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COVID-19 AND STOCK RETURNS: EVIDENCE FROM MALAYSIA

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ABSTRACT

The severe acute respiratory syndrome (SARS) coronavirus or Covid-19 has affected the world unprecedentedly. Malaysia is not exempted from its impact. The Malaysian government announced a nationwide lockdown in the middle of March 2020. The magnitude of the outbreak had caused panic to the public and financial panic in the stock market. This study examined the impact of Covid-19 cases and the action taken by the government through movement control orders (MCOs) and economic stimulus packages in the stock market. Event study methodology was used to assess the impact of Covid-19 on stock returns in Bursa Malaysia. Consistent with the efficient market hypothesis, the study found that during the early stages of the MCOs, the cumulative average abnormal returns (CAAR) reflected significant negative returns. However, it showed positive returns after

MCO 3 and MCO 4. The results implied that the market perceived that the pandemic was under control. The study also revealed a significant relationship between CAAR and the number of cases announced, supporting the notion that in a less to a moderately free country such as Malaysia, investors showed a certain lack of trust in the number of cases reported by the authorities, and thus overreacted to the number of reported cases. The stimulus packages that were expected to stabilise the economy and society were found to be positively significant during the early stages of the MCOs.

Keywords: Covid-19, pandemic, Malaysia, event study, efficient market hypothesis.

JEL Classification: G010, G140.

INTRODUCTION

The severe acute respiratory syndrome coronavirus 2 or Covid-19 is an infectious disease that causes respiratory infections in humans. Before December 2019, the virus was relatively unknown until an outbreak of pneumonia emerged in Wuhan, China. Subsequently, the virus spread across the world in mid-January 2020 when many Chinese nationals flew home or abroad for the Chinese lunar year celebrations. Covid-19 was classified by the World Health Organization (WHO) as a pandemic on 12 March 2020. According to WHO, Covid-19 has an incubation period of 14 days. The virus can be transmitted within that period (WHO, 2020), and the transmission can quickly occur through respiratory droplets. People, especially those with pre-existing medical condition and weak immune systems, are more vulnerable to the virus.

Generally, Covid-19 cases in Malaysia can be categorised by waves (Shah et al., 2020) and clusters. During the early stage, the cases were confined to just a few imported cases (Zack, 2020) involving foreigners who arrived in Malaysia on 24 January 2020. The 2nd wave occurred on 4 March 2020 due to a sudden surge in the number of positive cases caused by a Malaysian who returned from China.

The situation became worse following a religious event held from 28 February until 2 March 2020 involving 12,500 attendees at Masjid

Seri Petaling, Kuala Lumpur (Roslan, 2020). This cluster had led to huge spikes in the number of local cases (Ministry of Health, 2020). Malaysia recorded 2,000 active cases by the end of March 2020, and more than 5000 confirmed infections by 15 April 2020 (Kaos, 2020). It was the largest cumulative number of confirmed Covid-19 infections in Southeast Asia during the period. The highest number of Covid-19 cases in Malaysia in the second wave was reported on 5 June with 277 new cases.

By 1 September 2020, the Covid-19 outbreak had affected most countries globally, with 25,637,635 confirmed positive cases and 854,772 deaths. About 99 percent of patients experienced mild infections and recovered, but 1 percent (61,145) were in serious or critical condition (Worldometer, 2020). Since the outbreak of the disease in China which spread globally in early 2020, its impact has been especially severe on the tourism and airline industries due to lockdowns or restricted movements and travel bans imposed by various countries.

Following the steps taken by other countries affected by the pandemic, the Malaysian government announced on 16 March 2020, that a 14-day MCO be imposed nationwide to control the spread of the disease. This led to the shutting down of all government and private premises except those which were categorised under essential services. It also restricted individuals from travelling to other states that had been declared as red zones. All citizens were prohibited from leaving the county, and the country's borders were closed to foreigners. All sports, religious, social and cultural activities were also prohibited (Bunyan, 2020).

The duration of the first MCO was from 18 March until 31 March 2020 (Bunyan, 2020). However, it was further extended to 14 April 2020 (Anis, 25 March 2020) and after that to 28 April 2020 (Rodzi, 2020), and subsequently to 12 May 2020 (Povera & Harun, 2020) in response to the rising number of cases in the country. On 1 May 2020, a "Conditional Movement Control Order" (CMCO) was announced by the Prime Minister. The deliberate easing of restrictions permitted most businesses to restart on 4 May under rigorous standard operating procedures (SOP) until 9 June 2020. It was later replaced by the Recovery Movement Control Order (RMCO) until 31 August (Loo, 2020).

The stock market plummeted immediately (Bursa Malaysia, 2020) in response to the MCO announcement on 16 March 2020. The hardest-hit industries were the airlines, tourism, and retail businesses, which led to an increasing number of people losing their jobs and a reduction in trade volume. Small and medium-sized enterprises were also severely affected due to the decline in social spending and fixed expenses on rents, wages and interests (Duan et al., 2020). The severity of the outbreak reported in the number of daily new cases was also expected to affect the economy and stock market.

The main objectives of this paper are to assess the extent of the impact of the outbreak and how the measures taken by the government through the implementation of the MCOs and the handing out of stimulus packages affected the stock market. The MCO announcements which impacted stock prices can be explained based on market efficiency hypothesis (Fama, 1970). We hypothesized that the control measures taken by the government to mitigate the spread of Covid-19 helped restrain the panic and thus was expected to have had a positive effect on stock prices in line with investor sentiment driven hypothesis (Baker & Wurgler, 2007; Chen et al., 2020; Yu & Yuan, 2011). Similarly, we also expected the government's announcements of the stimulus packages to exert a positive impact on stock prices. As the pandemic has been unprecedented, there is still no empirical study on the impact of Covid-19 on the Malaysian stock market. Findings from this paper are crucial to policymakers, the investment community, and the corporate sector to make informed decisions based on the government's measures and the response of market participants during this pandemic period. It also contributes to the literature which has investigated stock market reactions to various disasters and crises.

We employed the event study methodology with a sample of 760 companies listed on Bursa Malaysia to achieve the study's objectives. The sample period taken for the study was 144 days (2 January to 31 July 2020). Various event windows were examined to assess the reaction of the market towards the MCOs. The event day (t_o) was the official announcement day of the MCOs. The results indicated that the market reacted negatively to the MCO announcement during the early stages, but after MCO 3 and MCO 4, the market's reaction turned positive. The results also showed a significant relationship between CAAR and the number of cases announced, which supported

the notion that in a less to moderately free country such as Malaysia, investors could overreact to these announcements. Following Erdem (2020), we defined less free countries as those with relatively low political and civil liberties rights indicators. The stimulus packages which were expected to stabilise the economy and the society were only positively significant during the early stages of the MCOs.

The outline of the paper is as follows. In Section 2, we review previous studies and discuss our paper's contribution. This is followed by Section 3, where we describe our data and the methodology used, specifically the event study method and regression analysis. In Section 4, we examine the results of the event study and the regression results. Finally, our concluding remarks are presented in Section 5.

LITERATURE REVIEW

Since the outbreak of Covid-19 in China, the pandemic has posed unprecedented uncertainty to global markets. It is believed that this virus and SARS which appeared in 2002 are quite similar, but the severity of the current infection is more dreadful than the earlier one. Similar to a terrorist attack, Burch et al. (2016), and Chen et al. (2007) found that the SARS epidemic in 2002 caused shock and panic selling in the stock market. On the other hand, Nippani and Washer (2004) focused on stock indices of eight countries which were seriously affected by SARS and found that SARS had no negative impact on the affected countries' stock markets except for those based in China and Vietnam. It may be because the most severe negative impacts of SARS were seen on the local consumption side, especially in tourism and air travel-related services in those countries (Siu & Wong, 2004).

Lee and McKibbin (2004) evaluated the global economic impact of SARS. They found that the SARS epidemic spread rapidly through countries via cross border travel and affected the economies of many countries due to financial integration and globalisation. Coupled with the widespread media coverage, Marinč (2016) found that geographical proximity and information disseminated on an outbreak had also influenced the affected countries' asset prices. The results indicated that the impact of the epidemic on stock prices was generally negative. The effect was prominent in smaller and more

volatile stocks and less established industries. Using the Infectious Disease Equity Market Volatility (EMV) tracker, Baker et al. (2020) showed that the early-phase impact of Covid-19 looked similar to the impact of other infectious disease outbreaks in the past. However, as the threat became increasingly apparent and overwhelming, the Dow Jones Industrial Average, which was high in February 2020, crashed in February up to March 2020.

Baker et al. (2020) also attributed the adverse stock market reactions to the severity and ease of spread of the Covid-19 virus and the high death rate among those infected with the virus. The high stock market volatility was also due to the rapid diffusion of information compared to the previous pandemics. The MCOs had brought a severe plunge in demand for various services. It significantly reduced the flow of labour to businesses. The Economist (2020) noted that "One of the ways virus damages the economy is to interfere with the supply of labour, goods and services. But more serious is its spill-over effect." This spill-over effect on the capital market was expected to be negatively consistent with Marinč's (2016) study. However, as the pandemic has been unprecedented, it is vital to study the impact of this pandemic on the stock market to assess the market responses to this health crisis.

Effects of MCO on the Equity Market

As of 1 September 2020, Malaysia reported 9340 infected cases, 127 death, and 9054 recoveries. Malaysia was one of the earliest countries that implemented the MCOs (Shah et al., 2020) as the threat of the virus became increasingly apparent. Many businesses were affected because of the 'social distancing' and 'stay-at-home' orders. Tourism, airlines, event management, and sports industries were the most badly hit sectors. All events which drew crowds were cancelled. The suspension of tourism, business travel, and work visas severely impacted Malaysia's industries, which relied very much on its economic growth. It is estimated that there was a loss of over RM45 billion in the Malaysian tourism industry due to the Covid-19 pandemic for the first half of 2020 (Bernama, 2020).

The MCOs that restricted and reduced people and factory activities led to reduced demand for energy products such as aviation fuel, coal and others, which subsequently caused a fall in oil prices.

Coupled with the overproduction of oil by Saudi Arabia and Russia in early March 2020, the US stock markets declined over 30 percent from February 2020, a record high, to a crash in early March 2020 indicating that volatilities of equities and oil prices had spiked to crisis levels (Li, 2020). The spill-over effect on the world financial markets witnessed a plunge in their stock prices. The spill-over effect of oil crisis on stock prices was further supported by Le and Chang (2015) that changes in oil prices had a significant impact on stock market returns in Malaysia. Their study period included the Asian Financial Crisis in 1998. Le and Chang (2015) established that the immediate response of the Malaysian stock market was found to be positive, which afterwards turned negative in the four to nine months following the oil price shocks.

Ozili and Arun (2020) highlighted that firm profits were likely to be lower due to fear and uncertainty. The global stock markets erased about US$6 trillion in wealth in one week from 24 to 28 February 2020. However, they found that the impact of the social distancing policies on the country's stock market indices and economic activities were positive. They contended that the increasing number of confirmed coronavirus cases did not significantly affect the level of economic activities.

Alam et al. (2020) revealed that the market responded favourably with significantly positive average abnormal returns (AAR) during the lockdown period in their study of 31 companies listed on the Bombay Stock Exchange (BSE). On the contrary, negative AAR was found in the pre-lockdown period. They contended that this was because the government's action to impose a lockdown was seen as an effective way to stop the virus from spreading, and the reaction was reflected in the buoyant stock market returns. On the other hand, the negative AAR in the pre-lockdown period was due to global panic at the beginning of the pandemic.

Consistent with Alam et al. (2020) results, Narayan et al. (2020) showed that all policies, on aggregate, had positive effects on the G7 countries' stock market excess returns. However, nationwide lockdown influenced returns the most in the majority of the countries researched, followed by stimulus packages and travel bans. In Malaysia's context, where the MCOs were successfully enforced, had led to the flattening

of the Covid-19 curve (Abdul Rashid, 2020). Thus, we hypothesise that the stock market should have negative returns at the beginning of the MCOs H_1. However, it is expected to have positive returns once the pandemic is under control H_2.

The Effect of COVID-19 Detection on the Malaysian Stock Market

Bursa Malaysia tumbled during the initial MCO as investors sold securities due to the fear of expected economic impact caused by the virus (Aruna, 2020). It has been found that most of the Covid-19 research currently focuses more on specific countries (Ramelli & Wagner, 2020; 2020; Al-Awadhi et al., 2020). Except for a study by Ashraf (2020), who used daily confirmed new and death cases from 64 countries, and found that stock markets responded negatively to the growth in new confirmed cases. His findings showed that the stock markets reacted more on new confirmed cases rather than on the rise in the number of deaths. Generally, adverse market reaction was more robust during the early stages of the pandemic, while the stock markets responded at varying speeds to the Covid-19 news depending on the stage of the outbreak.

Ashraf's (2020) findings were consistent with Erdem (2020), where it was found that the pandemic had significant adverse effects on the stock market. They found that the growth in the number of new cases on stock returns was about three times more than that of growth in the number of deaths. Using the Freedom Index as their independent variable, they found that the impact on the stock market returns in freer countries was less than those in less-free countries for every increase in the number of cases per million. In addition, Lei and Wisniewski (2018) concurred that expropriation was more likely to happen in autocratic states (the opposite of democratic or free state) amid economic challenges. There was a likelihood of increased mismanagement of firms which can lower firm value during the uncertainty period. Malaysia is categorised as having a "flawed democracy", relatively lesser in terms of full democracy and freedom practices as assessed by the Democracy Index of the Economist Intelligence Unit (The Economist, 2020). With a record of 52/100 freedom index (Freedom House, 2020), Malaysia is considered as partly free or relatively low to moderate in terms of political rights and civil liberties freedom measurements. Thus, we hypothesise that

the numbers of new and death cases are expected to have a negative impact on stock returns H_3.

Stimulus Package and Stock Market Performance

To curb the effects of the Covid-19 pandemic, the Malaysian government has launched a total of RM295 billion worth of stimulus packages. The "caring package" or Prihatin economic stimulus package of RM250 billion (Povera, 2020) was announced on 27 March 2020, followed by drastic measures of a six-month loan moratorium offered by Bank Negara Malaysia (BNM) to reduce the financial impact of the lockdown orders. Of these, RM128 billion was distributed to protect the people's welfare, and RM100 billion was channelled to support businesses, including small and medium enterprises (SMEs). On 6 April, a special stimulus plan worth RM10 billion was announced, which was aimed at helping small and medium-sized enterprises (SMEs) in mitigating the impact of MCOs (Daim, 2020). An additional Short-Term Economic Recovery Plan (Penjana) with 40 initiatives worth RM35 billion was also announced on 5 June 2020 to alleviate the effects of the pandemic (Loheswar, 2020). Various measures such as prohibiting short selling were also taken by the Malaysian government to mitigate the capital market's challenges due to the MCO.

The announcement was well-received by the public, and a positive reaction in the stock market was evident (Zainul, 2020). The market reaction was also influenced by the situation in other economies as the process of globalisation has made economies worldwide become more interdependent. It increases synchronisation in the global stock markets, and are especially affected by the stock markets' movement in the United States. In accordance with the efficient market hypothesis (EMH), when investors perceive that news positively impacts the market then the investors will behave more optimistically. Conversely, if the investors perceive the news as bad, then sentiments become relatively pessimistic, and the market will indicate a downward trend. Based on this hypothesis, the stock prices reflect all available information, and stocks always trade at their fair value on exchanges. On the other hand, according to semi-strong EMH, it contends that security prices have factored in publicly available market information but not material non-public information. Superior gain is possible if material non-public information is available.

After the first MCO announcement in March 2020, the stock market's negative impact signalled a significant decline in earnings and a global economic recession (Liew & Surendran, 2020). However, with the stimulus packages' announcement, it was expected that the Malaysian market volume and participation would be stabilised. In the Prihatin stimulus packages, the loan repayment moratorium, which was estimated to be worth RM100 billion, resulted in around RM15 billion excess cash a month in the market. The liquidity in the market partly contributed to the rally in the stock market which was a surprise to many.

Nevertheless, Teng and Surendran (2020) attributed the rally to the government's low-interest rates policy. A low-interest-rate environment would motivate, especially institutional investors, to take greater risks to increase their returns. The low-interest-rate regime also encouraged personal and business spending, improved revenues and corporate earnings and thus better-expected stock returns. It was consistent with Ozili and Arun (2020) that a higher level of fiscal policy spending positively impacted economic activities. Thus, we hypothesise that the stimulus packages provided by the Malaysian government will have a positive impact on stock returns H_4.

METHODOLOGY

Data

This study investigated the effects of Covid-19 cases and the actions taken by the government, on the stock returns in Bursa Malaysia. The required data was extracted from Thomson Reuters Datastream database. The initial sample consisted of 826 public listed companies. Due to incomplete information for some companies, the final sample consisted of 760 companies listed on Bursa Malaysia. Daily stock prices, the market index and all financial data were obtained from the same database. The data was collected from 2 January 2020 to 31 July 2020 (144 observation days). The selected period would allow the analysis of the implication of the specific events between the announcement of the first Covid-19 cases in Malaysia and the announcement of the RMCO on the market returns in Malaysia. Event study was employed to assess the short-term impact of the pandemic

on the stock returns. The announcement dates of the MCOs (these include MCOs, CMCO, RMCO announcements) were selected as the event day. To investigate the impact of the announcements on stock prices, we set up three event windows consisting of 15 observation days: (-7, 0), (0, +7) and (-7, +7). The dates for each event (stimulus packages, MCOs and number of cases) were collected from various Internet sources.

Event Study Methodology

The event study methodology is an established method for measuring the abnormal stock returns when an event is announced (Song et al., 2011; Yazi, et al., 2015). The events include, for instance, announcements of the MCOs, announcements of the government stimulus packages, announcements of the economic sectors to resume operations or announcements of Covid-19 new or death cases. In assessing the abnormal returns of the stocks (the actual returns minus the required rate of returns), Capital Asset Pricing Model (CAPM) was employed to estimate the required rate of returns of the stocks:

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

where, $R(R_{it})$ is the required rate of return of stock *i* on day *t*. R_f denotes 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 is the beta measurement for stock *i* estimated from the historical betas' average for two years prior to the event date and were extracted from Datastream database. R_{mt} is the return of the benchmark index, Kuala Lumpur Composite 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 as follows:

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

Where,

AR_{it} is the daily abnormal returns of stock *i* on day *t*
R_{it} *is* the actual return of stock *i* on day *t*
$R(R_{it})$ is the required rate of return for stock *i* on day *t*

Then the average abnormal returns *(AAR)* for a sample of N stock for each day are calculated as follows:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \quad (3)$$

Where, *N* is the number of firms with abnormal returns on day *t.*

The cumulative average abnormal returns (CAAR) represents the average total effect of the event across all firms, thus:

$$CAAR_t = \sum_{i=1}^{n} AAR_{i,t} \quad (4)$$

To determine the significant value of the CAAR, the one sample t-test is conducted.

Regression Analysis

Multiple regression analysis was conducted to test the hypotheses by assessing the impact of Covid-19 cases based on the measures taken by the government (e.g. MCOs and stimulus packages) on stock market performance.

$$CAAR_t = \alpha + \beta_1 ln(KLCI)_t + \beta_2 ln(DJI)_{t-1} + \beta_3 ln(OIL)_{t-1} + \beta_4 NEW_t + \beta_5 DEATH_t + \beta_6 MCOst + \beta_7 STIMULUS_t + \mathcal{E}_t \quad (5)$$

where

$CAAR_t$ = cumulative average abnormal returns
$ln(KLCI)_t$ = natural log of KLCI index return;
$ln(DJI)_t$ = natural log Dow Jones Index return;
$ln(OIL)_t$ = natural log WTI crude oil return;
NEW_t = number of new cases;
$DEATH_t$ = number death cases;
$MCOs_t$ = dummy variable equal 1 on MCO announcement day + subsequent 4 trading days, and zero for otherwise;
$STIMULUS_t$ = dummy variable equal 1 on stimulus package announcement day + 4 subsequent days, and zero for otherwise.

The KLCI, DJI, and oil prices are used as the control variables as they might affect the CAAR (Lee & McKibbin, 2004) for model with dependent variable CAAR. While KLCI is used as the barometer for movements of the Malaysian market, DJI is used as the leadership of price in the world market that influences international investors to respond to news from the United States due to their greater liquidity, capitalization and cheaper transaction costs (Becker et al., 1995). The use of oil prices is in line with studies which have established the existence of a relationship between changes in oil prices and stock prices of oil exporting countries (Le & Chang, 2015; Salisu & Isah, 2017; Nusair & Al-Khasawneh, 2018). Le and Chang (2015) established that changes in oil prices have a significant impact on stock market returns in Malaysia. On the other hand, Salisu and Isah (2017) confirmed the existence of a nonlinear relationship between oil prices and stock prices where the relationship is found to be stronger among oil exporting countries and that rising oil prices increase stock returns only when stock markets are bullish while falling oil prices lower stock returns only when stock markets are bearish (Nusair & Al-Khasawneh, 2018).

The dummy variable equals to 1 was assigned to the MCO announcement dates and their subsequent four trading days (total of five trading days of observation). It was found that Bursa Malaysia did not reach its full efficiency level in a semi-strong form market. Mohammed et al. (2010) found that the CAAR still exhibited clear upward or downward trends even a few days after announcement dates. Thus, the observation of five trading days was to capture the short-term market reactions in a near efficient semi-strong form market.

FINDINGS AND DISCUSSION

This section is divided into two parts; (1) an event study methodology measuring the reaction of stock prices (CAAR) following Covid-19 events in Malaysia; and (2) regression analysis to determine the relationship of stock returns with Covid-19 events.

CAAR Analysis

Firstly, to gauge the impact of Covid-19 events on the Malaysian stock market, we chose specific events such as the announcement of

the first, 100th, 1000th, 5000th Covid-19 cases as well as the highest cases in one day in Malaysia. Besides that, relevant announcements made by the Malaysian government that could have had an economic implication such as MCO announcements, loan moratorium announcement, and announcements of various stimulus packages to boost the different economic sectors affected by Covid-19 were taken into consideration. The results of the CAAR and *t*-statistics for each of the chosen event windows are presented in Table 1.

Table 1

Selected Covid-19 Events and the Impact on CAAR of Malaysian Stocks

Date	Obs. Day	Event	CAAR (%)	*t*-statistic
3 – 25 Jan 2020	17	Announcement of first Covid-19 cases in Malaysia	3.37	3.2445***
3 Jan – 9 Mar 2020	46	Malaysia reached the 100th case mark	-0.98	9.3871***
15 – 31 Mar 2020	12	PM Tan Sri Muhyiddin Yassin announces the first 14-day MCO	-6.69	-12.2577***
18 – 31 Mar 2020	10	First MCO (18 – 31 March 2020)	-3.44	-20.7979***
3 Jan – 20 Mar 2020	55	Malaysia reached the 1,000th case mark	-10.47	2.8037***
3 Jan – 24 Mar 2020	57	KLSE suspends short selling	-9.43	1.7215**
3 Jan – 25 Mar 2020	58	Announcement of MCO extension until 14 April and moratorium	-11.05	1.2631
3 Jan – 27 Mar 2020	60	Announcement of PRIHATIN Stimulus Package	-9.63	0.5937
1 – 14 Apr 2020	10	Second MCO (1 – 14 April 2020)	10.43	0.0437

(continued)

Date	Obs. Day	Event	CAAR (%)	*t*-statistic
10 – 28 Apr 2020	13	Announcement of MCO extension until 28 April	6.18	6.1997***
3 Jan - 16 Apr 2020	74	Malaysia reached the 5,000th case mark	3.19	0.2525
15 – 28 Apr 2020	10	Third MCO (15 – 28 April 2020)	6.05	6.4990***
23 Apr – 12 May 2020	13	Announcement of MCO extension until 12 May	10.61	6.1997***
29 Apr – 12 May 2020	7	Fourth MCO (29 April – 12 May 2020)	6.70	11.3876***
3 Jan – 1 May 2020[1]	85	Announcement of economic sectors to resume operations 4 May 2020: Economic sectors resume operations	10.77	1.9211**
3 Jan – 5 June 2020	105	Announcement of highest case in one day, 277 cases	8.44	5.1688***
11 May – 9 June 2020	18	Announcement of Conditional MCO until 9 June	-6.31	19.1415***
13 May – 9 June 2020	17	Conditional MCO (13 May – 9 June)	-7.24	19.3970***
7 June – 31 July 2020	39	Announcement of Recovery MCO until 31 August	11.66	34.3054***
10 June – 31 July 2020	39	Recovery MCO (10 June – 31 Aug 2020)	11.95	36.5359***

Note: Significant at different levels: 1%, 5% and 10% denoted by *, **, ***, respectively.

Based on the results in Table 1, it can be seen that the announcement of the detection of the first Covid-19 cases in Malaysia did not have a negative impact on CAAR. Similarly, the announcement of the highest case in one day, also did not have a negative impact on CAAR. On the contrary, CAAR was found to be significant and positive on both dates.

However, the announcement of related Covid-19 events such as the 100th and 1000th case mark, were found to have had a significant and negative CAAR. The negative CAAR could be attributed to several events happening simultaneously during the time: (1) the rapid increase in positive Covid-19 cases i.e., new cases were in triple digits; (2) the announcement of the 100th and 1000th case mark were between a timespan of only two weeks; (3) the announcement of the first MCO; and (4) the announcement of the first two Covid-19 related deaths. These events were interpreted as negative news and absorbed by the Malaysian stock market.

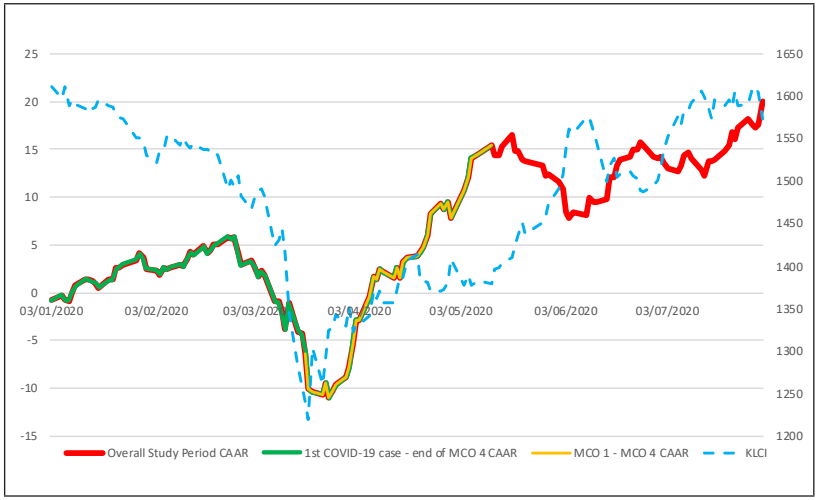
We also calculated the impact of the announcement of the 5000th case mark on CAAR but it was found to be positive and insignificant. We attributed the results to stock market investors being affected by the announcement in a dissimilar manner to the first 100th and 1000th case mark. It could also be attributed to the investors being reassured by the government of Malaysia of its actions in containing the spread of the virus; hence, an increase in Covid-19 cases no longer had the same effect on the stock market as before. Besides that, we also calculated the impact of MCO announcements on CAAR. It was found that the nnouncement of the first and second MCO had a significant and negative impact on CAAR. It reflected the absorption of information perceived by the market on the MCO's negative effects on Malaysia's various economic sectors. The MCO required all non-essential public and private entities to cease operations with employees being arequired to work from home. Moreover, in some industries, such as transportation, hotel and tourism, the MCO caused their revenue to deteriorate significantly. However, subsequent announcements of the 3rd and 4th MCO were found to be significantly positive which indicated that the economy had readjusted to the new normal brought by the MCO and it could also be attributed to the various stimulus packages announced by the Prime Minister within the same period. It should also be noted that the announcement of the conditional MCO (CMCO) was found to have had a significantly negative effect on CAAR, indicating the stock returns' negative reaction towards the news. On the other hand, the announcement of the recovery MCO (RMCO) was found to have had a significantly positive effect on CAAR.

Figure 1 depicts the CAAR from January 2020 to July 2020 for three events: (1) the announcement of the first Covid-19 before the start of

MCO 1; (2) beginning of MCO 1 until the end of MCO 4; and (3) the overall study period. Besides that, the movement of KLCI was also added as a comparison.

Figure 1

KLCI and CAAR from January to July 2020.



It can be seen from Figure 1 that the movement of CAAR for Malaysian stocks and KLCI as the main indicator of the stock market (Bursa Malaysia) are almost in tandem with each other, with some considerable differences. From 3 January to 3 March 2020 Malaysian stocks were on an incline while KLCI was declining. However, from the beginning of the first MCO announcement, both Malaysian stocks and KLCI declined sharply. As mentioned earlier, this could be due to several events that could have connoted negative market performance such as the imposition of MCO, the increase of Covid-19 cases to triple digits, and the first deaths due to Covid-19. However, CAAR rallied from the end of March, and since 7 April 2020, it could be seen that Malaysian stocks were experiencing positive CAAR. There was a sudden decrease in CAAR from the middle of May 2020 which could be attributed to the introduction of conditional MCO, which allowed most business sectors to resume operations yet movements were restricted such as curfews and social distancing. Next, we examine the impact of the first MCO to the fourth MCO on short-term CAAR. The results are shown in Table 2.

Table 2

Short-term Impact of MCO Events on CAAR of Malaysian Stocks

Date	Obs. Days / Event Window	Event	CAAR (%)	*t*-statistic
3 Jan – 31 July 2020	144	Overall data observations	20.11	9.9765***
3 Jan – 12 May 2020	73	First Covid-19 case until end of MCO 4	12.41	2.4862***
18 Mar – 12 May 2020	39	MCO 1 – MCO 4	16.49	0.7020
10 – 18 Mar 2020	(-7, t_0)	MCO 1	-6.76	-1.3656
18 – 26 Mar 2020	(t_o, +7)		-9.94	-8.0590***
10 – 26 Mar 2020	(-7, +7)		-12.69	-3.9538***
24 Mar – 1 Apr 2020	(-7, t_o)	MCO 2	-9.94	-8.0590***
1 – 9 Apr 2020	(t_o, +7)		6.55	-6.3426***
24 Mar – 9 Apr 2020	(-7, +7)		-1.78	-9.7708***
7 – 15 Apr 2020	(-7, t_o)	MCO 3	6.75	-0.4744
15 – 23 Apr 2020	(t_o, +7)		1.71	7.8244***
7 – 23 Apr 2020	(-7, +7)		12.01	1.5694*
21 – 29 Apr 2020	(-7, t_o)	MCO 4	4.33	7.9999***
29 Apr – 12 May 2020	(t_o, +7)		7.28	15.0091***
21 Apr – 12 May 2020	(-7, +7)		10.48	7.6132***

Note: t_0 is the announcement of the MCO /extension of the MCO

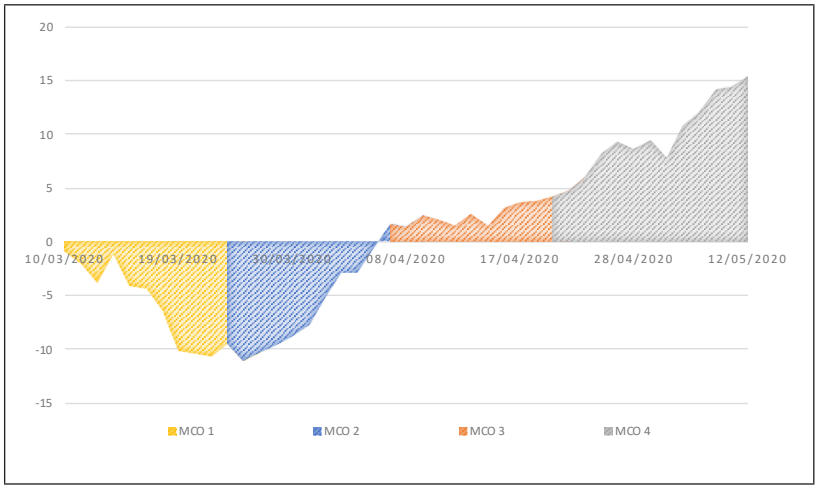
*, **, *** denote statistical significance at 1%, 5% and 10%, respectively.

The results in Table 2 show the three types of analysis: (1) the overall period of this study; (2) from the detection of the first Covid-19 case in Malaysia; and (3) throughout the duration of all four MCOs. Malaysian stocks have experienced a significant and positive CAAR (Figure 2) after mid-April which coincided with the flattening of the Covid-19 curve. The CAAR were positive before and after the announcements of MCO 3 and MCO 4. This indicated that investors do not view news of MCO extensions as negative. However, in the short-term, CAAR appeared to be negative throughout the period before and after the announcements of MCO 1 and MCO 2. Thus,

the findings supported hypotheses 1 and 2 that 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 reportedly under control, the returns were positive.

Figure 2

CAAR Chart from MCO 1 to MCO 4 Event Windows



Descriptive Statistics Analysis

Table 3

Descriptive Statistics

	CAAR	KLCI	WTI Crude Oil Price	No. of New Cases	No. of Death Cases	MCOs	Stimulus Package	DJI
Mean	6.2162	1481.65	37.60	41.72	0.5764	0.2083	0.1597	25720.73
Median	4.8201	1505.25	39.43	10.5	0	0	0	25868.12
Std. Dev.	7.4770	99.06	14.71	61.01	1.2932	0.4075	0.3676	2596.86
Min.	-11.05	1219.72	-37.63	0	0	0	0	18591.93
Max.	20.10	1611.42	63.29	277	8	1	1	29551.42
N	144	144	144	144	144	144	144	144

Table 3 presents the descriptive statistics of the variables. The observations were 144 days, from 3 January to 31 July 2020. The CAAR within this study period was between -11.05 percent and 20.10 percent with an average of 6.21. For KLCI, the lowest KLCI was 1219.72, and the highest was 1611.42, which was at the beginning of this study period. For crude oil prices, it was between -37.63 and 63.29 with an average of 36.60. Meanwhile, for DJI, the lowest was 18,591.93, and the highest was 29,551.42 with an average of 25,720.73.

Regression Results

Multiple regression analysis was conducted to identify variables which were most likely to affect both CAAR and KLCI. The regression analysis followed a base model consisting of only the control variables and an extended model to include the Covid-19 variables (Equation 5). In Model 1 and Model 2, CAAR was selected as the dependent variable while KLCI, the benchmark for market performance, crude oil price and the Dow Jones Industrial Average (DJI) were selected as control variables. The number of new cases, number of death cases, dummy variable for MCO and dummy variable for the injection of stimulus packages were selected as Covid-19 specific variables. Model 3 and Model 4 used KLCI as the dependent variable. The purpose was to compare the effects of the Covid-19 specific variables on CAAR as well as the benchmark index.

We performed the regression analysis firstly with the control variables and later added all the Covid-19 variables. From the first regression (Table 4), Model 1 indicated that all our control variables were significant in affecting CAAR where both the DJI and crude oil price were significant and negative in affecting CAAR while KLCI was found to be significantly positive in affecting CAAR. In Model 2, except for the MCO dummy variable, all the other Covid-19 variables had a significant and negative effect on CAAR.

In Model 3, we found that the control variables, DJI and crude oil prices were significantly positive in affecting KLCI. In Model 4, when Covid-19 variables were added, it was found that only the announcements of new Covid-19 cases were significant and negatively affected KLCI. All other Covid-19 variables were insignificant in affecting KLCI.

Table 4

Multiple Regression: The Impact of Covid-19 on CAAR and KLCI

	Dependent Variable: CAAR				Dependent Variable: KLCI			
	[1]		[2]		[3]		[4]	
	Coef.	t-Stat.	Coef.	t-Stat.	Coef.	t-Stat.	Coef.	t-Stat.
CONSTANT	-667.947	-7.575***	-461.096	-4.816***	-5178.124	-8.784***	-4355.036	-6.440***
	[88.180]		[95.733]		[589.525]		[676.250]	
LNKLCI	127.987	7.854***	117.810	7.657***				
	[16.296]		[15.386]					
LNDJI	-22.211	-2.012**	-34.942	-3.334***	633.896	10.128***	558.953	7.997***
	[11.041]		[10.479]		[62.587]		[69.898]	
LNOIL	-9.673	-4.352***	-10.070	-4.640***	63.437	3.942***	49.248	2.836***
	[2.222]		[2.170]		[16.094]		[17.366]	
NEW CASES			-.023	-1.847*			-.189	-1.905*
			[0.012]				[.099]	
DEATH CASES			-1.226	-2.349**			-1.929	-.451
			[0.522]				[4.278]	
MCOS			1.088	.792			-17.994	-1.615
			[1.374]				[11.138]	
STIMULUS PACKAGE			-3.206	-2.197**			4.610	.386
			[1.459]				[11.956]	
R^2	0.384		0.499		0.795		0.806	
ADJ. R^2	0.370		0.473		0.792		0.797	
F STAT.	28.647***		19.102***		271.478***		93.902***	
N	144		144		144		144	

Note: Standard errors are in parentheses. Significant at different levels: 10%, 5%, and 1% denoted by *, **, ***, respectively.

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Table 5

Split-window Period: The Impact of Covid-19 on CAAR

	Dependent Variable: CAAR 3 January–6 April 2020				Dependent Variable: CAAR 7 April–31 July 2020			
	[5]		[6]		[7]		[8]	
	Coef.	t-Stat.	Coef.	t-Stat.	Coef.	t-Stat.	Coef.	*t*-Stat.
CONSTANT	-5.559	-.086	112.003	1.264	-181.175	-1.358	71.847	.735
	[64.860]		[88.635]		[133.438]		[97.728]	
*LN*KLCI	-45.392	-3.420***	-66.134	-4.002***	3.901	.181	-14.938	-1.007
	[13.273]		[16.525]		[21.534]		[14.841]	
*LN*DJI	29.904	4.279***	32.326	4.967***	14.236	.615	2.495	.156
	[6.989]		[6.508]		[23.130]		[15.988]	
*LN*OIL	8.724	4.272***	11.173	3.718***	5.859	2.961***	7.502	4.930***
	[2.042]		[3.005]		[1.979]		[1.522]	
NEW CASES			-.017	-1.730*			-.031	-4.561***
			[.010]				[.007]	
DEATH CASES			.294	1.013			-.655	-1.617
			[.291]				[.405]	
MCOS			-.364	-.289			.783	.928
			[1.261]				[.844]	
STIMULUS PACKAGE			2.527	3.215***			-5.822	-5.782***
			[.786]				[1.007]	
R^2	0.797		0.842		0.412		0.741	
ADJ. R^2	0.787		0.823		0.388		0.715	
F STAT.	81.179***		44.114***		17.041***		28.248***	
N	66		66		78		78	

Note: Standard errors are in parentheses. Significant at different levels: 10%, 5%, and 1% denoted by *, **, ***, respectively.

Due to the difference between the results of CAAR and KLCI, we divided the period into two windows, from 3 January to 6 April 2020 as the first window period and from 7 April to 31 July 2020 as the second window period. The date 6 April was chosen as the end of the first window period because this was the turning point where CAAR was zero and from 7 April onwards, CAAR was positive (Figure 1 and Figure 2). The results are shown in Table 5.

When the period was split, it was found that all control variables were significant in affecting the CAAR in the first window period. However, in the second window period, it was found that only crude oil prices were significant in affecting CAAR. Both the KLCI and DJI were found to be insignificant in affecting CAAR. For Covid-19 variables, it was found that in the first window period only the stimulus package was positively significant in affecting CAAR. The other variables were found to be insignificant. However, for the second window period, it was found that both new Covid-19 cases and the stimulus package were negatively significant in affecting CAAR while the other Covid-19 variables were found to be insignificant. Overall, oil prices had a significant positive effect in both the window periods, indicating that oil prices were an important factor in determining market sentiment. The number of new cases reported had negatively affected the CAAR in both the window periods and was significant throughout all the models. It showed that market participants were very cautious about the uncertainty posed by the development of the pandemic. Since Malaysia's political and civil liberties rights index showed a partly free with relatively low to moderate score (52/100), our results showed support of hypothesis 3 where the number of new and death cases are expected to impact stock returns due to overreaction and lack of confidence in the number of cases reported (Erdem, 2020). The unprecedented political turmoil, which saw a sudden change in the government during the onset of the Covid-19 outbreak, could possibly further justify the negative impact of the stock returns (BBC, 2020).

For Hypothesis 4, that the stimulus packages should positively impact CAAR was only supported in model 6, which was only during the early stage of the MCO periods. For the subsequent period, the indication was negative. The positive impact during the early stage was consistent with the EMH that the market perceived that the

stimulus would positively impact companies and the economy. At the later stage, all the information was already reflected in the stock market prices, the impact on the subsequent incremental assistance might not be obvious then, and thus the results could be distorted by other factors.

CONCLUSION

This study examined the effects of Covid-19 cases and the Malaysian government's measures on stock market returns. The study used market data extracted from Thomson Reuters Datastream database to measure the abnormal returns. The final sample consisted of 760 companies listed on Bursa Malaysia. The event study method and capital asset pricing model were used to assess the pandemic's short-term impact on stock returns.

The findings were consistent with Alam et al. (2020) that the market reacted positively with significantly positive CAAR during the lockdown period. We found significant positive CAAR after MCO 3 and MCO 4 as the government has allowed almost all sectors to resume their business (Anis, 1 May 2020). The relaxation of the MCOs was in line with expectations that people were eager to go back to work as livelihoods were affected due to the two months' lockdown. Besides, the huge amount of stimulus packages has provided large liquidity in the market, and a low-interest rates regime may also lead to positive abnormal returns. The negative CAAR during the early stage of MCO reflected the panic and uncertainty posed by the pandemic.

As Malaysia is relatively low in the freedom index, it was expected that people were inclined to comply with the regulations and government orders, and therefore the MCO was successfully enforced. However, as contended by Erdem (2020), less free countries are associated with autocratic states, leading to mismanagement during uncertain times and lower firm values and negatively affecting stock market performance. Thus investors in less-free countries such as Malaysia could lack trust; that the number of cases was being underreported, and therefore they overreacted to the announcements as compared to the freer countries.

Consistent with the EMH, the stimulus package was impactful at the beginning of the MCO periods. It had a significant positive impact on the CAAR. The implication on EMH can be linked to the level of freedom of the country in terms of information transparency as stock prices absorb information in relation to how the government manages the spread of Covid-19 and how investors perceive the effect will be on business operations and performance. At the later stage, the effects on the subsequent incremental assistance may not be that impactful. The results could be distorted by other factors, such as the long period of MCOs, which was extended to 31 December 2020 including political instability. The study was limited in its analysis to July 2020 when the MCO was still enforced. Future investigations should extend the research to cover the whole MCO period and to include macroeconomic variables such as interest rates, liquidity, and the performance of specific sectors during the pandemic.

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