*Peer-Reviewed Article*

*Jurnal Keuangan dan Perbankan*
Volume 26, Issue 4 October 2022, page. 758-778
ISSN: 1410-8089 (Print), 2443-2687 (Online)
DOI: 10.26905/jkdp.v26i4.8226

# COVID-19 Pandemic, Dividend Policy, and Stock Market Reaction: Evidence from the Manufacturing Companies in Indonesia

Powell Gian Hartono[1]*, Muhammad Yaasiin Raya[2]
[1]*Master of Management Program, Faculty of Economics and Business, Satya Wacana Christian University, Jl. Diponegoro No.52-60, Salatiga 50711, Indonesia*
[2]*Department of Sharia Economics Law, Faculty of Sharia and Law, Alauddin State Islamic University, Jl. H. M. Yasin Limpo No. 36, Gowa 92118, Indonesia*
*Corresponding Author: 912020018@student.uksw.edu

**Abstract**

This study aimed to examine the impact of the COVID-19 crisis on the dividend policy of Indonesia's manufacturing companies and the stock market reaction to this corporate action in 2020. The purposive sampling technique was used to select 87 manufacturing companies to examine the impact of the crisis on dividend policy from 2014 to 2020, while the market reaction was tested on 42 companies. Data were analyzed using the dynamic panel data regression with the SYS-GMM estimation method, as well as the one sample T-test and the Wilcoxon sign-ranked tests. The findings showed that Indonesia's manufacturing companies formulated a positive dividend policy during the COVID-19 pandemic. The stock market reaction to this corporate action was weak, meaning it became sluggish during a crisis. These results indicate that the effort to signal the market positively was ineffective. Therefore, companies must formulate corporate actions or other managerial policies to reduce capital market sluggishness in crisis. They should also implement an optimal dividend policy to increase their value to contribute to the Indonesian economy, specifically in crisis conditions, such as the COVID-19 pandemic.

**Keywords** : COVID-19 Pandemic Crisis; Dividend Announcement; Dividend Policy; Dividend Signaling Theory; Stock Market Reaction
**JEL Classification** : C33, G01, G35



## 1. INTRODUCTION

The COVID-19 pandemic has a global impact. At the end of January 2020, the spread of this virus was declared a Public Health Emergency of International Concern (PHEIC) by the World Health Organization (Robiyanto & Yunitaria, 2022). The consequence significantly impacted the global economy as a systemic crisis. This was illustrated by the aggressive sharp decline in stock prices and increased world stock market volatility (Ali, 2022), disrupting the global economy. Empirical studies examined the negative impact of the COVID-19 pandemic crisis on the stock market performance

(Ashraf, 2021; Cepoi, 2020; Owusu & Bentum-ennin, 2021; Utomo & Hanggraeni, 2021). Additionally, studies explored the impact of the crisis on commodity markets (Ahmed & Sarkodie, 2021; Hung, 2021; Shruthi & Ramani, 2021), cryptocurrency market (Conlon & McGee, 2020; Montasser, Charfeddine, et al., 2022), and equity market (Baig & Chen, 2022; Mazumder & Saha, 2021).

In Indonesia, the economic impact of the COVID-19 pandemic crisis is illustrated by several indicators. According to the Indonesian Statistics Agency, negative economic growth was indicated by -2.07% year-on-year gross domestic product (GDP) in 2020. The large-Scale Social Restrictions in Indonesia hampered the activities of people and goods; thus, the industrial production chain was disrupted. This condition caused the business cycle to be disrupted. Therefore, GDP as a macroeconomic variable was adequate to represent the crisis condition because it represented an extreme decline. The inflation rate fell to 1.68%, illustrating the low money circulation. This is because people were reluctant to spend money due to the uncertainty of when the crisis would end until the end of 2020. However, during the crisis, the Indonesian government implemented a policy of direct cash assistance to the public to stimulate the circulation of money. Thus, the fall of inflation during the crisis was not as extreme as GDP. The decline is considered not too extreme compared to the inflation rate in 2015 - 2020, whose fluctuations were not extreme, so this macroeconomic variable is an invalid attribute representing the crisis. Moreover, the IDX composite fell by 33.25%, the lowest level in 2020 compared to the beginning of this year. This was also indicated by SRI-KEHATI, a competitive index of high-performing companies implementing sustainable and responsible investment. This index composite declined by 36.55% compared to the beginning of 2020 (Ri'a et al., 2022; Tinungki, Hartono, et al., 2022; Tinungki, Robiyanto, et al., 2022).

The COVID-19 pandemic significantly and negatively impacts company performance, causing decreased corporate earnings, increased earnings volatility, and poor stock performance. As a result, companies distribute dividends to shareholders to reduce information asymmetry about their long-term growth (Baker, Mendel, et al., 2016; Hardy, 2021). Based on dividend signaling theory and asymmetric information, the market considers that dividends distributed to shareholders inform the company's future profitability. This is because their increase is viewed by the market as a prospective long-term growth opportunity and good financial stability (John & Williams, 1985; Miller & Rock, 1985). The reduction or elimination of dividends indicates the company's poor future profitability and volatile earnings (Ali, 2022). According to the agency theory, company management does not reduce or eliminate dividends distributed when faced with a decrease in income to maintain personal benefits for management as agents (Lambrecht & Myers, 2012). Several studies examined dividend policy during the COVID-19 pandemic. According to Tinungki, Robiyanto, et al. (2022), 212 companies on the Indonesia Stock Exchange maintained or increased dividend rates during the crisis. Furthermore, Tinungki, Hartono, et al. (2022) found that SRI-KEHATI indexed companies distributed dividends positively. Ali (2022) found that most companies in the G-12 countries set a positive dividend policy in 2020.

The pecking order theory holds that companies suppress or eliminate dividends due to uncertainties caused by a crisis. They prioritize internal funding through retained earnings with the lowest capital risk than external funding from liability and equity. Moreover, companies do not subtract retained earnings from net income to ensure certainty of economic conditions and systemic crisis. In this case, they must ensure that they survive through the crisis (Lim, 2016; Myers, 1984; Tinungki, Hartono, et al., 2022; Tinungki, Robiyanto, et al., 2022). Reddemann, Basse, et al. (2010) found that European insurance companies suppressed the rates of dividends during the 2008-2009 crises. In line with this, Hauser (2013) found that firms in the U.S.A distributed dividends negatively compared to the pre-crisis period due to declining company performance. Abdulkadir, Abdullah, et al. (2015) also found a negative policy in crisis conditions compared to the Nigerian Stock Market companies before the crisis. Krieger, Mauck, et al. (2021) found that 213 firms suppressed, and 93 firms eliminated dividends in the 2020 crisis. Additionally, Cejnek, Randl, et al. (2021) found that S&P500, EuroStoxx50, and FTSE100 firms had negative policies during the 2020 pandemic crisis.

Dividend distribution as a corporate action gives a reaction to the stock market. A positive signal for the corporate action occurred during the COVID-19 pandemic. The distribution is quite sensitive to a crisis and uncertainty as a definite return when stock market performance falls (Ashraf, 2021; Cepoi, 2020; Sharma, 2021). Tinungki, Robiyanto, et al. (2022) reported a positive stock market reaction to dividend distribution with significant and positive cumulative abnormal returns. This indicated buying actions on shares that distribute dividends, which responded quickly and positively. Robiyanto & Yunitaria (2022) reported no significant abnormal return on the distribution by companies indexed LQ-45 in Indonesia. This indicates that the stock market was pessimistic during the pandemic period. The results support Tinungki, Hartono, et al. (2022) , which found the same condition for SRI-KEHATI indexed companies in Indonesia.

Studies should explore the company's ability to set the dividend policy during the COVID-19 pandemic that caused a decline in corporations' profitability. This condition is strongly suspected of suppressing the dividend rate (Krieger et al., 2021). However, companies might conduct positive distribution to signal to the market about good long-term growth. They maintain the stability of their policy in crisis conditions to ensure excellent financial performance (Ali, 2022). Moreover, it is important to examine the stock market's reaction to corporate action through dividend distribution during a crisis. The markets pessimistic about crisis and uncertainty do not react positively to announcements (Robiyanto & Yunitaria, 2022). In contrast, optimistic markets react positively to the announcement, indicated by significant and positive abnormal returns (Tinungki, Robiyanto, et al., 2022). Therefore, the market reaction test adequately describes the market reaction during the crisis caused by the COVID-19 pandemic so that this corporate action can be assessed for its effectiveness against the capital market sluggishness.

This study aimed to investigate the dividend policy of manufacturing companies in Indonesia during the COVID-19 pandemic in 2020. It also intended to investigate the stock market reaction to corporate action announcements of dividend distribution for Indonesian manufacturing companies. The study focused on manufacturing companies because they contribute significantly to the Indonesian economy. The industry contributed to the national gross domestic product (GDP) by 20% in 2019. This put Indonesia in the top five highest G20 countries whose manufacturing industries contribute to national GDP. Performance in the manufacturing industry even exceeds the national economic growth. In 2020, the manufacturing industry's contribution to the national gross domestic product (GDP) was IDR 2,760.43 trillion, or about 19.8%. Furthermore, 193 manufacturing companies were listed on the Indonesia Stock Exchange in October 2020, the largest proportion compared to other sectors (Hartono, Lestari, et al., 2020; Indonesian Ministry of Industry, 2022). Academics and practitioners agree that optimal policy governance increase firm value (Salvatori, Robiyanto, et al., 2020). The manufacturing companies' optimal dividend policy governance could increase firm value and contribute more to the Indonesian economy (Tinungki, Hartono, et al., 2022).

This empirical study contributes to the literature in several ways. First, it aimed to examine the impact of the COVID-19 pandemic on Indonesia's manufacturing companies' dividend policy using dynamic panel data regression. Based on previous studies, no study examined the impact of the crisis due to the COVID-19 pandemic on the dividend policy of manufacturing sector companies in Indonesia. In addition, this study uses dynamic panel data regression using the system-generalized method of moment (SYS-GMM) estimation method, where the statistical analysis instrument for testing the causality relationship is a sophisticated analytical instrument in the context of the panel data structure. Second, it intended to examine the stock market reaction to dividend announcements as a corporate action during the COVID-19 pandemic. Moreover, based on previous studies, no research examines the market reaction to dividend announcements during this crisis for manufacturing companies in Indonesia. Thus, it is necessary to examine these two interrelated aspects. The impact of the crisis on dividend policy and the market reaction test to their dividend announcements are comprehensive studies that examine the relevance of dividend signaling theory or pecking order theory for the dividend policy, precisely in crisis conditions due to the COVID-19 pandemic for manufacturing companies in Indonesia. The results showed that the companies set a positive policy during the crisis, and the stock market reaction to the announcements was weak. Giving a positive signal to the market through distributions is not proven effectively increases stock market sluggishness.

This study was presented through a paper with several sections arranged systematically. Section 1 contains Introduction and Literature Review, while Section 2 discusses Hypothesis Development based on the underlying theory, rationale, and previous studies. Furthermore, Section 3 contains Methods, Data, and Analysis, including the instruments used. Section 4 presents the empirical results of the statistical analysis, while Section 5 describes the results' interpretation. Additionally, Section 6 contains Conclusions, Implications, Limitations, and Suggestions. It provides a comprehensive summary of the results and discussion, managerial implications, limitations, and suggestions for future studies.

## 2. HYPOTHESES DEVELOPMENT

Issues related to when the COVID-19 pandemic would end have implications for a crisis and an economic recession because they were more than two quarters in 2020 (Wegman et al., 2017). These conditions impacted the stock market through high stock price volatility and uncertainty of returns on investment. Additionally, restricted movement of people and goods disrupts the industrial production chain and hampers the business cycle. This condition negatively impacts profitability due to decreased activity and the company's low capital ratio. Consequently, companies were forced to maintain stability to survive the crisis. They increased retained earnings and reduced the dividend rate for further investments with internal capital sources with lower risk than external sources (Altig et al., 2020; Cejnek et al., 2021; Krieger et al., 2021). Also, other conditions besides the pandemic crisis allow companies not to press or distribute dividends to give a positive signal about their long-term growth. They maintain or even increase the distributions to maintain policy stability in crisis conditions and provide signals about financial prospects (Ali, 2022; John & Williams, 1985; Miller & Rock, 1985).

The company's external attribute as a dividend policy determinant is a macroeconomic factor. Gross domestic product is one crucial macroeconomic indicator to describe economic growth opportunities. One proxy for measuring the crisis variable due to the COVID-19 pandemic is year-on-year gross domestic product (GDP), representing economic growth (Ong, Thaker, et al., 2018; Romus, Anita, et al., 2020). The dividend policy robustness test is measured using the dividend per share (DPS) and dividend payout ratio (DPR) proxies (Hartono, Sari, et al., 2021; Hauser, 2013). Ong et al. (2018) found a positive effect of GDP on the policy, while Tinungki, Hartono, et al. (2022); and Tinungki, Robiyanto, et al. (2022) found a negative effect. Therefore, a non-directional hypothesis approach was used to develop the following two hypotheses:

**$H_1$: Gross Domestic Product (GDP) affects Dividend per Share (DPS);**

**$H_2$: Gross Domestic Product (GDP) affects the Dividend Payout Ratio (DPR).**

This study also aimed to examine the effect of the crisis due to the COVID-19 pandemic on dividend policy using dummy variables as robustness checking of the GDP proxy. Crisis and non-crisis conditions were formed as binary dummy variables (Tinungki, Hartono, et al., 2022; Tinungki, Robiyanto, et al., 2022). Therefore, the third and fourth hypotheses were developed as follows:

**$H_3$: The crisis due to the COVID-19 pandemic affects Dividends per Share (DPS);**

**$H_4$: The crisis due to the COVID-19 pandemic affects the Dividend Payout Ratio (DPR).**

A company's dividend policy could influence the stock market as its investment return. This impact is measured by the stock market reaction as abnormal returns to distribution on the days around its announcement (Robiyanto & Yunitaria, 2022). Khanal & Mishra (2017) stated that the stock market reaction in a sluggish economic situation was not as good as in normal conditions. According to Tinungki, Robiyanto, et al. (2022) , the stock market reacted positively to the announcement of dividends by 212 companies in Indonesia in sluggish economic conditions. This was considered a definite return amid uncertainty over the end of the COVID-19 pandemic crisis. The positive reaction was indicated by abnormal returns and cumulative abnormal returns. The stock market reaction to dividend announcements in sluggish economic conditions is not as sensitive as in normal economic conditions. However, Khanal & Mishra (2017) found a positive stock market reaction to the announcements in crisis periods. Anwar, Singh, et al. (2017) found a positive stock market reaction, while Tinungki, Hartono, et al. (2022) found no reaction in SRI-KEHATI indexed companies in Indonesia. Robiyanto & Yunitaria (2022) also found similar results in LQ-45 indexed companies. Therefore, the fifth and sixth hypotheses were developed as:

**$H_5$: There is a significant abnormal return around the dividend announcement;**

**$H_6$: There is a significant cumulative abnormal return around the dividend announcement.**

## 3. METHOD, DATA, AND ANALYSIS

This study used a quantitative approach to examine the causality relationship among exogenous on endogenous variables. It also used an event study to examine the significance of abnormal and cumulative abnormal returns on the events studied. Secondary data from www.idx.co.id and finance.yahoo.com helped observe the impact of the crisis on dividend policy from 2014 – 2020. The event study was conducted during the crisis due to the COVID-19 pandemic in 2020, five days before to after the announcement. The study used the purposive sampling technique approach with certain criteria to test policy during the COVID-19 pandemic. The criteria were manufacturing companies listed on the Indonesia Stock Exchange (IDX), paying dividends at least once during the study period, not undergoing initial public offerings and delisting, and having complete financial reports to meet the variables' needs. Furthermore, the event study on the market reaction test must ensure that the event window is free from compounding effects by eliminating companies with compounding events (McWilliams & Siegel, 1997). The additional criteria were that the companies do not delay payments during the study period or revise the amount and do not take corporate actions. These actions include stock splits, reverse stock splits, buybacks, mergers, acquisitions, and others, which affect abnormal returns. Of the 713 companies listed on the IDX in 2020, there were 87 manufacturing companies sampled within a 7-year study period, resulting in 609 observations. Additionally, 42 companies were subjects for the event study, in which the company distributed dividends once or more during 2020. There were 49 observations studied for the event study (Hartono et al., 2021; Robiyanto & Yunitaria, 2022; Sekaran & Bougie, 2016).

This study tested the effect of the crisis due to COVID-19 as an exogenous variable on dividend policy as an endogenous variable. In the test, the proxies used for the crisis are gross domestic product (GDP) and binary dummy variables. The proxies used for dividend policy are dividend payout ratio (DPR) and dividends per share (DPS). Furthermore, the variables' consistency was tested by forming a complex empirical model. Other postulated exogenous variables were tested as control variables, including profitability, financial leverage, firm size, and investment opportunity, while past dividends were used as instrumental variables. The control variables are postulated as evidenced by Ranajee et al. (2018); Sharma & Bakshi (2019); Singla & Samanta (2018); Tinungki, Hartono, et al. (2022); Wahjudi (2020); and Yusof & Ismail (2016). Table 1 presents the variables, proxies, and their formulations.

***Table 1.*** Variable, Proxy, and Formulation

| Variable | Proxy | Formulation | Reference |
|---|---|---|---|
| Dividend Policy | Dividend per Share (DPS) | $DPS = \frac{Total\ Dividend}{Outstanding\ Shares}$ | Hartono & Matusin (2020); Hartono et al. (2021); Ranajee, Pathak, & Saxena (2018) |
| | Dividend Payout Ratio (DPR) | $DPR = \frac{Dividend\ per\ Share}{Earnings\ per\ Share}$ | Tinungki, Hartono, et al. (2022); Tinungki, Robiyanto, et al. (2022); Yusof & Ismail (2016) |
| The COVID-19 Pandemic Crisis | Gross Domestic Product (GDP) | GDP annual growth of Indonesia | Romus et al. (2020); Tinungki, Hartono, et al. (2022); Tinungki, Robiyanto, et al. (2022) |
| | Binary Dummy Variable (BD) | 1 = crisis<br>0 = no crisis | Tinungki, Hartono, et al. (2022); Tinungki, Robiyanto, et al. (2022) |
| Profitability | Earning per Share (EPS) | $EPS = \frac{Net\ Income}{Outstanding\ Shares}$ | Hartono et al. (2021); Sharma & Bakshi (2019); Yusof & Ismail (2016) |
| Financial Leverage | Debt to Equity Ratio (DER) | $DER = \frac{Total\ Liability}{Total\ Equity}$ | Akhmadi & Robiyanto (2020); Hartono et al. (2021); Sharma & Bakshi (2019) |
| Company Size | Total Assets (TA) | $TA = ln(Total\ Assets)$ | Ranajee et al. (2018); Singla & Samanta (2018); Yusof & Ismail (2016) |
| Investment | Market Price to Book Value | $MB = \frac{Market\ Stock\ Price}{Book\ Value}$ | Ranajee et al. (2018); Sharma & Bakshi (2019); Singla & |

| Variable | Proxy | Formulation | Reference |
|---|---|---|---|
| Opportunity | Ratio (MB) | | Samanta (2018) |
| Past Dividend | Lagged-1 of Dividend per Share (L.DPS) | $L.DPS = DPS_{i,t-1}$ | Athari, Adaoglu, & Bektas (2016); Bostanci, Kadioglu, & Sayilgan (2018); Tinungki, Hartono, et al. (2022) |
| | Lagged-1 of Dividend Payout Ratio (L.DPR) | $L.DPR = DPR_{i,t-1}$ | Sharma (2021); Sharma & Bakshi (2019) |

The impact of the COVID-19 pandemic on dividend policy was tested using dynamic panel data regression with the system-generalized moments (SYS-GMM) parameter estimation method with a two-step estimator approach (Baltagi, 2005; Biørn, 2017). Dynamic panel data regression with SYS-GMM captures the behavior of individual and time-series elements. The method also overcomes the unbalance in the first difference-generalized method of moments (FD-GMM) parameter estimation method with too small time series elements. The SYS-GMM overcomes this limitation with the orthogonal deviation method as of minimizes data loss in the condition of few time series elements or unbalance conditions. Furthermore, this estimation method is called a general system because it enforces the equivalence between the original adjusted systems and combines the differences and levels. SYS-GMM has more proportionality than other generalized moment estimation methods (Arellano & Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1998; Tinungki, 2019).

The analysis began with descriptive statistics, followed by testing the bivariate correlation between the variables. The normality test was conducted to determine the direction of approach to parametric or non-parametric statistics for correlation analysis. Furthermore, the model specification tests for the SYS-GMM estimation were the instrument validity test with the Sargan-Test, the consistency test with the Arellano-Bond Test, and the unbiased test. The parameter significance test was performed in two stages: a simultaneous test with $Wald\ \chi^2$ and a partial test with Z-Test. Data processing used SPSS version 22 and STATA version 22 programs. Therefore, the empirical models are described in the following equations.

$$DPS_{i,t} = \alpha_{i,t} + \beta_1 GDP_{i,t} + \beta_2 EPS_{i,t} + \beta_3 DER_{i,t} + \beta_4 TA_{i,t} + \beta_5 MB_{i,t} + \delta DPS_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

$$DPR_{i,t} = \alpha_{i,t} + \beta_1 GDP_{i,t} + \beta_2 EPS_{i,t} + \beta_3 DER_{i,t} + \beta_4 TA_{i,t} + \beta_5 MB_{i,t} + \delta DPR_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

$$DPS_{i,t} = \alpha_{i,t} + \beta_1 BD_{i,t} + \beta_2 EPS_{i,t} + \beta_3 DER_{i,t} + \beta_4 TA_{i,t} + \beta_5 MB_{i,t} + \delta DPS_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

$$DPR_{i,t} = \alpha_{i,t} + \beta_1 BD_{i,t} + \beta_2 EPS_{i,t} + \beta_3 DER_{i,t} + \beta_4 TA_{i,t} + \beta_5 MB_{i,t} + \delta DPR_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

Where, $DPS_{i,t}$: dividend per share on the $i$ -th company and the $t$-th year; $DPR_{i,t}$: dividend payout ratio on the $i$ -th company and the $t$-th year; $GDP_{i,t}$: gross domestic product on the $i$ -th company and the $t$-th year; $BD_{i,t}$: covid-19 crisis binary dummy variable on the $i$ -th company and the $t$-th year; $EPS_{i,t}$: earning per share on the $i$ -th company and the $t$-th year; $DER_{i,t}$: debt to equity ratio on the $i$ -th company and the $t$-th year; $TA_{i,t}$: total assets on the $i$ -th company and the $t$-th year; $MB_{i,t}$: market price to book value ratio on the $i$ -th company and the $t$-th year; $DPS_{i,t-1}$: dividend per share on the $i$ -th company and the $(t-1)$-th year; $DPR_{i,t-1}$: dividend payout ratio on the $i$ -th company and the $(t-1)$-th year; $\varepsilon_{i,t}$: regression model residual on the $i$ -th company and the $t$-th year; $\alpha_{i,t}$: intercept on the $i$ -th company and the $t$-th year; $\beta_1, \beta_2, \ldots, \beta_5$: exogenous variable slopes; $\delta$: instrumental variable slope.

Testing the causality relationship with the regression model has endogeneity problems resulting in biased and inconsistent parameter estimates (Li, 2016). Ongore & Kusa (2013) stated that gross domestic product affects profitability. According to Bangun et al. (2017), financial leverage and firm size predictors affect profitability. Sunardi et al. (2020) found that firm size affects financial leverage. These findings showed that profitability and financial leverage have endogeneity. Li (2016) found that the generalized method of moments is a parameter estimation method with the highest corrective effect in overcoming endogeneity problems among exogenous variables than other methods. Additionally, this estimation method handles endogeneity on explanatory endogenous variables or lagged-1 of endogenous variables as instrumental to endogenous variables (Arellano & Bover, 1995; Baltagi, 2005; Biørn, 2017). This supports by Dang et al. (2018); Tinungki, Hartono, et al. (2022); Tinungki, Robiyanto, et al. (2022).

The effect of the independent variable of dividend announcements was tested on the dependent variable of the stock price using daily basis analysis (Robiyanto & Yunitaria, 2022). This event study aimed to analyze the presence of abnormal and cumulative abnormal returns on the dividend announcement event five days (t-5) to one day before the announcement (t-1). The tests were also performed for the announcement day (t), one day after (t+1), until the fifth day following the announcement (t+5). The test began with testing the normality of the data with the Kolmogorov-Smirnov Test. Normally distributed data were tested with the one sample T-Test, and those abnormally distributed were tested with the One Sample Wilcoxon Signed-Rank Test. The data were processed using the SPSS version 22 program. Abnormal and cumulative abnormal returns were determined by evaluating the realized and expected returns using the formulations in equations (5) (6), respectively. The abnormal and cumulative abnormal return formulations are found in equations (7) and (8), respectively (Ashraf, 2021; Bandiyono & Amalia, 2021; Robiyanto & Yunitaria, 2022)

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \quad (5)$$

$$E(R)_{i,t} = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}} \quad (6)$$

$$AR_{i,t} = R_{i,t} - E(R)_{i,t} \quad (7)$$

$$CAR_{i,t}(t, K) = \sum_{t=-5}^{K} AR_{i,t} \quad (8)$$

Where, $R_{i,t}$: realized return on the $i$-th issuer and the $t$-th day; $P_{i,t}$: adjusted close price on the $i$-th issuer and the $t$-th day; $P_{i,t-1}$: adjusted close price on the $i$-th issuer and the

$(t-1)$-th day; $E(R)_{i,t}$: expected return on the $i$-th issuer and the $t$-th day; $IHSG_{i,t}$: IDX composite on the $t$-th day; $IHSG_{t-1}$: IDX composite on the $(t-1)$-th day; $AR_{i,t}$: abnormal return on the $i$-th issuer and the $t$-th day; $CAR_{i,t}(t,K)$: cumulative abnormal return on the $i$-th issuer and the $t$-th day; $t=-5,-4,\dots,K$; $K=5$.

## 4. RESULTS

Table 2 presents the tested variables' descriptive statistics. The minimum DPS value means it did not distribute dividends in that period, assumed to be distributed at 0. The negative minimum DPR indicates that the company distributed dividends in a negative net income condition. The DPS and DPR values are in an overdispersion condition because the study subject combines the company's dividend distribution and non-distribution. Moreover, the minimum GDP value of -0.0207 indicates a negative year-on-year GDP in 2020. A negative EPS value indicates that the company's net income was negative. These extreme conditions were analyzed to produce a comprehensive empirical study. Table 2 presents the results of the data normality test using the Kolmogorov-Smirnov test, showing that the overall data for each variable are not normally distributed. Therefore, the bivariate correlation between variables was analyzed using the Spearman Correlation, a non-parametric statistical approach.

***Table 2.*** Descriptive Statistic and Kolmogorov-Smirnov Test for Variables from Table 1

| Proxy | N | Descriptive Statistic | | | | Normality Test | |
|---|---|---|---|---|---|---|---|
| | | Max. | Min. | Mean. | Std. Dev. | K-S stat. | Exact Sig. (2-tailed) |
| DPS | 609 | 6500.000 | 0.000 | 126.349 | 480.149 | 0.396 | 0.000 |
| DPR | 609 | 7.386 | -3.155 | 0.302 | 0.524 | 0.268 | 0.000 |
| GDP | 609 | 0.052 | -0.021 | 0.040 | 0.025 | 0.493 | 0.000 |
| BD | 609 | 1.000 | 0.000 | 0.143 | 0.350 | 0.515 | 0.000 |
| EPS | 609 | 17989.742 | -3013.506 | 271.702 | 970.250 | 0.330 | 0.000 |
| DER | 609 | 8.261 | 0.701 | 0.973 | 0.908 | 0.160 | 0.000 |
| TA | 609 | 19.679 | 11.804 | 15.097 | 1.619 | 0.083 | 0.000 |
| MB | 609 | 82.444 | 0.055 | 2.822 | 7.126 | 0.350 | 0.000 |

***Table 3.*** Spearman Bivariate Correlation

| Proxy | DPS | DPR | GDP | BD | EPS | DER | TA | MB |
|---|---|---|---|---|---|---|---|---|
| **DPS** | 1.000 | | | | | | | |
| **DPR** | **0.815 | 1.000 | | | | | | |
| **GDP** | 0.069 | *0.083 | 1.000 | | | | | |
| **BD** | -0.026 | -0.025 | **-0.612 | 1.000 | | | | |
| **EPS** | **0.749 | **0.453 | *0.082 | **-0.105 | 1.000 | | | |
| **DER** | **-0.182 | **-0.236 | -0.009 | -0.036 | *-0.085 | 1.000 | | |
| **TA** | **0.342 | **0.193 | 0.019 | 0.044 | **0.319 | **0.319 | 1.000 | |
| **MB** | **0.442 | **0.433 | 0.031 | 0.049 | **0.346 | -0.062 | **0.262 | 1.000 |

Description: Using a two-tailed statistics approach, (**) is significant at the 1% level and (*) is significant at the 5% level.

Table 3 presents the Spearman bivariate correlation analysis, showing that DPS and DPR have a very strong and significant correlation at 1%. This indicates that the two proxies have robust behavior to measure dividend policy variables. Similarly, GDP and BD have a strong and significant correlation at 1%, meaning they also have robust behavior to measure the COVID-19 pandemic variable.

***Table 4***. Sargan and Arellano Bond Tests

| **Model Empiris** | **Sargan Test** | **Arellano-Bond Test** | |
|---|---|---|---|
| | | **Order 1** | **Order 2** |
| | $\chi^2$ | $z$ | $z$ |
| (3) | 26.325 | -1.398 | 1.184 |
| (4) | 24.049 | *-2.737 | 0.254 |
| (5) | 26.201 | -1.397 | 1.176 |
| (6) | 23.967 | *-2.730 | 0.254 |

Description: (*) significant at the 5% level.

The empirical models of (1), (2), (3), and (4) were tested using dynamic panel data regression with the System-Generalized Method of Moments (SYS-GMM) estimation method. The analysis began with the model specification tests. First, the instrumental validity test was performed using Sargan Test. Table 4 presents the results of the Sargan Test for all tested empirical models. The results obtained shows that all tested empirical models have a p-value of $\chi^2 > 5\%$. Therefore, the entire empirical model validates over-identifying restriction conditions, implying no correlation between $Y_{i,t-1}$ and $\varepsilon_{i,t}$. Second, the parameter consistency test was conducted using Arellano-Bond Test. Table 4 shows the results of the Arellano-Bond Test for the entire empirical model, where order-2 has a p-value of $z > 5\%$. Therefore, the overall empirical model tested has no serial correlation of $\Delta v_{i,t}$ and $\Delta v_{i,t-2}$ in each parameter estimate or among $\varepsilon_{i,t}$ and $\varepsilon_{i,t-2}$.

The unbiased test compared $\delta$ of $DPS_{i,t-1}$ and $DPR_{i,t-1}$ on the SYS-GMM, the least square dummy variable-robust standard error (LSDV-RSE), and the ordinary least square-robust standard error (OLS-RSE) estimations. Table 5 shows that the unbiased test results for the empirical model (1) are $\delta$LSDV-RSE < $\delta$SYS-GMM < $\delta$OLS-RSE, meaning the parameter estimation is not biased. The empirical model (2) results showed that $\delta$LSDV-RSE < $\delta$SYS-GMM < $\delta$OLS-RSE, meaning the parameter estimation is unbiased. Table 6 shows the unbiased test in the empirical model (3). The results are $\delta$LSDV-RSE < $\delta$SYS-GMM < $\delta$OLS-RSE, meaning the parameter estimate is also unbiased. Similarly, the empirical model (4) results showed that $\delta$LSDV-RSE < $\delta$SYS-GMM < $\delta$OLS-RSE, meaning the parameter estimation is unbiased. The overall specification tests of the SYS-GMM model showed that the parameter estimates are consistent and unbiased. Therefore, the overall parameter estimation was feasible to be continued with the SYS-GMM parameter significance tests. The tests were conducted for the four empirical models with a simultaneous test using Wald Wald $\chi^2$ Test and a partial test with the Z-Test.

Tables 5 and 6 show the results of the Wald $\chi^2$ Test, where the empirical models (1), (2), (3), and (4) obtained $p$-value $\chi^2 < 5\%$, $p$-value $\chi^2 < 5\%$, $p$-value $\chi^2 < 5\%$, and $p$-value $\chi^2 < 5\%$, respectively. These results indicate that at least one exogenous variable in the entire empirical model of the SYS-GMM estimation significantly affects endogenous variables for each model. Furthermore, Z-test was performed on each exogenous variable by assessing the effect on endogenous variables with a two-tailed statistical approach and significance testing at 1%, 5%, and 10%.

***Table 5.*** Estimation of SYS-GMM, LSDV-RSE, and OLS-RSE Parameters for the COVID-19 Pandemic Crisis Variable with GDP Proxy

| Proxy | Empirical Model (1) | | | Empirical Model (2) | | |
|---|---|---|---|---|---|---|
| | **LSDV-RSE** | **SYS-GMM** | **OLS-RSE** | **LSDV-RSE** | **SYS-GMM** | **OLS-RSE** |
| $\alpha_{i,t}$ | -46.047 | ***-404.970 | 13.764 | -1.105 | 0.932 | 0.379 |
| | (488.931) | (155.675) | (106.859) | (1.217) | (0.960) | (0.310) |
| $GDP_{i,t}$ | 64.839 | ***-96.365 | -299.498 | -0.865 | ***-1.239 | -1.825 |
| | (288.003) | (28.353) | (272.857) | (1.665) | (0.459) | (1.695) |
| $EPS_{i,t}$ | 0.206 | ***0.344 | ***0.385 | -0.000 | 0.000 | 0.000 |
| | (0.187) | (0.010) | (0.104) | (0.000) | (0.000) | (0.000) |
| $DER_{i,t}$ | 53.248 | ***119.791 | 9.243 | **-0.157 | 0.010 | ***-0.064 |
| | (63.471) | (8.782) | (26.121) | (0.062) | (0.012) | (0.023) |
| $TA_{i,t}$ | 3.534 | *20.405 | -1.118 | 0.109 | -0.044 | -0.006 |
| | (30.100) | (10.612) | (8.394) | (0.076) | (0.063) | (0.015) |
| $MB_{i,t}$ | 1.657 | ***5.064 | **6.029 | 0.018 | **-0.007 | ***0.011 |
| | (5.407) | (0.650) | (2.384) | (0.023) | (0.004) | (0.004) |
| $DPS_{i,t-1}$ | -0.434 | ***-0.014 | 0.069 | ---------- | ---------- | ---------- |
| | (0.055) | (0.003) | (0.054) | | | |
| $DPR_{i,t-1}$ | ---------- | ---------- | ---------- | -0.036 | ***0.171 | ***0.383 |
| | | | | (0.101) | (0.036) | (0.114) |
| No. of Obs. | 522 | 522 | 522 | 522 | 522 | 522 |
| No. of Groups | 87 | 87 | ---------- | 87 | 87 | ---------- |
| No. of Intruments | ---------- | 26 | ---------- | ---------- | 26 | ---------- |
| $R^2$ | 0.455 | ---------- | 0.583 | 0.000 | ---------- | 0.126 |
| Adj-$R^2$ | 0.448 | ---------- | 0.578 | -0.011 | ---------- | 0.116 |
| F-statistic | 1.740 | ---------- | ***10.770 | ***4.030 | ---------- | ***15.430 |
| Wald $\chi^2$ | ---------- | ***9970.540 | ---------- | ---------- | ***51.600 | ---------- |

Description: Using a two-tailed statistics approach, (***) is significant at the 1% level, (**) is significant at the 5% level, and (*) is significant at the 10% level. The numbers in parenthesis are the standard error for the SYS-GMM method and the robust standard error for LSDV-RSE and OLS-RSE.

Tables 5 and 6 show the results of the Wald $\chi^2$ Test, where the empirical models (1), (2), (3), and (4) obtained $p$-value $\chi^2 < 5\%$, $p$-value $\chi^2 < 5\%$, $p$-value $\chi^2 < 5\%$, and $p$-value $\chi^2 < 5\%$, respectively. These results indicate that at least one exogenous variable in the entire empirical model of the SYS-GMM estimation significantly affects endogenous variables for each model. Furthermore, Z-test was performed on each exogenous variable by assessing the effect on endogenous variables with a two-tailed statistical approach and significance testing at 1%, 5%, and 10%.

Table 5 shows the results of the Z-Test for the empirical models (1) and (2), while Table 6 shows the results for models (3) and (4). Empirical model estimation (1) shows that $GDP_{i,t}$ and $DPS_{i,t-1}$ negatively affect $DPS_{i,t}$ at 1% significance. There are positive effects on $DPS_{i,t}$ by $EPS_{i,t}$, $DER_{i,t}$, and $MB_{i,t}$ at 1% significance, and $TA_{i,t}$ at 10% significance. In the empirical model (2), there are negative effects on $DPR_{i,t}$ by $GDP_{i,t}$ at 1% significance, and $MB_{i,t}$ at 5% significance. $DPR_{i,t-1}$ has a positive effect at 1% significance. In model (3), there are positive effects on $DPS_{i,t}$ by $BD_{i,t}$, $EPS_{i,t}$, $DER_{i,t}$, and $MB_{i,t}$ at 1% significance, and $TA_{i,t}$ at 10% significance. $DPS_{i,t-1}$ has a negative effect at 1% significance. In model (4), $BD_{i,t}$ and $DPR_{i,t-1}$ positively predict $DPR_{i,t}$ with 1% significance, while $MB_{i,t}$ negatively affect $DPR_{i,t}$ at 5% significance. This means that testing the effects of $GDP_{i,t}$, and $BD_{i,t}$ on $DPS_{i,t}$, and $DPR_{i,t}$ with control variables produce robust results for hypotheses. It is indicated by the negative effects of $GDP_{i,t}$ on $DPS_{i,t}$, and $DPR_{i,t}$, and positive effects of $BD_{i,t}$ on $DPS_{i,t}$, and $DPR_{i,t}$, supporting $H_1$, $H_2$, $H_3$, and $H_4$.

***Table 6.*** Estimation of SYS-GMM, LSDV-RSE, and OLS-RSE Parameters for the COVID-19 Pandemic Crisis Variable with Binary Dummy Variable

| Proxy | Empirical Model (3) | | | Empirical Model (4) | | |
|---|---|---|---|---|---|---|
| | **LSDV-RSE** | **SYS-GMM** | **OLS-RSE** | **LSDV-RSE** | **SYS-GMM** | **OLS-RSE** |
| $\alpha_{i,t}$ | -36.938 | ***-398.041 | -1.104 | -1.104 | 0.945 | 0.288 |
| | (485.661) | (154.748) | (105.396) | (1.197) | (0.956) | (0.246) |
| $BD_{i,t}$ | -3.760 | ***8.032 | 22.293 | 0.064 | ***0.092 | 0.132 |
| | (16.005) | (2.034) | (19.342) | (0.119) | (0.033) | (0.120) |
| $EPS_{i,t}$ | 0.207 | ***0.344 | ***0.385 | -0.000 | 0.000 | 0.000 |
| | (0.187) | (0.010) | (0.104) | (0.000) | (0.000) | (0.000) |
| $DER_{i,t}$ | 53.353 | ***120.634 | 9.284 | **-0.156 | 0.011 | ***-0.064 |
| | (63.522) | (8.734) | (26.121) | (0.062) | (0.012) | (0.023) |
| $TA_{i,t}$ | 3.127 | *19.569 | -1.147 | 0.106 | -0.049 | -0.007 |
| | (30.047) | (10.516) | (8.397) | (0.078) | (0.064) | (0.016) |
| $MB_{i,t}$ | 1.669 | ***5.072 | **6.028 | -0.018 | **-0.007 | ***0.011 |
| | (5.407) | (0.645) | (2.385) | (0.023) | (0.004) | (0.004) |
| $DPS_{i,t-1}$ | -0.043 | ***-0.014 | 0.069 | ---------- | ---------- | ---------- |
| | (0.055) | (0.003) | (0.054) | | | |
| $DPR_{i,t-1}$ | ---------- | ---------- | ---------- | -0.035 | ***0.173 | ***0.383 |
| | | | | (0.101) | (0.036) | (0.114) |
| No. of Obs. | 522 | 522 | 522 | 522 | 522 | 522 |
| No. of Groups | 87 | 87 | ---------- | 87 | 87 | ---------- |
| No. of Intruments | ---------- | 26 | ---------- | ---------- | 26 | ---------- |
| $R^2$ | 0.455 | ---------- | 0.583 | 0.000 | ---------- | 0.127 |
| Adj-$R^2$ | 0.449 | ---------- | 0.578 | -0.011 | ---------- | 0.116 |
| F-statistic | 1.710 | ---------- | ***10.740 | ***3.990 | ---------- | ***15.420 |
| Wald $\chi^2$ | ---------- | ***10070.090 | ---------- | ---------- | ***52.410 | ---------- |

Description: Using a two-tailed statistics approach, (***) is significant at the 1% level, (**) is significant at the 5% level, and (*) is significant at the 10% level. The numbers in parenthesis are the standard error for the SYS-GMM method and the robust standard error for LSDV-RSE and OLS-RSE.

The event study of dividend announcements in the COVID-19 pandemic crisis began with descriptive statistical analysis and data normality test with the Kolmogorov-Smirnov Test. The test was conducted on abnormal returns ($AR_{i,t}$) and cumulative abnormal returns ($CAR_{i,t}$) at a time (t) for 49 observation units (n). The study was conducted from five days before (t-5) to five days after the dividend announcement (t+5). Table 7 shows the results of the Descriptive Statistics and the Kolmogorov-Smirnov Test on $AR_{i,t}$. The highest and lowest $AR_{i,t}$ were the issuers of IMAS and TRIS at t-1 of 23.4%, and t-5 of -9.2%, respectively. The value of Average Abnormal Return ($AAR_t$) is shown from the mean ($\bar{x}_t$), where the lowest and highest values were at t-5 of -0.3% and t+3 of 1.3%, respectively. The largest and smallest standard deviations ($s_t$) were at t-1 and t-4, showing the highest and lowest $AR_{i,t}$ variations, respectively. Overall, overdispersion conditions indicate high variations of $AR_{i,t}$ among issuers on each observation day. The normality test of $AR_{i,t}$ data on each day of observation showed results of exact sig. > 5% for t-5, t-4, t-3, t-2, t, t+1, t+2, t+3, and t+4, meaning the data are normally distributed. The results of the Kolmogorov-Smirnov Test at t-1 and t+5 are also exact sig. < 5%, meaning the data are not normally distributed. Therefore, the abnormal return significance test for normally and abnormally distributed data uses the One Sample T-Test and the One Sample Wilcoxon Signed-Rank Test, respectively.

Table 7 also shows the results of the Descriptive Statistics and the Kolmogorov-Smirnov Test of cumulative abnormal return ($CAR_{i,t}$). The highest and lowest $CAR_{i,t}$ are the issuers of WIIM and WTON at t+5 of 44.17% and t-3 of -13.3%, with the cumulative abnormal return from t-5 to t+5 and from t-5 to t-3, respectively. Cumulative Average Abnormal Return ($CAAR_t$) is shown from the mean ($\bar{x}_t$) by the lowest value at t-4 of -0.3% from t-5 to t-4. The highest mean is at t+3 is 2.4%, with a cumulative average from t-5 to t+3. The largest and smallest standard deviation ($s_t$) is at t+5 and t-5, showing the highest and lowest variation of $CAR_{i,t}$, respectively. Overall, overdispersion conditions indicate a high variation of $CAR_{i,t}$ among issuers on each observation day. The normality test of $CAR_{i,t}$ data on each day of observation showed results of exact sig. > 5% for t-5, t-4, t-3, t-2, t-1, t, t+1, t+2, t+3, t+4, and t+5, meaning the data are normally distributed. Therefore, the cumulative abnormal return significance test for normally distributed data uses the One Sample T-Test.

***Table 7.*** Descriptive Statistic and Kolmogorov-Smirnov Test on Abnormal Return and Cumulative Abnormal Return

| t | n | Abnormal Return | | | | | | Cumulative Abnormal Return | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Descriptive Statistic | | | | Kolmogorov-Smirnov Test | | Descriptive Statistic | | | | Kolmogorov-Smirnov Test | |
| | | Max. | Min. | $\bar{x}_t$ | $s_t$ | K-S stat. | Exact Sig.(2-tailed) | Max. | Min. | $\bar{x}_t$ | $s_t$ | K-S stat. | Exact Sig.(2-tailed) |
| t-5 | 49 | 0.077 | -0.092 | -0.003 | 0.031 | 0.097 | 0.706 | 0.077 | -0.092 | -0.003 | 0.031 | 0.097 | 0.706 |
| t-4 | 49 | 0.051 | -0.064 | -0.001 | 0.021 | 0.103 | 0.637 | 0.077 | -0.097 | -0.003 | 0.033 | 0.109 | 0.565 |
| t-3 | 49 | 0.087 | -0.084 | 0.002 | 0.029 | 0.123 | 0.415 | 0.107 | -0.133 | -0.001 | 0.050 | 0.160 | 0.147 |
| t-2 | 49 | 0.049 | -0.072 | -0.000 | 0.022 | 0.105 | 0.618 | 0.122 | -0.113 | -0.001 | 0.049 | 0.108 | 0.575 |
| t-1 | 49 | 0.234 | -0.067 | 0.011 | 0.043 | 0.242 | 0.005 | 0.244 | -0.075 | 0.009 | 0.062 | 0.129 | 0.357 |
| t | 49 | 0.101 | -0.050 | 0.002 | 0.030 | 0.172 | 0.099 | 0.344 | -0.095 | 0.011 | 0.073 | 0.152 | 0.185 |
| t+1 | 49 | 0.059 | -0.061 | -0.003 | 0.026 | 0.108 | 0.581 | 0.289 | -0.111 | 0.008 | 0.069 | 0.127 | 0.379 |
| t+2 | 49 | 0.085 | -0.074 | 0.003 | 0.032 | 0.118 | 0.471 | 0.252 | -0.093 | 0.011 | 0.071 | 0.161 | 0.140 |
| t+3 | 49 | 0.127 | -0.049 | 0.013 | 0.029 | 0.102 | 0.647 | 0.295 | -0.088 | 0.024 | 0.079 | 0.173 | 0.093 |
| t+4 | 49 | 0.056 | -0.071 | -0.000 | 0.024 | 0.117 | 0.475 | 0.263 | -0.103 | 0.024 | 0.080 | 0.160 | 0.145 |
| t+5 | 49 | 0.187 | -0.060 | -0.002 | 0.038 | 0.206 | 0.026 | 0.442 | -0.121 | 0.021 | 0.106 | 0.183 | 0.066 |

Table 8 shows the $AR_{i,t}$ significance test results on each day of observation using the One Sample T-Test with a significance level of 5%. There is a significant abnormal return at t+3 with positive T-stat and $AAR_t$ values, supporting $H_5$ for t+3. The significance test of $AR_t$ with One Sample Wilcoxon Signed-Rank Test also showed a significant abnormal return at t+5 with negative $AAR_t$, supporting $H_5$ for t+5. Furthermore, the $CAR_{i,t}$ significance test with One Sample T-Test shows cumulative abnormal returns at t+3 and t+4 with positive T-stat and $CAAR_t$ values, supporting $H_6$ for t+3 and t+4.

***Table 8.*** One Sample T-test and One Sample Wilcoxon Signed-Rank Test on Abnormal Return, as well as One Sample T-test on Cumulative Abnormal Return

| **t** | $AAR_t$ | **One Sample T-Test For $AR_{i,t}$** | | | **One Sample Wilcoxon Signed-Rank Test for $AR_{i,t}$** | $CAAR_t$ | **One Sample T-Test for $CAR_{i,t}$** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **d.f.** | **T-stat.** | **Sig. (2-tailed)** | **Sig. (2-tailed)** | | **d.f.** | **T-stat.** | **Sig. (2-tailed)** |
| t-5 | -0.003 | 48 | -0.641 | 0.524 | ---------- | -0.003 | 48 | -0.641 | 0.524 |
| t-4 | -0.001 | 48 | -0.178 | 0.860 | ---------- | -0.003 | 48 | -0.707 | 0.483 |
| t-3 | 0.002 | 48 | 0.539 | 0.593 | ---------- | -0.001 | 48 | -0.155 | 0.878 |
| t-2 | -0.000 | 48 | -0.107 | 0.915 | ---------- | -0.001 | 48 | -0.208 | 0.836 |
| t-1 | 0.011 | ---------------------------- | | | 0.100 | 0.009 | 48 | 0.009 | 0.301 |
| t | 0.002 | 48 | 0.407 | 0.686 | ---------- | 0.011 | 48 | 1.057 | 0.296 |
| t+1 | -0.003 | 48 | -0.702 | 0.486 | ---------- | 0.008 | 48 | 0.864 | 0.392 |
| t+2 | 0.003 | 48 | 0.560 | 0.578 | ---------- | 0.011 | 48 | 1.088 | 0.282 |
| t+3 | 0.013 | 48 | 3.128 | 0.003 | ---------- | 0.024 | 48 | 2.161 | 0.036 |
| t+4 | -0.000 | 48 | -0.128 | 0.899 | ---------- | 0.024 | 48 | 2.070 | 0.044 |
| t+5 | -0.002 | ---------------------------- | | | 0.048 | 0.021 | 48 | 0.021 | 0.162 |

## 5. DISCUSSION

The effect of the COVID-19 pandemic crisis on the dividend policy of manufacturing companies in Indonesia is robust on all parameter estimates with various measurement proxies. The negative effects of $GDP_{i,t}$ on $DPS_{i,t}$, and $DPR_{i,t}$ are relevant to the positive effects of $BD_{i,t}$ on $DPS_{i,t}$ and $DPR_{i,t}$. It means that manufacturing companies in Indonesia established a positive policy during the crisis. These results contradict Abdulkadir et al. (2015); Hauser (2013); and Reddemann et al. (2010), which found that companies suppress or eliminate dividends in sluggish economic conditions. Specifically, the results contradict Cejnek et al. (2021); and Krieger et al. (2021), which showed that companies set negative policies during the pandemic crisis. However, the results support Ali (2022), which examined 8889 companies in G-12 countries and found that most set positive policies by maintaining and increasing dividend levels. Tinungki, Hartono, et al. (2022) found that green index companies in Indonesia also set a positive dividend policy. In line with the two previous studies, Tinungki, Robiyanto, et al. (2022) found that 212 companies in Indonesia set a positive policy in crisis conditions.

Companies experienced a decline in revenue, highly volatile earnings, and poor stock performance due to the systemic COVID-19 pandemic crisis. To reduce information asymmetry related to the future growth opportunity, they distributed dividends as a positive signal to the market, even when experiencing the impact of the crisis. Based on the dividend signaling theory, the findings mean that companies do not set a negative policy to avoid negative signals related to their growth prospects. They continue paying the same dividends or increasing them from the previous year. This aims to create a stable policy during the COVID-19 pandemic to ensure excellent financial performance (Ali, 2022; Altig et al., 2020; Baker et al., 2016).

Past predictors positively affected dividend policy in empirical models (2) and (4), meaning that the companies set policies even in crisis conditions. The weak correlations among $EPS_{i,t}$ with $GDP_{i,t}$, and $BD_{i,t}$ indicated that companies' profitability as the main policy predictor has no relationship with predictors of the COVID-19 pandemic crisis impact on the policy. This shows that the company's policy is positive in crisis conditions influenced by the crisis predictor, even with decreased revenue. In line with $EPS_{i,t}$, proxies $DER_{i,t}$, $TA_{i,t}$, and $MB_{i,t}$ have weak and insignificant correlations with $GDP_{i,t}$ and $BD_{i,t}$. It means that debt, company size, or investment opportunity do not determine the policy influenced by the pandemic predictors.

Manufacturing companies should set a positive dividend policy in the COVID-19 crisis conditions to give a favorable signal to the stock market to test the stock market's reaction. The corporate action was suspected of being an attempt to increase stock trading activities in sluggish economic conditions (Tinungki, Hartono, et al., 2022; Tinungki, Robiyanto, et al., 2022). The results showed a positive abnormal return on the third day after the dividend announcement and a significant abnormal return after five days, but with a negative $AAR_t$ value. Observation of $AAR_t$ showed no positive movement from the announcement until the fifth day after the announcement. Furthermore, there were positive significant cumulative abnormal returns on the third and fourth days after the announcement. $CAAR_t$ were negative from five to two days before the announcement. There was an increase in $CAAR_t$ from one day before until the third and fourth day after the announcement, with significant cumulative abnormal returns. Moreover, $CAAR_t$ decreased by 12.5% on the fifth day after, compared to the fourth day. These results indicate movements towards a positive cumulative abnormal return on dividend announcements.

The abnormal and cumulative abnormal returns observations showed stock market reactions to dividend announcements during the COVID-19 pandemic crisis, but with slow responses. These results contradict Tinungki, Robiyanto, et al. (2022), which found very fast positive reactions to the announcement. The rapid response was indicated by significant and positive abnormal and cumulative abnormal returns after the announcement. Tinungki, Hartono, et al. (2022) also found no significant stock market reaction to dividend announcements on SRI-KEHATI indexed companies in Indonesia. This supports Robiyanto & Yunitaria (2022), which found no significant reaction to the pandemic crisis in 2020, even in the previous year. The results are in line with Khanal & Mishra (2017), which found positive stock market reactions to dividend announcements, but with a slow response. According to Khanal & Mishra (2017), the stock market reaction to announcements in sluggish economic conditions is not as fast as in normal economic conditions or after a sluggish economy. Therefore, the efforts of manufacturing companies in Indonesia to establish a favorable dividend policy in crisis conditions were less effective in increasing stock trading activities in sluggish economic conditions (Robiyanto & Yunitaria, 2022; Tinungki, Hartono, et al., 2022).

## 6. CONCLUSION, IMPLICATION, LIMITATIONS, AND SUGGESTIONS

### Conclusion

The COVID-19 pandemic crisis has influenced companies to set positive dividend policies, pay the same amount, or increase the dividend rate from the pre-crisis period. This aims to give a positive signal to the sluggish market conditions during the crisis and increase the low trading in the stock market. The policy illustrates the relevance of the dividend signaling theory to the policy set. However, this condition is irrelevant to the pecking order theory, where the company does not increase the retained earnings as a source of internal capital with the lowest risk but still distributes dividends positively. This necessitates testing the stock market reaction to this corporate action. Furthermore, the stock market reaction to the announcement of a significant dividend is considered weak, implying sluggish market conditions during the crisis due to the COVID-19 pandemic. Uncertainty about when the COVID-19 pandemic would end strongly influences the sluggishness. There has been no significant effort to end the crisis even at the end of 2020, such as vaccines and easing of the partial lockdown or Large-Scale Social Restrictions (PSBB). Therefore, this study has implications for Indonesia's manufacturing companies to take corporate actions or managerial policies more effectively, giving a positive signal to the sluggish stock market during the crisis.

$DPS_{i,t}$ and $DPR_{i,t}$ are overdispersion equivalent to $BD_{i,t}$, $EPS_{i,t}$, and $MB_{i,t}$, proving a significant partial test. The equidispersion of $GDP_{i,t}$, $DER_{i,t}$, and $TA_{i,t}$ proxies are not commensurate with $DPS_{i,t}$ and $DPR_{i,t}$. However, dynamic panel data regression with the SYS-GMM estimation method captures behavior robustly and produces a significant effect. This means it is a robust estimation method for panel data structures by producing consistent, unbiased, and more efficient parameter estimates (Arellano & Bond, 1991; Arellano & Bover, 1995; Baltagi, 2005; Biørn, 2017; Blundell & Bond, 1998).

The optimal dividend policy in Indonesia's manufacturing companies increases firm value. This was seen during the COVID-19 pandemic, forcing the country to implement PSBB. The pandemic hampered industrial production chains more sensitive to the manufacturing industry than other sectors such as service, agriculture, and mining. Therefore, the optimal management of dividend policy for manufacturing companies contributed to the Indonesian economy during the crisis caused by the COVID-19 pandemic.

**Limitation and suggestions**

The parameter estimation in the empirical models (1) and (3) showed better partial test results than in models (2) and (4). Although the endogenous variables' proxies have significant correlations and measure the variables robustly, the partial significance tests on the two proxies are quite different. Therefore, further studies could formulate proxies for endogenous variables and perform robustness checking with other estimation methods to produce more goodness of fit parameter estimates.

This study conducted tests only in times of crisis. The pandemic condition has not been contained in Indonesia, and studies have not examined post-crisis conditions. Further studies could examine the conditions before, during, and after the COVID-19 pandemic crisis (Abdulkadir et al., 2015; Hauser, 2013). Moreover, this study was limited to the complexity of the model with exogenous and endogenous variables. Further studies could a mediation test of Profitability suspected of having endogeneity on the effect of the COVID-19 pandemic crisis on dividend policy. The stock market reaction was tested using simple statistical instruments. Therefore, further could use more sophisticated analytical instruments such as time series analysis, even more complex empirical models (Baulkaran, 2019; Shahzad et al., 2019).

**REFERENCES**

Abdulkadir, R. I., Abdullah, N. A. H., & Woei-Chyuan, W. (2015). Dividend policy changes in the pre-, mid-, and post-financial crisis: evidence from the nigerian stock market. *Asian Academy of Management Journal of Accounting and Finance*, *11*(2), 103–

126. http://web.usm.my/journal/aamjaf/vol 11-2-2015/aamjaf110215_05.pdf

Ahmed, M. Y., & Sarkodie, S. A. (2021). COVID-19 pandemic and economic policy uncertainty regimes affect commodity market volatility. *Resources Policy*, *74*, 102303. https://doi.org/10.1016/j.resourpol.2021.102303

Akhmadi, A., & Robiyanto, R. (2020). The Interaction Between Debt Policy, Dividend Policy, Firm Growth, and Firm Value. *Journal of Asian Finance, Economics and Business*, *7*(11), 699–705. https://doi.org/10.13106/jafeb.2020.vol7.no11.699

Ali, H. (2022). Corporate dividend policy in the time of COVID-19: Evidence from the G-12 countries. *Finance Research Letters*, *46*. https://doi.org/10.1016/j.frl.2021.102493

Altig, D., Baker, S., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., Davis, S. J., Leather, J., Meyer, B., Mihaylov, E., Mizen, P., Parker, N., Renault, T., Smietanka, P., & Thwaites, G. (2020). Economic uncertainty before and during the COVID-19 pandemic. *Journal of Public Economics*, *191*, 104274. https://doi.org/10.1016/j.jpubeco.2020.104274

Anwar, S., Singh, S., & Jain, P. K. (2017). Impact of Cash Dividend Announcements: Evidence from the Indian Manufacturing Companies. *Journal of Emerging Market Finance*, *16*(1), 29–60. https://doi.org/10.1177/0972652716686238

Arellano, M., & Bond, S. (1991). Some Monte Tests of Specification for Panel Data: Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, *58*(2), 277–297. https://doi.org/10.2307/2297968

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, *68*(1), 29–51. https://doi.org/10.1016/0304-4076(94)01642-D

Ashraf, B. N. (2021). Stock markets' reaction to Covid-19: Moderating role of national culture. *Finance Research Letters*, *41*(May 2020), 101857. https://doi.org/10.1016/j.frl.2020.101857

Athari, S. A., Adaoglu, C., & Bektas, E. (2016). Investor protection and dividend policy: The case of Islamic and conventional banks. *Emerging Markets Review*, *27*, 100–117. https://doi.org/10.1016/j.ememar.2016.04.001

Baig, A. S., & Chen, M. (2022). Did the COVID-19 pandemic (really) positively impact the IPO Market? An Analysis of information uncertainty. *Finance Research Letters Journal*, *46*, 102372. https://doi.org/10.1016/j.frl.2021.102372

Baker, M., Mendel, B., & Wurgler, J. (2016). Dividends as reference points: A behavioral signaling approach. *Review of Financial Studies*, *29*(3), 697–738. https://doi.org/10.1093/rfs/hhv058

Baltagi, B. H. (2005). *Econometric Analysis of Panel Data* (3rd ed.). John Wiley & Sons, Ltd.

Bandiyono, A., & Amalia, P. (2021). The Effect of State Budget Ratification and Expenditure on The Indonesian Capital Market : An Empirical Study on The LQ 45 Index Shares. *Jurnal Keuangan Dan Perbankan*, *25*(2), 379–399. https://doi.org/10.26905/jkdp.v25i2.5134

Bangun, N., Tjakrawala, F. X. K., Andani, K. W., & Santioso, L. (2017). The Effect of Financial Leverage, Employee Stock Ownership Program and Firm Size on Firm Performance of Companies Listed in Indonesia Stock Exchange. *International Business and Accounting Research Journal*, *1*(2), 82.

https://doi.org/10.15294/ibarj.v1i2.7

Baulkaran, V. (2019). Stock market reaction to green bond issuance. *Journal of Asset Management*, *20*(5), 331–340. https://doi.org/10.1057/s41260-018-00105-1

Biørn, E. (2017). *Econometrics of Panel Data: Methods and Applications* (1st ed.). Oxford University Press.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8

Bostanci, F., Kadioglu, E., & Sayilgan, G. (2018). Determinants of Dividend Payout Decisions: A Dynamic Panel Data Analysis of Turkish Stock Market. *International Journal of Financial Studies*, *6*(4), 93. https://doi.org/10.3390/ijfs6040093

Cejnek, G., Randl, O., & Zechner, J. (2021). The COVID-19 Pandemic and Corporate Dividend Policy. *Journal of Financial and Quantitative Analysis*, *56*(7), 2389–2410. https://doi.org/10.1017/S0022109021000533

Cepoi, C. (2020). Asymmetric dependence between stock market returns and news during COVID-19 financial turmoil. *Finance Research Letters*, *36*. https://doi.org/10.1016/j.frl.2020.101658

Conlon, T., & McGee, R. (2020). Safe haven or risky hazard? Bitcoin during the Covid-19 bear market. *Finance Research Letters*, *35*(May), 101607. https://doi.org/10.1016/j.frl.2020.101607

Dang, C., (Frank) Li, Z., & Yang, C. (2018). Measuring firm size in empirical corporate finance. *Journal of Banking and Finance*, *86*, 159–176. https://doi.org/10.1016/j.jbankfin.2017.09.006

Hardy, B. (2021). Covid-19 bank dividend payout restrictions: effects and trade-offs. In *BIS Bulletin* (Vol. 39). https://www.bis.org/publ/bisbull38.pdf

Hartono, P. G., Lestari, H. S., Wijaya, R., Hartono, A. B., & Tinungki, G. M. (2020). Likuiditas sebagai Prediktor Profitabilitas: Sebuah Studi Empiris pada Perusahaan Sektor Industri Manufaktur. *DERIVATIF: Jurnal Manajemen*, *14*(2), 126–137. https://doi.org/10.24127/jm.v14i2.475

Hartono, P. G., & Matusin, A. R. (2020). Determinants of Dividend Policy of Real Estate, Property, and Building Construction Companies Listed in IDX with Unbalanced Panel Data Approach. *TIJAB (The International Journal of Applied Business)*, *4*(2), 139. https://doi.org/10.20473/tijab.v4.i2.2020.139-156

Hartono, P. G., Sari, W. R., Tinungki, G. M., Jakaria, & Hartono, A. B. (2021). The Determinants of Dividend Policy: an Empirical Study of Inconsistent Distribution of Dividends using Balanced Panel Data Analysis. *Media Ekonomi Dan Manajemen*, *36*(2), 89–106. https://doi.org/10.24856/mem.v36i2.2023

Hauser, R. (2013). Did dividend policy change during the financial crisis? *Managerial Finance*, *39*(6), 584–606. https://doi.org/10.1108/03074351311322861

Hung, N. T. (2021). Oil prices and agricultural commodity markets: Evidence from pre and during COVID-19 outbreak. *Resources Policy*, *73*. https://doi.org/10.1016/j.resourpol.2021.102236

Indonesian Ministry of Industry, I. M. of I. (2022, February 10). Industri Manufaktur

Indonesia Semakin Ekspansif. *Kementrian Perindustrian Republik Indonesia*. https://kemenperin.go.id/artikel/23125/Industri-Manufaktur-Indonesia-Semakin-Ekspansif

John, K., & Williams, J. (1985). John, K., Williams, J., 1985. Dividends, dilution, and taxes: a signaling equilibrium. J. Financ. 40, 1053–1070. *The Journal of Finance*, *40*, 1053–1070. https://doi.org/10.1111/j.1540-6261.1985.tb02363.x

Khanal, A. R., & Mishra, A. K. (2017). Stock price reactions to stock dividend announcements: A case from a sluggish economic period. *North American Journal of Economics and Finance*, *42*(June 2009), 338–345. https://doi.org/10.1016/j.najef.2017.08.002

Krieger, K., Mauck, N., & Pruitt, S. W. (2021). The impact of the COVID-19 pandemic on dividends. *Finance Research Letters*, *42*(September), 101910. https://doi.org/10.1016/j.frl.2020.101910

Lambrecht, B. M., & Myers, S. C. (2012). A Lintner Model of Payout and Managerial Rents Managerial Rents. *The Journal of Finance*, *67*(5), 1761–1810.

Li, F. (2016). Endogeneity in CEO power: A survey and experiment. *Investment Analysts Journal*, *45*(3), 149–162. https://doi.org/10.1080/10293523.2016.1151985

Lim, K. (2016). The Shift of a Dividend Policy and a Leverage Policy during the 2008 Financial Crisis. *International Journal of Finance & Banking Studies (2147-4486)*, *5*(6), 09–14. https://doi.org/10.20525/ijfbs.v5i6.600

Mazumder, S., & Saha, P. (2021). COVID-19: Fear of pandemic and short-term IPO performance. *Finance Research Letters*, *43*(February), 101977. https://doi.org/10.1016/j.frl.2021.101977

McWilliams, A., & Siegel, D. (1997). Event studies in management research: Theoretical and empirical issues. *Academy of Management Journal*, *40*(3), 626–657. https://doi.org/10.2307/257056

Miller, M. H., & Rock, K. (1985). Dividend Policy under Asymmetric Information. *The Journal of Finance*, *40*(4), 1031–1051. https://doi.org/10.1111/j.1540-6261.1985.tb02362.x

Montasser, G. El, Charfeddine, L., & Benhamed, A. (2022). COVID-19, cryptocurrencies bubbles and digital market efficiency: sensitivity and similarity analysis. *Finance Research Letters*, *46*(PA), 102362. https://doi.org/10.1016/j.frl.2021.102362

Myers, S. C. (1984). The Capital Structure Puzzle. *The Journal of Finance*, *39*(3), 575–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

Ong, C. L., Thaker, H. M. T., Khaliq, A., & Thaker, M. A. M. T. (2018). The Determinants of Dividend Payout: Evidence from the Malaysian Property Market. *Iqtishadia*, *10*(2), 1. https://doi.org/10.21043/iqtishadia.v10i2.2863

Ongore, V. O., & Kusa, G. B. (2013). Determinants of Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Financial Issues*, *3*(1), 237–252. http://www.econjournals.com/index.php/ijefi/article/view/334

Owusu, P., & Bentum-ennin, I. (2021). The impact of COVID-19 on stock market performance in Africa: A Bayesian structural time series approach. *Journal of Economics and Business*, *115*. https://doi.org/10.1016/j.jeconbus.2020.105968

Ranajee, R., Pathak, R., & Saxena, A. (2018). To pay or not to pay: what matters the most for dividend payments? *International Journal of Managerial Finance*, *14*(2), 230–244. https://doi.org/10.1108/IJMF-07-2017-0144

Reddemann, S., Basse, T., & Von Der Schulenburg, J. M. G. (2010). On the impact of the financial crisis on the dividend policy of the european insurance industry. *Geneva Papers on Risk and Insurance: Issues and Practice*, *35*(1), 53–62. https://doi.org/10.1057/gpp.2009.37

Ri'a, N. I., Priyadi, M. P., & Mildawati, T. (2022). Government Policy Accountability On Implementation Of Cash Direct Assistance Program For Communities Affected By Covid-19 (Case Study in Ende Regency). *Neo Journal of Economy and Social Humanities*, *1*(1), 71–79. https://doi.org/10.56403/nejesh.v1i1.27

Robiyanto, R., & Yunitaria, F. (2022). Dividend announcement effect analysis before and during the COVID-19 pandemic in the Indonesia Stock Exchange. *SN Business & Economics*, *2*(2), 1–20. https://doi.org/10.1007/s43546-021-00198-8

Romus, M., Anita, R., Abdillah, M. R., & Zakaria, N. B. (2020). Selected Firms Environmental Variables: Macroeconomic Variables, Performance and Dividend Policy Analysis. *IOP Conference Series: Earth and Environmental Science*, *469*(1). https://doi.org/10.1088/1755-1315/469/1/012047

Salvatori, E. G., Robiyanto, R., & Harijono, H. (2020). An Analysis of the Relationship Between Earnings and Corporate Taxes on Dividend Policy of Companies in Sri-Kehati Index. *Journal of Management and Entrepreneurship Research*, *1*(1), 1–12. https://doi.org/10.34001/jmer.2020.6.01.1-1

Sekaran, U., & Bougie, R. (2016). *Reserach Methods for Bussiness A Skill-Bulding Approach* (7th ed.). John Wiley & Sons.

Shahzad, K., Rubbaniy, G., Lensvelt, M. A. P. E., & Bhatti, T. (2019). UK's stock market reaction to Brexit process: A tale of two halves. *Economic Modelling*, *80*, 275–283. https://doi.org/10.1016/j.econmod.2018.11.013

Sharma, R. K. (2021). Factors influencing dividend decisions of Indian construction, housing and real estate companies: An empirical panel data analysis. *International Journal of Finance and Economics*, *26*(4), 5666–5683. https://doi.org/10.1002/ijfe.2087

Sharma, R. K., & Bakshi, A. (2019). An evident prescience of determinants of dividend policy of Indian real estate companies: An empirical analysis using co-integration regression and generalised method of moments. *Journal of Financial Management of Property and Construction*, *24*(3), 358–384. https://doi.org/10.1108/JFMPC-02-2019-0012

Shruthi, M. S., & Ramani, D. (2021). Statistical analysis of impact of COVID 19 on India commodity markets. *Materials Today: Proceedings*, *37*, 2306–2311. https://doi.org/10.1016/j.matpr.2020.07.729

Singla, H. K., & Samanta, P. K. (2018). Determinants of dividend payout of construction companies: a panel data analysis. *Journal of Financial Management of Property and Construction*, *24*(1), 19 – 38. https://doi.org/10.1108/JFMPC-06-2018-0030

Sunardi, N., Husain, T., & Kadim, A. (2020). Determinants of Debt Policy and Company's Performance. *International Journal of Economics and Business Administration*, *VIII*(Issue 4), 204–213. https://doi.org/10.35808/ijeba/580

Tinungki, G. M. (2019). Orthogonal iteration process of determining K value on estimator of Jackknife ridge regression parameter. *Journal of Physics: Conference Series*, *1341*(9). https://doi.org/10.1088/1742-6596/1341/9/092001

Tinungki, G. M., Hartono, P. G., Robiyanto, R., Hartono, A. B., Jakaria, J., & Simanjuntak, L. R. (2022). The COVID-19 Pandemic Impact on Corporate Dividend Policy of Sustainable and Responsible Investment in Indonesia: Static and Dynamic Panel Data Model Comparison. *Sustainability*, *14*(10), 6152. https://doi.org/10.3390/su14106152

Tinungki, G. M., Robiyanto, R., & Hartono, P. G. (2022). The Effect of COVID-19 Pandemic on Corporate Dividend Policy in Indonesia : The Static and Dynamic Panel Data Approaches. *Economies*, *10*(1), 11. https://doi.org/10.3390/economies10010011

Utomo, C. D., & Hanggraeni, D. (2021). The Impact of COVID-19 Pandemic on Stock Market Performance in Indonesia. *Journal of Asian Finance, Economics and Business*, *8*(5), 777–0784. https://doi.org/10.13106/jafeb.2021.vol8.no5.0777

Wahjudi, E. (2020). Factors affecting dividend policy in manufacturing companies in Indonesia Stock Exchange. *Journal of Management Development*, *39*(1), 4–17. https://doi.org/10.1108/JMD-07-2018-0211

Wegman, F., Allsop, R., Antoniou, C., Bergel-Hayat, R., Elvik, R., Lassarre, S., Lloyd, D., & Wijnen, W. (2017). How did the economic recession (2008–2010) influence traffic fatalities in OECD-countries? *Accident Analysis and Prevention*, *102*, 51–59. https://doi.org/10.1016/j.aap.2017.01.022

Yusof, Y., & Ismail, S. (2016). Determinants of dividend policy of public listed companies in Malaysia. *Review of International Business and Strategy*, *26*(1), 88–99. https://doi.org/10.1108/RIBS-02-2014-0030