Jurnal REKSA: Rekayasa Keuangan, Syariah dan Audit
Vol. 11, No. 1, March 2024, pp.62-73
ISSN 2089-6581 (print) | 2614-3720 (online)
http://journal2.uad.ac.id/index.php/reksa/index

Indonesian Market Volatility During the COVID-19 Pandemic: Foreign versus Domestic Investors

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Received: 13 June 2024 **Revised:** 24 August 2024 **Accepted:** 25 August 2024

ABSTRACT

This study examines the effect of institutional ownership on stock price volatility before and after the announcement of the first confirmed COVID-19 cases in Indonesia. The sample includes all public companies listed on the Indonesian stock exchange minus financial firms. Data for this study were retrieved from the Osiris database. The results of this study indicate that when a market was relatively stable (before the discovery of the COVID-19 pandemic in Indonesia), there was no effect of institutional ownership on stock price volatility. However, after the announcement of confirmed COVID-19 cases, this study finds a positive influence of institutional ownership on stock price volatility. This research contributes in two important ways. First, the previous study predicts that extreme market volatility is a signal of an incoming recession. This situation should alarm various stakeholders to anticipate potential unexpected outcomes. Second, institutional investors play a crucial role in the market. Understanding their trading behavior during the pandemic period provides insight for various stakeholders in the decision-making process.

KEYWORDS
COVID-19 pandemic
Price volatility
Institutional ownership
Domestic investors
Foreign investors

Introduction

The impact of global pandemics such as SARS and EBOLA on stock market volatility has been well documented in the literature (Chen et al., 2007, 2018; Del Giudice & Paltrinieri, 2017; Ichev & Marinč, 2018; Wang et al., 2013). Compared to previous pandemics, the COVID-19 pandemic has had the most shocking effect on the financial market (Baker et al., 2020). The effect of the pandemic spread rapidly around the world soon after its first outbreak in Wuhan, China, by the end of 2019. In Indonesia, the Jakarta Composite Index (IHSG) experienced a sharp decline of around 25% since the beginning of 2020. By the end of the first quarter of 2020, foreign capital outflow from the Indonesian market reached Rp125.2 trillion (Bank Indonesia, 2020).

Recent research has documented substantial increases in global market volatility due to the COVID-19 outbreak (Al-Awadhi et al., 2020; Albulescu, 2020; Anh & Gan, 2020; Ashraf, 2020; Baig et al., 2020; Liu et al., 2020; Singh et al., 2020; Zhang et al., 2020). The research suggests significant associations between market volatility and pandemic-related issues such as growth in confirmed cases, fatalities, death ratios, and government interventions. While negative abnormal returns occur in both developed and less developed markets (Singh et al., 2020), Liu et al. (2020) find that countries in Asia experienced more negative abnormal returns than other countries.

To date, the COVID-19 pandemic is a health crisis with the most shocking effects on the global market (Baker et al., 2020). This situation provides a unique setting for understanding how investors react

to extreme uncertainties. Prior studies suggest that foreign institutional ownership and domestic institutional ownership have opposite effects on share price volatility (Che, 2018).

Indonesia provides an interesting setting for conducting research on the relationship between institutional ownership and market volatility during the crisis for two reasons. First, as an emerging market, Indonesia offers a higher rate of return. However, compared to developed markets, emerging markets are riskier. Accordingly, during the crisis, Indonesia is vulnerable to capital outflow as investors tend to secure their investment portfolios in lower-risk markets. Second, institutional investors, including foreign ones, are major players in the Indonesian market. Their decision to leave exacerbates market instability.

Studies on the impact of institutional ownership in the Indonesian market provide mixed findings. Wang (2013) and Naraswari and Viverita (2015) document the stabilizing effect of foreign institutional ownership. In contrast, Ekaputra (2015) shows the destabilizing effect of foreign ownership. Using the COVID-19 pandemic setting, this study extends previous literature on the impact of institutional ownership on market volatility. A shorter observation period (one quarter before the announcement of the first confirmed COVID-19 cases to one quarter after the announcement) is used to minimize other confounding factors. The study specifically shows how institutional investors quickly react to extreme uncertainty. The one-quarter period is considered long enough for investors to make sound decisions and short enough for government policies or any other crisis mitigation efforts to work effectively.

The study observes daily stock price volatility in Indonesia from January to June 2020, dividing the observation period into pre- and post-COVID-19 infection announcement phases. March 20, 2020, serves as the cut-off date, marking the announcement of the first confirmed COVID-19 cases in Indonesia. The sample includes all companies listed on the Indonesian stock exchange, excluding financial firms, resulting in 363 firms after eliminating incomplete and missing data. Market volatility is compared between the pre- and post-COVID-19 announcement periods. Daily stock price volatility is regressed against explanatory variables, with institutional ownership further decomposed into foreign and domestic ownership, based on investor nationality data from the Osiris database.

The findings reveal different associations between institutional ownership (both domestic and foreign) before and after the announcement of confirmed COVID-19 cases. Regression analysis shows no significant effect of either domestic or foreign institutional ownership on stock price volatility during the pre-announcement period. However, in the post-announcement period, there is a positive association between institutional ownership and stock price volatility, with foreign ownership showing a slightly stronger effect than domestic institutional ownership.

Additionally, the study finds different associations between explanatory variables and price volatility in the pre- and post-announcement periods of the COVID-19 infection. This research contributes in several ways. First, it aligns with previous studies suggesting that extreme market volatility may signal an incoming recession, which should alert various stakeholders to anticipate potential unexpected outcomes. Second, the crucial role of institutional investors in the market is highlighted, as understanding their trading behavior during the pandemic provides valuable insights for stakeholders in the decision-making process. Furthermore, the study extends the literature on the asymmetric impact of investor responses to extreme uncertainty.

Literature Review and Hypothesis Development

The COVID-19 Pandemic and Price Volatility

The COVID-19 Pandemic has created high uncertainty in the market. Such uncertainty will result in a higher risk perception. Prospect theory (Kahneman & Tversky, 1979) suggests that different risk profiles might induce different risk-taking behaviors. The theory suggests that people will be risk-averse in the gain condition and risk-taker in the loss condition. To avoid perceived loss due to extreme uncertainty, an

ISSN 2089-6581 (print) | 2614-3720 (online) Vol. 11, No. 1, March 2024, pp. 62-73

informed investor will anticipate such perceived potential loss by restructuring their portfolio. As investors tend to herd each other, this situation will create volatility in the market. Accordingly, H1 is formulated.
H1. There is a difference in market volatility before and during the COVID-19 pandemic.

Institutional Investors and Stock Price Volatility

Trading behaviors of investors, among others, influence market volatility. There are various types of investors, including individual investors and institutional investors. Institutional investors are market players who significantly affect company liquidity and performance in the global stock market, both in developed and developing countries (Khorana et al., 2005). They are informed traders. Institutional investors incorporate firm-specific information into stock prices via their trading activities (Chakravarty, 2001; Ferreira & Laux, 2007; Hartzell & Starks, 2003; Kim & Yi, 2015; Piotroski & Roulstone, 2004). Using samples of firms listed on the Korean Stock Exchange, Kim and Yi (2015) show that trading by foreign and domestic short-term institutions minimizes accrual mispricing.

Prior research on the relationship between institutional ownership and stock volatility provides mixed results. Research supporting the positive impact of institutional ownership on the stability of stock returns is based on several arguments. First, institutions have a better ability to process information. Better information content of stock prices reduces the variance of stock returns (West, 1988). Second, institutional investors often undertake investments on behalf of others. Such a fiduciary role requires institutional investors to choose less volatile stocks. The stabilizing effect (reducing volatility) of institutional ownership is documented in many studies (Badrinath & Wahal, 2002; Griffin et al., 2003; Grinblatt, 2000; Li et al., 2011; Nofsinger & Sias, 1999; Vo, 2016; Wermers, 1999).

On the other hand, research supporting the negative impact of institutional ownership on the stability of stock returns can be explained using herding behavior. In selling and buying activities, institutional investors tend to herd each other. Dennis and Strickland (2002) state that whenever the absolute value of returns is high, institutional investors tend to react more and herd more compared to individual investors. Therefore, the higher the proportion of institutional ownership, the higher the volatility of shares. Another argument for the positive association between institutional ownership and stock price volatility is that institutional investors are better informed than individual investors (Sias, 1996). Institutional investors are willing to trade at a higher price to obtain information rent (Lin et al., 2007). Furthermore, combining information superiority and economies of scale allows institutional investors to adjust their investment portfolios more frequently. The positive association between the level of institutional ownership and the volatility of stock returns is documented in many studies (e.g., Dennis & Strickland, 2002; Sias, 1996; Xu & Malkiel, 2003). Accordingly, H2 is fomulated.
H2. Institutional ownership has a positive effect on share price volatility.

Foreign Institutional Ownership and Market Volatility

Institutional investors consist of domestic and foreign institutional investors. Although both are institutional investors, they often show opposite effects on share price volatility (Che, 2018). The impact of foreign investor ownership on the volatility of stock returns in the literature is debatable. Several studies document the negative impact of foreign participation on stock return volatility. In the context of the Taiwanese capital market, Chiang and Chan (2017) document the positive effect of foreign participation on market stability. Using samples from six countries in ASEAN, Naufa et al. (2019) found that foreign ownership had a positive impact on the stock market through a decrease in stock return volatility, especially during and after the financial crisis. Using samples from 31 emerging markets, Li et al. (2011) documented the stabilizing effect of large foreign ownership on market volatility.

In contrast, other studies suggest a positive relationship between foreign ownership and the volatility of stock returns. Within the context of a developed market, Che (2018) found a positive effect of foreign ownership on the volatility of stock returns in Norway. Che (2018) argues that foreign investors tend to

use short-term investment horizons and act as momentum traders. Compared to domestic investors, foreign investors tend to be more aggressive (Che, 2018). Similar results were also documented by Chen et al. (2013) using data from the Chinese stock market. Within the context of the Indonesian stock market, Wang (2007) finds that stocks with a higher proportion of foreign ownership tend to be more volatile. Further, Wang (2007) claims that such high volatility in the market is not only driven by the trading activities of foreign investors but rather by domestic investors mimicking the trading behavior of foreign investors. Accordingly, H2a is formulated.

H2a. Foreign institutional ownership has a positive influence on stock price volatility before and after the announcement of the COVID-19

Research Method

All data were obtained from the Osiris database. The sample included all companies listed on the Indonesia Stock Exchange, excluding financial firms and firms with incomplete data. The final sample consisted of 363 companies. The observation period was divided into two segments. The first observation period started from the first trading day in 2020 and continued until the date of the announcement of the first confirmed COVID-19 case (March 20, 2020). The second observation period began after the announcement date and extended for one quarter. To test the hypothesis, a two-sample t-test was used to compare market volatility one quarter before and one quarter after the announcement of the first confirmed COVID-19 case. Lag regression was applied in the models, with daily share prices during the observation periods regressed against other explanatory variables as of the latest year reporting date (December 31, 2019).

Variable and Measurements

The dependent variable is daily share price volatility. Daily price volatility is the price of share j at day t minus the price of share j at day t-1 scaled by the share price of share J at day t. The independent variable is institutional ownership. Institutional ownership is the proportion of total institutional ownership to the total share outstanding at year-end. Institutional ownership is calculated as follows.

$$\text{Institutional Ownership} = \frac{\sum Stock\ Owned\ by\ Institutional\ Investor\ i.t}{\sum Total\ Share\ Recorded\ i.t} X100\%$$

This study further decompose institutional ownership into domestic and foreign institutional ownership. Domestic institutional ownership is the total stock owned by domestic shareholders to the total share outstanding at year-end. Foreign institutional ownership is the total stock owned by foreign shareholders to the total share outstanding at year-end. This study include size, leverage, sales growth, capitalization growth, return on asset (ROA), and price-to-book ratio as control variables. The measurement of independent and control variables is discussed in the following empirical model section.

Empirical Model

The following empirical models are used to examine the effect of institutional ownership on share price volatility. The first model investigates the effects of total institutional ownership on share price volatility prior to the announcement of confirmed COVID-19 cases. The second model assesses the impact of domestic and foreign institutional ownership on share price volatility following the announcement of confirmed COVID-19 cases.

$$Vola\_Pre = \beta_0 + \beta_1 Institution_{i.t} + \beta_2 SIZE_{i.t} + \beta_3 Leverage_{i.t} + \beta_4 SalesGrowt_{i.t} + \beta_5 CapGROWTH_{i.t} + \beta_6 ROA_{i.t} + \beta_7 PBV_{i.t} + \varepsilon_{i.t} \quad (1)$$

$$Vola\_Post = \beta_0+\beta_1 Institution_{i.t}+\beta_2 SIZE_{i.t} + \beta_3 Leverage_{i.t} +\beta_4 SalesGrowt_{i.t} + \beta_5 CapGROWTH_{i.t} +\beta_6 ROA_{i.t} + \beta_7 PBV_{i.t} + \varepsilon_{i.t} \quad (2)$$

Vola_pre is share price volatility from the first trading day of 2020 up to the announcement date of COVID-19 confirmed cases by the Indonesian authority. Vola_post is share price volatility during one quarter after the announcement of COVID-19 confirmed cases by the Indonesian authority. Domestic is the percentage of a company's outstanding shares owned by domestic investors. Foreign is the percentage of the company's outstanding shares owned by foreign investors. The institution is total institutional ownership consisting of ownership by domestic investors and ownership by foreign investors. Size is the natural logarithm of the asset set. Leverage is the percentage of total debt to total assets. Sales growth is sales at year t minus sales at t-1 scaled by sales at year t. CapGrowth is market capitalization at year t minus market capitalization at year t t-1 scaled by market capitalization at year t. ROA is the return on asset, which refers to net income divided by total assets. PBV is the ratio of market price to book value of equity.

Results and Discussions

Descriptive Statistics

Table 1 reports descriptive statistics, consisting of maximum and minimum values, mean and standard deviation. The maximum value of institutional ownership is 100, and the minimum value is 0. The mean and standard deviation of institutional ownership are 68.32 and 23.19, respectively. This data suggests that institutional investors are major players in the market. The minimum and maximum value of domestic investor ownership is from 0 to 99.96%. The mean and standard deviation of domestic investor ownership are 50.35 and 30.43, respectively. The minimum and maximum value of foreign investor ownership is from 0 to 99.95%. The mean and standard deviation of foreign investor ownership are 17.97% and 27.611, respectively. Overall, table 1 shows that although domestic investors are major investors, the proportion of foreign investors in the market is significant.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Vola_Pre	363	-0.00953	0.0074327	-0.0495012	0.0083776
Vola_Post	363	0.001324	0.0095475	-0.1421053	0.0208145
Domestic	363	50.35408	30.42961	0	99.96
Foreign	363	17.96959	27.6117	0	99.95
Institution	363	68.32366	23.18696	0	100
SIZE	363	12.42739	1.636168	8.388671	15.95582
Leverage	363	63.49091	69.43103	0	245.59
SalesGrowth	363	0.002418	0.2295542	-0.6204457	0.3923698
CapGrowth	363	-0.14895	0.4759646	-1.452422	0.5041421
ROA	363	2.710331	6.266476	-9.71	16.14
PBV	363	169.1901	98.09078	18	326

Price Volatility Pre and Post Announcement of COVID-19 Infection

Table 2 shows the mean and standard deviation of stock price volatility before and after the announcement of the COVID-19 infection in Indonesia. The mean before the announcement of COVID-19 infection in Indonesia is – 0.0095307. The mean of share price volatility one quarter after the announcement is 0.0013236. This finding confirms that there has been an increase in price volatility after the discovery of the COVID-19 infection in Indonesia. The difference test for the mean of share price volatility for periods before and after the COVID-19 infection shows a p-value of 0.000 (P-value <0.05). The result suggests a significant difference in stock price volatility between the two periods (before and

after the announcement of confirmed COVID-19 cases. This supports the first hypothesis, stating that there is a difference in stock price volatility before and during the COVID-19 pandemic.

The data confirm an increase in market volatility after announcing the first confirmed COVID-19 case in Indonesia (March 20, 2020). In response to the uncertainty surrounding the COVID-19 Pandemic, the majority of investors quickly adjust their investment portfolios. Table 1 shows that institutional investors dominate the Indonesian market. Institutional investors are perceived as well-informed and sophisticated. Other non-institutional investors (less sophisticated ones) tend to mimic the behavior of sophisticated investors. Accordingly, the higher the uncertainty surrounding the COVID-19 pandemic, the more volatile the market.

Table 2. Two-sample t-test with unequal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Vola_Pre	363	-0.0095307	0.0003901	0.0074327	-0.0102979	-0.0087636
Vola_Post	363	0.0013236	0.0005011	0.0095475	0.0003382	0.0023091
combined	726	-0.0041036	0.0003759	0.0101289	-0.0048416	-0.0033655
Diff		-0.0108544	0.0006351	-0.0121013		

Before The Confirmed COVID-19 Cases Announcement

The second hypothesis predicts that institutional ownership has a significant effect on stock price volatility. Using observations of share price volatility from the first trading day in 2020 to the announcement date of COVID-19, the first confirmed cases in Indonesia on March 20, 2020, Table 3 reports no significant effect of institutional ownership on stock price volatility. Accordingly, for the period before the COVID-19 confirmed cases announcement, the data cannot support the hypothesis that predicts a significant influence of institutional ownership on share price volatility.

Table 3. Regression Results Before COVID-19 Announcement

Variables	Vola_Pre
Institution	9.79e-06
	(1.66e-05)
SIZE	-0.00131***
	(0.000251)
Leverage	2.95e-06
	(6.17e-06)
SalesGrowth	0.00104
	(0.00182)
CapGrowth	0.00234***
	(0.000825)
ROA	0.000140*
	(7.53e-05)
PBV	-9.52e-06**
	(4.14e-06)
Constant	0.00748**
	(0.00322)
Observations	363
R-squared	0.107

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

ISSN 2089-6581 (print) | 2614-3720 (online) Vol. 11, No. 1, March 2024, pp. 62-73

Further, with a confidence level of 99%, the data suggest that variables such as sizes, market capitalization growth, and price-to-book ratio significantly influence stock price volatility. With negative coefficient values, the data suggest that size and price-to-book ratio have a stabilizing effect on share price volatility. Therefore, ceteris paribus, the share price of companies with larger sizes and higher price-to-book ratios is less volatile compared to those of those with smaller sizes and lower price-to-book ratios.

Return on asset shows marginal influence on stock price volatility at a confidence level of 90%. However, other control variables, such as leverage and sales growth, have no significant influence on share price volatility. In contrast, the regression test reported in Table 3 shows positive coefficient values of sales growth, market capitalization growth, and return on asset variables. The results suggest the destabilizing effect of these variables on share price volatility. Ceteris paribus, companies with higher levels of sales growth, higher market capitalization growth, and higher return on asset ratio will experience more share price volatility compared to companies with lower levels of sales growth, market capitalization growth, and return on asset ratio.

After decompose institutional ownership variables into domestic and foreign institutional ownership, the regression test remains to find no significant effect of either domestic institutional ownership or foreign institutional ownership on share price volatility (Table 4). This finding indicates that both domestic and foreign investors have similar trading behavior. This similar trading behavior might indicate the presence of herding behavior among institutional investors (domestic and foreign) in the Indonesian stock market.

Table 4. Regression Results Before COVID-19 Announcement

Variables	Vola_Pre
Domestic	7.09e-06
	(1.73e-05)
Foreign	1.48e-05
	(1.90e-05)
SIZE	-0.00132***
	(0.000252)
Leverage	3.14e-06
	(6.19e-06)
SalesGrowth	0.00100
	(0.00182)
CapGrowth	0.00236***
	(0.000827)
ROA	0.000137*
	(7.56e-05)
PBV	-9.38e-06**
	(4.15e-06)
Constant	0.00761**
	(0.00323)
Observations	363
R-squared	0.107

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Price Volatility After the Announcement of COVID-19 Infection

This study hypothesizes that institutional ownership affects stock price volatility before and after the discovery of the COVID-19 cases. Table 5 shows a positive effect of institutional ownership on stock price volatility during one quarter after the announcement confirmed COVID-19 cases at a 99% confidence

level (p-value <0.01). The results partially support the hypothesis on the influence of institutional ownership before and after the announcement of the confirmed COVID-19 cases. A positive coefficient value indicates that the higher the institutional ownership, the greater the stock price volatility. These findings suggest the destabilizing effect of institutional ownership during the crisis. Institutional investors responded to extreme uncertainties following the COVID-19 pandemic by quickly restructuring their investment portfolios. These actions exacerbate market volatility.

Table 5. Regression Results After COVID-19 Announcement

Variables	Vola_Post
Institution	5.56e-05***
	(2.12e-05)
SIZE	0.00102***
	(0.000321)
Leverage	-1.03e-05
	(7.90e-06)
SalesGrowth	0.00660***
	(0.00232)
CapGrowth	8.44e-05
	(0.00106)
ROA	0.000163*
	(9.64e-05)
PBV	-1.58e-05***
	(5.29e-06)
Constant	-0.0123***
	(0.00412)
Observations	363
R-squared	0.114

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Domestic Ownership, Foreign Ownership, and Price Volatility

Table 6 reports a significant effect of foreign ownership on stock price volatility after discovering the COVID-19 cases in Indonesia at a 95% confidence level. The beta coefficient on each variable of ownership is positive. These results indicate both types of institutional investors positively influence stock price volatility. Compared to domestic ownership, foreign ownership shows a stronger influence on stock price volatility.

Overall, the findings show that both domestic and foreign investors exhibit similar trading behavior either before or after the announcement of the COVID-19 pandemic. Before the COVID-19 Pandemic, both types of institutional investors do not affect market price volatility. However, after the announcement of the COVID-19 pandemic, both types of institutional investors create instability in the market. However, foreign investors have more flexibility in re-arranging their investment portfolios to other markets. During the crisis, they relocate their investment to a more stable market. Therefore, compared to that of developed markets, emerging markets, including Indonesia, experienced more market volatility.

Table 6. Regression results after the announcement of confirmed COVID-19 cases

Variables	Vola_Post
Domestic	5.32e-05**
	(2.22e-05)
Foreign	6.02e-05**
	(2.44e-05)
SIZE	0.00101***
	(0.000322)
Leverage	-1.01e-05
	(7.92e-06)
SalesGrowth	0.00657***
	(0.00233)
CapGrowth	0.000102
	(0.00106)
ROA	0.000160*
	(9.67e-05)
PBV	-1.57e-05***
	(5.31e-06)
Constant	-0.0121***
	(0.00414)
Observations	363
R-squared	0.114

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Conclusion

This study documents evidence of the negative impact of the COVID-19 pandemic on the Indonesian stock market's stability. Within the context of the COVID-19 pandemic, this study extend previous literature on the impact of institutional ownership on stock price volatility. The findings of this study suggest that when market conditions were relatively more stable (before the discovery of the COVID-19 pandemic in Indonesia), there was no effect of institutional ownership either by foreign or domestic investors on stock price volatility. However, in conditions of (perceived) high uncertainty (after the discovery of confirmed COVID-19 cases), foreign and domestic institutional ownership shows a positive impact on stock price volatility. Compared to domestic institutional investors, foreign investors tend to be more sensitive toward the pandemic-related uncertainties.

In addition to the institutional ownership variable, this study also documents the different effects of several variables such as ROA, capitalization growth, leverage, price-to-book ratio, and SIZE on stock price volatility before and after the announcement of COVID-19 cases. After the announcement of the confirmed COVID-19 cases in Indonesia, leverage and size show a significant influence on stock price volatility. Before the announcement, these variables did not have a significant effect on stock price volatility. In contrast, before the announcement of the COVID-19 case in Indonesia, the findings suggest that ROA, market capitalization growth, and price-to-book ratio significantly influence stock price volatility. This influence disappears after the announcement. This indicates that during the crisis, investors focus more on external factors such as government crisis mitigation policies and other macroeconomic factors than on firms' specific fundamental factors. This finding should alarm policymakers to implement sound and timely crisis mitigation policies.

This study has several limitations. The observation period of this study was limited to one quarter one quarter after the announcement of the first COVID-19 case in Indonesia. Future studies can use longer observation periods. The COVID-19 pandemic's impact spread to almost all stock markets; this study only

focuses on the Indonesian market. A Cross-countries analysis might provide better insight into the impact of COVID-19 on the global market. Prior literature suggests that the volatility of the exchange rate also influences the volatility of stock prices. This study does not control the effects of exchange rate volatility.

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