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EVENT STUDY ON THE IMPACT OF THE COVID-19 OUTBREAK ON THE MALAYSIA STOCK MARKET RETURNS

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Abstract

This study investigates the impact of the COVID-19 outbreak on the Malaysia stock market returns. We perform an 'event study' to investigate the effect of the announcement of the coronavirus as a global pandemic by the World Health Organization on 11th March 2020, on the KLCI stock returns. The historical stock prices, before, on and after the announcement date, from each 30 components of KLCI were analysed. The results show that there is a significant difference in abnormal returns among days before and after the announcement date. Moreover, the Malaysia stock market is negatively impacted by the pandemic announcement. Therefore, we can conclude that the Malaysia stock market is inefficient at the semi-strong level and that the stock prices do not reflect the change in the stock market instantly.

Keywords: abnormal returns; Covid-19; event study; market efficiency; stock market

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Introduction

The number of people infected by the disease continues to increase every day. While the impact of the disease varies by location, there are now more than 5 hundreds million confirmed cases of people with COVID-19 around the globe and more than 6.3 million people have died from the disease, according to the World Health Organization, WHO (June, 2022). Entering an endemic stage, with the advancement and different sorts of antibodies to control the COVID-19 indications, nevertheless we will never disregard how the coronavirus outbreak caused the overnight impact of exceptional changes in human life, with rising mortality rates, putting entire nations on constrained lockdown, crushing the worldwide economy, and tossing hundreds of thousands out of work. The COVID-19 pandemic not only contributed to a change in the organization and work model of many entities, causing their decentralization, forcing greater flexibility of operation, and starting the transformation towards remote work but also influencing internal relations, employee adjustment and human resources management (Carnevale & Hatak, 2020). First broke out in Wuhan, China at the end of 2019, the novel coronavirus pandemic brought global economic activity to a sudden halt in the first half of 2020 (Gerlagh et.al., 2020). The motivation of this study emergences from this point of view. We would like to investigate the short-term impact of the COVID-19 outbreak on the Malaysia stock market returns. Apart from stock market, COVID-19 has severely paralyzed other important sectors of the economy such as tourism, education, transport, trade, services and many others. However, in this study, we only focusing on stock returns in Malaysia.

SARS and Ebola are some of epidemic diseases that spread in a particular region. While pandemic diseases such as Asian Influenza and Covid-19 outburst across a wider geographical region and affecting a huge population. In the literature, many studies investigating the impact of SARS and Ebola outbreaks on the stock market returns of the affected country. Nippani & Washer (2004) revealed that SARS had no negative impact on the affected countries' stock markets except for China and Vietnam. Meanwhile Ichev and Marinc (2018) suggested that the geographic proximity of information to the financial markets has an impact on the stock returns of the firms that are closer to the origin place of the Ebola disease. In finance, the major events move the market. Earnings surprise, dividend announcement, merger announcement and stock splits seem to create opportunities to generate abnormal stock returns. Being able to predict and play financial market events allows market participants to build a sustainable and high-performing risk management strategy. Here is what we called the Efficient Market Hypothesis, EMH introduced by an economist, Eugene Fama. There are three forms of the EMH namely the weak, the semi-strong and the strong EMH. The weak EMH says that future prices can be predicted by analyzing historical prices. The semi-strong EMH is almost as weak EMH plus the prices quickly adjusted to publicly available new information. In this level, the fundamental analysis cannot be used to achieve risk adjusted returns. Finally, the strong version of the EMH says that not only the prices immediately respond to the publicly available new information, but they also respond to the private information. If the financial markets are informationally efficient, there should be an immediate reaction to the event on the announcement date and no further reaction on subsequent trading days.

In this study, we are testing the content of the information intended to see the market reaction due to the coronavirus outbreak. The date of the event is considered as of 11th March 2020 which the World Health Organization declared that the COVID-19 outbreak as a global pandemic. We perform an event study to test the hypothesis of the market efficiency at the semi-strong level for FTSE Bursa Malaysia KLCI, (KLCI). This study will examine whether pandemic announcement has a significant impact on the Malaysia stock market. We want to investigate how does the KLCI stock prices respond, whether positively or negatively, to this pandemic announcement. We employ an event study approach to analyze the short-term impact of Covid-19 pandemic on stock index returns in KLCI.

Research Hypothesis

H_0: The announcement of COVID-19 as a pandemic by WHO has no effect on the Malaysia stock prices returns i.e., the average abnormal returns on the event day are zero implying the stock market is semi-strong efficient

H_1: The announcement of COVID-19 as a pandemic by WHO has a significant effect on the Malaysia stock prices returns i.e., the average abnormal returns on the event day are statistically different from zero implying the stock market is inefficient

Literature Review

There are numbers of related research in examining the effects of coronavirus outbreaks on stock market performance (Liu et. al., 2020; Lee et. al., 2020; Chia et. al., 2020; Al-Awadhi et.al., 2020; Ashraf, 2020; Aldhamari et. al., 2022). With the WHO declaration of COVID-19 as a pandemic, stock markets across the world started plummeting. Most of the stock markets reacted negatively to the COVID-19-induced crisis. Liu et al., 2020 indicates that countries in Asia experienced more negative abnormal returns as compared to other countries. This can be supported by Lee et. al., 2020. The increasing numbers of COVID-19 cases in Malaysia tended to adversely affect the performance of the Kuala Lumpur Composite Index (KLCI) and all sectoral indices, except for the real estate investment fund index. Moreover, Chia et. al., (2020) found that daily new confirmed COVID-19 cases and deaths had negative but insignificant impact on the returns on Malaysia stock indices. Al-Awadhi et. al., (2020) found that the stock returns across all companies included in the Hang Seng Index and Shanghai Stock Exchange Composite Index are significantly negative correlated with the number of daily cases and death of COVID-19 recorded. This claim can also be supported by similar research done by Ashraf (2020). Ashraf observed negative and proactive response of stock market from 64 countries around the globe. Furthermore, Aldhamari et. al., (2022) in their study of Malaysia stock market reaction towards the COVID-19 outbreak observed that the investors react negatively to the announcement of the movement control order. They also found that only firms in the health-care sector reported significant positive CAARs.

In addition to the introduction, the rest of this paper is organized as follows: Section 2 elaborates the research methodology used in this study. The findings of the study will be demonstrated in Section 3 and the final section provides the conclusion on the outcome.

Methods

To test the market efficiency at semi-strong level, we applied an event study method (Salameh & Albahsh, 2011). An event study is a tool applied to measure the impact of an event or news on the stock returns of the company. The event study literature began with Ball & Brown (1968). Later, a group of researchers, Fama et.al., (1969) developed the traditional event study methodology when they investigated how fast security prices adjust to new information rather than to infer market efficiency based on the independence of event proceeding price changes. The procedure involves calculating daily abnormal returns, AR for each firm in the days surrounding the announcement of the event being studied. Abnormal returns are essential in determining a security's or portfolio's risk-adjusted performance when compared to the overall market or a benchmark index. Then, calculate the average abnormal returns, AAR for each day in the event window.

Finally, sum the average abnormal returns over the T days in the event window (i.e., over all times t) to form the cumulative average abnormal returns, CAAR. The CAAR is a useful statistical analysis in addition to the AAR because it helps us get a sense of the aggregate effect of the abnormal returns. CAAR is used to measure the effect of lawsuits, buyouts, and other events have on stock prices. We calculate the CAAR on an event period for sampled firms experiencing the same firm-specific event to capture the valuation impact of that event. We then test the statistical significance of the CAARs. If the CAAR is statistically different from zero, we can say that the event significantly influences stock prices.

Study Area

This study examines the short-term impacts of the COVID-19 pandemic on Malaysia Stock Market. The data of this event study consist of daily closing prices of the top 30 companies listed on Bursa Malaysia, were retrieved from iSaham Stock Screener, on a period of 101 trading days, starting from 1st November 2019 to 25th March 2020. FTSE Bursa Malaysia KLCI is selected as the benchmark index to calculate the abnormal returns. The tool used for conducting the event study analysis was Microsoft Excel and SPSS 20th version.

The event date in this study is chosen as 11th March 2020, when the declaration of COVID-19 as a global pandemic by the World Health Organization, WHO. After identifying the event date or the announcement date, we define the period of the event study. There are estimation period and event period. The estimation window should be chosen in such a way to make sure that the returns in the estimation window are not affected by the event. To accomplish this, it is sensible to have the estimation window ends several days before the event, and it should not include any dates that are also in the event window. The estimation window should also be long enough to calculate meaningful estimates of normal returns. In practice, researchers choose estimation windows ranging from 90 to 200 days. However, in this study, we set it up to 80 trading days prior to the event window to obtain the expected returns.

The event period is from 26th February to 25th March 2020. The length of event window is 21 trading days. Based on the normal returns obtained from estimation window, the expected returns and the abnormal returns are calculated within the event window. To study the influence in different periods, we set up seven event windows consisting of 10 days before and after the event day: (-10,10), (-5, 5), (-2,2), (-10, 0), (0, 10), (-5,0) and (0, 6). The timeline in the study is illustrated in Figure 1.

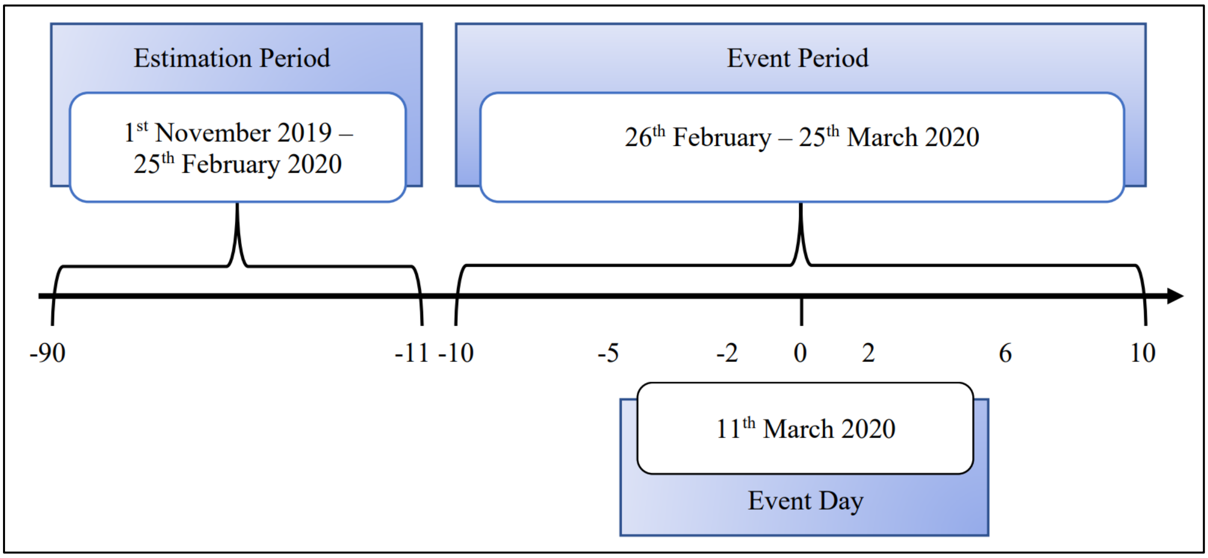

Figure 1. Event study timeline.

The daily stock return or normal return is defined by the following equation (Siddikee, 2018).

$$R_{i,t} = \frac{S_t - S_{t-1}}{S_{t-1}} \quad (1)$$

where S_t and S_{t-1} represent the stock prices at *t* and *t*-1 respectively.

The expected return is the normal return of stock as if the event had not occurred. The expected return of stock *i* at day *t* was derived using the risk-adjusted returns model, which is based on the following equation:

$$E(R_{i,t}) = \hat{\alpha}_i + \hat{\beta}_i R_{m,t} \quad (2)$$

where $R_{m,t}$ is the actual market return on day *t*. The $\hat{\alpha}_i$ and $\hat{\beta}_i$ coefficients are estimated by running a 'single index model' regression of the firm's returns onto the market returns during estimation period. The $\hat{\alpha}_i$ is simply the firm's recent performance track record while the $\hat{\beta}_i$ is its sensitivity and responsiveness to general market movements. Then, the values of $\hat{\alpha}_i$ and $\hat{\beta}_i$ used to estimate the expected returns and the abnormal returns during the event period.

Abnormal return is simply the difference between the actual return and the expected return on a given day.

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (3)$$

An abnormal return can be either positive or negative. If an announcement of an event is good news, we expect abnormal returns to be positive, indicating that the market believes that the event will increase the firm's value. Otherwise, a negative abnormal return signals bad news and the market believes that the event would decrease the firm's future profitability.

Under the null hypothesis of no abnormal returns for firm *i* on day *t* during the event window, we construct test statistics based on the standardised abnormal returns. These test statistics will be asymptotically normally distributed (as the length of the estimation window, *T*, increases).

The variance of the residuals from the market model is calculated using

$$\hat{\sigma}^2(AR_{i,t}) = \frac{1}{T-2}\sum_{t=2}^{T}\hat{\mu}_{i,t} \quad (4)$$

where T is the number of observations in the estimation period.

We repeat the procedure to obtain the abnormal returns for the 30 top companies on Bursa Malaysia. Since we have 30 companies, it is usually of more interest whether the abnormal returns averaged across all companies is statistically different from zero than whether this is the case for any specific individual company. Therefore, we calculate the average of these abnormal returns during the event period which should give us the average abnormal returns on day *t*, AAR_t in the event period based on the equation:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \quad (5)$$

where N is the number of firms of interest.

This AAR_t will have the variance given by the following formula:

$$\hat{\sigma}^2(AAR_t) = \frac{1}{N^2}\sum_{i=1}^{N}\hat{\sigma}^2(AR_{i,t}) \quad (6)$$

We then construct a test statistic, for testing the null hypothesis that the AAR_t across the 30 companies is zero, which will asymptotically follow a standard normal distribution:

$$SAAR_t = \frac{AAR_t}{\sqrt{\hat{\sigma}^2(AAR_t)}} \sim N(0,1) \quad (7)$$

where $\widehat{SAR}_{i,t}$ is the standardised average abnormal returns.

Prior to test for the significance of the AARs, we first need to check whether the AARs have followed a normal distribution or not. Checking for normality can be done with the Shapiro-wilk test of normality. The data with p-value greater than 0.05 concluded as normally distributed while data with p-value less than or equal to 0.05 are not normally distributed.

Furthermore, the hypothesis testing is done to determine whether there is a significant difference in average abnormal returns during the event period. The data that follow the normal distribution will be analysed using one sample t-test, while data which are not normally distributed, we analyse using one-sample Wilcoxon signed rank test. The results are shown below. If p-value greater than 0.05, H_0 is accepted. If p-value accepted, that's mean, on the particular days, the average abnormal returns across firms are not significance or not differ from zero. Meanwhile, if H_0 is rejected, that's mean, on the particular days, the average abnormal returns across firms are significance or differ from zero.

Sometimes there is a leakage of information so we might want to investigate whether there is a significant difference in the average abnormal returns among the days before and after the declaration of the pandemic by the WHO. Therefore, to do so, we conduct paired-sample T- test.

Finally, we obtained the Cumulative Average Abnormal Returns (*CAAR*) by adding up the AAR_t of each day from day t_0 to t_1 using the following formula:

$$CAAR(t_0, t_1) = \sum_{t=t_0}^{t_1} AAR_t \quad (8)$$

where t= (-10, -9, -8, …., 8, 9, 10)

The variance of this CAAR will be obtained by following equation:

$$\hat{\sigma}^2\left(CAAR(t_0,t_1)\right) = \frac{1}{N(N-d)} \sum_{i=1}^{N}\left(CAR_i(t_0,t_1) - CAAR(t_0,t_1)\right) \tag{9}$$

We have decided to evaluate seven event windows, within the event period to compare the CAAR. Then, we do cross sectional t-tests to test the significance of the CAAR.

Result and Discussion

On 11 March 2020 as WHO declared the novel coronavirus as a pandemic, 25 out of 30 listed companies on Bursa Malaysia logged positive AR as shown in Figure 2.

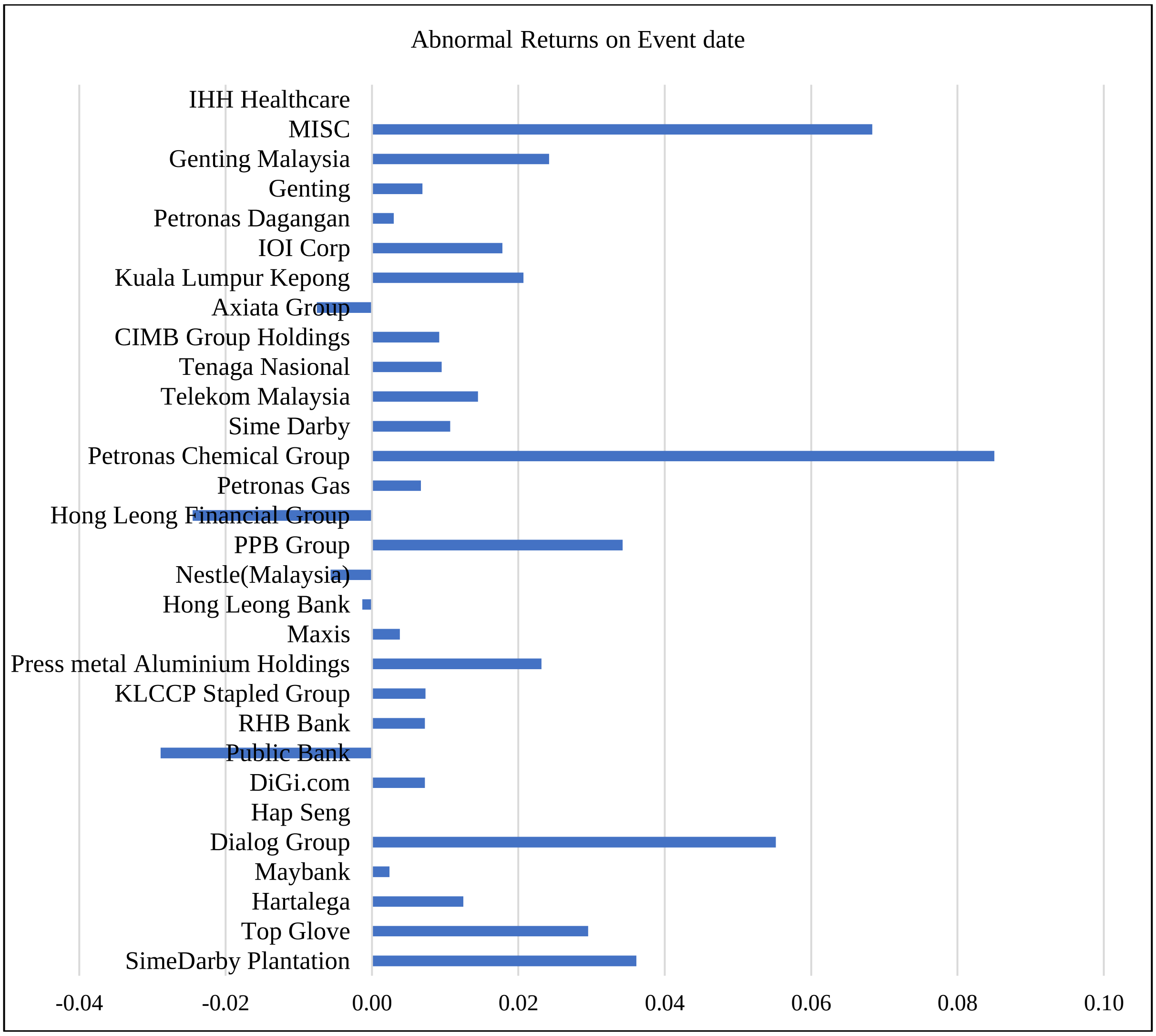

Figure 2. Plot of Abnormal Returns on the event day.

Next, Figure 3 displays the fluctuation above and below zero line of the Average Abnormal Returns (AARs) across firms within the event period. t0 dated 11th March 2020 is the event date. As we can see roughly that the highest point of the plot at t+7 which is an AAR of 6.1% occurs after the pandemic announcement. In the other hand, the lowest point of -5.1% also occurs after the announcement date. Moreover, after t+2, the AAR gradually increase for a couple of days even though the Malaysia's Prime Minister announced the lockdown of entire country starting 18th March 2020 on t+3.

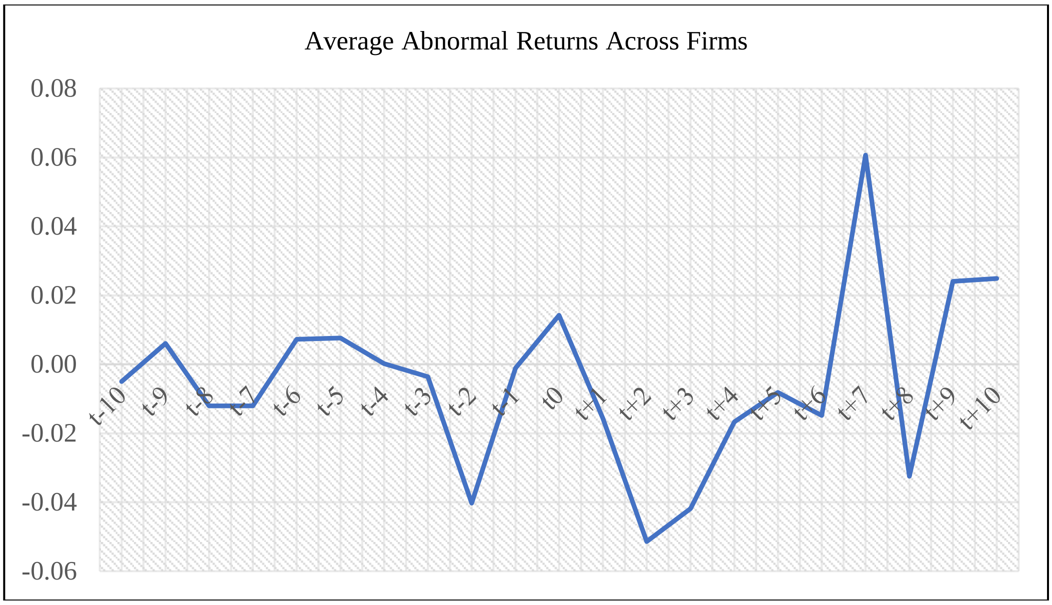

Figure 3. Plot of Average Abnormal Returns in the event period.

As demonstrated in Figure 4, the CAAR plot shows fluctuation around negative values, because of the breaking news of the COVID-19 outbreak in the media. In the event window (0, +6), the Malaysia stock market responded most negatively due to the pandemic.

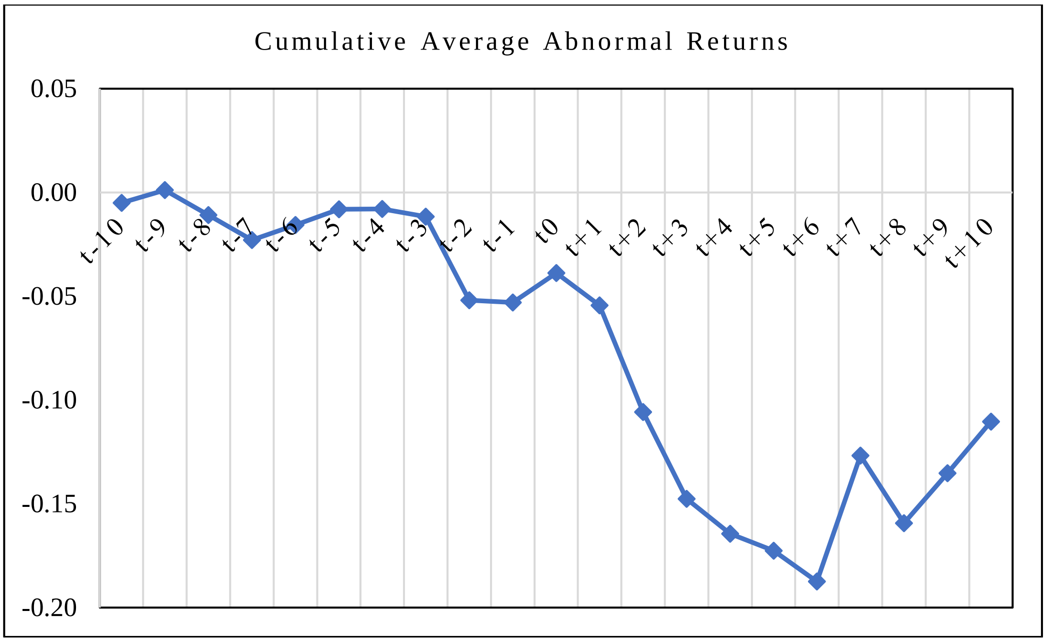

Figure 4. Plot of Cumulative Average Abnormal Returns in the event period.

Significance of results

Based on the statistical test, only 6 of the firms obtained significant abnormal returns as shown in Table 1. The significant ARs mean that, there is a statistically significant different between the normal returns and expected returns obtain on that day.

Table 1. The company with significant AR on the event day.

Company	AR on t0	Significance
SimeDarby Plantation	3.6%	Yes
Dialog Group	5.5%	Yes
Public Bank	-2.9%	Yes
PPB Group	3.4%	Yes
Hong Leong Financial Group	-2.5%	Yes
Petronas Chemical Group	8.5%	Yes
MISC	6.8%	Yes

As for AARs across the companies within the event period, only AARs obtained on t(-10), t(-4), t(-3), t(-1) and t(5) are significant. The results are demonstrated in Table 2 below.

Table 2. The day with significant AARs within the event period.

Date	Label	AARs	Significance
26 February 2020	t(-10)	-0.5%	Yes
5 March 2020	t(-4)	0.02%	Yes
6 March 2020	t(-3)	-0.36%	Yes
10 March 2020	t(-1)	-0.11%	Yes
18 March 2020	t(5)	-0.82%	Yes

To test whether there is a significant difference in the AARs before and after the pandemic announcement, we did paired-sample T- test. Refer to Table 3, since the p-value is equal to 0.283 which is greater than 0.05, therefore, we can conclude that there is a significant difference in abnormal returns among days before and after the announcement date. Judging from the mean values, AARs before and after the announcement date are negatives which indicates that there is a negative sentiment that led to the decrease of the stock returns.

Table 3. Result of the paired-sample t-test between the AARs before and after the event day.

Mean AAR		p-value	Decision
Before	–0.00601178	0.283	H_0 is rejected
After	–0.00823030		

Lastly, the following Table 4 illustrated the significance of the Cross-Sectional t-test analysis that have been done to test the significance of the CAAR obtained. The results conclude that there is a significant negative CAAR in all the chosen event windows.

Table 4: Results of the cross-sectional t-test on the CAARs

Event window	(-10,10)	(-5, 5)	(-2, 2)	(-10,0)	(0, 10)	(-5,0)	(0,6)
Cumulative Average Abnormal Return	-3.3102	-4.7065	-2.8262	-1.1620	-1.7209	-0.6909	-4.0344
Std Dev for CAAR t-test	1.0127	1.0176	0.5359	0.2516	0.3726	0.1338	0.7964
Cross Sectional t-test	-3.2686	-4.6250	-5.2733	-4.6183	-4.6184	-5.1627	-5.0656

Conclusion

The financial markets are said to be informationally efficient when there is an immediate reaction to the event on the announcement date and no further reaction on subsequent trading days. In this study, we examine the short-term impact of the broke out of novel COVID-19 pandemic on the financial market of Malaysia. 'Event study' results show that across the 30 companies listed in the KLCI, on average, respond negatively to the coronavirus outbreak and the declaration of the COVID-19 as a global pandemic. Since there is a significance effect of the announcement on the KLCI stock returns, therefore, we can conclude that the Malaysia stock market is inefficient at the semi-strong level because the stock prices do not reflect the change in the market instantly or the stock prices slowly adjusted to the new information.

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Author Contribution

The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

Conflict of Interest

The author declares no conflict of interest.

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