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THE COVID-19, POLICY AND CAPITAL MARKET: EMPIRICAL EVIDENCE FROM INDONESIA

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ABSTRACT

This paper aims to examine the impact of Covid-19 on the Indonesian capital market. Second, we test whether any policy from regulators could mitigate its effects. By using daily time-series data from January to July, we propose the simplest regression model (ordinary least squares) to test its effect. We also conducted some robustness with various sectors and splitting samples to make sure that our findings are robust and consistent. We find that Covid-19 (proxied by new cases, cumulative cases, new deaths, and cumulative deaths) has a negative effect on stock price in all indexes, i.e., composite, Islamic, and all sectors (the worst in the financial sector). In other words, a higher number of Covid-19 leads to a lower stock price in Indonesia. Second, the regulations from the government (the President, Financial Service Authority, Central Bank of Indonesia, and Indonesian Stock Exchange) could reduce its negative impact. It means that the negative effect of Covid-10 on the Indonesian stock market is becoming lower after including policies from all regulators. Hence, measuring Covid-19's drawbacks on the capital market by relevant policies in Indonesia. It is also quite pivotal to explore which one policy either effective or ineffective to mitigate Covid-19.

KEYWORDS: Capital market; Covid-19; Indonesia; Policy.

INTRODUCTION

This study aims to examine whether the Coronavirus (Covid-19) has an impact on the Indonesian stock market. It has a severe impact on many aspects including financial markets across the world. The Indonesian president announced the first Covid-19 case in Indonesia March 2, 2020 (WHO, 2020). Many economic activities were restricted, people were not allowed to leave, and social distancing was carried out. The government and community response to prevention efforts such as work from home, cancellations of various public events. The termination of public transportation, the prohibition of going home, and slowing down economy are also occurred (IMF, 2020).

According to the Indonesian Stock Exchange's data, Covid-19 also hits the Indonesian financial market. There was capital outflow (IDR159.3 trillion) and it leads to high volatility. Indonesian composite index was corrected until 28.44%, but the Jakarta Islamic Index rose by 2.52%. The decline is caused by a number cases or death with dramatic increase daily up to now. So, many shares have been sold at undervalued prices. All sectors have declined sharply during Covid-19, including trade, services, investment by 20.88%. The Covid-19 also creates investors' panic in the market. Its outbreak was not anticipated earlier, a prolonged impact, and cause a snowball effect on the dollar. Its impact could be worse than the global financial crisis in 2008.

The second purpose of this study is to test whether any policies from either the Indonesian government or authorities could reduce its negative impact on the market. The Indonesian Financial Services Authority (OJK), President, Indonesian Stock Exchange (IDX), and Central Bank (BI) implement some regulations to overcome Covid-19's impact. On March 31, 2020, President Joko Widodo issued a Government Regulation called "PERPPU" to maintain financial system stability from Covid-19's effect. The government also implemented fiscal policies to support national economic recoveries such as health care, benefits, and social assistance. To reopen the economy, the government announced "New Normal" to encourage Indonesian people to carry out activities as before but with new behaviors or habits with clean and healthy behaviors. The government also carried out fiscal, monetary, and macroeconomic policies to maintain liquidity.

On April 22, 2020, OJK issued five regulations (POJK) to support PERPPU for handling Covid-19. OJK also issued several policies, relief and or postponement of credit or leasing payments for MSMEs and informal workers until 1 year. BI also issued a monetary stimulus policy through a triple intervention intensity, lowered mandatory current ratio of foreign exchange all banks, expanded underlying transactions for foreign investors, and used global-domestic custodian banks for investment activities (IMF, 2020).

On May 11, 2020, the total number of corona virus cases in Indonesia up to 35,295. Per day, its increase shows the ineffectiveness of the government policies to deal with Covid-19. All countries are also still in the handling of Covid-19, where the positive numbers increase significantly. It makes investors withdraw money in cash. Therefore, this study would provide empirical analysis to examine whether any policy from government could reduce Covid-19's impact on capital market. Up to July 7, 2020, the Covid-19 climbs sharply with unpredictable endings (the details are in Figure 1). This figure depicts Covid-19 data in Indonesia, including the number of new cases, cumulative cases, new deaths, and cumulative deaths since the first case occurred March 2, 2020

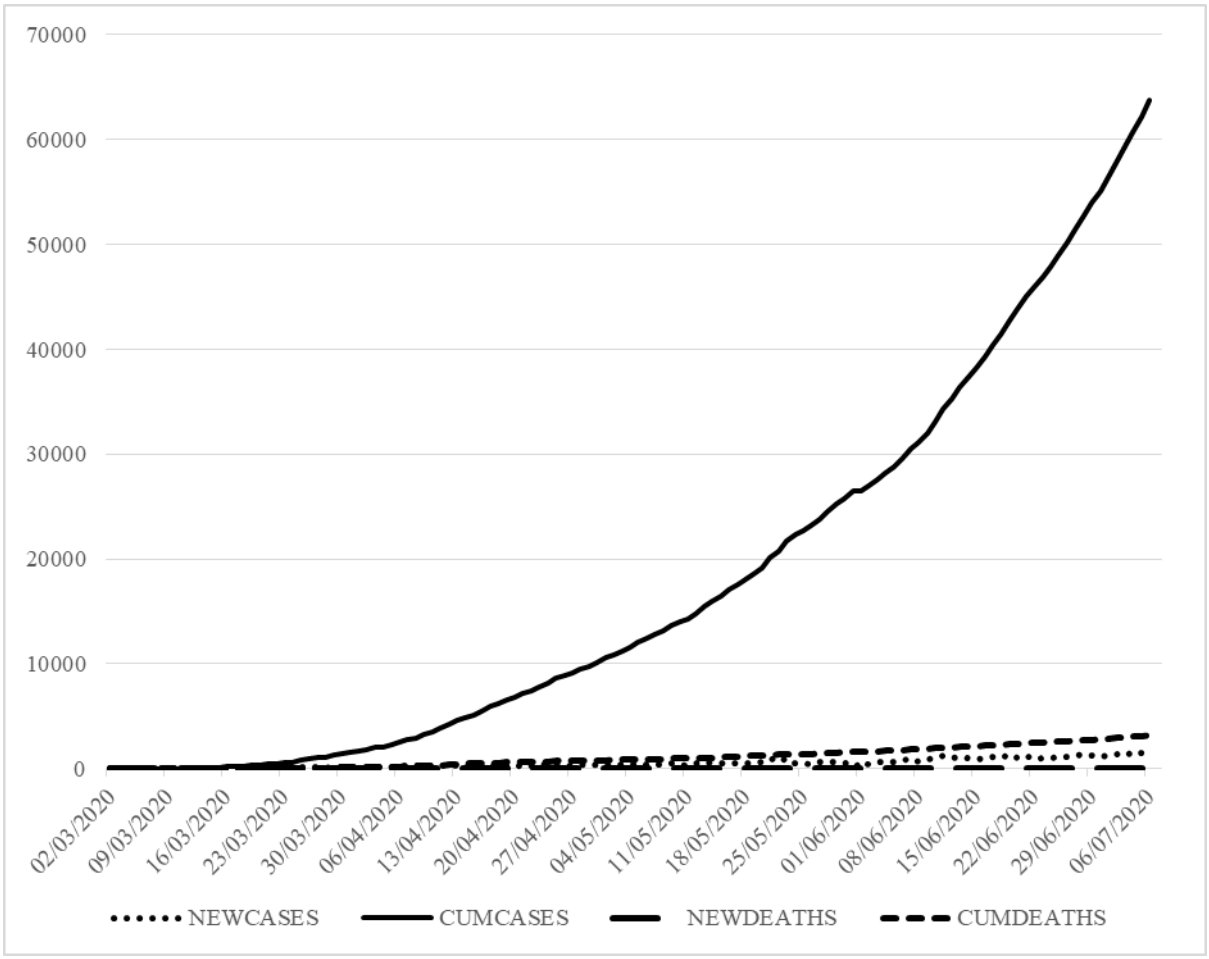

Figure 1. Covid-19 in Indonesia

Figure 1 above shows the increasing number of covid-19 cases. This paper has some contributions as follows. To the literature, this study would be beneficial to enhance the literature by providing many proxies for Covid-19 like new cases, cumulative cases, new deaths, and cumulative deaths. Besides, to measure its impact this study proposes various indexes in an emerging country. For the policy makers, this study shed a light whether or which policies are effective to diminish Covid-19's impact.

This study offers some distinguish settings compared to previous studies. First, this study offers deeply understanding on Indonesian context as a unique market since there is no sign of declining Covid-19 compared to other countries with decline or recovery condition. The prior studies commonly focused on wider context (cross-country analysis) about the impact of Covid-19 on the capital market (Ali et al., 2020; Haroon & Rizvi, 2020; Zhi Da, Joseph Engelbeg, 2011).

Second, this study prefers to explore Covid-19's impact on stock price index rather than price volatility or return (Haroon & Rizvi, 2020; He et al., 2020, Corbet, Larkin and McMullan, 2020). Some previous studies found that Covid-19 influences the composite index and several industrial sectors in the world (Goodell & Huynh, 2020; Zhang et al., 2020). Industry is a sector that is very important in improving the national economy (Triyani, Setyahuni and Kiryanto, 2020). Therefore, we hypothesize that Covid-19 has a negative impact on the Indonesian capital market.

Third, this paper analyzes any policy interventions empirically to measure negative impact of Covid-19 on capital market, while other studies focused on discussed it implicitly about

the necessary of those policies. Sharif et al., (2020) stated that the regulation from the government could alleviate Covid-19's impact on the capital market.

To test the impact of Covid-19 on Indonesian capital market as first hypothesis, we examine the direct effect of Covid-19, proxied by four proxies on Indonesian stock indexes by including exchange rate (Rupiah to USD) as a control variable. The exchange rate influences the Indonesian capital market due to its appreciation or deprecation value. We adopt prior study (Sharif et al., 2020; Gormsen and Koijen, 2020) who examine the impact of Covid-19 (number of cases) on stock index price (Dow Jones 30). Our second hypothesis is whether any policy from Indonesian government or other regulators could reduce the negative impact of Covid-19 on Indonesian stock market. We argue that any regulations or interventions from the regulators diminish its impact (Sharif, Aloui and Yarovaya, 2020; Zhang, Hu and Ji, 2020; Luchtenberg and Vu, 2015).

This paper is organized as follows. The next section would discuss method, results and discussions, and the conclusions

METHOD

This paper relies on Covid-19 data in Indonesia, which is proxied by four measures such as the number of new cases (NC), cumulative cases (CC), new deaths (ND), and cumulative deaths (CD) from March 2 to July 7, 2020. Those data from World Health Organization (WHO) open database. Next, the capital market data are from DataStream (Thomson Reuters Eikon) including the price of IDX composite (IH) and Jakarta Islamic index (JI). All sectors are included as alternative measures: agriculture (AG), finance (FI), infrastructure (IN), manufacture (MA), mining (MN), basic (BA), construction (CO), consumer (CS), and miscellaneous (MI). All of them are time series daily data in which composed from prior Covid-19 period (January 1, 2020) up to current Covid-19 period (July 7, 2020).

The policy measures use several Indonesian regulators, entailing the Indonesian Financial Service Authority or OJK (OJ). Then, the President, ministries, or other local government (PR) when declared some regulations or interventions to tackle Covid-19. The Indonesia Stock Exchange or IDX (ID) also announced some interventions in the capital market to diminish the negative impact of Covid-19 on Indonesian Capital Market. Those data are computed manually from each regulators' official website by putting dummy 1 if there is any regulations or intervention in certain day and 0 for otherwise. We utilize ordinary least squares estimator (OLS) to examine the relationship since it is the simplest model to examine the effect of independent variable on dependent variable.

The alternative measures for any Indonesian policy related to Corona disease also published policy at the International Monetary Fund (IMF)'s Website including a). policy background (PO) such as lockdown, etc. b). reopening economy such as easing restrictions "new normal", etc. c). fiscal packages to support national economic recovery like health care, benefits, and coverage of social aids for low-income households, etc. d). monetary and macroeconomic policies like reducing policy rate, easing liquidity, etc. e). exchange rate and balance of payments such as spot and domestic non-deliverable foreign exchange market, etc. The details of those variables are in Table 1 below:

Table 1. Data of Variables

Variables	Definitions	Sources	Citations
NC	The number of new cases Covid-19 daily in Indonesia	www.who.int	(Ali et al. 2020)
CC	The number of cumulative cases		(Al-Awadhi et al. 2020)
ND	The number of new deaths		(Haroon and Rizvi 2020)
CD	The number of cumulative deaths		(Ashraf 2020)
IH	The price of stock index from IDX Composite which represents all Indonesian stocks daily in Rupiah	Datastream	(Ali et al., 2020) (Haroon and Rizvi 2020) (Al-Awadhi et al. 2020)
JI	The price from Jakarta Islamic Index which is all Islamic stocks		
AG	The price from agriculture sector		
FI	The price from finance		
IN	The price from infrastructure		
MA	The price from manufacture		
MN	The price from mining		
BA	The price from basic		
CO	The price from construction		
CS	The price from consumer		
MI	The price from miscellaneous		
IU	The exchange rate from United States Dollar (USD) to local currency (IDR) in Rupiah		
OJ	Dummy 1 for any interventions from the OJK and 0 for otherwise	www.ojk.go.id	(Goodell 2020)
PR	Dummy 1 for regulations from the President, Ministries, and other local governments and 0 for otherwise	www.covid19.go.id	(Sharif et al. 2020)
ID	Dummy 1 for policies from the Indonesian Stock Exchange (IDX) and 0 for otherwise	www.idx.co.id	(Liu et al. 2020)
PO	Dummy 1 for policy from Indonesian government such as lockdown, mandatory mask, etc., and 0 for otherwise	www.imf.org	(Wagner 2020)
RE	Dummy 1 for any reopening economy regulation from government such as relaxations, etc., and 0 for otherwise		(He et al. 2020)
FC	Dummy 1 for any regulation related to fiscal packages and 0 for otherwise		(Ashraf 2020)
MO	Dummy for any monetary and macroeconomic policy and 0 for otherwise		(Zhang, Hu, and Ji 2020)
EX	Dummy 1 for any exchange rate and balance of payment policy and 0 for otherwise.		(Al-Awadhi et al. 2020)

Our composed model is as follows:

$$StockIndexPrice_t = \alpha_t + \beta_1 Covid19_t + \beta_2 IU_t + \varepsilon_t \quad (1)$$

$StockIndexPrice_t$ denotes the two indexes either Indonesian Composite Index or Jakarta Islamic index at time t (daily), while $Covid19_t$ is proxied by new cases (NC), cumulative cases (CC), new deaths (ND), and cumulative deaths (CD) at the day t. IU_t is the exchange rate obtained from local currency (Rupiah) to United States Dollar (USD). ε_t is the standard errors or residuals.

To capture the impact of Covid-19 on stock index price in each sector as the additional analysis for robustness. So, we run Equation (1) with stock index price is from all sectors as mentioned above at the time *t*. A uniqueness of Indonesian market is containing 9 sectors compared to other country. Further, in this study we provide price of stock index rather than return or volatility like mostly prior studies focus (Haroon and Rizvi, 2020; He *et al.*, 2020). This study also offers deep understanding by focusing on one capital market (Indonesia) to explore deeper market in each sector, rather than wider context or cross-country analysis like previous research (Ali et al. 2020).

In addition, We modify the regression model from previous studies by accommodating policy with dummy values. So, we include various kinds of policies into the regression model from Equation (1) to compose Equation (2) as follows:

$$StockIndexPrice_t = \alpha_t + \beta_1 Covid19_t + \beta_2 Policies_t + \beta_3 IU_t + \varepsilon_t \quad (2)$$

$Policies_t$ denotes dummy 1 values if there are any kinds of policies from various regulators such as the Financial Service Authority or OJK (OJ), President, Ministries, or other local governments (PR), Indonesian Stock Exchange (ID), policy background (PO), reopening economy (RE), fiscal (FC), monetary and macroeconomic (MO), and exchange rate and balance of payments (EX). We will run all of proxies in Equation (2) like Equation (1) in various proxies for stock index price and covid-19. To avoid confounding effect between policies, we conduct same robustness tests by testing the different proxies, various

Covid-19 measures, and splitting samples per sector. Based on Table 3, among policy variables are no high correlations.

RESULTS AND DISCUSSION

Prior commencing the regression analysis, we conduct a preliminary test of the data. In Table 2, we provide the descriptive statistics of the variables over the period January 1, 2020 to July 7, 2020. The results depict that the mean values of new cases, cumulative cases, new death, and cumulative deaths are 339, 12,047, 16, and 713 people. The average of stock price index for composite index and Jakarta Islamic Index are IDR5,188.15 and IDR559.50. While consumer is the largest stock index price with average price IDR1,833.09, followed by mining, manufacture, agriculture, finance, infrastructure, miscellaneous, construction, and basic industry. We select Indonesian Rupiah (IDR) since it is the national currency in Indonesia. The exchange rate is IDR14,560.10 in average.

This table depicts the descriptive statistics for all variables including the number of observations, mean value, standard deviation, minimum, and maximum values.

Variables	Obs.	Mean	Std. Dev.	Min	Max
NC	188.00	339.09	421.07	0.00	1,624.00
CC	188.00	12,047.66	17,110.56	0.00	63,749.00
ND	188.00	16.86	19.52	0.00	82.00
CD	188.00	713.73	913.83	0.00	3,171.00
IH	126.00	5,188.15	693.77	3,937.63	6,325.41
JI	133.00	559.50	77.63	393.86	699.45
AG	131.00	1,110.69	191.32	819.63	1,524.46
FI	131.00	1,110.57	182.85	846.75	1,378.65
IN	131.00	929.51	111.15	688.97	1,139.73
MA	131.00	1,213.94	148.54	873.83	1,473.92
MN	131.00	1,308.23	129.13	1,047.49	1,584.09
BA	131.00	759.31	119.92	507.36	983.24
CO	131.00	376.62	69.66	286.84	503.88
CS	131.00	1,833.09	161.36	1,375.70	2,114.57
MI	131.00	916.12	187.58	637.14	1,252.45
OJ	189.00	0.10	0.30	0.00	1.00
PR	189.00	0.19	0.39	0.00	1.00
ID	189.00	0.11	0.31	0.00	1.00
IU	132.00	14,560.10	857.21	13,572.50	16,575.00
PO	182.00	0.16	0.37	0.00	1.00
RE	182.00	0.14	0.35	0.00	1.00
FC	182.00	0.50	0.50	0.00	1.00
MO	182.00	0.32	0.46	0.00	1.00
EX	182.00	0.66	0.47	0.00	1.00

Table 2. Descriptive Statistics

We also examine the coefficient correlation among variables using pairwise correlation test to make sure that one variable did not correlate highly with other variables. If the correlation between two variables is high, we need to examine them into different model estimation separately to avoid multicollinearity. Table 3 depicts that NC has high correlation coefficient with CC (0.96), ND (0.87), and CD (0.97). Those variables are highly correlated since they are same proxies to measure Covid-19 but we separate them into different model estimations. Therefore, our models would provide estimations results with no multicollinearity.

Table 3. Colleration Testing

Coef.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(25)
(1) NC	1.00																							
(2) CC	0.96	1.00																						
(3) ND	0.87	0.82	1.00																					
(4) CD	0.97	0.99	0.84	1.00																				
(5) IH	-0.50	-0.40	-0.56	-0.45	1.00																			
(6) JI	-0.39	-0.29	-0.46	-0.34	0.98	1.00																		
(7) AG	-0.50	-0.41	-0.55	-0.46	0.99	0.97	1.00																	
(8) FI	-0.58	-0.47	-0.62	-0.54	0.97	0.91	0.95	1.00																
(9) IN	-0.41	-0.31	-0.48	-0.35	0.98	0.99	0.97	0.92	1.00															
(10) MA	-0.33	-0.23	-0.41	-0.27	0.96	0.99	0.95	0.88	0.98	1.00														
(11) MN	-0.43	-0.34	-0.47	-0.38	0.97	0.98	0.97	0.90	0.97	0.97	1.00													
(12) BA	-0.35	-0.26	-0.43	-0.30	0.96	0.99	0.95	0.88	0.98	0.99	0.96	1.00												
(13) CO	-0.64	-0.54	-0.66	-0.60	0.97	0.91	0.97	0.97	0.92	0.87	0.93	0.87	1.00											
(14) CS	-0.19	-0.12	-0.27	-0.14	0.87	0.95	0.87	0.75	0.93	0.97	0.92	0.95	0.75	1.00										
(15) MI	-0.47	-0.35	-0.54	-0.42	0.98	0.96	0.97	0.97	0.95	0.93	0.94	0.92	0.97	0.83	1.00									
(16) OI	0.11	0.13	0.17	0.15	-0.23	-0.22	-0.22	-0.23	-0.21	-0.21	-0.22	-0.20	-0.23	-0.20	-0.23	-0.18								
(17) PR	0.12	0.09	0.16	0.13	-0.46	-0.44	-0.45	-0.47	-0.44	-0.42	-0.45	-0.41	-0.46	-0.38	-0.47	-0.36	1.00							
		0.03			0.83	0.85	0.79	0.79	0.84	0.85	0.78	0.84	0.73	0.80	0.84	0.62								
(20) PO	-0.29	-0.28	-0.26	-0.30	-0.29	-0.40	-0.31	-0.15	-0.37	-0.47	-0.40	-0.47	-0.12	-0.59	-0.21	-0.04	0.08	0.61	0.32	0.30				
(21) RE	0.81	0.85	0.65	0.81	-0.18	-0.13	-0.19	-0.20	-0.14	-0.10	-0.17	-0.13	-0.30	-0.06	-0.12	-0.50	0.02	-0.14	-0.17	-0.01	1.00			
(22) FC	0.81	0.72	0.80	0.78	-0.67	-0.54	-0.66	-0.78	-0.56	-0.47	-0.55	-0.48	-0.80	-0.29	-0.71	-0.83	0.33	-0.25	-0.44	-0.29	0.44	1.00		
(23) MO	0.39	0.45	0.31	0.41	-0.39	-0.43	-0.43	-0.30	-0.42	-0.46	-0.47	-0.47	-0.35	-0.52	-0.28	-0.44	0.05	0.38	0.12	0.18	0.55	0.06	1.00	
(24) EX	0.59	0.51	0.61	0.55	-0.91	-0.86	-0.91	-0.90	-0.85	-0.84	-0.87	-0.85	-0.91	-0.75	-0.88	-0.87	0.39	0.22	0.69	-0.05	0.31	0.70	0.57	1.00

We present our regression analysis results in Table 4. Panel A depicts that all proxies of Covid-19 have negative relationship significantly to Indonesian capital market. These findings confirm prior studies from prior studies who find that Covid-19 has negative impact on the financial markets since it creates market shocks and negative sentiment for investors (Goodell & Huynh, 2020; Zhang et al., 2020; Brown *et al.*, 2015; Meegan, Corbet and Larkin, 2018; Corbet, Gurdgiev and Meegan, 2018. New deaths have largest coefficient, compared to number of cases. New cases also have larger impact rather than cumulative cases. The composite index declines are also more considerable rather than Jakarta Islamic Index. Panel B overall provides lower negative coefficient of Covid-19 on Indonesian capital market. These results indicate that the policy from government and authorities could lower negative impact of Covid-19 on the capital market. The results are consistent with previous study who find that any policy from the government could minimize the negative impact from Covid-19 on the capital market since it would maintain stock price (Sharif et al., 2020). The details of Table 4 are as follows:

Variables	Panel A. Y=Indonesian Stock Market (IHSG and JII) X=Covid-19							
	IH				JI			
NC	-0.72***				-0.06***			
	(0.06)				(0.00)			
CC		-0.01***				-0.00***		
		(0.00)				(0.00)		
ND			-14.53***				-1.20***	
			(1.52)				(0.17)	
CD				-0.34***				-0.03***
				(0.02)				(0.00)
IU	-0.63***	-0.67***	-0.59***	-0.66***	-0.07***	-0.07***	-0.07***	-0.07***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
Const.	14,686.51***	15,248.27***	14,046.93***	15,038.06***	1,650.91***	1,701.15***	1,593.25***	1,681.70***
	(428.55)	(426.64)	(473.59)	(402.71)	(51.53)	(50.70)	(54.86)	(49.87)
Obs.	124.00	124.00	124.00	124.00	132.00	132.00	132.00	132.00
Variables	**Panel B. Y= Indonesian Stock Market (IHSG and JII); X=Covid-19 and Policy**							
	IH				JI			
NC	-0.66***				-0.05***			
	(0.16)				(0.01)			
CC		-0.01***				-0.00***		
		(0.00)				(0.00)		
ND			-3.82				-0.47*	
			(2.37)				(0.27)	
CD				-0.40***				-0.03***
				(0.07)				(0.01)
OJ	-82.30	-63.81	-69.47	-57.86	-10.28	-9.03	-9.45	-8.48
	(51.79)	(51.79)	(54.55)	(49.77)	(6.80)	(6.79)	(6.97)	(6.67)
PR	-90.71*	-68.63	-68.69	-63.45	-4.70	-3.01	-2.83	-2.80
	(52.43)	(51.72)	(55.10)	(49.57)	(6.82)	(6.72)	(6.95)	(6.58)
ID	-106.98	-117.99	-150.89*	-100.17	-9.85	-8.36	-11.90	-7.14
	(78.71)	(78.36)	(82.03)	(75.46)	(7.88)	(7.91)	(8.05)	(7.79)
PO	-69.03		-631.38***	-326.24*	4.08	6.35	10.43	-0.06
	(162.37)		(177.61)	(176.44)	(28.07)	(27.93)	(28.60)	(27.56)
RE	269.63*	210.26	43.92	223.78*	19.05	9.38	-3.20	9.83
	(146.25)	(139.44)	(138.34)	(130.69)	(18.65)	(16.84)	(16.55)	(16.06)
MO	-10.65	109.42	-66.45	164.12	-14.84	6.70	-12.71	10.69
	(131.59)	(139.60)	(137.71)	(134.38)	(15.05)	(16.08)	(15.38)	(15.81)
EX	-564.98***	-747.28***		-434.66***	-66.14*	-89.71***	-80.48**	-83.13**
	(115.71)	(171.51)		(118.00)	(33.82)	(32.99)	(34.07)	(32.40)
FC		123.86	-811.80***		26.51	48.44	22.00	59.25*
		(170.56)	(97.94)		(31.40)	(32.83)	(32.10)	(32.60)
IU	-0.36***	-0.38***	-0.32***	-0.419***	-0.05***	-0.05***	-0.04***	-0.05***
	(0.04)	(0.04)	(0.04)	(0.042)	(0.00)	(0.00)	(0.00)	(0.00)
Const.	11,049.47***	11,342.71***	10,480.53***	11,816.786***	1,371.18***	1,404.01***	1,312.75***	1,448.53***
	(552.77)	(576.21)	(565.02)	(574.465)	(71.90)	(75.23)	(70.86)	(76.81)
Obs.	121.00	121.00	121.00	121.00	129.00	129.00	129.00	129.00

Table 4. Regression Analysis of Covid-19 on Indonesian Stock Market

This table provides time series regression analysis using ordinary least squares (OLS). Panel A consists of Covid-19 proxied by new cases (NC), cumulative cases (CC), new deaths (ND), and cumulative deaths, controlled by exchange rate (IU), as independent variables and Indonesian stock market proxied by composite index (IH) and Jakarta Islamic Index (JI). While, Panel B consists of those variables plus policy from Financial Service Authority (OJ), President (PR), Indonesian Stock Exchange (ID), any policy such as lockdown (PO), reopening economy (RE), fiscal (FC), monetary and macroeconomic (MO), and exchange rate and balance of payments (EX). Significant levels are * for 10% ($p<0.10$), ** for 5% ($p<0.05$), and *** for 1% ($p<0.01$). Standard errors are in parentheses.

Further, Table 5 captures the details impact of Covid-19 on Indonesian capital market in each sector. Panel A provides that new cases have negative impact on all sectors. The largest decline is in financial sector, while the lowest decline is in consumer sector. Panel B also depicts that cumulative cases of Covid-19 have negative effect on stock price index in all sectors, however its impact is mostly lower than new cases. Panel C presents the same results where new deaths due to Covid-19 have negative impacts on all sectors in Indonesian stock market. These results are consistent with Table 4. Financial sector is the worst sector with largest decline in the stock price index, while consumer index is the sector with lowest price decline. Panel D is the analysis of cumulative deaths on each sector of Indonesian stock market. The number of new deaths is more considerable rather than the number of cumulative cases. The details of Table 5 are presented below:

Variables	**Panel A. Y=Indonesian Stock Markets in Each Sector; X=Covid-19 (New Cases)**								
	AG	**FI**	**IN**	**MA**	**MN**	**BA**	**CO**	**CS**	**MI**
NC	-0.20***	-0.21***	-0.09***	-0.09***	-0.12***	-0.08***	-0.09***	-0.05**	-0.17***
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
IU	-0.17***	-0.16***	-0.10***	-0.14***	-0.11***	-0.11***	-0.05***	-0.14***	-0.18***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Const.	3,649.87***	3,511.97***	2,495.55***	3,341.65***	3,000.27***	2,456.74***	1,221.54***	3,964.83***	3,609.41***
	(139.61)	(123.68)	(77.35)	(108.40)	(105.81)	(89.20)	(46.07)	(148.65)	(116.79)
Obs.	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00
R^2	0.77	0.80	0.79	0.77	0.71	0.76	0.81	0.62	0.83
Variables	**Panel B. Y=Indonesian Stock Markets in Each Sector; X=Covid-19 (Cumulative Cases)**								
	AG	**FI**	**IN**	**MA**	**MN**	**BA**	**CO**	**CS**	**MI**
CC	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
IU	-0.18***	-0.17***	-0.11***	-0.15***	-0.12***	-0.12***	-0.06***	-0.14***	-0.19***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Const.	3,820.36***	3,687.48***	2,573.52***	3,423.38***	3,102.19***	2,528.72***	1,302.34***	4,017.33***	3,750.92***
	(135.90)	(123.81)	(75.77)	(106.84)	(103.11)	(87.79)	(45.25)	(147.74)	(119.03)
Obs.	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00
R^2	0.79	0.80	0.80	0.77	0.73	0.77	0.82	0.63	0.83

Table 5. Regression Analysis of Covid-19 on Indonesian Stock Market in Each Sector

Panel A consists of Covid-19 as independent variables, while Indonesian stock market in each sector proxied by agriculture (AG), finance (FI), infrastructure (IN), manufacture (MA), mining (MN), basic (BA), construction (CO), consumer (CS), and miscellaneous (MI) as dependent variables. Panel B contains same dependent and control variables, while the independent variable is Covid-19 proxied by cumulative cases (CC). Panel C consists of Covid-19 proxied by new deaths (ND) as independent variable, while Indonesian stock market in each sector as dependent variable. Panel D, the independent variable is Covid-19 proxied by cumulative deaths (CD).

Variables	Panel C. Y=Indonesian Stock Markets in Each Sector; X=Covid-19 (New Deaths)								
	AG	**FI**	**IN**	**MA**	**MN**	**BA**	**CO**	**CS**	**MI**
ND	-4.03***	-4.42***	-1.84***	-1.82***	-2.22***	-1.67***	-1.97***	-0.83*	-3.59***
	(0.47)	(0.42)	(0.25)	(0.35)	(0.35)	(0.29)	(0.17)	(0.47)	(0.39)
IU	-0.15***	-0.14***	-0.10***	-0.13***	-0.10***	-0.10***	-0.04***	-0.14***	-0.16***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Const.	3,456.45***	3,299.62***	2,407.17***	3,254.44***	2,893.68***	2,376.39***	1,127.09***	3,924.91***	3,437.17***
	(153.28)	(136.69)	(82.58)	(114.01)	(114.78)	(93.44)	(54.46)	(152.39)	(127.50)
Obs.	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00
R^2	0.73	0.77	0.76	0.75	0.67	0.74	0.75	0.61	0.81
Variables	**Panel D. Y=Indonesian Stock Markets in Each Sector; X=Covid-19 (Cumulative Deaths)**								
	AG	**FI**	**IN**	**MA**	**MN**	**BA**	**CO**	**CS**	**MI**
CD	-0.10***	-0.10***	-0.04***	-0.04***	-0.05***	-0.04***	-0.04***	-0.02***	-0.08***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
IU	-0.17***	-0.16***	-0.10***	-0.14***	-0.11***	-0.11***	-0.05***	-0.14***	-0.18***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Const.	3,752.22***	3,620.32***	2,541.32***	3,388.78***	3,059.98***	2,497.99***	1,270.37***	3,992.34***	3,696.89***
	(129.55)	(111.30)	(74.53)	(106.38)	(101.63)	(87.64)	(40.37)	(148.12)	(110.42)
Obs.	130	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00
R^2	0.80	0.84	0.80	0.77	0.73	0.77	0.86	0.63	0.85

Table 6. Regression Analysis of Covid-19 on Indonesian Stock Market in Each Sector (Continue)

Table 7 provides the impact of Covid-19 with policy interventions on each sector. Panel A depicts that new cases still have negative impact on Indonesian capital market in all sectors. Panel B describes the impact of cumulative cases after including the policy from various regulators. Panel C indicates that new deaths have negative coefficient on stock price index in all sectors, financial sector as the worst. Lastly, Panel D tests the impact of cumulative deaths due to Covid-19 on all sectors with policy interventions. So, the Covid-19 has negative relationship on stock price index in all sectors. The financial sector is the sector with biggest price decline, while consumer is the lowest. Further, its negative coefficient is lower when including policy interventions from any regulators.

Most of policies such as President**,** IDX**,** and policy background result negative coefficient on the stock price index. Those policies limit the economic activities (lockdown, etc.) to avoid the Covid-19's spread, but it is compensated by the dropped of economy (reflected at the free-fall capital market). So, the relationship is negative. While the reopening economy has positive coefficient on the capital market as enhancing economic activity, i.e., relaxing some restrictions "new normal". The rest policy variables (OJK, fiscal, monetary, and exchange rate) also have negative coefficient since they did not change the market panic. The market possibly views those policies as the indicator of economic crash.

The policies from Indonesian government and authorities enhance the investor optimism to invest again. So, the policies could alleviate the negative effect of Covid-19 on Indonesian capital market. The Indonesian President, Joko Widodo, issued a Regulation called "PERPPU" to maintain financial system stability. It provides a foundation for government, banking, and financial authorities to take extraordinary steps to ensure public health. The government also implemented fiscal policies to support national economic recoveries such as health care, benefits and social assistance coverage for low-income households, unemployment benefits, tax breaks, capital injections, interest subsidies, loan guarantees, and restructuring funds. To reopen the economy, the government announced "New Normal" to encourage Indonesian people to carry out activities as before but with new behaviors or habits with clean and healthy behaviors. In this phase, opening malls, parks, and recreation areas with healthy protocol has been socialized is to revive Indonesia's economic activities. The government also carried out fiscal, monetary, and macroeconomic policies to maintain liquidity.

The OJK issued five regulations (POJK) to support PERPPU such as relief or postponement of credit or leasing payments for MSMEs and informal workers until 1 year. While the IDX implements some rules to alleviate Covid-19's impact, i.e., maintaining market to be normal and efficient, changing auto rejection limit, trading halt, splitting operation, working from home, dispensing mandatory obligations, trading time, easing reporting liability, and providing stimulus. Our arguments are supported by Sharif, Aloui, and Yarovaya (2020) who find that Covid-19 makes the U.S. market crash as the bad news

for investors, but after the government implements some policy responses, the market stock price jumps again. The details of these results are in Table 7. As follows:

Panel B consists of Covid-19 proxied by cumulative cases (CC). Further, Indonesian stock market in each sector as dependent variables.

Variables	Panel B. Y=Indonesian Stock Markets in Each Sector; X=Covid-19 (Cumulative Cases) and Policy								
	AG	**FI**	**IN**	**MA**	**MN**	**BA**	**CO**	**CS**	**MI**
CC	-0.00***	-0.00***	-0.00**	-0.00**	-0.00***	-0.00***	-0.00***	-0.00	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OJ	-10.81	-12.23	-10.50	-17.77	-11.36	-8.09	-5.72	-27.03	-20.96
	(16.19)	(12.21)	(10.59)	(13.15)	(13.41)	(10.68)	(5.23)	(17.01)	(14.09)
PR	-21.13	-19.66	-5.58	-0.77	-17.43	4.56	-8.06	-3.25	-9.86
	(16.08)	(12.13)	(10.51)	(13.06)	(13.32)	(10.61)	(5.20)	(16.89)	(13.99)
ID	-10.75	-34.05***	-13.95	-16.70	-21.12	-11.11	-6.29	-20.22	-20.34
	(18.94)	(14.28)	(12.38)	(15.38)	(15.69)	(12.50)	(6.12)	(19.89)	(16.48)
PO	-17.59	-11.78	-27.72	-102.04***	-84.30***	-109.91***	15.33	-134.63***	6.80
	(47.62)	(35.92)	(31.14)	(38.67)	(39.45)	(31.42)	(15.40)	(50.02)	(41.44)
RE	88.87**	109.64***	22.53	-4.39	23.01	-9.78	20.27	-19.44	39.30
	(40.08)	(30.23)	(26.21)	(32.55)	(33.21)	(26.45)	(12.96)	(42.10)	(34.88)
MO	-6.85	80.17***	-15.30	4.96	18.86	24.00	14.74	-55.83	68.76**
	(38.29)	(28.88)	(25.04)	(31.10)	(31.72)	(25.27)	(12.38)	(40.22)	(33.33)
EX	-206.71***	-206.99***	-50.94**	-65.90**	-86.93***	-49.54**	-90.25***	5.70	-227.18***
	(32.98)	(24.88)	(21.57)	(26.78)	(27.33)	(21.76)	(10.66)	(34.65)	(28.70)
IU	-0.08***	-0.07***	-0.08***	-0.11***	-0.07***	-0.09***	-0.02***	-0.13***	-0.09***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Const.	2,537.10***	2,392.39***	2,204.62***	2,916.07***	2,434.39***	2,137.73***	792.99***	3,828.17***	2,468.61***
	(185.54)	(139.97)	(121.36)	(150.69)	(153.73)	(122.45)	(60.00)	(194.92)	(161.49)
Obs.	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.0
R^2	0.89	0.93	0.86	0.88	0.84	0.88	0.91	0.83	0.91

Table 7. Regression Analysis of Covid-19 on Indonesian Stock Market in Each Sector with Policy (Continue)

Panel B consists of Covid-19 proxied by cumulative cases (CC). Further, Indonesian stock market in each sector as dependent variables.

Variables	Panel B. Y=Indonesian Stock Markets in Each Sector; X=Covid-19 (Cumulative Cases) and Policy								
	AG	**FI**	**IN**	**MA**	**MN**	**BA**	**CO**	**CS**	**MI**
CC	-0.00***	-0.00***	-0.00**	-0.00**	-0.00***	-0.00***	-0.00**	-0.00	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OJ	-10.81	-12.23	-10.50	-17.77	-11.36	-8.09	-5.72	-27.03	-20.96
	(16.19)	(12.21)	(10.59)	(13.15)	(13.41)	(10.68)	(5.23)	(17.01)	(14.09)
PR	-21.13	-19.66	-5.58	-0.77	-17.43	4.56	-8.06	-3.25	-9.86
	(16.08)	(12.13)	(10.51)	(13.06)	(13.32)	(10.61)	(5.20)	(16.89)	(13.99)
ID	-10.75	-34.05**	-13.95	-16.70	-21.12	-11.11	-6.29	-20.22	-20.34
	(18.94)	(14.28)	(12.38)	(15.38)	(15.69)	(12.50)	(6.12)	(19.89)	(16.48)
PO	-17.59	-11.78	-27.72	-102.04***	-84.30**	-109.91***	15.33	-134.63***	6.80
	(47.62)	(35.92)	(31.14)	(38.67)	(39.45)	(31.42)	(15.40)	(50.02)	(41.44)
RE	88.87**	109.64***	22.53	-4.39	23.01	-9.78	20.27	-19.44	39.30
	(40.08)	(30.23)	(26.21)	(32.55)	(33.21)	(26.45)	(12.96)	(42.10)	(34.88)
MO	-6.85	80.17***	-15.30	4.96	18.86	24.00	14.74	-55.83	68.76**
	(38.29)	(28.88)	(25.04)	(31.10)	(31.72)	(25.27)	(12.38)	(40.22)	(33.33)
EX	-206.71***	-206.99***	-50.94**	-65.90**	-86.93***	-49.54**	-90.25***	5.70	-227.18***
	(32.98)	(24.88)	(21.57)	(26.78)	(27.33)	(21.76)	(10.66)	(34.65)	(28.70)
IU	-0.08***	-0.07***	-0.08***	-0.11***	-0.07***	-0.09***	-0.02***	-0.13***	-0.09***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Const.	2,537.10***	2,392.39***	2,204.62***	2,916.07***	2,434.39***	2,137.73***	792.99***	3,828.17***	2,468.61***
	(185.54)	(139.97)	(121.36)	(150.69)	(153.73)	(122.45)	(60.00)	(194.92)	(161.49)
Obs.	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.0
R^2	0.89	0.93	0.86	0.88	0.84	0.88	0.91	0.83	0.91

Table 8. Regression Analysis of Covid-19 on Indonesian Stock Market in Each Sector with Policy (Continue)

Panel C consists of Covid-19 proxied by new deaths (ND).

Variables	Panel C. Y=Indonesian Stock Markets in Each Sector; X=Covid-19 (New Death) and Policy								
	AG	**FI**	**IN**	**MA**	**MN**	**BA**	**CO**	**CS**	**MI**
ND	-0.72	-1.28**	-0.75*	-0.71	-0.25	-0.92**	-0.12	-0.45	-0.44
	(0.66)	(0.55)	(0.42)	(0.53)	(0.55)	(0.43)	(0.22)	(0.68)	(0.57)
OJ	-12.43	-14.56	-11.06	-18.47	-12.97	-8.73	-6.55	-27.48	-22.12
	(16.77)	(13.85)	(10.74)	(13.33)	(13.92)	(10.89)	(5.57)	(17.06)	(14.41)
PR	-19.25	-17.48	-6.06	-0.85	-14.54	3.89	-6.55	-3.30	-8.38
	(16.80)	(13.87)	(10.76)	(13.35)	(13.95)	(10.91)	(5.58)	(17.10)	(14.44)
ID	-18.37	-45.91***	-18.51	-21.51	-26.87*	-16.57	-9.22	-23.29	-25.49
	(19.51)	(16.11)	(12.50)	(15.50)	(16.20)	(12.67)	(6.48)	(19.85)	(16.76)
PO	-196.09***	-174.18***	-60.35*	-149.02***	-151.24***	-137.43***	-64.76***	-116.84**	-201.48***
	(49.52)	(40.90)	(31.73)	(39.36)	(41.12)	(32.16)	(16.46)	(50.39)	(42.56)
RE	48.73	51.80	8.43	-21.93	-16.39	-26.02	-0.04	-30.59	10.86
	(39.80)	(32.87)	(25.50)	(31.64)	(33.05)	(25.85)	(13.23)	(40.50)	(34.21)
FS	-261.50***	-286.60***	-71.54***	-90.91***	-139.50***	-73.42***	-117.33***	-10.20	-265.84***
	(29.37)	(24.26)	(18.82)	(23.35)	(24.39)	(19.08)	(9.76)	(29.89)	(25.24)
MO	-52.71	9.41	-41.37*	-22.91	-17.01	-7.13	-3.57	-73.62*	37.56
	(37.05)	(30.60)	(23.74)	(29.45)	(30.76)	(24.06)	(12.31)	(37.70)	(31.84)
IU	-0.06***	-0.05***	-0.07***	-0.10***	-0.05***	-0.07***	-0.01***	-0.12***	-0.08***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Const.	2,300.99***	2,031.20***	2,077.12***	2,777.84***	2,243.48***	1,985.93***	695.37***	3,740.02***	2,307.08***
	(175.54)	(144.97)	(112.48)	(139.54)	(145.77)	(114.01)	(58.35)	(178.63)	(150.87)
Obs.	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.00
R^2	0.89	0.91	0.86	0.88	0.83	0.88	0.90	0.83	0.91

Table 9. Regression Analysis of Covid-19 on Indonesian Stock Market in Each Sector with Policy (Continue)

Panel D consists of Covid-19 proxied by cumulative deaths (CD).

Variables	Panel D. Y=Indonesian Stock Markets in Each Sector; X=Covid-19 (Cumulative Deaths) and Policy								
	AG	**FI**	**IN**	**MA**	**MN**	**BA**	**CO**	**CS**	**MI**
CD	-0.09***	-0.14***	-0.05***	-0.05***	-0.07***	-0.05***	-0.04***	-0.04	-0.07***
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)	(0.02)	(0.02)
OJ	-9.18	-9.78	-9.59	-16.80	-10.27	-7.30	-5.03	-26.22	-19.50
	(15.83)	(11.07)	(10.42)	(13.00)	(13.24)	(10.59)	(5.02)	(16.93)	(13.74)
PR	-20.36	-18.43*	-5.19	-0.33	-16.58	5.33	-7.77	-3.18	-9.70
	(15.67)	(10.95)	(10.31)	(12.86)	(13.11)	(10.48)	(4.97)	(16.76)	(13.60)
ID	-7.95	-29.86**	-12.35	-15.02	-19.39	-9.94	-5.07	-18.67	-17.56
	(18.54)	(12.96)	(12.20)	(15.22)	(15.51)	(12.40)	(5.88)	(19.83)	(16.09)
PO	-64.82	-82.51**	-54.45	-130.19***	-114.52***	-130.90***	-5.05	-159.82***	-38.33
	(50.60)	(35.37)	(33.30)	(41.55)	(42.33)	(33.85)	(16.06)	(54.12)	(43.92)
RE	91.48**	113.00***	24.41	-2.67	21.90	-11.95	21.72*	-15.40	46.31
	(38.04)	(26.59)	(25.03)	(31.23)	(31.82)	(25.45)	(12.07)	(40.69)	(33.02)
MO	4.24	96.58***	-8.84	11.64	24.80	27.53	19.67	-48.80	81.28**
	(37.46)	(26.19)	(24.65)	(30.76)	(31.34)	(25.06)	(11.88)	(40.06)	(32.52)
EX	-158.98***	-135.26***	-24.12	-37.53	-55.10*	-26.79	-69.79***	29.93	-183.66***
	(37.91)	(26.51)	(24.95)	(31.13)	(31.72)	(25.36)	(12.03)	(40.55)	(32.91)
IU	-0.09***	-0.09***	-0.08***	-0.11***	-0.07***	-0.09***	-0.02***	-0.13***	-0.10***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Const.	2,668.05***	2,588.80***	2,278.51***	2,994.03***	2,519.67***	2,197.71***	849.37***	3,896.60***	2,591.37***
	(189.52)	(132.50)	(124.72)	(155.62)	(158.56)	(126.79)	(60.15)	(202.71)	(164.52)
Obs.	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.00
R^2	0.90	0.94	0.87	0.88	0.84	0.88	0.92	0.83	0.92

Table 10. Regression Analysis of Covid-19 on Indonesian Stock Market in Each Sector with Policy (Continue)

CONCLUSION

In conclusions, this study find that Covid-19 has negative impact on the Indonesian capital market. The most considerable indicator with largest negative impact is new deaths rate. The worst sector with declining price index is the financial sector. Its negative impact from Covid-19 could be reduced by policies from Indonesian President (PERPPU, Task Force of Covid-19, national budget, and some rules from ministries and local governments) and other authorities like OJK (risk mitigation, countercyclical, credit/leasing postpone**,** and minimum capital for banks), and IDX (auto rejection, trading halt, time operation, and market stimulus).

The policy from those regulators, according to the IMF, are grouped by policy background (lockdowns, travel and activity restrictions, working and learning from home), reopening economy (new normal, restriction relaxation, and public facility opening), fiscal (boost testing, treatment capability, national recovery program, cash transfer, electric subsidy, unemployment benefit, tax reliefs, capital injection, credit guaranties, loan restructuration), monetary (BI policy rate), and macroeconomic (liquidity conditions, lower reserve requirement, repo and reverse repo operations, FX swap, bond market), and exchange rate and balance of payments (spot, domestic foreign exchange market, custodian, and ease global supply-chain disruptions). All of those policies together are relevant to reduce Covid-19's impact on Indonesian capital market, even though the number of Covid-19 up to present still increasing sharply.

The implications of this study are as follows. First, the government should pay more attention to measure the new death cases due Covid-19. Second, the crucial sector that should be maintained from Covid-19's effect is the financial sector. Third, the regulators should keep improving their policy which have been proven could reduce the Covid-19 numbers, but it is still difficult to decrease the number of Covid-19 especially the new cases per day.

This paper has some limitations such as using ordinary least squares with no comparison to other models such generalized method of moments (GMM) to address endogeneity issue. In addition, there are the number of health people from Covid-19 that is not included in this paper. Further, the stock price indexes could be developed by comparing with the return and price volatility.

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