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# Impact of Movement Control Order on Risk-Adjusted Performance of the Malaysian Real Estate Investment Trusts (M-REITs)

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**Abstract**

The first Movement Control Order (MCO) implemented by the Malaysian government from 18th March 2020 to 3rd May 2020 was unprecedented. Since Malaysia was only mildly affected by previous epidemics or pandemics unlike the COVID-19, studies of the pandemic impact on the performance of Malaysian firms and M-REITs in specific were limited. To close this gap, this study compares Sharpe ratio, Treynor ratio and Jensen Alpha ratio of 18 M-REITs for sub-periods before, during and after the MCO. Paired sample t-test results for all these three risk-adjusted performance measures consistently show that M-REITs significantly performed better during the MCO compared to before the MCO as well as after the MCO compared to before the MCO. The results suggest that the business model and portfolio of real estate managed by M-REITs are resilient against both systematic and unsystematic risk factors, and imply that the intrinsic value of M-REITs is not significantly affected by the market uncertainty caused by movement restriction. The findings also bolster investors' confidence to include M-REITs as part of their diversified investment portfolio to achieve sustainable return performance in the post-Covid period. To remain resilient and sustainable, the management of M-REITs should diversify the portfolio of properties and real estate they managed since the movement restriction had varying repercussions on different types of real estate. Rooms for further diversification are justified by a larger percentage of M-REITs having positive Treynor ratios after the MCO sub-period if compared to positive Sharpe ratios. A well-diversified portfolio managed by an M-REIT can reduce unsystematic risk, which is part of the total risk measured by standard deviation, eventually moving towards a positive Sharpe ratio.

*Keywords*: Movement Control Order, real estate investment trusts, Sharpe ratio, Treynor ratio, Jensen Alpha ratio



## 1.0 INTRODUCTION

Real estate investment trusts (REITs) are companies which own and actively manage a portfolio of income-producing commercial real estate. Types of real estate operated by REITs could include hotels, resorts, shopping centres, hospitals, healthcare facilities, office buildings, warehouses and apartment buildings. In November 2014, equity REITs has been recognised as a distinct asset class in the Global Industry Classification Standard by Standard & Poor's (S&P) and Morgan Stanley Capital International (MSCI). REITs pool funds from investors and will distribute a minimum of 90 percent of their net profit each year as dividends to investors (Jing & Samsudin, 2018). Recurring rental and leasing incomes generated from commercial real estate owned provide stable earnings and dividends to investors in REITs.

Malaysia was the first Asian country to introduce Listed Property Trust (LPT) in 1989. However, LPTs failed in general due to a restricted regulatory framework (Tee & Choong, 2022) and a deficiency in tax incentives (Newell, 2012). After the Securities Commission Malaysia revamped the REIT guidelines in 2005, Axis REIT was the first REIT listed on Bursa Malaysia (which is the stock exchange of Malaysia), followed by 9 others in 2006 and 2007. In 2006, the first Islamic REIT (I-REIT), Al-Aqar Healthcare REIT, was listed. Today, there are 19 REITs listed on Bursa Malaysia. At the end of the fourth quarter of 2022, the aggregate market value of 19 M-REITs was US$ 8.87 billion (MYR 39.07 billion), contributed 20.77 percent and 9.41 percent to the total market size of REITs in the Asia Pacific market and emerging market, respectively (EPRA Total Markets Table 2022, 2022).

On 31st December 2019, the first outbreak of the Novel Corona Virus Disease (COVID-19) was reported in Wuhan, China. With many countries worldwide reporting confirmed cases at the beginning of 2020, World Health Organization (WHO) has declared COVID-19 to be a global pandemic. Countries across the globe started to implement measures such as lockdowns of national borders and movement restrictions on their people within the community to break the chain of infection and prevent widespread of the pandemic. This COVID-19 pandemic has not only affected the normal lifestyles of people all over the globe but also seriously disrupted the operations of many businesses. Tourism-related industries such as airlines, hotels, resorts and tourist spot operators are the first to feel the impact. In

addition, during the period of movement restriction, shopping malls and retail stores are closed, except for those selling essential goods and services to households.

In Malaysia, the sudden surge of positive cases arising from the Sri Petaling cluster in early March 2020 has forced the federal government to implement the Movement Control Order (MCO) effective from 18th March 2020. This MCO period was extended until 3rd May 2020. The subsequent Conditional Movement Control Order (CMCO) effective from 4th May 2020 to 9th June 2020 has allowed some sectors to resume their business operations by fulfilling certain standard operating procedures. The MCO period has had a profound consequence on the Malaysian economy and financial markets. Povera et al. (2020) reported that the Malaysian economy suffered RM 63 billion (USD 14.68 billion) in losses during the MCO period, averaging RM 2.4 billion (USD 0.56 billion) daily. Travelling restrictions and aversion have seriously hit tourism-related industries such as airlines, hotels and entertainment. Disruption of the global supply chain and international trade activities have also affected the production and inventory management of manufacturing industries as well as the sales demand of retail industries.

The outbreak of COVID-19 shook global stock markets and wiped out over 20 percent of their value in the first quarter of 2020. The significant slumps in the value of several stock indices including Nasdaq 100 and S&P 500 were triggered by the panic selling among investors when lockdowns are implemented in the country. The Malaysian stock market has no exception to being dampened by the MCO with a wild rout triggered by investors' worries over movement restrictions to business performance. The FTSE Bursa Malaysia (FBM) KLCI Index on the second day of MCO 1.0 dipped to its lowest level in 11 years since 7 October 2009 as investors liquidated their shares for cash. The year-to-date FBM KLCI was down by 23.2 percent (refer to Table 1). More than half of the component stocks in the FBM KLCI have seen their share prices decline by double digits. The losses were compounded by economic fears over an escalating COVID-19 pandemic.

The services sector, which has always been less susceptible to economic cycles, as opposed to construction or manufacturing, was the first to suffer the impacts of movement restrictions. Most of the M-REITs invest in commercial retail and office (refer to Table 1) are highly related to the services industry. As shown in Table 1, the performance of M-REITs has recorded double-digit losses immediately after the lockdown is implemented, except for a few. Despite the fact that the Bursa Malaysia REIT index was down by 19 percent on a year-to-date basis, it has outperformed the market due to its defensive characteristics. In the past, M-REITs have been attractive to investors because they offered stable rental and capital growth, in addition to their mandatory dividend payout.

**Table 1** REITs Listed on Bursa Malaysia and Year-To-Date (YTD) Price Performance of M-REITs, FBM KLCI and REITs Index (Source: Bursa Malaysia, 2021)

| M-REIT | Specialised or Diversified | Portfolio | Closing Price on 31/12/2019 | Closing Price on 19/3/2020 | % change |
|---|---|---|---|---|---|
| Capitaland | Specialised | Retail | 1.00 | 0.785 | -21.5 |
| Hektar | Specialised | Retail | 0.99 | 0.595 | -39.9 |
| IGB | Specialised | Retail | 1.89 | 1.57 | -16.9 |
| KIP | Specialised | Retail | 0.86 | 0.635 | -26.2 |
| Tower | Specialised | Office | 0.82 | 0.55 | -32.9 |
| UOA | Specialised | Office | 1.23 | 1.10 | -10.6 |
| Atrium | Specialised | Industrial | 1.04 | 0.88 | -15.4 |
| Al-'Aqar | Specialised | Healthcare | 1.32 | 1.27 | -3.8 |
| KLCC | Diversified | Retail, office | 7.90 | 7.60 | -3.8 |
| Pavilion | Diversified | Retail, office | 1.74 | 1.51 | -13.2 |
| Amanah Harta | Diversified | Retail, office | 0.765 | 0.58 | -24.2 |
| Sunway | Diversified | Retail, office, hotel | 1.82 | 1.55 | -14.8 |
| AmFirst | Diversified | Retail, office, hotel | 0.495 | 0.36 | -27.3 |
| Al-Salam | Diversified | Retail, office, industrial | 0.81 | 0.60 | -25.9 |
| Amanah Raya | Diversified | Retail, office, industrial | 0.74 | 0.51 | -31.1 |
| MRCB-Quill | Diversified | Retail, office | 1.00 | 0.51 | -49.0 |
| Axis | Diversified | Office, industrial | 1.77 | 1.86 | 5.1 |
| YTL | Diversified | Hotel, hospitality | 1.36 | 0.75 | -44.9 |
| **FBM KLCI** | | | 1,588.76 | 1,219.72 | -23.2 |
| **REITs Index** | | | 962.81 | 780.16 | -19.0 |

A firm's primary objective is to maximise its shareholders' wealth, which would in turn maximise the capital gain and dividend yield in an efficient market. In other words, the market share price reflects the expectation of the investors on a firm's future performance. Panic among market investors during the pandemic becomes a particular concern on whether they can form rationale fair value expectation on businesses and M-REITs in specific. Since Malaysia was not affected by previous epidemics or pandemics such as Severe Acute Respiratory Syndrome (SARS), Middle-East Respiratory Syndrome (MERS) and Ebola Virus Disease (EVD) to a similar extent alike the current COVID-19 pandemic, there were very limited studies on how epidemic or pandemic affects the value of Malaysian firms and M-REITs in specific. Previous studies on the impact of SARS include Siu and Wong (2004), Smith (2006) and Tew, Lu, Tolomiczenko and Gellatly (2008), while Joo, Maskery, Berro, Rotz, Lee and Brown (2019) studied the impact of MERS. To close the research gap, this study aims to examine the impact of lockdown in Malaysia on the performance of individual M-REITs. This paper differs from previous studies in that it attempts not only to measure the impact of lockdown due to pandemic on the performance of individual M-REITs instead

of the REIT sectorial index in Malaysia but also compares three different risk-adjusted performance measures (Sharpe ratio, Treynor ratio and Jensen Alpha ratio) of individual M-REITs before, during and after MCO period to further analyse how M-REITs react to systematic and unsystematic risk factors. The findings of this study can contribute to the literature on M-REITs and provide recommendations to M-REIT investors as well as the management of M-REITs.

## 2.0 LITERATURE REVIEW

Lee, Jais, and Chan (2020) study investigated the impact of positive and death Covid-19 cases in Malaysia, China and the United States as well as financial market volatility during the pandemic on the year-to-date return of FTSE Bursa Malaysia Kuala Lumpur Composite Index (KLCI) and the 13 sectorial indices in bursa Malaysia. The findings showed that KLCI and all the sectorial indices are adversely affected by positive Covid-19 cases in Malaysia, except for the REIT sectorial index. However, results also showed that the higher the number of death cases in Malaysia increases the performance of the REIT sectorial index. This indicated that the REIT sector was a defensive sector during the Covid-19 outbreak. In addition, higher financial market volatility has adversely affected the performance of KLCI and all the sectorial indices, except for REIT sectorial index.

According to Akinsomi (2021), movement restrictions were initiated in the top REIT markets in the world that made up the FTSE EPRA Global REIT Index, including the United States, the United Kingdom, Japan, Australia, Brazil and South Africa. The restriction has brought significant effects on the revenues and cash flows of a business. As a result, businesses are having difficulty paying rentals, service banks loans and disbursing salaries to employees. To aid those moderately and greatly affected retailers, owners of retail and listed REITs in South Africa formed the Property Industry Group led by the CEO of the largest REIT in South Africa to offer 40% to 100% rental deduction during the months from April to June.

In Mexico, Chiu, Rubio, Arguelles, and Poo (2020) found that the REIT sector index fell by 36.7% between 28th February 2020 and 23rd March 2020. Within the three weeks after the first contagion was announced in Mexico, most of the individual REITs certificate prices have yielded unfavourable performance, with declines of between 8% and 42%. On 30th June 2020, 4 out of 15 listed REITs recorded more than 30% fall in prices compared to 31st December 2019. During the same period, REIT sector index fell by 19.5%.

Besides, Akinsomi (2021) also explored the performance of global REITs during the periods of pre-COVID and COVID. Performance of REITs in major European countries had been negatively affected, whereby REITs in France, the United Kingdom and Germany recorded -35%, -24% and -16% rates of return respectively over the period from pre-COVID in January 2020 to during COVID in April 2020.

According to Schnure (2020), the lockdown restriction has affected many businesses across the economy to a nearly complete shutdown condition. Most businesses are struggling to pay the monthly rentals and around ten million or more employees have lost their jobs which caused the rate of unemployment to increase rapidly. In turn, the deterioration of businesses had negatively affected the performance of commercial real estates and REITs. More specifically, the pandemic had catalysed the decrease in demand for leased space in the first quarter of the year, and it would be worsening until the economy resume its normal operations. During that period, the vacancy rate increased and the rental rate decreased.

The pandemic had closed down the travel sector and related industries globally since most countries had restricted and stopped international travel to prevent the increase in positive cases. Thus, the hospitality industry was the most severely affected due to the lack of global travel. In Malaysia, Jaafar (2020) reported that Sunway REIT's property income fell by 9% to RM103.51 million (USD 23.98 million) at the end of March 2020 from RM113.77 million (USD 27.87 million) a year ago. At the same time, both the retail and hotel sectors' property income fell by 7% respectively. Sheel (2020) study on the United States hotel industry found that the occupancy rate, average daily rate and revenue per available room sharply declined for the period from January until August 2020 compared to previous years were a direct consequence of the Covid-19 pandemic. Journal of Hospitality Financial Management (JHFM) index for hotel industry stocks yielded negative and shockingly low market premiums this year on an average (-9.8%, -37.96% and -15.34% for the Lodging, Hotel-Motel REIT and overall hotel industry indices respectively). Lodging Index consists of the 10 largest market-cap firms in the lodging sector. Hotel-Motel REIT stock Index consists of the 10 largest hotel-motel REIT firms currently trading in U.S. equity markets.

Sebastian (2021) explored the impact of the Covid-19 pandemic on the stock market return of Singapore REITs (S-REITs). S-REITs had undergone tremendous growth since their inception in 2002, where there were 42 S-REITs with aggregate market capitalization reaching more than SGD 100 billion (USD 73.96 billion) as of the end of 2020. The study adopted an event study methodology based on key announcement dates on which the Singapore government released information pertaining to the spread and control measures of the pandemic. Using the event study regression model, mixed reactions in abnormal returns were observed. The hospitality REITs sector was more affected by the pandemic, but not the stock market in general. The author argued that the stock market sometimes may not be a good representation of the state of the economy.

## 3.0 METHODOLOGY

The sample for this research consists of all the 18 M-REITs listed on Bursa Malaysia throughout the sampling period. These include Al'Aqar Healthcare REIT, Al-Salam REIT, Amanah Harta Tanah PNB, Amanah Raya REIT, AmFirst REIT, Atrium REIT, Axis REIT, Capitaland Malaysia Mall Trust, Hektar REIT, IGB REIT, KIP REIT, KLCC Property Holdings, MRCB-Quill REIT, Pavilion REIT, Sunway REIT, Tower REIT, UOA REIT and YTL Hospitality REIT. The sampling period for this research is from 7th February 2020 to 24th June 2020, which will be further divided into three sub-periods. Before the MCO period (BMCO) started on 7th February 2020 and ended on 17th March 2020, during MCO period (DMCO) started on 18th March 2020 and ended on 3rd May 2020, while after the MCO period (AMCO) started on 4th May 2020 and ended on 24th June 2020. Each of these sub-periods covers 32 trading days on Bursa

Malaysia. The daily closing price of all the M-REITs and the FTSE Bursa Malaysia Kuala Lumpur Composite Index (FBM KLCI) are collected from the Bloomberg database. In addition, the annualised yield of Malaysian Treasury Bills which is a proxy for the risk-free rate of return is collected from the Bank Negara Malaysia database.

From these daily closing prices, daily returns $r_t$ for each M-REIT is computed, where $r_t = (P_t - P_{t-1}) / P_{t-1} \times 100\%$. $P_t$ refers to M-REIT closing share price on day t, while $P_{t-1}$ refers to M-REIT closing share price on day t-1. Then, by summing up daily returns $r_t$ in the respective sub-periods of BMCO, DMCO and AMCO and dividing by 32 trading days in each sub-period, the average daily return $r_i$ for each M-REIT in each sub-period is computed, associated with the standard deviation of daily returns $\sigma_i$. Similarly, daily market return $r_m$ is computed, where $r_m = (I_t - I_{t-1}) / I_{t-1} \times 100\%$. $I_t$ indicates the FBM KLCI closing market index on day t, while $I_{t-1}$ indicates the FBM KLCI closing market index on day t-1. Then, by summing up daily returns $r_m$ in the respective sub-periods of BMCO, DMCO and AMCO and dividing by 32 trading days in each sub-period, the average daily market index return $R_m$ in each sub-period is computed. In addition, daily risk-free rate of return $R_f$ is computed by dividing the risk-free rate of return per annum by 365 days.

Three risk-adjusted performance measures are used as parameters to compare the M-REITs' performance in this study, which are the Sharpe ratio, Treynor ratio and Jensen Alpha ratio. These measures are calculated for each M-REIT in each sub-period (BMCO, DMCO and AMCO).

Sharpe ratio measures return earned in excess of the risk-free rate of return per unit of total risk, stated in times.

$$\text{Sharpe ratio} = (r_i - R_f) \div \sigma_I \quad \text{(Eqn. 1)}$$

Treynor ratio measures return earned in excess of the risk-free rate of return per unit of systematic risk, stated in %. Beta $\beta_i$ which measures the systematic risk of each respective M-REIT is obtained by regressing daily M-REIT returns $r_t$ against daily FBM KLCI returns $r_m$.

$$\text{Treynor ratio} = (r_i - R_f) \div \beta_i \quad \text{(Eqn. 2)}$$

Jensen Alpha ratio measures the abnormal return over the required return calculated from the Capital Asset Pricing Model (CAPM), stated in percentage (%).

$$\text{Jensen Alpha ratio} = r_i - [R_f + \beta_i(R_m - R_f)] \quad \text{(Eqn. 3)}$$

From the daily FBM KLCI returns computed, the average daily market return ($R_m$) obtained were -0.60% for the BMCO period, 0.37% for the DMCO period and 0.18% for the AMCO period. Annualised yield of the 3-month Malaysian Treasury bills of 2.65% for the BMCO period, 2.29% for the DMCO period and 2.15% for the AMCO period were used as the proxy for risk-free rate of return. At such, the daily risk-free rate of return ($r_f$) applicable to these three sub-periods were 0.00726%, 0.00627% and 0.00589% respectively.

By using these three risk-adjusted measures, this study can further analyse how the individual M-REITs react to both systematic and unsystematic risk factors across the three sub-periods of MCO. Systematic risk measured by beta is captured by all three risk-adjusted measures, but the unsystematic risk is only captured by the Sharpe ratio as it considers total risk. Systematic risk, also known as market risk or non-diversifiable risk, refers to changes in any factor that generally affects the performance of almost all firms in the economy. On the other hand, unsystematic risk, also known as diversifiable risk, company-unique risk or firm-specific risk, refers to changes in any factor specifically associated with a firm only which influences its performance. In this study, business challenges and restrictions during the MCO can be considered as a systematic risk factor, while types of real estate in the portfolio managed by individual M-REITs can be considered as an unsystematic risk factor. Individual M-REITs can eliminate their exposure to unsystematic risk if their management manages a well-diversified portfolio of properties and real estate. Fundamental performance measures commonly found in past REITs literature such as net property income, return on equity, total share return and Tobin's Q are not selected for this study because these measures can only be obtained annually from annual reports, thus not suitable to achieve the objective of this study.

Once all the performance measures are calculated for each M-REIT in each sub-period, two-tailed paired sample t-tests will be conducted to compare the mean risk-adjusted performance of M-REITs for BMCO versus DMCO, DMCO versus AMCO as well as BMCO versus AMCO. The results obtained will then be used to determine whether the null hypothesis of the following hypotheses is rejected or otherwise.

H1: There is a significant difference between mean Sharpe ratio of M-REITs for BMCO and DMCO periods.
H2: There is a significant difference between mean Sharpe ratio of M-REITs for DMCO and AMCO periods.
H3: There is a significant difference between mean Sharpe ratio of M-REITs for BMCO and AMCO periods.
H4: There is a significant difference between mean Treynor ratio of M-REITs for BMCO and DMCO periods.
H5: There is a significant difference between mean Treynor ratio of M-REITs for DMCO and AMCO periods.
H6: There is a significant difference between mean Treynor ratio of M-REITs for BMCO and AMCO periods.
H7: There is a significant difference between mean Jensen Alpha ratio of M-REITs for BMCO and DMCO periods.
H8: There is a significant difference between mean Jensen Alpha ratio of M-REITs for DMCO and AMCO periods.
H9: There is a significant difference between mean Jensen Alpha ratio of M-REITs for BMCO and AMCO periods.

## 4.0 RESULTS AND DISCUSSION

Table 2 summarises the Sharpe ratio of all the 18 M-REITs for the sub-periods of BMCO, DMCO and AMCO. All the M-REITs recorded a negative Sharpe ratio for the BMCO period. In contrast, 17 out of the 18 M-REITs (94.4 percent) generated a positive Sharpe ratio for the DMCO period. For the AMCO period, the results were mixed with 10 (or 55.6%) M-REITs having a positive Sharpe ratio and the other 8 having a negative Sharpe ratio.

**Table 2** Sharpe ratio of M-REITs before, during and after MCO

| | Sharpe Ratio | | |
|---|---|---|---|
| **M-REITs** | **Before MCO** | **During MCO** | **After MCO** |
| Al'Aqar | -0.2335 | 0.0740 | -0.0234 |
| Al-Salam | -0.3228 | 0.0889 | -0.0079 |
| Amanah Harta | -0.3243 | 0.1002 | -0.0754 |
| Amanah Raya | -0.3883 | 0.1089 | 0.0731 |
| AmFirst | -0.5789 | 0.1180 | 0.0295 |
| Atrium | -0.3050 | 0.1885 | 0.0464 |
| Axis | -0.1214 | 0.1571 | 0.1304 |
| Capitaland | -0.4368 | 0.0985 | -0.0897 |
| Hektar | -0.4865 | 0.0924 | -0.1405 |
| IGB | -0.2957 | 0.0885 | 0.0696 |
| KIP | -0.3413 | 0.1798 | -0.1130 |
| KLCC | -0.2813 | 0.0907 | 0.0223 |
| MRCB-Quill | -0.5119 | 0.1166 | -0.0703 |
| Pavillion | -0.2451 | 0.0764 | 0.0084 |
| Sunway | -0.3573 | -0.0354 | 0.0443 |
| Tower | -0.4905 | 0.1102 | 0.0369 |
| UOA | -0.3086 | 0.1154 | -0.0855 |
| YTL | -0.4470 | 0.0268 | 0.1078 |

Table 3 summarises the Treynor ratio of all the 18 M-REITs for the sub-periods of BMCO, DMCO and AMCO. Alike the Sharpe ratio, all the 18 M-REITs still recorded a negative Treynor ratio for the BMCO period. This indicates that both systematic and unsystematic risk factors have quite similar influences on M-REITs. In contrast, there were 15 (83.3%) M-REITs generated a positive Treynor ratio for the DMCO period. For the AMCO period, 12 (66.7%) M-REITs have a positive Treynor ratio, while 6 others have a negative Treynor ratio. For the AMCO period, it is worth noting that a larger percentage of the M-REITs have positive Treynor ratio (66.7%) as opposed to a positive Sharpe ratio (55.6%). This finding could be attributable to exposure to unsystematic risk factors such as a portfolio of properties managed by M-REITs was insufficiently diversified. As shown in Table 1, there were 8 out of 18 M-REITs specialised in managing one type of real estate property only. Furthermore, 6 out of the 10 diversified M-REITs only managing two types of real estate properties. These indicate that majority (14 out of 18, or 77.8%) of the M-REITs were insufficiently diversified.

**Table 3** Treynor ratio of M-REITs before, during and after MCO

| | Treynor Ratio | | |
|---|---|---|---|
| **M-REITs** | **Before MCO** | **During MCO** | **After MCO** |
| Al'Aqar | -0.0972 | 0.0022 | -0.0013 |
| Al-Salam | -0.0549 | 0.0755 | 0.0018 |
| Amanah Harta | -0.0273 | 0.0199 | -0.0028 |
| Amanah Raya | -0.0186 | 0.0086 | 0.0037 |
| AmFirst | -0.0169 | 0.1162 | 0.0007 |
| Atrium | -0.0147 | 0.0119 | 0.0015 |

| | | | |
|---|---|---|---|
| Axis | -0.0063 | -0.0062 | 0.0222 |
| Capitaland | -0.0248 | -0.0295 | -0.0041 |
| Hektar | -0.0394 | 0.0062 | -0.0033 |
| IGB | -0.0240 | 0.0055 | 0.0067 |
| KIP | -0.0270 | 0.0114 | -0.0032 |
| KLCC | -0.0052 | 0.0018 | 0.0012 |
| MRCB-Quill | -0.0323 | 0.0227 | 0.0057 |
| Pavillion | -0.0159 | 0.0018 | 0.0006 |
| Sunway | -0.0136 | -0.0012 | 0.0022 |
| Tower | -0.0213 | 0.0147 | 0.0057 |
| UOA | -0.0075 | 0.0037 | -0.0007 |
| YTL | -0.0371 | 0.0043 | 0.0515 |

Table 4 summarises the Jensen Alpha ratio of all the 18 M-REITs for the sub-periods of BMCO, DMCO and AMCO. For the BMCO period, only 3 (or 16.7%) M-REITs yielded a positive abnormal return. In contrast, there were a total of 14 (which is 77.8%) M-REITs generated actual returns that exceeded their required returns for the DMCO period. However, for the AMCO period, the number of M-REITs that recorded a negative abnormal return out-numbered those that recorded a positive abnormal return, with 10 versus 8. This result in the AMCO period could be attributable to superior FBM KLCI performance that caused the average daily market index return ($R_m$) to be high and individual M-REITs' abnormal return (Jensen Alpha) to be low or even becomes negative. Superior FBM KLCI performance in the AMCO period was driven by expansionary monetary policy through the reduction of overnight policy rate (OPR) by Bank Negara Malaysia, Covid-19 related economic stimulus package that increased households' liquidity and strong market rally on rubber glove stocks such as Top Glove Berhad, Hartalega Berhad, Kossan Rubber Berhad and Supermax Berhad, where both Hartalega Berhad and Top Glove Berhad were the component companies that made up the FBM KLCI. If individual M-REITs performance is not compared to FBM KLCI, there are 12 M-REITs with positive Treynor ratios (refer to Table 3) in contrast to only 8 with positive Jensen Alpha ratios. Therefore, negative Jensen Alpha ratios for M-REITs in the AMCO period might not be so much an alarming signal that REIT investors need to be too worried about.

**Table 4** Jensen Alpha ratio of M-REITs before, during and after MCO

| | **Jensen Alpha** | | |
|---|---|---|---|
| **M-REITs** | **Before MCO** | **During MCO** | **After MCO** |
| Al'Aqar | -0.0035 | -0.0006 | -0.0009 |
| Al-Salam | -0.0086 | 0.0038 | 0.0000 |
| Amanah Harta | -0.0059 | 0.0029 | -0.0012 |
| Amanah Raya | -0.0046 | 0.0021 | 0.0007 |
| AmFirst | -0.0048 | 0.0035 | -0.0003 |
| Atrium | -0.0026 | 0.0029 | 0.0000 |
| Axis | 0.0011 | 0.0036 | 0.0015 |
| Capitaland | -0.0061 | 0.0020 | -0.0015 |
| Hektar | -0.0117 | 0.0012 | -0.0025 |
| IGB | -0.0048 | 0.0008 | 0.0007 |
| KIP | -0.0069 | 0.0036 | -0.0016 |
| KLCC | 0.0028 | -0.0008 | -0.0001 |
| MRCB-Quill | -0.0100 | 0.0047 | -0.0008 |
| Pavillion | -0.0022 | -0.0011 | -0.0003 |
| Sunway | -0.0021 | -0.0028 | 0.0002 |
| Tower | -0.0052 | 0.0031 | 0.0008 |
| UOA | 0.0010 | 0.0002 | -0.0019 |
| YTL | -0.0100 | 0.0002 | 0.0030 |

As shown in Table 5, the mean Sharpe ratio was highest in DMCO (0.9974), followed by AMCO (-0.0021) and BMCO (-0.3592). Similarly, the mean Treynor ratio was highest in DMCO (0.0150), followed by AMCO (0.0049) and BMCO (-0.0269). Alike both Sharpe and Treynor ratios, the mean Jensen Alpha ratio was also highest in DMCO (0.0016), followed by AMCO (-0.0002) and BMCO (-0.0047). Therefore, all the three risk-adjusted measures consistently showed that M-REITs performance rebounded from losses (negative signs) in BMCO to gains (positive signs) in DMCO.

**Table 5** Mean risk-adjusted performance of M-REITs before, during and after MCO

| Period | Sharpe Ratio | Treynor Ratio | Jensen Alpha Ratio |
|---|---|---|---|
| **BMCO** | -0.3592 | -0.0269 | -0.0047 |
| **DMCO** | 0.9974 | 0.0150 | 0.0016 |
| **AMCO** | -0.0021 | 0.0049 | -0.0002 |

Table 6 summarises the beta measures obtained for each M-REIT over the three sub-periods of BMCO, DMCO and AMCO. Since all the betas are below the market beta of 1.00, M-REITs can be inferred as defensive stocks. KLCC REIT recorded the highest beta among all the M-REITs over the entire sampling period, which was 0.7089 in the BMCO sub-period. Apart from that, most of the M-REITs moved in the same direction with the market as their betas are positive in sign. Out of the total of 54 observations over the entire sampling period, only 4 showed negative betas. They are Axis REIT (-0.3722) and Capital Land REIT (-0.0616) in the DMCO sub-period as well as MRCB-Quill REIT (-0.1971) and Al-Salam REIT (-0.0992) in the AMCO sub-period.

**Table 6** Beta of M-REITs before, during and after MCO

| M-REITs | Before MCO | During MCO | After MCO |
|---|---|---|---|
| **Al'Aqar** | 0.0403 | 0.5372 | 0.3389 |
| **Al-Salam** | 0.1879 | 0.0522 | -0.0992 |
| **Amanah Harta** | 0.3277 | 0.1782 | 0.2831 |
| **Amana Raya** | 0.4874 | 0.4060 | 0.3054 |
| **AmFirst** | 0.6260 | 0.0313 | 0.4402 |
| **Atrium** | 0.4730 | 0.3381 | 0.3797 |
| **Axis** | 0.3851 | -0.3722 | 0.0698 |
| **Capital Land** | 0.3920 | -0.0616 | 0.2682 |
| **Hektar** | 0.3877 | 0.4352 | 0.5212 |
| **IGB** | 0.3228 | 0.3623 | 0.1366 |
| **KIP** | 0.3904 | 0.4442 | 0.3557 |
| **KLCC** | 0.7089 | 0.5026 | 0.2676 |
| **MRCB-Quill** | 0.4307 | 0.2414 | -0.1971 |
| **Pavillion** | 0.3295 | 0.6720 | 0.2901 |
| **Sunway** | 0.4869 | 0.6085 | 0.3223 |
| **Tower** | 0.4310 | 0.2723 | 0.1800 |
| **UOA** | 0.5927 | 0.6061 | 0.8518 |
| **YTL** | 0.3560 | 0.2732 | 0.0607 |

Two-tailed paired sample t-test results are reported in Table 7. Generally, eight out of the nine tests revealed a significant difference in the mean risk-adjusted performance of M-REITs across the sub-periods at 1% level of significance. The mean for all three performance measures consistently pointed out that M-REITs performed significantly better in the DMCO sub-period compared to the BMCO sub-period. Mean Sharpe, Treynor and Jensen Alpha ratios for the BMCO sub-period were lower than those for the DMCO sub-period, resulted in negative differences in mean. Likewise, results also revealed that M-REITs mean performance for all three measures was significantly superior in the AMCO sub-period compared to the BMCO sub-period. Again, mean Sharpe, Treynor and Jensen Alpha ratios for the BMCO sub-period were lower than those for the AMCO sub-period, resulted in negative differences in mean. Political instability and the sudden change in the coalition that formed the federal government at the end of February 2020 had brought highly negative market sentiment towards both local and foreign investors, hence causing the Malaysian stock market in general and M-REITs with no exception to tumble drastically during the BMCO period. In just half a trading day on 24$^{th}$ February 2020 after Tun Mahathir resigned as the Prime Minister, the FBM KLCI plunged by 38.94 points or 2.61% to 1,492.94, which was below the market investors' psychological level of 1,500 for the first time in that year (Ho, 2020). This possibly explains the risk-adjusted performance measures of M-REITs on average were significantly inferior in the BMCO period.

Besides, M-REITs' performance, especially those retail REITs, was not much affected in the DMCO period due to their anchor tenants who are hypermarket operators, such as Aeon, Metrojaya and Village Grocer, and retailers of globally recognised brands, are still able to pay their rentals. For example, IGB REIT who managed the Mid Valley Megamall and The Gardens Mall yielded positive Sharpe ratio (0.0885), Treynor ratio (0.0055) and Jensen Alpha ratio (0.0008) in the DMCO sub-period further proven this. These tenants still generated stable sales and cash inflows during the MCO period because households still went to these hypermarkets and retailers to grab the needed groceries and essential products upon following the standard operating procedures laid down by the Malaysian National Security Council (NSC), also known as *Majlis Keselamatan Negara (MKN)*. Moreover, many of the tenants have signed multi-year leasing

agreements previously with the respective REITs, hence market investors were less worried about the cash flow position and business sustainability of M-REITs. Similar findings were reported by Olick (2020) in the United States, where REIT tenants in some hard-hit sectors continued to struggle, their ability to pay rental for the month of May did not appreciably worsen.

**Table 7** Paired Sample t-test (two-tailed) results for the mean risk-adjusted performance of M-REITs

| Periods | Sharpe Ratio | | | Treynor Ratio | | | Jensen Alpha Ratio | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean Difference | t-stat | p-value | Mean Difference | t-stat | p-value | Mean Difference | t-stat | p-value |
| **BMCO vs. DMCO** | -1.3566* | 16.1701 | 0.0000 | -0.0419* | 4.3856 | 0.0004 | -0.0063* | 5.1715 | 0.0001 |
| **DMCO vs. AMCO** | 0.9995* | 4.2958 | 0.0005 | 0.0101 | 1.1898 | 0.2505 | 0.0018* | 3.0849 | 0.0067 |
| **BMCO vs. AMCO** | -0.3571* | 12.5260 | 0.0000 | -0.0318* | 5.3999 | 0.0000 | -0.0045* | 4.6369 | 0.0002 |

* denote significance at 1% level.

Table 8 summarises whether the null hypothesis for H1 to H9 is rejected or otherwise. The null hypothesis for eight out of the nine hypotheses in this study is rejected at the 1% level. Rejection of the null hypothesis for H1, H4 and H7 indicates that the mean Sharpe ratio, Treynor ratio and Jensen Alpha ratio for M-REITs are significantly higher during the MCO sub-period in comparison to before the MCO sub-period. Likewise, the rejection of the null hypothesis for H3, H6 and H9 indicates that the mean for these M-REITs performance measures is significantly better after the MCO sub-period in comparison to before the MCO sub-period. These findings are somehow contradicting to what were initially expected after reviewing some previous research studies. Studies by Akinsomi (2021) in France, Germany and the United Kingdom and Chiu et al. (2020) in Mexico revealed that performance of REITs in those countries were negatively affected during the period of Covid-19 and the associated movement restriction. Notwithstanding, findings from this study are consistent with what was found by Lee et al. (2020) study in Malaysia where REIT sectorial index performed positively during the Covid-19 period as opposed to the general market index of FBM KLCI and 12 other sectorial indices that performed negatively. When compared between the DMCO sub-period and the AMCO sub-period, only Sharpe ratio and Jensen Alpha ratio of the former performs significantly better than the latter, resulting in the rejection of the null hypothesis for H2 and H8. In terms of Treynor ratio, there is no significant difference in mean between them, thus failed to reject the null hypothesis of H5.

**Table 8** Summary of hypothesis test results

| Hypothesis | Decision on Null Hypothesis |
|---|---|
| H1: There is a significant difference between mean Sharpe ratio of M-REITs for BMCO and DMCO periods. | Reject |
| H2: There is a significant difference between mean Sharpe ratio of M-REITs for DMCO and AMCO periods. | Reject |
| H3: There is a significant difference between mean Sharpe ratio of M-REITs for BMCO and AMCO periods. | Reject |
| H4: There is a significant difference between mean Treynor ratio of M-REITs for BMCO and DMCO periods. | Reject |
| H5: There is a significant difference between mean Treynor ratio of M-REITs for DMCO and AMCO periods. | Do not reject |
| H6: There is a significant difference between mean Treynor ratio of M-REITs for BMCO and AMCO periods. | Reject |
| H7: There is a significant difference between mean Jensen Alpha ratio of M-REITs for BMCO and DMCO periods. | Reject |
| H8: There is a significant difference between mean Jensen Alpha ratio of M-REITs for DMCO and AMCO periods. | Reject |
| H9: There is a significant difference between mean Jensen Alpha ratio of M-REITs for BMCO and AMCO periods. | Reject |

## ■5.0 CONCLUSION

Poor performance of M-REITs before the MCO was mainly attributable to political instability in Malaysia during February 2020. The stable performance of M-REITs during and after the MCO was due to the business stability and sustainability of their tenants as well as the multi-year leasing agreements they had previously signed with their tenants. According to report by Kaur (2020), IGB REIT had curate the

appropriate and targeted action plans including rental support on a case-by-case basis to mitigate the challenges faced by tenants in their Mid Valley Megamall and The Gardens Mall. IGB REIT considered business tolerance, tenant relationship, differences in rent structures, risk of tenant business sustainability and expected business recovery period.

One of the implications of this study is that investors who had previously invested in shares of M-REITs should continue to hold the shares they owned rather than jump into the bandwagon of panic sell-off of their M-REIT shares before the MCO period. Results obtained from this research, summarised in Table 6, indicated that most of the M-REITs are defensive stocks with betas less than the market beta of 1.00 because they have resilient business models against both market risk and firm-specific risk. Both the Treynor ratio and Jensen Alpha ratio that captured only market or systematic risk yield consistent results with the Sharpe ratio that captured both market risk and firm-specific risk. Apart from that, M-REITs management should consider diversifying their portfolio of properties and real estate since a pandemic like COVID-19 will not necessarily exert negative ramification on the performance of retail REITs and industrial REITs, unlike the case of most hospitality REITs. Previous studies by Schnure (2020), Sheel (2020) in the United States and Sebastian (2021) in Singapore provided evidence that hospitality REITs were severely and negatively affected during the Covid-19 pandemic. According to Olick (2020), industrial REITs that managed warehouses experienced growing demands during the pandemic as retail moved online and businesses kept more inventories due to longer waiting time for cross-border logistics. Diversifying will not only increase the risk absorption capability of M-REITs but also stabilise the risk-adjusted performance measures of M-REITs. There are still rooms for M-REITs to further diversify their portfolios as evidenced by a larger percentage of the M-REITs having positive Treynor ratios in the AMCO sub-period if compared to positive Sharpe ratios and also 14 out of 18 (or 77.8%) M-REITs only manage one to two types of real estate in their respective portfolio (refer to Table 1). Further diversification into different types of properties and real estate will reduce unsystematic risk, which in turn lower down total risk and move towards a positive Sharpe ratio.

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