level; **' significant at 5% significance level; *' significant at 10% significance level.

From Table 10, we can see that even when ROE is used as the dependent variable, the difference-in-difference (Treated × After) is still insignificant. This indicates that the large-scale social restriction did not affect nonessential firms more than the essential firms in terms of financial performance.

5. Conclusion

The COVID-19 has been spreading for over one year. The government has made efforts to prevent the outbreak using several policies. Focusing on firms' financial performance, this research investigates the effect of the COVID-19 pandemic on firms' financial performance. The current study can contribute as one consideration for the government in making future policies as this research investigates the effect of large-scale social restriction on firms' financial performance.

As the effect of the COVID-19, firms' financial performance in the second quarter of 2020 was lower compared to the second quarter of 2019 performance. As for the LSSR, both essential sectors and non-essential sectors after the LSSR experienced a decrease in their financial performance with no significant difference. These results are robust after clustering the standard errors to firm level as well as by performing the placebo test. These findings can be considered by the

government in response to the COVID-19 pandemic. The government is recommended to focus on the response to the pandemic first. To give a better understanding, future studies can include the period after the COVID-19 pandemic is over to see the aftermath of the COVID-19 pandemic.

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