The Effects of Market Strength, Information Asymmetry, and Industrial Characteristics on Malaysian Firms' CAR During COVID-19 Pandemic

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Abstract: Research Question: Would the COVID-19 pandemic induce investment opportunities or threats for companies listed at Bursa Malaysia? **Motivation:** This study investigates whether the market strength and information asymmetry experienced during a crisis and industrial characteristics have an impact on shareholders' abnormal returns. **Idea:** The study uses market strength as measured by trading volume and information asymmetry as measured by bid-ask spread aims to suggest potential investment opportunities in different categories of industries for investors. **Data:** The study uses data of 620 companies listed on Bursa Malaysia, collected from 16 Mar 2020 to 9 Jun 2020. The data were divided into 3 event windows based on the government's Movement Control Order (MCO) announcements. **Method/ Tools:** The event study method is used to calculate the cumulative abnormal returns (CAR) as the dependent variable. Multiple regression analysis with hierarchical model specifications were used in assessing the impact of the explanatory variables on the dependent variables. **Findings:** The findings suggest that during periods of uncertainty, firm characteristics such as larger and older firms are at a disadvantage compared to smaller and younger firms. In terms of market characteristics, the study shows that Increased trading volume has greater returns to investors. However, the bigger bid-ask spread associated with higher abnormal returns reflects the inefficiency of the stock market. This study also found that in the month following the announcement of the first MCO, the CAR of firms in vulnerable industries reduced by an extra 5% compared to firms who were not classified as vulnerable industry category. As the MCO prolonged, the CAR of firms in vulnerable industries fell by an extra 9.5% compared to other firms listed in Bursa Malaysia. The negative impact on the vulnerable industries shows glooming prospects of those firms. **Contributions:** Market reactions to pandemics and MCOs are negative especially at the beginning period. The strength of the market, information asymmetry, and industrial characteristics have a strong influence on the abnormal returns during the observed periods. The study also shows that historical financial track records are not good predictors of a firm's prospects during this unprecedented COVID-19 pandemic.

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1. Introduction

Since its outbreak in early 2020, empirical evidences have documented the devastating impact of the novel corona virus (COVID-19) pandemic on the global economy and the stock markets. The aftermath of the pandemic and its spill-over effect is also reported to damage labour supply, goods and services. To curb the spread of the virus, Malaysia has implemented phases of Movement Control Order (MCO) since 18 March 2020 where only essential services were allowed to operate with restricted hours and minimum number of employees. Only the identified ten essential services namely the Food; Water; Energy; Communications and Internet; Security and Defence; Solid Waste and Public Cleansing Management and Sewerage; Healthcare and Medical including dietary supplement; Banking and Finance; E-commerce and Logistics are allowed to operate. While businesses and offices that were categorized as non-essential had to temporarily suspend their operations. The list of essential services has been expanded to 15 sectors in the third phase of MCO from 15 April 2020 until 28th April 2020.

On 19 March 2020, FBM KLCI fell to its lowest in the last 10 years, at 1,219.72 points (Abdul Aziz, 2020). The implementation of MCO had induced investors into panic selling at the early stages of the MCOs. The reactions from the market were negative due to uncertainties but when the spread of the virus was contained in the subsequent MCOs, the market returns were positive (Song *et al.*, 2021a). The KLCI rebounded to 1575.2 at the end of the study period when CMCO was implemented. Several studies have been conducted to quantify the impact of the COVID-19 pandemic as well as actions taken by the government to minimise the spread of infection. The stimulus packages that channelled liquidity into the economy had created stimulated profitability seeking and volatility in the stock market. The increase in market strength as measured by the volume traded and liquidity is largely contributed by the participation of retail investors during the MCO 2 in April 2020 onwards (Surendran, 2020; Fitzgerald, 2021). The Malaysian market is known as a semi-strong form efficient market which during a period of uncertainty, may experience higher information asymmetry between the investors and the managers and potential moral hazard. For instance, the large controlling shareholders who are common in Malaysian public listed firms may possess information asymmetry advantages that allow them to realize the abnormal profits before the market adjusts its share prices to their real value (Demsetz, 1986). Chen and Poon (2007) have shown that capital markets that face higher information asymmetry are illiquid and less developed which is reflected in the wider bid-ask spread and induces higher transaction costs.

During the pandemic, some industries such as tourism and transportation are vulnerable due to the lockdown while other industries such as health care sectors thrive. However, whether the pandemic would induce profit opportunities or threats in different industries during the crisis period and how to market strength and information asymmetry would impact the shareholders' returns is still yet to be ascertained. Similarly, whether firms' past financial health would change the impact of the market and industry's influence on shareholders' returns is also yet to be concluded. Since Malaysia is one of the most affected emerging markets from the pandemic, this study attempts to answer the questions raised, that whether the market strength and information asymmetry experienced during the crisis, industrial and firm characteristics have an impact on shareholders' abnormal returns, and provide empirical evidence for potential investment opportunities for investors.

This study finds that trading volume and bid-ask spread have a significant positive impact on the CAR while firms in the industries classified as vulnerable have a significant negative impact. Firms' past financial performance has no effect on the CAR during the pandemic indicating past performance is unable to explain firms' resilience during a crisis.

The rest of the paper flows as follows: First, we review the related literature followed by describing the data used for the analysis. After which, we analyse the impact of the explanatory variables on the cumulative abnormal returns CARs. Finally, we conclude the paper with suggestions to both investors and policymakers.

2. Literature Review

The COVID-19 pandemic has severely affected the stocks market worldwide. In a study on the COVID-19 outbreak, Liu *et al.* (2020) found 21 leading stock market indices among major affected countries fell quickly after the virus outbreak. Countries in Asia are found to experience more negative abnormal returns as compared to other countries. The adverse stock indices' abnormal returns confirmed investors' pessimistic sentiment on future returns and fears of uncertainties.

From a developing country perspective, such as Malaysia, the capital market is also not spared from this pandemic. Documented studies mentioned that the successful enforcement of the MCOs has led to the flattening of the COVID-19 curve (Abdul Rashid, 2020). Song *et al.* (2021b) found the negative cumulative average abnormal returns (CAAR) of stock at Bursa Malaysia during the early stage of MCO reflected the panic and uncertainty posed by the pandemic. However, significant positive CAAR after MCO 3 and MCO 4 as the government has channelled stimulus packages into the economy and allowed almost all sectors to resume their business (Anis, 2020). The relaxation of the MCOs and the huge amount of stimulus packages have provided large liquidity in the market and increased the market strength. The benchmark index, FTSE BM KLCI has rebounded from a low of 1219 on 19 March 2021 to 1575 on 9 Jun 2020.

While many recent kinds of literature have examined the impact of the COVID-19 pandemic on the stock markets returns, scant studies have examined the impact of the market strength and information asymmetry which was prevalent during the pandemic, and industrial characteristics, as well as firms' financial strength on the abnormal returns.

2.1 Market Strength and Information Asymmetry - Volume and Bid-Ask Spread

Volume measures the number of shares traded during a specific period. It indicates the overall activities of stocks and a sign of market strength. It is usually used by investors to identify momentum and confirm a trend in the market. Rising market with increased volume are typically viewed as bullish, strong, and healthy. When trading volume increases, the demand of shares will be more than the supply of shares and thus the prices would generally move up and vice versa if volume decreases (Lee and Rui, 2002). If the trading volume is high, market liquidity would also increase which will facilitate better order execution. A liquid stock can be sold in the market easily without much little impact on the stock's price, thus with lower transaction costs.

Studies have shown that capital markets that face higher information asymmetry are illiquid and less developed (Chen and Poon, 2007) which is reflected in the wider bid-ask spread. During a pandemic crisis, Hong *et al.* (2021) suggested that market inefficiency creates profitable opportunities for traders and speculators. This can be seen from the stimulus packages that pumped liquidity into the economy which has created stimulated profitability seeking and volatility in the stock market. When the market is volatile, especially during a period of uncertainty, the bid-ask spread may be much wider. Bid-ask spread is also widely used as a proxy to measure information asymmetry (Attig *et al.*, 2006;

Chu and Song, 2010). For instance, a wider bid-ask spread may be observed to most low-priced securities because either they are new or small in size, and have less analyst coverage. The asymmetry of information tends to be higher also in firms with concentrated ownership (Chu and Song, 2010). This is because controlling shareholders possess information asymmetry advantages that allow them to realize the abnormal profits with bigger bid-ask spread before the market adjusts its share prices to their real value (Demsetz, 1986).

Będowska-Sójka and Echaust (2020) found that the bid and ask prices of Closing Percent Quoted Spread (CQS) is superior to other proxies such as Percent Effective Spread, Percent Price Impact, Percent Realised Spread, and Percent Quoted Spread. They also found that even though the spreads are higher for small stocks as compared to the big ones, the size of the company has no impact on the nature of dependency between a benchmark and a proxy.

Amihud and Mendelson (1986), and Saleemi (2021) on the other hand, observed the relation between security returns and the percentage of bid-ask spreads. They found that gross returns increase with the spread. Le and Gregoriou (2020) also found that securities whose yields are more sensitive to liquidity shocks (wider bid-ask spread) relate to the higher returns. Thus, their findings suggest that the liquidity cost must be priced in returns due to the pandemic-related uncertainty. However, Leirvik *et al.* (2017) demonstrated that the stock market returns are not explained by the market liquidity and liquidity cost. This is supported by Saleemi (2021) who found that if the period is analysed during the pandemic-related restrictions, the liquidity cost was found to be negatively but insignificantly related with yields on the DJI index. The above discussion indicates that there is no unified standard to elucidate the relationship between bid-ask spread and asset returns. Thus, this study aims to investigate and confirm the hypotheses that the volume and bid-ask spread, the indicators of market strength and proxy for information asymmetry or efficiency of a market, affects the stock returns during the pandemic-related uncertainty in an emerging market.

H_1: There is a relationship between trading volume and abnormal returns.
H_2: There is a relationship between bid-ask spread and abnormal returns.

2.2 Firms' Industrial Characteristics

The COVID-19 outbreak has adversely impacted firm performance and it is more intense for firms in the industries that are considered vulnerable. In their study on firm-level exposure to epidemic diseases, Hassan *et al.* (2020) argued that the COVID-19 crisis manifests itself at the firm level is a simultaneous shock to both demand and supply. Using listed companies in the US and 80 other countries that were affected by the spread of COVID-19, supply and financing-related concerns are relatively more salient in regions where the spread of COVID-19 is less contained. It is also observed that overwhelmingly pessimism associated with COVID-19 exists significantly across heterogeneous firms and sectors. Firms most pessimistic (have negative sentiment) are in the transportation sector since that industry was being hit hard by cancelled air routes and closed borders. Technology firms are the least pessimistic, buoyed by the working-from-home orders issued by many governments and the much-needed investments in software and hardware solutions (Hassan *et al.*, 2020).

Country-specific studies on the impact of the pandemic have also grown since the first COVID-19 outbreak was detected in Wuhan, China. Using a sample of listed firms in China, Xiong *et al.* (2020) highlighted vulnerable industries such as transportation, hotel and tourism, real estate, and construction, food and beverage retail, postage warehouse, and

video entertainment, tend to have significantly lower cumulative abnormal returns (CAR) around the COVID-19 outbreak. The intensification of the pandemic is also being thought to cause a long-term impact on its tourism industry due to cancelled events and flights (Hoque *et al.*, 2020). The highly infectious COVID-19 is expected to thwart the tourism and hospitality sector further, which raises questions about its current challenges and future survival (Kaushal and Srivastava, 2021). Based on data from 185 countries, Škare *et al.* (2021), also reiterated that the outbreak has proven to have a more destructive impact on the travel and tourism industry than previous other crises. This also negatively affects the insurance industry due to the cancellation of travels, events, and other economic losses (Babuna *et al.*, 2020). Gu *et al.* (2020) meanwhile, revealed that the manufacturing industry also tends to incur negative effects of the COVID-19. Their study on 34040 Chinese enterprises in Suzhou, found this industry to have the greatest negative effect while industries such as construction, information transfer, computer services and software, and health care and social work were positively impacted. Meanwhile, Song *et al*. (2021a) also shed light into the drivers of restaurant firms' stock returns during the COVID-19 shock. Using 795 firm-year observations obtained from U.S restaurants' annual reports and other databases, the results showed firms with strong past firm-level characteristics and internationalized are more resilient to stock declines reacting to COVID-19 than otherwise similar firms.

In the case of Malaysia, Lee *et al.* (2020) used the market indices in understanding the impact of the COVID-19 on different sectors and revealed that the stock market performance was adversely affected by the increasing numbers of COVID-19 cases. Except for the Real Estate Investment Fund (REIT) index, the study found the main Kuala Lumpur Composite Index (KLCI) and other sectoral indices to be significantly volatile during the pandemic outbreak. The tourism industry in Malaysia is also not spared from the adverse effect of the pandemic. Foo *et al.* (2021), found that this communicable disease has adversely impacted the flow of tourists from around the world, with cancelled flights and accommodation bookings due to worries about the virus. The number of tourists declined tremendously since the Malaysian government banned and imposed travel restrictions.

Online business or e-business may be less affected by the coronavirus but studies have found that this industry is also not out of the list. Hasanat *et al.* (2020) conducted a survey study on the COVID-19 on e-business in Malaysia and found that they are severely affected. This is because Malaysia relies on many merchandise products from China and major retailers were temporarily locked down, particularly during the MCO period. As the economy recovers and with only selected MCOs, CMCOs and RMCOs, this industry is expected to recover faster as consumers adapt themselves to the new normal of working from home (WFH) and purchase online.

In light of the past literature, we hypothesize that stock returns in vulnerable industries, such as tourism and travel, manufacturing, construction, restaurants and food services, and banking tend to be significantly negatively affected.

H_3: Abnormal returns of firms belonging to vulnerable industries are negatively impacted by the COVID-19 pandemic.

2.3 Firm Fundamental Financial Characteristics

A strong fundamental has long been regarded as a key indicator on firm sustainability and growth potential. The COVID-19 outbreak could amplify firm pre-crisis weaknesses where firms with strong internal characteristics are expected to cushion their performance from the devastating effect of the pandemic. In their survey study on firm-level expectations and behaviour towards COVID-19 response, Buchheim *et al.* (2020) used a sample of 6000

German firms across all sectors of the economy, observed that financially weak firms, as measured by their pre-crisis business situation, are harder hit initially and expects more difficulties in their businesses outlook and managerial mitigation strategies.

Ding *et al.* (2021) din an examination on firm immunity to the COVID-19 pandemic using corporate data across 61 countries. Their study revealed that the pandemic-induced drop in stock returns was milder among firms with stronger pre-2020 finances. These include firms with more cash and undrawn credit, less total and short-term debt, and those with a larger profit. Firms with global supply chains and customer locations, large corporations and government-controlled firms, also tend to be less affected by the COVID-19 outbreak. Song *et al.* (2021a) meanwhile found larger-sized firms, having more leverage and cash flows, but with less ROA, are more resilient to stock declines reacting to COVID-19 than otherwise similar firms. Dividend as another firm financial characteristic did not reveal any significant moderating effect on the association between COVID-19 and U.S restaurant stock returns.

Narang *et al*. (2020) reiterated that pre-shock firm-specific characteristics play an important role in shaping the stock market response to the COVID-19 outbreak. The results of their OLS regression on BSE 500 firms, found that beta, book-to-market (BM) ratio, market capitalization, and age are found to be significant determinants of CARs during the downfall period. Small, high beta, loser, and low profitability firms have experienced a greater price decline than big, growth, low beta, winner, and high profitability firms during the pandemic period. On the other hand, Xiong *et al.* (2020) observed that Chinese listed firms having higher profitability and growth opportunity, higher combined leverage, and less fixed assets are less affected by COVID-19.

In the case of Malaysia, Khatib and Nour (2021) revealed that all firm characteristics, namely, performance (ROA and ROE), dividend, liquidity, and leverage are significantly impacted by the COVID-19. However, a further analysis does not provide strong evidence on the difference between pre and post COVID-19 periods. Using OLS regression, the study used a sample of 188 listed non-financial firms from the Malaysian market covering a period of two years (2019-2020). The MCO imposed in March through May 2020, not only restricts people's movement but affects companies' financial profits and significantly the stock returns as well.

In line with the above literature and the context of Malaysia's stock market, we use the historical financial health of the firms such as the current ratios, retained earnings, debt ratios, and return on assets (ROA) as a robustness check on the consistency of our results. Thus, we hypothesize that:

H_{4a-d}: Firm historical financial characteristics do have an impact on firm stock returns amidst the COVID-19 pandemic.

3. Methodology

3.1 Data

This study investigates the effects of market strength, information asymmetry, industry, and firm financial characteristics on the stock returns at Bursa Malaysia. Based on the available information of market, industry, and financial data from the Thomson Reuters DataStream database, an initial sample of 635 public listed companies was identified after eliminating those from the utilities and banking sectors. A further screening shows that 12 companies have incomplete financial data and four new (age fewer than 3 years) companies with an abnormally high beta of more than 10. These companies were excluded and thus left 619 companies in the final sample.

The market data was collected from 16 Mar 2020 to 9 Jun 2020 and were divided into 3 event windows based on the government's MCO announcements. Period 1 starts from 16 Mar 2020 to 15 April (After 1 month of MCO 1), Period 2 from 16 April 2020 to 9 Jun 2020 (MCO 3 until CMCO), and Period 3 from 16 March to 9 Jun (MCO 1 until CMCO).

The selected period allows the analysis of the effects of the independent variables on the firms' CARs in Malaysia during the lockdown period. CARs were calculated using the event study method with the three-event windows specified. Pre-pandemic industry and firm-level financial data for the year 2020 were collected from the same database. Descriptive analysis was performed to show the distribution of the data, and regression analysis was employed to see the effects of the explanatory variables on the dependent variables.

3.2 Event Study Methodology

The event study methodology is a widely used method in measuring the abnormal stock returns around the event date (Song *et al.*, 2011; Yazi *et al.*, 2015; Song *et al.*, 2021b). It is able to detect the impact of specific events on security prices (Binder, 1988) and under certain conditions, tests using OLS produce similarly powerful results as other methodologies (Greenwald, 1983; Karafiath, 1988).

This study uses Capital Asset Pricing Model (CAPM) in estimating the required rate of returns of the stocks:

$$R(R_{it}) = R_f + \beta_{it}(R_{mt} - R_f) \quad (1)$$

where

$R(R_{it})$ = the required rate of return of stock *i* on day *t*;
R_f = the daily risk-free rate derived from the average 3-months Treasury Bills for one year divided by 365 and adjusted for the inflation rate;
β_i = the beta measurement for stock *i* estimated from the historical betas' average for two years before the event date and were extracted from Thomson Reuters DataStream database; and
R_{mt} = the return of the benchmark index, KLCI on day *t.*

After establishing the required rate of return, the abnormal or unexpected return (AR_{it}) for each stock *i* on event day *t* is measured (the actual returns minus the required rate of returns). The effect on the rate of returns on stock *i* is as follows:

$$\mathrm{AR_{it}} = \mathrm{R_{it}} - \mathrm{R(R_{it})} \quad (2)$$

where

$\mathrm{AR_{it}}$ = the daily abnormal returns of stock *i* on day *t*;
$\mathrm{R_{it}}$ = the actual return of stock *i* on day *t*; and
$\mathrm{R(R_{it})}$ = the required rate of return for stock *i* on day *t.*

The cumulative abnormal returns (CAR) represent the total effect of the event across the window period, thus:

$$\mathrm{CAR_t} = \sum_{i=1}^{n} \mathrm{AR_{i,t}} \quad (3)$$

3.3 Regression Analysis

Multiple regression analysis was conducted to test the hypotheses by assessing the impact of the firm and market characteristics of the public listed companies on their abnormal returns for the three windows specified. The general model is specified in the equation below:

$$CAR_i = \alpha + \beta_1 \ln(TA)_i + \beta_2 (AGE)_i + \beta_3 \ln(VOL)_i + \beta_4 SP_i + \beta_5 Vind_i + \beta_6 CR_i + \beta_7 RETA_i + \beta_8 TDTAi + \beta_9 ROA_i + \varepsilon_t \quad (4)$$

where

CAR_i	=	Cumulative abnormal returns;
$\ln(TA)_i$	=	Natural log of total assets;
AGE_i	=	Years of establishment;
$\ln(VOL)_i$	=	Natural log of average market volume during the window period;
SP_i	=	Average percentage of closing quotes of Ask – Bid spread during the window period;
Vind	=	Vulnerable industries due to MCO; with dummy "1" for vulnerable industry, otherwise "0";
CR_i	=	Current ratio;
$RETA_i$	=	Retained earnings/total assets;
$TDTA_i$	=	Debt ratio; and
ROA_i	=	Return on assets.

The total assets and age are used as the control variables as they might have effects on the CAR. The second group of variables consists of market variables namely the market strength as measured by volume and information asymmetry variable as measured by the bid-ask spread. The third and fourth groups of variables are the firm's industry which was classified into the vulnerable industry and non-vulnerable industry following Xiong *et al.* (2020) and lastly firm's financial characteristics. We use the current ratio (liquidity), retained earnings ratio (financial strength), debt ratio (solvency), and ROA (profitability) to measure the financial characteristics of the firms.

4. Findings and Discussion

4.1 Descriptive Statistics

Table 1 presents the descriptive statistics from the dataset used in this study. The total number of public listed firms in Bursa Malaysia available in Thomson Reuter was 825. However, due to incomplete information, the final number used in this study is 620 firms. Because this study utilizes three different window periods, the variables cumulative abnormal returns (CAR), market volume (VOL), and Spread were calculated separately for each window. It can be seen that the average CAR is smaller in Period 1 compared to Periods 2 and 3. While the average market volume is the smallest in Period 3, followed by Period 1 and 2. For spread, the smallest spread is in Period 2 followed by Period 1 and 3. Since the data is relatively large, the theoretical distribution of the sample mean is deemed to be distributed roughly normally following the conventional rule-of-thumb that a sample size of 30 is big enough for a normal distribution.

Table 1: Descriptive results

	N	Mean	Median	Std. Dev.	Min.	Max.
CAR_1(%)	631	7.90	3.32	26.55	-71.98	156.90
CAR_2(%)	631	9.16	2.74	30.46	-66.81	187.80
CAR_3(%)	631	12.91	2.40	42.58	-78.59	275.15
VOL_1('000)	629	5900.66	903.07	15212.10	1.44	150162.00
VOL_2('000)	627	7056.34	907.57	18356.08	1.00	178385.00
VOL_3('000)	626	4248.53	600.03	12748.11	0.10	145611.00
$Spread_1$(%)	631	7.20	3.28	10.80	-43.44	81.67
$Spread_2$(%)	631	5.35	2.58	8.22	-43.31	58.13
$Spread_3$(%)	631	9.70	4.02	15.55	-66.57	129.21
Firm Size - Total Assets('000)	631	2257674	443594	7205085	5610	101640700
Firm Age	631	20.95	21.00	8.94	2.00	48.00
Vulnerable Industry	631	0.68	1.00	0.47	0.00	1.00
Current Ratio	630	3.92	1.97	8.56	0.09	124.42
TDTA	631	19.11	15.92	17.63	0.00	136.00
RETA	631	0.12	0.17	0.37	-2.04	0.85
ROA(%)	626	1.95	2.49	9.47	-80.53	44.06

Notes: Cumulative abnormal return (CAR), Volume (VOL) and Spread for the period of 16th March – 15th April 2020 i.e. MCO 1 and 2. Cumulative abnormal return (CAR), Volume (VOL) and Spread for the period of 16th April – 9th June 2020 MCO 3 – CMCO. Cumulative abnormal return (CAR), Volume (VOL) and Spread for the period of 16th March – 9th June 2020 i.e. MCO 1 until CMCO, whole study period.

4.2 Regression Results

Three multiple regression analysis were conducted for three different window periods. The regression results are divided into four models, the first model is the base model with control variables firm size and age. The second model incorporates market variables namely, market volume and spread to represent market strength and information asymmetry. The third model incorporates industry information where dummy variable is used to measure if the firms are from vulnerable industries, and firm characteristics such as current ratio, debt ratio, retained earnings ratio, and firm performance (ROA) are presented in Model 4.

In regression analysis, if an independent variable that is very highly correlated with one or more other independent variables will result in a relatively large standard error. The regression coefficient will be unstable and will vary greatly from one sample to the next. Therefore, before performing the regression analysis, correlation analysis was employed to detect for any potential correlation between the independent variables. The results show that all independent variables in all the models for the three periods analysed exhibit very low correlation of less than 0.4. Further diagnostic test to detect for any potential multicollinearity problem among the independent variables using Variance Inflation Factor (VIF) Statistics indicates all VIF values of around 1, confirms that there is no correlation between a given explanatory variable and any other explanatory variables in the models.

In the first model (Table 2), both firm size and firm age are found to be significantly negative in affecting CAR. When additional variables are added to the equation, firm age becomes positive and insignificant. In both Model 2 and 3, market volume and spread are found to be significantly positive in affecting CAR supporting hypotheses 1 and 2. This is in line with the hypothesis that market strength increases CAR, whereby as volume increases, potential return also increases. The positive significant bid-ask spread on CAR reflects information asymmetry is prevalent in the Malaysian market as highlighted by Chu and Song (2010) and Hong *et al.* (2021). For Model 3, the industry variable is found to be negatively significant with CAR supporting hypothesis H3, while firm characteristics ($H4_{a.d}$) in Model 4 are found to be insignificant in affecting CAR. It indicates that the historical

financial track records of a firm are not able to explain the variance in the firms' CARs during the unprecedented pandemic period.

Table 2: Regression results for period 1: 16 March until 15 April 2020

	Model 1	Model 2	Model 3	Model 4
Constant	53.170***	29.804***	30.742***	30.742***
	[8.612]	[8.720]	[9.472]	[9.472]
Firm Size	-2.924***	-4.450***	-4.074***	-4.074***
	[0.674]	[0.685]	[0.812]	[.812]
Firm Age	-0.329***	0.001	0.002	.002
	[0.120]	[0.113]	[0.113]	[.113]
VOL_1		5.292***	4.998***	4.998***
		[0.451]	[0.475]	[.475]
$Spread_1$		0.357***	0.326***	.326***
		[0.069]	[0.073]	[.073]
Vulnerable Industry			-5.022**	-5.022**
			[2.049]	[2.049]
Current Ratio				.018
				[.065]
Debt Ratio				-.041
				[.115]
RETA				-3.391
				[3.126]
ROA				-.044
				[.114]
Dependent Variable: CAR_1				
N	620	620	620	620
Adj. R-Square	.050	.227	.233	.231
F-Statistics	17.231***	46.435***	38.514***	21.629***

Notes: Standard errors are in parentheses. Significance at 10%, 5% and 1% levels are denoted by *, **, ***.

For the second period (Table3), regression results appear to be similar to the first period. In Model 1, both firm size and age are significant and negatively correlated to CAR. Firm age becomes positive and insignificant when other variables are included in the regression. For Model 2, firm size appears to be negatively significant to CAR while market volume and spread are positive and significant in affecting CAR. For Model 3, the industry variable is found to be negatively affecting CAR, although the result is inconclusive. This could properly suggest the indifferent market reaction towards another MCO, CMCO, or other prolonged restrictions as announced by the government. In Model 3 and 4, with very little difference to the adjusted r-square, it appears that the variable that measures firms in vulnerable industry and firms' financial specific variables such as current ratio, debt ratio, and retained earnings ratio does not improve the regression results.

When a longer period is adopted, that is, Period 3 (Table 4), the regression results still appear to be similar to the previous regression models. As indicated by the base model (Model 1), both firm size and age have a significantly negative effect on CAR in all three periods. However, the r-square for the base model is very small, indicating that more variables should be added to improve the model. When more variables are added, for firm-specific variables, only firm size is found to be negative and significant in affecting CAR. Market information such as market volume and spread, as well as vulnerable industry variables, are found to be significant in affecting CAR.

Table 3: Regression results for period 2: 16 April until 9 June 2020

	Model 1	Model 2	Model 3	Model 4
Constant	47.038***	25.372**	25.910**	24.24**
	[9.936]	[10.132]	[10.130]	[11.034]
Firm Size	-2.413***	-4.197***	-4.044***	-3.729***
	[0.777]	[0.782]	[0.788]	[.930]
Firm Age	-0.304**	0.131	0.125	.111
	[0.138]	[0.133]	[0.133]	[.134]
VOL_2		5.158***	5.111***	5.108***
		[0.473]	[0.473]	[.501]
$Spread_2$		0.384***	0.396***	.325**
		[0.146]	[0.147]	[.159]
Vulnerable Industry			-3.451	-3.641
			[2.388]	[2.409]
Current Ratio				-.022
				[.135]
Debt Ratio				-.066
				[.076]
RETA				3.125
				[3.663]
ROA				-.258
				[.136]
Dependent Variable: CAR_2				
N	621	621	621	621
Adj. R-Square	0.027	0.182	0.183	.184
F-Statistics	9.523***	35.487***	28.858***	16.564***

Notes: Standard errors are in parentheses. Significance at 10%, 5% and 1% levels are denoted by *, **, ***.

Table 4: Regression results for period 3: 16 March until 9 June 2020

	Model 1	Model 2	Model 3	Model 4
Constant	90.111***	42.343***	43.663***	41.154***
	[13.752]	[13.612]	[13.540]	[14.687]
Firm Size	-4.972***	-7.243***	-6.840***	-6.237***
	[1.077]	[1.051]	[1.054]	[1.237]
Firm Age	-0.575***	0.064	0.073	.039
	[0.191]	[0.176]	[0.175]	[.176]
VOL_3		8.896***	8.838***	8.562***
		[0.660]	[0.657]	[.697]
$Spread_3$		0.768***	0.790***	.677***
		[0.148]	[0.148]	[.160]
Vulnerable Industry			-9.032***	-9.479***
			[3.140]	[3.17]
Current Ratio				-0.009
				[0.177]
Debt Ratio				-0.049
				[0.101]
RETA				-1.185
				[4.842]
ROA				-.327
				[.178]
Dependent Variable: CAR_3				
N	623	623	623	623
Adj. R-Square	0.06	0.277	0.288	.286
F-Statistics	19.964***	60.647***	50.743***	28.636***

Notes: Standard errors are in parentheses. Significance at 10%, 5% and 1% levels are denoted by *, **, ***.

5. Conclusion

This study investigates whether the market strength and information asymmetry experienced during a crisis, industrial and firm characteristics have an impact on shareholders' abnormal returns. The findings of this study have several implications. Firstly, during periods of uncertainty such as at the beginning of the implementation of MCO, larger and older firms are at a disadvantage compared to smaller and younger firms. The results are unlike those found by Ding *et al.* (2021) and Song *et al.* (2021a) who found larger and financially strong firms to be more resilient to stock decline due to Covid-19.

Secondly, the volume and bid-ask spread which indicates the strength of the market and information asymmetry have a strong influence on the abnormal returns. The higher the volume, the higher is the abnormal returns, consistent with the expectation that an active stock market with an increase in stock demand provides greater liquidity with lower transaction costs, generates greater returns to investors. The significant positive relationship of bid-ask spread on the CAR indicates that during the period of uncertainty, information asymmetry is even more severe given the large concentration of ownership in public listed firms in Malaysia (Chu and Song, 2014). The findings support Chen and Poon (2007) that capital markets that face higher information asymmetry are illiquid and less developed provide an opportunity for greater abnormal returns. However, the bigger bid-ask spreads and higher abnormal returns reflect the inefficiency of the stock market that might increase transaction costs and exploitation by those who possess information advantages. Thus, a more efficient surveillance system to curb unusual market activities to ensure a fair and orderly market by the Bursa Malaysia and the Securities commission is vital.

Thirdly, consistent with the efficient market hypothesis (EMH) as well as studies on the capital market reaction by Baker *et al.* (2020), and Marinč (2016), market reactions to epidemics are negative. This is to be expected because as the market absorbs negative information of the development of the pandemic and the actions of the government implementing MCO, stock prices fell reflecting uncertainties of how businesses will be impacted by this new information at the beginning period. This study extends the previous studies by adding vulnerable industry variables into the model specified. This is to extract the effect of MCO towards firms that are especially in the vulnerable industries in the event of the COVID-19 pandemic. The impact of vulnerable industry variable on stock returns is even more severe. It has a significant and negative effect on CAR in two out of three of the study periods. Besides that, this study also found that all things being equal, in the month following the announcement of the first MCO, the CAR of firms in vulnerable industries would reduce by an extra 5.0% compared to firms who are not classified as vulnerable industry category. As the MCO prolonged, based on results in Period 3, the CAR of firms in vulnerable industries fell by an extra 9.5% compared to other firms listed in Bursa Malaysia. The negative impact of the vulnerable industries on the CAR shows glooming prospects of those vulnerable firms, which require government intervention to support them to sustain their businesses.

Fourthly, this study also finds firms' financial specific variables to be insignificant when they were introduced into the regression model as a robustness check on the impact of the market variables and industry's influence on the CAR. It shows that historical financial track records are not good predictors of a firm's prospects, especially during a crisis. The results are dissimilar to findings by Khatib and Nour (2021), Liu *et al.* (2021), and Xiong *et al.* (2020) who all found firm financial variables such as profitability, leverage, growth, and liquidity to be significant in affecting CAR of public listed firms during Covid-19. With firm financial specific variables added in the equation, they do not change the results of the explanatory variables namely market strength, information asymmetry, and industry variables leading to the conclusion that during a pandemic, the market strength, information

asymmetry, and industry characteristics are significant predictors on CAR. Future research such as cross-country comparisons on the impact of liquidity and information asymmetry on CAR during the crisis is suggested.

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