# FUNDAMENTAL ANALYSIS OF THE FIRM ON STOCK RETURNS IN THE UNCERTAINTY CAUSED BY THE COVID-19 PANDEMIC: THE CASE OF EMERGING ECONOMY

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## Abstract

This paper refers to a previous study of Barua (2020), which shows the impact of the pandemic on aggregate demand and supply. The novelty and the purpose of this study is to examine the fundamental impact arising from the uncertainties created by the COVID-19 pandemic caused by the Indonesian government restrictions policy (spectrum) on stock returns of the sample companies listed on the Indonesia Stock Exchange (IDX) with a minimum of 200 trading days in 2020 from 2016 to 2020. This study used multiple regression analysis and cross-sectional for the cumulative abnormal return (CAR). The result shows that the fundamentals tested had no significant effect on cumulative abnormal returns. On the other hand, only the current ratio showed a significant effect on Spectrum 1 and 4; Spectrum 1 had a positive effect while Spectrum 4 had a negative effect, and the debt service coverage ratio (DSCR) had a slightly significant effect on Spectrum 1. The study results indicate that each spectrum had different levels of uncertainty, which gave rise to different perspectives for each investor. This study provides a perspective for investors to see different levels of uncertainty on the current ratio (CR) and DSCR as determinants of fundamentals for investment consideration.

**Keywords:** Event Study, Cumulative Abnormal Returns, Fundamental Analysis

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## 1. INTRODUCTION

The COVID-19 pandemic is a global phenomenon that began in December 2019. On December 31, 2019, the World Health Organization (WHO) branch office in China announced the detection in Wuhan City, Hubei Province, China, of a form of pneumonia with no known cause (WHO, 2020).

The COVID-19 pandemic has caused a negative impact on the global economy mostly derived from the loss of economic activity arising from the implementation of lockdowns, strict quarantine, and social distancing. Global financial markets have shown an unparalleled albeit varied reaction to the COVID-19 pandemic (Rahman et al., 2021).

The rapid spread of COVID-19 throughout the world led to economic uncertainty (Baker et al., 2020) and produced a massive global economic shock in 2020. Especially for Indonesia, after the announcement of the first COVID-19 cases on March 2, 2020 (Nuraini, 2020), the immediate impact was seen in the decline of the Composite Stock Price Index (*Indeks Harga Saham Gabungan*, *IHSG*) on the Indonesia Stock Exchange (IDX) during March 2020, which stood at 5,361.25 points on March 2, 2020. By March 31, 2020, it was at 4,538.93 points, having reached its lowest point on March 24, 2020, at 3,937.63 points[1].

Jakarta Composite Index fluctuated significantly throughout March 2020 following the announcement of Indonesia's first case of COVID-19. This was evidence of investor overreaction at the IDX in the form of panic selling driven by uncertainty arising from the pandemic. It also related to the responses of governments in various countries that were suspending economic activities and restricting people's movement, imposing travel bans, and implementing economic stimulus packages in anticipation of an economic slowdown and job losses (Phan & Narayan, 2020).

Although various studies have examined overreaction, specifically overreaction due to financial performance, and board of directors (BOD) structure (Ni et al., 2019), overreaction due to expectations prompted by the macroeconomic situation (Bordalo et al., 2020), and overreaction related to environmental, social, and corporate governance (Cui & Docherty, 2020), this study aims to determine the existence of an indication of overreaction on the IDX due to the uncertainty caused by the COVID-19 pandemic.

The COVID-19 pandemic in Indonesia throughout 2020 caused uncertainty in the form of several spectrums, as follows:

1. The first spectrum began with the announcement of large-scale social restrictions (*Pembatasan Sosial Berskala Besar*, *PSBB*) on March 31, 2020, by the president of the Republic of Indonesia, Joko Widodo (Sekretariat Kabinet Republik Indonesia, 2020).

2. The second spectrum concerned the time when, due to the number of additional COVID-19 cases, the *PSBB* in Jakarta was reinforced from September 14, 2020 (DKI Jakarta Health Service, 2020); this continued reinforcement of the *PSBB* resulted in uncertainty for all businesses and investors.

3. The third spectrum concerned the announcement by Robert Redfield, director of the Centers for Disease Control and Prevention (CDC), through his letter to governors on August 27, 2020, that the COVID-19 vaccine was ready for distribution on November 1, 2020 (Smith, 2020).

4. The fourth spectrum commenced with the announcement of the imposition of emergency community activity restrictions (*Pemberlakuan Pembatasan Kegiatan Masyarakat Darurat, PPKM Darurat*) on July 1, 2021, for Java and Bali (Ministry of Home Affairs, 2021).

Based on the above-mentioned spectrums, the COVID-19 pandemic created uncertainty. This research, therefore, seeks to contribute to the financial behavior study literature regarding the effects on the business world of overreaction in the capital market caused by pandemic-related uncertainty, especially in Indonesia, and to further examine its impact on the sector. This study is conducted specifically in Indonesia due to government policy changes that lead to market reaction which is unique from other countries in the region.

Many prior studies have examined overreaction. Research to determine under- or overreaction in India concluded that investor reactions were motivated by a desire to avoid uncertainty, resulting in under- or overreaction (Maher & Parikh, 2011). Studies on overreaction have typically used a contrarian strategy. For example, Wu (2011) in research on overreaction, traced the contrarian strategy and momentum on the Shanghai Stock Exchange (SSE) from 1990 to 2001. It was also concluded that a contrarian strategy with significant overreaction produced more abnormal returns compared to the momentum strategy (Malin & Bornholt, 2013), while Reddy et al. (2019) concluded that there had been a long-term reversal of returns and significant near-term momentum in Shanghai Stock Market. The long-term impact of overreaction has also been observed in the Indonesian stock market, while a strong reversal in India was shown by the cumulative abnormal returns (CAR) strategy (Maheshwari & Dhankar, 2015). Abebe Assefa et al. (2014) examined the contrarian investment strategy for companies with a minimum capitalization value of USD5 billion traded on the United States (US) stock market. They concluded that there had been an overreaction during the research period and investors had been able to take advantage of market inefficiencies and earn abnormal returns by following the contrarian strategy.

In research on individual stock reactions to extreme changes in the American stock market between 1926 and 2013, out of a total of 663 events (310 positive and 353 negative), both statistically and economically, there was an overreaction to positive and negative events (Piccoli et al., 2017). The announcement of a company's earnings is a manifestation of investor overreaction because, for investors, a current earnings announcement provides a strong basis for predicting future earnings performance (Alwathnani et al., 2017). The reaction of market prices to new information depends greatly on the importance of the information signal provided, with one such signal being media coverage (Palomino et al., 2009). Investors tend to buy stocks that attract their attention, while the events that attract their attention are observed, such as news (media coverage), unusual trading volumes, and extreme returns (Barber & Odean, 2008). The COVID-19 pandemic, which spread very quickly throughout the world, created global economic uncertainty (Baker et al., 2020). China recorded stock price reversals at both the industrial and individual levels.

[1] Data were taken from S&P Global Market Intelligence (http://www.capitaliq.spglobal.com).

Due to the lockdown in Wuhan, even company stocks with a positive CAR showed a strong reversal and retail investors displayed a stronger overreaction, alongside those with smaller institutional ownerships (Huo & Qiu, 2020).

In a previous study, Ahrori and Lucik (2017) proved the global cointegration model of Indonesia's gross domestic product (GDP). Their research demonstrated that Indonesia is not significantly affected by global turmoil. Thus, global uncertainty does not have a direct shock effect on the Indonesian economy. Royhana and Warninda (2021), meanwhile, showed a significant and negative effect of uncertainty on stock market returns in Japan. Uncertainty in the United States and England had a positive impact, while China negatively impacted stock market returns in Indonesia. Based on the above, the research problem of this study is formulated as follows:

*RQ1: How did the impact on the fundamentals due to the announcement of the first PSBB on March 31, 2020, reflect the stock return at the IDX?*

*RQ2: How did the impact on the fundamentals due to the announcement of the reinforcement of the second PSBB in Jakarta on September 14, 2020, reflect the stock return at IDX?*

*RQ3: How did the impact on the fundamentals due to the United States CDC's announcement on August 27, 2020, that the COVID-19 vaccine was ready for distribution in the US from November 1, 2020, reflect the stock return at IDX?*

*RQ4: How did the impact on the fundamentals due to the announcement of emergency community activity restrictions for Java and Bali on July 1, 2021, reflect the stock price return at IDX?*

The economic impact of the COVID-19 pandemic is known as "*Coronanomics*" (Eichengreen, 2020). This paper refers to a previous study (Barua, 2020), which shows the impact of the pandemic on aggregate demand and supply. The novelty of this paper is to illustrate the impact of the COVID-19 pandemic on the fundamentals of the companies listed at IDX due to Indonesian government regulations on the restriction of social activities both domestically and abroad and the announcement by the CDC that the vaccine was ready for distribution in the United States starting from November 1, 2020. The research problem this study has the following objectives:

1. To provide an understanding of the impact on the fundamentals due to the announcement of the first *PSBB* on March 31, 2020, and its reflection on the stock return at IDX.

2. To provide an understanding of the impact on the fundamentals due to the announcement of the reinforcement of the second *PSBB* in Jakarta on September 14, 2020, and its reflection on the stock return at IDX.

3. To provide an understanding of the impact on the fundamentals due to the United States CDC's announcement on August 27, 2020, that the COVID-19 vaccine was ready for distribution in the United States starting from November 1, 2020, and its reflection on the stock return at IDX.

4. To provide an understanding of the impact on the fundamentals due to the announcement of emergency community activity restrictions for Java and Bali on July 1, 2021, and its reflection on the stock return at IDX.

The structure of this paper is as follows. Section 2 reviews the relevant literature. Section 3 analyses the methodology that has been used to conduct empirical research. Section 4 presents the results of this study, and Section 5 discusses and links them with the results of previous studies. Section 6 provides the conclusion the research reached.

## 2. LITERATURE REVIEW

### 2.1. Event study

According to Binder (1998), the event study methodology was first used in 1969 by Fama, Fisher, Jensen, and Roll. They used an event study in an attempt to evidence how stock responded to information on a particular event (Fama et al., 1969).

An event study centres on an issue to be addressed, specifically considering the cross-sectional correlation. In the case of event-date clustering, a relatively low cross-correlation among abnormal returns is serious in terms of over-rejecting the null hypothesis of zero average normal returns (Kolari & Pynnönen, 2010).

In an efficient market, an apparent underreaction will occur roughly as frequently as an overreaction. If there is a random split of anomalies between underreaction and overreaction, this will be consistent with market efficiency (Fama, 1998).

An event study will typically commence with a regression of stock returns on the market returns to provide parameters in order to estimate the expected stock return. Abnormal returns are the estimated difference in terms of actual stock returns minus expected returns. In their semi-strong form, abnormal returns equal zero (Maneenop & Kotcharin, 2020).

The market-adjusted model is used for stock returns. The assumption is that the best estimator of a securities return is the market index at that time. There is no requirement to use the estimation period to form the estimation model since the estimated return of securities is the same as the market index return (Bintara et al., 2020).

### 2.2. Efficient market hypothesis

According to the efficient market hypothesis (EMH), the prices of securities fully reflect the available information and are divided into three categories: 1) *weak form*: the information available is previous price information (market data); 2) *semi-strong form*: when prices have adjusted to publicly available information (for example, annual earnings announcement); 3) *strong form*: when individual investors or groups of investors have monopoly access to information related to price formation (Fama, 1970).

The weak form of EMH is related to an idea that developed in the 1960s, which stated that changes in stock prices follow a random path; as such, the price change over time is random (independent). Today's price changes are, therefore, unrelated to yesterday's price changes, or those from the day before. Investors will thus react quickly to any random new information received by the market, and price changes will in turn be random (Jones, 2014).

If an anomaly occurs in the stock market, underreaction will be as frequent as overreaction; if a random separation occurs, then underreaction and overreaction are consistent with market efficiency (Fama, 1998).

To better understand overreaction in the capital market, we must first understand the normal reaction (Reddy et al., 2020). EMH is a well-known theory of market normality. It contends that an abnormal return is highly unlikely since stocks will always be traded at their fair value and the average return is only obtained based on past information.

The predictability of stock returns can be attributed to market inefficiencies or systematic changes in expected stock returns, thus rejecting the hypothesis that stock prices follow a random path (Jegadeesh, 1990). The momentum strategy is based on the underreaction hypothesis in which investors react to information to a lesser extent than they should, meaning prices are not adjusted immediately (Jegadeesh & Titman, 1993). Investors will ultimately correct both strategies and prices will return to their equilibrium (Galariotis, 2014).

### 2.3. Fundamental analysis

The most common approaches to stock prediction are as follows: 1) fundamental analysis; 2) technical analysis, and 3) technology (machine learning) (Kumar et al., 2022; Nti et al., 2020). *Fundamental analysis* is conducted by examining the financial, operations, and/or macroeconomic indicators that lead to the intrinsic value of the stock (Qian & Rasheed, 2007). The advantage of fundamental analysis is its focus on long-term investment and this type of analysis is focused on strategic investors (Hasaballah et al., 2019). *Technical analysis* uses historical prices as a baseline for predicting the future price of the stock (Ahmadi et al., 2018) and employs the following assumptions: 1) price and volume reflect everything, 2) prices drive trends, and 3) history will be repeated (Qian & Rasheed, 2007). Machine learning, employing a base of technologies, is the most recent method in stock market prediction. It involves basing the current stock market index on the training of past values (Parmar et al., 2018).

The intrinsic value of a stock is defined as the present value of its expected future dividends or cash flows to common shareholders, reflecting the availability of current information. The estimates used for determining intrinsic value include market multiples such as the book-to-market ratio, dividend yield, and earning-to-price ratio (Artikis & Kampouris, 2022; Indahwati & Agustini, 2022; Lee et al., 1999).

Five financial ratios are used when conducting fundamental analysis: 1) profitability ratio; 2) liquidity ratio; 3) operating capacity ratio; 4) development ability ratio, and 5) solvency and risk ratio (Ma et al., 2018).

### 2.4. Hypothesis development

Based on the following literature review, the current study proposes the following research hypotheses:

*H1: Following the announcement of large-scale social restrictions (PSBB) on March 31, 2020, the fundamentals negatively impact stock prices. The initial implementation of PSBB generated uncertainty for businesses. Many business activities were affected as they were unable to operate as they did before the pandemic.*

*H2: Following the announcement of the reinforcement of the second PSBB in Jakarta on September 14, 2020, the fundamentals negatively impact stock prices. This created further uncertainty due to the limitations imposed on business activities.*

*H3: Following the United States CDC's announcement on August 27, 2020, that the COVID-19 vaccine would be ready for distribution in the United States starting from November 1, 2020, the fundamentals positively impact stock prices. This reflects the expectation that vaccine availability would bring an end to the COVID-19 pandemic.*

*H4: Following the announcement of emergency community activity restrictions (PPKM Darurat) for Java and Bali on July 1, 2021, the fundamentals negatively impact stock prices. The implementation of PPKM Darurat and reinstatement of limitations again created uncertainty for business activities.*

*H5a: Companies operating in the non-essential sector will fundamentally experience a negative impact from the first PSBB implementation.*

*H5b: Companies operating in the non-essential sector will fundamentally experience a negative impact due to the re-imposition of PSBB in Jakarta.*

*H5c: Companies operating in the non-essential sector will fundamentally experience a positive impact from the United States CDC's announcement that the vaccine is ready for distribution in the United States.*

*H5d: Companies operating in the non-essential sector will fundamentally experience a negative impact due to the implementation of PPKM Darurat in Java and Bali.*

## 3. RESEARCH METHODOLOGY

The research method consists of qualitative analysis and quantitative analysis methods. *The qualitative research method* is research that is used by using statements or premises, which are then concluded. Quantitative research uses numbers tested by hypothesis and then the conclusion (Gruszczynski, 2019). The quantitative research method consists of: 1) survey, 2) correlational, 3) experimental, 4) causal-comparative or *ex post facto* (Apuke, 2017). The *quantitative correlational method* is used to determine relationship between two or more variables. This study uses this method to measure the uncertainty caused by the pandemic COVID-19.

### 3.1. Data

Based on Cooper and Schindler (2014), a variety of studies can be conducted in relation to the objective. In this study, the objective is to learn how one variable produces changes to another variable; we, therefore, use the casual-explanatory method. Purposive sampling was chosen as the method by which to select the companies, with the details as follows:

1. Companies with a minimum of 200 trading days' worth of stock and listed on the IDX throughout the year 2020.
2. Companies for which financial statements were available for the years 2016 and 2020.

3. Companies with positive equity.

Based on the above selection criteria, the following sample sizes were obtained:

1. Spectrum 1: 360 companies.
2. Spectrum 2: 334 companies.
3. Spectrum 3: 343 companies.
4. Spectrum 4: 335 companies.

### 3.2. Data sources

In this study, we use quantitative data from secondary data sources. The source of data for this study was the paid database of S&P Global Market Intelligence[2], which is an institution that provides various financial information on all finances. Data from S&P Global Market Intelligence are reliable, it's a world-leading provider of financial information services similar to Bloomberg. The secondary data comprise the daily closing price of the companies' stock on the event dates and its fundamentals.

### 3.3. Data collection technique

The data for this study were collected via the literature study and documentation technique. The literature study reviewed various journals, articles, financial statement data, and other books that were deemed vital to the enrichment of the study. The documentation technique entailed the recording of documents during the process of collecting data related to the study. The data used is ten days before and ten days after the spectrum set date.

### 3.4. Operational definition

First, an abnormal return during the event period is calculated using the following formula (Musnadi et al., 2018):

$$AR_{it} = R_{it} - E(R_{it}) \quad (1)$$

where $AR_{it}$ is the abnormal return of daily stock $i$ on date $t$, $R_{it}$ is the realization of daily return on stock $i$ on date $t$, and $E(R_{it})$ is the expected return from stock $i$ on date $t$. Second, realized returns are calculated by altering the daily share prices. Third, the expected rate of return $E(R_{it})$ is calculated using the market-adjusted model, as follows (Musnadi et al., 2018):

$$E(R_{it}) = R_{it} - RM_{it} \quad (2)$$

where $RM_{it}$ is the market return that was calculated by changes in the Jakarta Composite Index. Fourth, this study measures $CAR$ with the following formula (Jones, 2014):

$$CAR = \sum_{t=1}^{n} AR_{it} \quad (3)$$

The ratios used for fundamental analysis in this study are proxied as:

1. *Current ratio (CR). CR* is an indicator of company solvency. Solvency is an important indicator of a company's financial condition as the absence of a strong solvency baseline could jeopardize a company's ability to pay its debt on time (Ma et al., 2018). A high *CR* indicates that the company's working capital is not spinning and hindering its ability to obtain profit (Bintara et al., 2020).

Rochim and Ghoniyah (2017) and Ozlen (2014) demonstrated that *CR* has a positive and significant impact on stock returns. This implies that the greater the company's ability to fulfill its short-term debt, the higher the investors' return. After an economic crisis and prior to making a capital market investment decision, investors will typically focus on cash management, accounts receivable, and company inventories (Bintara et al., 2020). *CR* is calculated using the formula provided in (Gitman & Zutter, 2019):

$$Current\ ratio = \frac{Current\ assets}{Current\ liabilities} \quad (4)$$

2. *Debt service coverage ratio* (*DSCR*). *DSCR* indicates the company's ability to service its debt from its net operating income. Net operating income is defined as multiple current debt obligations: debt obligations due within one year, including interest, principal, sinking funds, and lease payments (Ferdando, 2023b).

*DSCR*, which reflects the relation between net income and debt, is considered a key factor in a company's financial stability since it relates to capital structure and firm solvency and is assumed to indicate financial distress. Study results have shown a negative relation between *DSCR* and financial distress (Roa & Ufo, 2017).

*DSCR* is calculated using the formula from (Ferdando, 2023b):

$$DSCR = \frac{Net\ operating\ income}{Total\ debt\ service} \quad (5)$$

2. *Sales growth*. In this study, sales growth is proxied by the *compound annual growth rate* (*CAGR*). *CAGR* provides an accurate method of calculating and determining the returns for anything (in this study, sales) that can rise or fall in value over time. It also can be used to evaluate two alternatives by comparing the performance of one stock against others in an industry or with a market index. However, *CAGR* does not consider investment risk (Ferdando, 2023a).

*CAGR* based on Goodman (2009a), Goodman (2009b), Van Boeckel et al. (2014) is the ratio most commonly applied in evaluating sales growth for companies and provides a different perspective when analyzing sales.

*CAGR* is formulated as follows (Ferdando, 2023a):

$$CAGR = \left( \left( \frac{Ending\ value}{Beginning\ value} \right)^{\frac{1}{n}} - 1 \right) x\ 100 \quad (6)$$

3. *Price-to-book value* (*PBV*). *PBV* indicates the extent of security undervaluation and can form the basis of an investment strategy and serve as an indicator of market overreaction. The implication thus arises that companies with a low *PBV* ratio are likely to become takeover targets (Astuty, 2017).

[2] http://www.capitaliq.spglobal.com

Based on Astuty (2017), *PBV* has a significant and positive impact on stock return. In the airline industry, the COVID-19 pandemic led to a significant fall in many firms' market value, which confirmed that investors overreacted to pandemic-related events (Maneenop & Kotcharin, 2020).

*PBV* is calculated using the following formula (Gitman & Zutter, 2019):

$$PBV = \frac{Market\ price\ per\ share\ of\ common\ stock}{Book\ value\ per\ share\ of\ common\ stock} \quad (7)$$

### 3.5. Empirical model

The study employs the multiple regression method to examine the hypotheses and determine how the independent variable influences the dependent variable, with simple regression analysis to satisfy the objective of the study, which is to analyze the reaction of fundamental factors against stock returns. E-Views 10 was used for the regression analysis.

The empirical model is as follows:

$$SR = \beta_0 + \beta_1 CR + \beta_2 DSCR + \beta_3 CAGR + \beta_4 PBV + Dummy + \varepsilon \quad (8)$$

where, *SR* is the stock return, $\beta_0$ is the constant, $\beta_1, \beta_2, \beta_3, \beta_4$ are the regression coefficients, *CR* is the current ratio, *DSCR* is the debt service coverage ratio, *CAGR* is the compound annual growth rate, *PBV* is the price–to–book value, *Dummy* is the essential and non-essential, $\varepsilon$ is the error.

## 4. RESULTS

In this study, we use data from listed companies at IDX, excluding companies in the financial sector from S&P Capital IQ with the criteria of having a minimum of 200 trading days during 2020 based on the IDX report. Our initial understanding was, companies with a minimum of 200 trading days would have been greatly impacted by the Indonesian government restriction regulation during the COVID-19 pandemic. We only conducted the study in Indonesia since, across the region, we learned that only in Indonesia that the government has imposed various types of restrictions from the maximum to a minimum; every restriction imposed by the government affects how the companies conduct their business, and the government decided which companies or sectors which were allowed to operate and not to operate, therefore, we focus this study only for Indonesia.

**Table 1.** Results of descriptive statistics

| *Selection criteria* | *N* | *Variables* | *Min* | *Max* | *Mean* | *Std. dev.* |
|---|---|---|---|---|---|---|
| Spektrum 1 (*S1*) | 360 | *CAR* | -9.1088 | 6.4018 | -3.1335 | 2.7518 |
| | | *CR* | 0.0800 | 456.6690 | 5.1605 | 28.1220 |
| | | *DSCR* | -9.8520 | 245.2517 | 3.3065 | 18.2934 |
| | | *CAGR* | -1 | 2.0284 | 0.0387 | 0.2120 |
| | | *PBV* | 0 | 38.7065 | 0.9579 | 2.7456 |
| Spektrum 2 (*S2*) | 334 | *CAR* | -10.3206 | 9.0871 | -0.8342 | 2.8828 |
| | | *CR* | 0.1332 | 73.6390 | 2.8117 | 5.5113 |
| | | *DSCR* | -4.0320 | 38.8401 | 1.3739 | 4.4670 |
| | | *CAGR* | -2.3544 | 2.7737 | 0.0843 | 0.4179 |
| | | *PBV* | 0 | 13.5093 | 0.8998 | 2.6236 |
| Spektrum 3 (*S3*) | 343 | *CAR* | -10.3206 | 9.0871 | -0.8165 | 2.8455 |
| | | *CR* | 0.1332 | 73.6390 | 2.7758 | 5.4480 |
| | | *DSCR* | -4.0320 | 38.8401 | 1.3384 | 4.4133 |
| | | *CAGR* | -2.3544 | 2.7737 | 0.0840 | 0.4181 |
| | | *PBV* | 0 | 13.5093 | 0.8124 | 1.6932 |
| Spektrum 4 (*S4*) | 335 | *CAR* | -1.4738 | 1.1275 | -0.1128 | 0.3787 |
| | | *CR* | 0.0593 | 201.7321 | 3.5937 | 14.0524 |
| | | *DSCR* | -33.4428 | 314.0605 | 6.7345 | 33.8689 |
| | | *CAGR* | -0.2202 | 0.9475 | 0.0815 | 0.1525 |
| | | *PBV* | 0 | 12.1815 | 0.7332 | 1.4079 |

*Note: The dependent variable is CAR; the independent variables are CR, DSCR, CAGR and PBV.*
*Source: Output from E-Views, 2022.*

Based on Table 1, the dependent variable *CAR* has a minimum value (min) of -10.3206 and a maximum value (max) of 9.0871 across all spectrums; it also has a negative average value (mean) across all spectrums: -3.1335 for *S1*, -0.8342 for *S2*, -0.8165 for *S3*, and -0.1128 for *S4*, and standard deviation (Std. dev.) values as follows: 2.7518 at *S1*, 2.8828 at *S2*, 2.8455 at *S3*, and 0.3787 at *S4*. The independent variable *CR* has a minimum value (min) of 0.0593 and a maximum value (max) of 456.6690 across all spectrums and the following average values (means): 5.1605 at *S1*, 2.8117 at *S2*, 2.7758 at *S3*, and 3.5937 at *S4*. The standard deviation (Std. dev.) values are as follows: 28.1220 at *S1*, 5.5113 at *S2*, 5.4480 at *S3*, and 14.0524 at *S4*. The independent variable *DSCR* has a minimum value (min) of -33.4428 and a maximum value (max) of 314.0605 across all spectrums and the following average values (means): 3.3065 at *S1*, 1.3739 at *S2*, 1.3384 at *S3*, and 6.7345 at *S4*. The standard deviation (Std. dev.) values are as follows: 18.2934 at *S1*, 4.4670 at *S2*, 4.4133 at *S3*, and 33.8689 at *S4*. The independent variable *CAGR* has a minimum value (min) of -1 and a maximum value (max) of 2.7737 across all spectrums and the following average values (means): 0.0387 at *S1*, 0.0843 at *S2*, 0.0840 at *S3*, and 0.0815 at *S4*, with the standard deviation (Std. dev.) values as follows: 0.2120 at *S1*, 0.4179 at *S2*, 0.4181 at *S3*, and 0.1525 at *S4*. The independent variable *PBV* has a minimum value (min) of 0 and a maximum value (max) of 38.7065 across all spectrums and average values (means) as follows: 0.9579 at *S1*, 0.8998 at *S2*, 0.8124 at *S3*, and 0.7332 at *S4*, with the following standard deviation (Std. dev.) values: 2.7456 at *S1*, 2.6236 at *S2*, 1.6932 at *S3*, and 1.4079 at *S4*.

**Table 2.** Normality test results

| *Selection criteria* | *Jarque-Bera* | *Probability* |
|---|---|---|
| Spektrum 1 | 4.2718 | 0.1181 |
| Spektrum 2 | 3.9165 | 0.1411 |
| Spektrum 3 | 5.5822 | 0.0614 |
| Spektrum 4 | 30.9429 | 0.0000 |

*Source: Output E-Views, 2022.*

From the results of the normality test in Table 2, the data for Spectrums 1 through 3 are normally distributed, as shown by the probability values greater than 0.05; for Spectrum 4, the data is not normally distributed, as indicated by a probability of 0.0000, which is below 0.05.

**Table 3.** Multicollinearity test results

| *Selection criteria* | *N* | *Variables* | *Centered VIF* | *Selection criteria* | *N* | *Variables* | *Centered VIF* |
|---|---|---|---|---|---|---|---|
| Spektrum 1 (*S1*) | 360 | *CR* | 1.0440 | Spektrum 2 (*S2*) | 334 | *CR* | 1.0572 |
| | | *DSCR* | 1.0072 | | | *DSCR* | 1.0235 |
| | | *CAGR* | 1.0451 | | | *CAGR* | 1.0320 |
| | | *PBV* | 1.0353 | | | *PBV* | 1.0185 |
| | | *DUMMY* | 1.0342 | | | *DUMMY* | 1.0270 |
| Spektrum 3 (*S3*) | 343 | *CR* | 1.0757 | Spektrum 4 (*S4*) | 335 | *CR* | 1.0554 |
| | | *DSCR* | 1.0238 | | | *DSCR* | 1.0809 |
| | | *CAGR* | 1.0429 | | | *CAGR* | 1.0931 |
| | | *PBV* | 1.0521 | | | *PBV* | 1.0658 |
| | | *DUMMY* | 1.0347 | | | *DUMMY* | 1.0158 |

*Note: VIF — variance inflation factor.*
*Source: Output E-Views, 2022.*

**Table 4.** Heteroskedasticity test results

| *Selection criteria* | *Breusch-Pagan-Godfrey* | |
|---|---|---|
| | *Obs * R-squared* | *Prob. Chi-square* |
| Spektrum 1 | 9.4482 | 0.0925 |
| Spektrum 2 | 1.6920 | 0.8899 |
| Spektrum 3 | 1.4242 | 0.9217 |
| Spektrum 4 | 7.8470 | 0.1649 |

*Source: Output E-Views, 2022.*

Based on Table 3, all of the variance inflation factor (VIF) results are below 10, which means there are no symptoms of multicollinearity for any of the spectrums or independent variables.

The results of the Breusch-Pagan-Godfrey heteroskedasticity test in Table 4 show Prob. Chi-square values > 0.05, thus indicating that there are no symptoms of heteroskedasticity across all spectrums.

From Table 5, the results of the Breusch-Godfrey serial correlation autocorrelation test show that Prob. Chi-square > 0.05, albeit only slightly above 0.05 for Spectrum 1; this indicates that there are no symptoms of autocorrelation across all spectrums.

**Table 5.** Autocorrelation test results

| *Selection criteria* | *Breusch-Godfrey serial correlation* | |
|---|---|---|
| | *Obs * R-squared* | *Prob. Chi-square* |
| Spektrum 1 | 5.6645 | 5.6645 |
| Spektrum 2 | 0.2129 | 0.2129 |
| Spektrum 3 | 0.4467 | 0.4467 |
| Spektrum 4 | 2.7794 | 2.7794 |

*Source: Output E-Views, 2022.*

**Table 6.** Regression analysis results

| *Variables* | *Spectrum 1* | | | *Spectrum 2* | | | *Spectrum 3* | | | *Spectrum 4* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Coef* | *t-stat* | *Prob.* | *Coef* | *t-stat* | *Prob.* | *Coef* | *t-stat* | *Prob.* | *Coef* | *t-stat* | *Prob.* |
| *CR* | 0.0088 | 3.5855 | 0.0004*** | 0.0122 | 0.4302 | 0.6673 | 0.0127 | 0.4499 | 0.6531 | -0.0020 | -2.1773 | 0.0302** |
| *DSCR* | -0.0091 | -1.9067 | 0.0574* | 0.0027 | 0.0835 | 0.9335 | 0.0017 | 0.0507 | 0.9596 | 0.0000 | 0.1485 | 0.8820 |
| *CAGR* | 0.9100 | 1.5210 | 0.1291 | -0.8689 | -1.6336 | 0.1033 | -0.8279 | -1.5813 | 0.1147 | -0.3112 | -2.5782 | 0.0104** |
| *PBV* | 0.0418 | 1.0504 | 0.2943 | -0.0221 | -0.4835 | 0.6291 | -0.0282 | -0.3321 | 0.7400 | 0.0235 | 1.6565 | 0.0986* |
| *Dummy* | 1.2741 | 3.7211 | 0.0002*** | -0.2748 | -0.7202 | 0.4719 | -0.3043 | -0.7982 | 0.4253 | 0.0266 | 0.4874 | 0.6263 |
| R-squared | 0.0513 | | | 0.0184 | | | 0.0180 | | | 0.0246 | | |
| Adjusted R-squared | 0.0379 | | | 0.0034 | | | 0.0034 | | | 0.0097 | | |
| Wald F-statistic | 6.6635 | | | 0.8184 | | | 0.7890 | | | 2.3085 | | |

*Note: Dependent variable is CR; the independent variables are: DSCR, CAGR, PBV and DUMMY; the model is estimated by using multiple regression model; numbers is the first column are the estimated coefficients, and the second column shows the t-statistics. The critical values of t-distribution at the 1%, 5% and 10% levels of significance are 2.63, 1.98, and 1.66, respectively; ***, **, *, significance at 1%, 5% and 10%.*

Table 6. showing that the stock market responds in Spectrums 1 and 3. It appears that investors perceive a decreasing uncertainty level in Spectrums 2 and 3, i.e., business sectors adapted to the COVID-19 pandemic as a new threat. Spectrum 1 represents circumstances of high uncertainty in Indonesia since the Indonesian government had ruled out a form of lockdown, namely *PSBB*, to manage the COVID-19 outbreak. Thus, at the beginning of the pandemic, people in Indonesia had no clear idea about how to cope with the virus.

## 5. DISCUSSION

The government subsequently issued a health protocol to enable people to safely conduct their activities amid the COVID-19 threat. Since the country had a relatively low number of COVID-19 cases, the government loosened the *PSBB*, prompting hope for the end of the COVID-19 pandemic.

Spectrum 2 represents further uncertain circumstances in which the governor of Special

Capital Region (DKI) of Jakarta re-tightened the *PSBB* due to a significant increase in the number of new COVID-19 cases in Jakarta. Everything returned to a similar state to that previously seen in Spectrum 1. Nevertheless, the Indonesian stock market anticipated this, meaning that investors perceived the tightened *PSBB* as a temporary measure, and people were able to continue their activities with the strict health protocol.

The insignificant Wald F-statistic test for the Spectrum 2 and 3 regression models indicates that investors perceived the COVID-19 pandemic as a business risk that could be mitigated with the implementation of a strict health protocol and COVID-19 vaccinations.

However, the Wald F-statistic test shows significant parameters for the Spectrum 4 regression model, meaning that the Indonesian stock market responded to the COVID-19 state of emergency following a spike in the number of new cases across the country. The state of emergency led to a tightening of the *PSBB*, which were subsequently renamed emergency community activity restrictions (*PPKM Darurat*) for Java and Bali. The result suggests that *PPKM Darurat* introduced a form of uncertainty to the business sectors as businesspeople and investors perceived an endless cycle of tightening and loosening of the *PSBB* policy.

The positive significant effect of CR indicates that companies with high liquidity are highly likely to survive a fall in revenue due to the COVID-19 pandemic. When a company's revenue falls, it draws on its cash balance to address the cash flow deficit while searching for alternative revenue streams. In other words, liquid assets provide a company with financial flexibility (Fahlenbrach et al., 2021).

Interestingly, the liquidity ratio had a negative effect on CAR in Spectrum 4. This indicates that investors at that time had different perspectives on the liquidity ratio. Unlike in Spectrum 1, it demonstrates that investors perceived liquid assets as the cost of financial distress as they saw a never-ending cycle of *PSBB* loosening and tightening. We also know that the cost of financial distress reduces a firm's value (Berk & DeMarzo, 2017).

DSCR measures a company's ability to pay interest fees to its creditors. We hypothesized that DSCR would have a positive effect on CAR in all spectrums. However, we found that DSCR negatively affected CAR in Spectrum 1, with no effects in the following spectrums. It would thus appear that a company with a high DSCR is more likely to add debt to increase its cash balance as opposed to acquiring assets to generate revenue. As such, an increase in corporate debt during Spectrum 1 leads to an increase in credit risk that reduces the company's value.

Furthermore, in the following spectrums, we found insignificant effects of DSCR on CAR. We know that from the outset of the COVID-19 pandemic, the Indonesia Financial Services Authority (*Otoritas Jasa Keuangan, OJK*) relaxed the non-performing loan policy by which Indonesian banks could restructure their loan portfolios. The policy aimed to prevent waves of bad loans as many businesses experienced financial distress due to the pandemic. In contrast, the loan restructuring program grants financial flexibility enabling companies to buy time to find alternative revenue streams. Therefore, loan repayment ceased to be a pressing issue for companies in financial distress during the COVID-19 pandemic.

We identified a significant negative effect of CAGR on CAR in Spectrum 4, although we found no significant effects of CAGR on CAR in the previous spectrums. This implies that the tightened *PSBB*, namely *PPKM Darurat*, raised the level of concern among businesspeople and investors over business growth in Indonesia.

Household consumption has driven Indonesia's GDP growth to date. In the second quarter of 2021, household consumption growth reached 5.93% (year on year), which was the highest level recorded during the pandemic. During the third quarter, when *PPKM Darurat* was implemented, household consumption growth fell to 1.03% (year on year) (Bank Indonesia, 2021).

In line with our hypothesis, PBV had a positive effect on CAR in Spectrum 4. There were also no significant effects of PBV on CAR in previous spectrums. It appears that the uncertainty created by the seemingly never-ending *PSBB* led investors to prefer purchasing company stocks with a positive outlook that could maintain some growth during the *PSBB/PPKM Darurat*.

We hypothesized that companies with core businesses deemed to be non-essential under the COVID-19 emergency policy were very likely to underperform. During the COVID-19 emergency, such non-essential businesses were only permitted to operate at 25%–50% of their regular capacity.

In Spectrum 4, the negative effects of CR and CAGR signal investors' pessimism. However, the positive effect of the non-essential business dummy variable signals their optimism. It is, therefore, evident that there was still room for optimism amid the storm of pessimism.

## 6. CONCLUSION

Previous research stated that the reaction of COVID-19 in the agricultural sector, consumer goods, basic and chemical industry, property and real estate, service, and investment impacted stock prices (Trisnowati & Muditomo, 2021). This study will contribute by providing an analysis of different set of circumstances (spectrum) for a longer period and its impact towards the companies and investors reaction. Learning from this study, companies were managed to adopt with their circumstances and reducing its negative reaction from investors as shown by the changes of relation from Spectrum 1 and 4 on the liquidity (*CR*) and growth (*CAGR*) and initially, in Spectrum 1 Companies which greatly impacted by the government regulation has a significant impact as shown by the *Dummy* results and it was no longer significant in Spectrum 4, this can be interpreted that companies and investors had managed to take pandemic COVID-19 become a New Normal.

The analysis results for Spectrum 1 show a significant effect of the announcement of the first *PSBB* on March 31, 2020, on stock returns on the IDX. Based on an analysis of the liquidity ratio and CAR, businesspeople and investors began to become pessimistic about business growth and

the sustainability of financial performance at the start of the COVID-19 pandemic.

Meanwhile, the announcement concerning the strengthening of the second *PSBB* in Jakarta on September 14, 2020, had no significant effect on stock returns on the IDX. Likewise, the US CDC's announcement on August 27, 2020, that the COVID-19 vaccine was ready for distribution in the United States starting from November 1, 2020, and the Java-Bali emergency community activity restrictions on July 1, 2021, had no significant effect on stock returns on the IDX. These results, therefore, demonstrate that Spectrum 2, 3, and 4 companies had started to adapt to both the threat posed by the COVID-19 pandemic and the implementation of health protocols. In terms of surviving the pandemic, we assume that the liquidity ratio and CAR are basic requirements for companies to continue their business.

The results of our analysis also show that the dummy variable was positive for non-essential companies. This implies that non-essential companies performed better than essential companies when the *PSBB* were relaxed. Non-essential businesses such as airlines experienced huge demand as people were able to fly again. People had the courage to travel and eat in restaurants because they quickly adapted to the threat of COVID-19 by following the requisite health protocols and getting vaccinated. Investors, therefore, expected higher demand for non-essential business products or services after the *PSBB* were relaxed. Despite all the restrictions implemented in Indonesia since the first case of COVID-19, business activity as reflected in CAR managed to survive and establish a new standard in dealing with uncertain situations. This finding reinforces previous research that economic turmoil has no significant effect on CAR.

This study is limited to non-financial sector companies and for further research is suggested to include financial sector.

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## APPENDIX

A summarization of the operational variables used in the study is shown in Table A.1:

**Table A.1.** Operational definitions of variables

| *Variable* | *Type of variable* | *Operational definition* | *Formula* | *Scale* |
|---|---|---|---|---|
| *Stock return (CAR)* | Dependent | *Stock return* is proxied by *cumulative abnormal return* (*CAR*). *CAR* captures the average-specific stock movements over a certain period during which the event being studied is assumed to affect stock returns (Jones, 2014). | $CAR = \sum_{t=1}^{n} AR_{it}$ | Ratio |
| *Current ratio (CR)* | Independent | *CR* is an indicator of company solvency. Solvency is an important indicator of a company's financial condition; without a strong solvency baseline, a company may run the risk of not being able to pay its debt obligations on time (Ma et al., 2018). | $CR = \frac{Current\ Assets}{Current\ Liabilities}$ | Ratio |
| *Debt service coverage ratio (DSCR)* | Independent | *DSCR* indicates the company's ability to service its debt from its net operating income. Net operating income is defined as multiple current debt obligations: debt obligations due within one year, including interest, principal, sinking funds, and lease payments (Ferdando, 2023b). | $DSCR = \frac{Net\ Operating\ Income}{Total\ Debt\ Service}$ | Ratio |
| *Sales growth (CAGR)* | Independent | *Sales growth* is proxied by the *compound annual growth rate (CAGR)*. *CAGR* is an accurate method for calculating and determining the return for anything (in this case, sales) that can rise or fall in value over time. It can also be used as a tool in evaluating two alternatives by comparing stock performance against other stocks in an industry or with a market index. | $CAGR = \left( \left( \frac{Ending\ value}{Beginning\ value} \right)^{\frac{1}{n}} - 1 \right) x\ 100$ | Ratio |
| *Price-to-book value (PBV)* | Independent | *PBV* indicates the extent of security undervaluation and can be used as a base for investment strategy and also as an indicator of market overreaction. It implies that companies with a low *PBV* ratio are likely to become takeover targets (Astuty, 2017). | $PBV = \frac{Market\ price\ per\ share}{Book\ value\ per\ share}$ | Ratio |
| *Dummy* | Independent | To differentiate essential from non-essential sectors. | 0: Essential<br>1: Non-essential | 0 or 1 |

*Source: Research data.*