



RESEARCH ARTICLE

Investment Resilience: A Study of Mutual Fund Performance in Malaysia's Islamic vs. Conventional Sector

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This paper aims to compare the return performance of Islamic (IMF) and conventional mutual funds (CMF) during two crisis periods: the global financial crisis (GFC), and the Covid-19 pandemic crisis. This study provides unique evidence on the impact of a worldwide contagious disease on mutual funds. The overall sample comprises 87 equity IMFs and 83 equity CMFs in Malaysia, covering the three crises from January 2000 to October 2020. This study employs two market risk-adjusted performance measures to estimate the funds' overall performance during the crises: one-factor and four-factor models. The main results are, on average, both IMFs and CMFs underperform the market return during the entire sample period. Both IMFs and CMFs were affected by the crises, but IMFs outperform CMFs during the crisis periods; for the both crises. However, even though the results indicate that IMFs outperform CMFs during the bearish markets period, IMFs do not show any significant investment hedging function during all crisis periods. The results suggest that viral pandemics have an impact on mutual funds, like the previous financial crises. One of the implications is IMF may provide investors with better returns at lower risks. The originality of this paper is the first study examining the impact of the Covid-19 crisis as well the financial crises and fund performance in Malaysia.

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INTRODUCTION

Islamic finance continues its rapid pace of growth, with the industry currently worth some US\$2.2 trillion and expected to increase further to US\$3.8 trillion by 2022 (MIFC, 2020). Nevertheless, the Islamic funds' management industry currently accounts for only a small share of the global funds' management industry. As of the end of 2016, the value of the global Islamic funds' management industry was only USD56.1 billion compared to USD84.9 trillion for the funds' management industry (or less than one percent) (COMCEC, 2018). As a result, it continues to be regarded as a somewhat niche financial sector. However, PriceWaterhouseCoopers projects that the Islamic fund management industry will experience accelerating growth in the future. Some of them increasingly regard Islamic funds as a subset of Socially Responsible Investment (SRI) and potentially open to wider investment (Bani Atta & Marzuki 2019a). In terms of location, Saudi Arabia and Malaysia

accounted for by far the largest shares of asset under management (AUM) (35.6 and 31.9 percent, respectively) and the number of funds (22.8 and 24.2 percent, respectively) (Bani Atta & Marzuki 2021).

Many studies have proven the impact of some financial crises that occurred in the past years on the financial markets. However, the likelihood of pandemics has been perceived as very low till very recently. Therefore, the exponential spread of Covid-19 was a major surprise that has resulted in a global rout of financial markets. A limited number of studies have deliberated on the economic and social repercussions of a viral illness. Almond (2006) and Kelly et al. (2011) were the earliest studies that corroborate the threats that viruses force on society due to increased death rate and health cost. However, these costs are strongly correlated with economic activities and can have a significant long-term impact on growth. Gong et al. 2020 showed that the flu pandemic (H1N1) caused financial intermediation inefficiency with an increase in loan spreads. Sharif et al. (2020) state that Covid-19, the viral illness, has become a serious economic event. According to Baele et al. (2019), investors should consider treasury securities during market instability, but public finances are also affected by the pandemic, which results in declining yields. Corbet et al. (2020) found that the Covid-19 influence has also spilled over to commodities as well as cryptocurrencies. So, the question can be asked here, did the Covid-19 affect the economy?

Given that the actively managed funds represent an actively managed portfolio, they are more dynamic because they can be rebalanced. Mirza et al. (2020) indicate that the variation in fund returns most probably echoes the impact of a global shock (like Covid-19) better than raw equity prices. Chevalier & Ellison (2017) show that the investment funds that are actively managed are expected to perform better than individual securities or market indices, especially in declining markets. Likewise, Bubeck et al. (2018) and Wang & Young, (2020) suggested that returns on portfolios and funds with active management reflect the influence of monetary shocks more than individual stocks or passive indices. The main question of the paper is how will Covid-19 affect the mutual fund industry and will its impact on Islamic funds be different from conventional funds?

The motivation for this study stems from a few factors. Firstly, the spread of Covid-19 in the world includes Malaysia, has been very extraordinary. The health care response and general awareness in the initial phase of the spread were very relaxed. However, in the later stage, there was an exponential growth in Covid-19 cases in the world. The rapid growth in the reported cases resulted in a shift in the pandemic's epicentre from China to most countries.

Consequently, Malaysia was forced to take very stringent and unprecedented measures to curb the spread of the virus. The second motivation behind this study is to evaluate the impact of Covid-19 on Islamic mutual funds (IMFs) compared to conventional mutual funds (CMFs) in Malaysia. IMFs apply Sharia screening in their portfolio construction. Sharia screening reduces the number of stocks in the universe, which potentially reduces diversification, and this screening requirement imposes additional monitoring and compliance costs. Thus, IMFs may have lower risk-adjusted returns than CMFs. The most notable from the previous studies is the IMFs outperform CMFs during the bear market. This outperformance could be because IMFs invest in a portfolio with strong Environment, Social and Governance (ESG) metrics. ESG refers to investments obligation to improve social welfare; and equitable and sustainable long-term wealth for stakeholders (Jamali et al., 2017; Turban & Greening, 1997). So, this study examines the performance of such funds with a massive exogenous shock to the economy. It is argued that the global internet boom, Asian financial crisis, and global financial crisis are financial crises, but Covid-19 is a massive exogenous economic shock that caused a financial crisis. Thus, investing in IMFs might better hedge against economic shocks such as financial and Covid-19 pandemic crisis.

Analyzing the performance of active mutual funds during the crises included the Covid-19 crisis, is particularly suitable for two reasons. First, it has led to an unprecedented output contraction and the fastest increase in unemployment on record. Investors surely want to hedge against such a severe crisis. Second, active managers have an opportunity to perform well during this crisis because the situation has created substantial price dislocations in financial markets (Pástor et al. 2020). The sharp response of equity markets to Covid-19 is analyzed in a growing number of studies. In the bond

market, liquidity evaporated in March 2020, not only for corporate bonds (e.g., Kargar et al. 2020, and O'Hara & Zhou, 2020) but also for the usually-liquid Treasuries (e.g., Schrimpf et al. 2020).

This paper seeks to expand the analysis on the impact of financial crises (such as the global financial crisis (GFC)) to include the effect of viral crises such as (Covid-19) on the performance of mutual funds. In addition, this paper seeks to discover the difference in the impact of these crises on IMFs compared to CMFs. The study will use the Panel data to answer the paper questions. Our main results show that both IMFs and CMFs in Malaysia are generally affected by the financial and viral crises. In addition, it is interesting to find that IMFs are generally able to outperform during the whole sample and losing market. Which indicates that IMFs can provide a haven for investors during times of immense global and financial stress. The organization of the paper is as follows. Section II reviews the previous studies, and Section III illustrates the Malaysian mutual fund industry background. Next, data and methodology are presented in Section IV, while Section V presents the results, and finally, Section VI presents the conclusion.

Previous studies

Financial crises

Previous studies have investigated the impact of crises on mutual fund performance and concluded that actively managed mutual funds outperform the market benchmark during recessions. Moskowitz (2000) found that from 1975 to 1994, on average, active funds' returns are higher during recessions by 6% per year. Kosowski, (2011) tested the period from 1962 to 2005 and found that, on average, mutual fund alphas in recessions exceed those in expansions by 3% to 5% per year. Kacperczyk et al. (2016) indicated that fund alphas are 1.6% to 4.6% per year higher in recessions over the 1980 to 2005 period.

Dharani and Natarajan (2011) compared and analyzed the risk and return behavior of Shariah-compliant index (Nifty Shariah index) and Conventional index (Nifty index) on a daily, monthly, and quarterly basis, period of study was from 2nd January 2007 to 31st December 2010. Study Employed t-test to compare the mean returns difference between both indices. The study concluded that there is no performance difference between the Nifty Shariah index and the Nifty Index on an average daily, monthly, and quarterly basis during the study period.

Philippas, (2013) examined fund managers' performance during an unprecedented world financial crisis using Greek domestic equity funds for the period 1/1/2007-30/11/2012. This period also covers the Greek fiscal crisis and the so-called "Grexit" possibility, forming a unique setting for analysis. He employed the widely used Treynor and Mazuy (1966) methodology augmented by new explanatory variables in order to identify fund managers' skills and capture the special characteristics of the Greek market, focusing on the extreme market conditions in the Greek stock market and the adverse shareholder sentiment reflected in fund outflows. The results indicated that fund managers did not possess any superior selectivity or market timing skill. Moreover, fund flows had a significant impact on funds' performance during the turbulent period under examination making active management more difficult. Zia-ur-Rehman et al. (2015) inspect the performance relationship between Islamic and conventional equity funds in Pakistan for the period 2007 to 2014. The study revealed no significant difference between Islamic and conventional and both funds underperformed the market. Islamic funds performed better in the crises period which indicates it provides hedging opportunities.

Shaliza et al., (2017) studied the performance of 200 Islamic mutual funds and conventional mutual funds in the Malaysia equity market from 2007-2015 and further period divided in financial crisis from 2007-2008 and 2007-2015 (full period), found no significant difference in performance in the full period between Islamic and conventional mutual funds and concluded IMFs performed slightly better than CMFs for both periods. IMFs showed less negative as compared to CMFs in the crises period. Yacine et al. (2017) observed the performance of Shariah Compliant mutual funds during the crises period. They have a low value at risk and a high sharp ratio in crises period. The results confirm that Islamic mutual funds provide hedging opportunities against crises.

Mansor et al. (2019) compared the return performance and persistence of ethical and conventional mutual funds during two extreme events, the Asian and the global financial crises, under Sharia

constraints. They found on average, both funds IMF and the CMF outperform the market benchmark during the entire sample period. None of the funds beat the others during the financial crises and the pre-crisis periods, and IMF outperforms the CMF over the study period. Their findings also indicate that ethical funds are more persistent, especially during the Asian Financial Crisis (AFC) and the Global Financial Crisis (GFC) periods. Hasan et al. (2021) evaluated the safe-haven role of assets in the US stock market during the 2008 global financial crisis (GFC) and the COVID-19 pandemic. The findings suggested that safe-haven assets may vary over time. The results indicated that silver and the Islamic stock index were safe havens during the 2008 GFC. Their supplementary analysis revealed that gold and Bitcoin still exhibit safe-haven behavior during severe market downturns. Contrary to our study, all of these studies investigate periods in which recessions are substantially milder than the Covid-19 pandemic. the risk-adjusted performance and investment style of Islamic mutual funds with that of conventional funds in the wake of the recent global financial crisis of 2009–2014. They used Riyadh Capital mutual funds as a proxy for Saudi Arabian mutual funds. The study also used the absolute and relative risk-adjusted measures with single factor (Jensen) and multifactor (Carhart) models are applied. The results suggested that Islamic funds outperformed conventional funds domestically, given similar risk exposure, and produced comparable results under lower market risk globally. Moreover, the results showed that Islamic funds are a relatively big cap from the strong statistical significance registered on the global side as evidenced by the different portfolio outcomes. Furthermore, Islamic funds tend to slightly favor a contrarian trading investment strategy as suggested by statistically significant local portfolio value and global difference portfolios results.

Covid-19 pandemic

In Malaysia, the first reported case of Covid-19 was in March 2020. This pandemic affect the global economy, and the cases are still growing for some countries. Few studies investigated the impact of Covid-19 on mutual funds performance and flows. However, these studies focus mainly on developed markets such as the USA and the UK. Therefore, a comprehensive study on the impact of this crisis on mutual fund performance in Malaysia as one of the emerging countries is strongly required.

Pastor & Vorsatz (2020) presented a comprehensive analysis of the performance and flows of U.S actively managed equity mutual funds during the Covid-19 crisis of 2020. They found that most active funds underperform passive benchmarks during the crisis, contradicting a popular hypothesis (mutual funds outperform during recessions). The finding also reveals that highly rated sustainability funds perform at par with funds with high star ratings. In addition, investors prefer funds with sustainability features during this pandemic period, suggesting that investors view sustainability as a necessity rather than a luxury good during the crisis period.

Mirza et al. (2020) evaluated the price reaction, performance, and volatility timing of European investment funds during the outbreak of Covid-19. They analyzed the period between January and June 2020 and demonstrated that while most investment funds exhibit stressed performance, social entrepreneurship funds showed resilience. Moreover, this remained robust during various stages of the evolution of this contagion. The social funds also demonstrated volatility timing that was absent for most of their counterparts. They argue that the overall stability of these funds are due to their niche investments in social enterprises that specialize in providing innovative solutions for social issues.

Rizvi et al. (2020) documented some preliminary evidence of European funds' performance and investment styles during the evolution of Covid-19. They assessed the period between January and May 2020 and categorized the spread of contagion into three phases. The results showed that Social Entrepreneurship funds demonstrated positive returns across the three phases, while most of the other subcategories plunged into the negative zone. The findings on style analysis suggest that fund managers have been drifting from high-risk options to low risk in size and investment strategy. Similarly, there has been a switch from high risk to relatively less sensitive sectors and a transition of investment from countries with higher to those with a lower number of cases.

Bokhtiar et al. (2021) examined the effect of the COVID-19 pandemic on global economic activity, the stock market, and the energy sector. They used the structural vector autoregression (SVAR) model for the data from 21 January 2020, to 26 February 2021. Their results showed that the COVID-19

cases significantly and negatively impact all the endogenous variables such as Baltic dry index (BDI), MSCI world index (MSCI), and MSCI world energy index (MSCIE). Our results also reveal that of the three variables, the stock markets indices (MSCI and MSCIE) are comparatively more affected by COVID-19 cases. In addition, the stock markets are more sensitive to the COVID-19 pandemic than the real economy. Mubarak & Al Arif (2021) determined the model for forecasting the index, using the Islamic stock index is used in six countries. They used the Autoregressive Conditional Heteroscedasticity - Generalized Autoregressive Conditional Heteroscedasticity (ARCH-GARCH) method on daily data over the period January 2020 to October 2020. The risk level of each index was found to be influenced by the residual value from the previous day. The results revealed the tendency of all stock prices to decline. These are associated with the impacts of the Covid-19 pandemic on current and future economic performance.

Based on the above studies, it is interesting to investigate how the IMF as a subset of ethical funds or ESG funds is affected during the pandemic COVID-19 compared to CMF. It is clear to us that the COVID-19 crisis has greatly affected the investment markets, including the strong markets. However, previous studies lacked a comparison on the impact of this important crisis between Islamic funds and conventional funds. There is extensive evidence related to previous financial crises such as the global financial crisis, that Islamic funds were less affected than conventional funds during bear markets (Abdullah et al. 2007; Mansor et al. 2019; Bani Atta and Marzuki, 2020). Presenting a comparison between Islamic and conventional funds is very important in a market such as the Malaysian market, as we mentioned at the beginning of the second section that Malaysia contributes significantly to Islamic funds globally and occupies rank 2 in this field. The choice of Malaysia comes from the motive of comparing Islamic and conventional funds, as Malaysia is one of the countries that lead Islamic finance. Malaysia contributes 27.1 percent or USD28.6 billion of the global AUM.

Malaysian mutual fund industry background

Malaysia started offering mutual funds after the first fund management company, Malayan Unit Trust Limited was established in 1959. Then, another two fund management companies were established in the 1960s and 1970s, ASM MARA Unit Trust Management and Asia Unit Trusts Berhad. The mutual fund industry grew exponentially when Permodalan Nasional Berhad (PNB) was introduced in 1979 and launched its first fund, Skim Amanah Saham Nasional (ASN), in 1981. In 1991, PNB launched its first mutual fund for Bumiputra, Amanah Saham Bumiputera (ASB), to encourage savings and facilitate their participation in the Malaysian capital market. Despite financial crises that took place twice between 1997/1998 and 2007/2008, the demand for mutual funds remains strong (Rubio et al. 2012). Later, Malaysian banks also started to offer their mutual funds, and these bank-affiliated mutual funds benefited from their bank-wide marketing, advertisements, and distribution channels. This development has increased the percentage of mutual fund net asset value to Bursa Malaysia market capitalization from 12.10 percent in 2004 to 22.39 percent in 2017 (Bani Atta & Marzuki, 2020).

As of 31 December 2018, the total net asset value of the mutual fund industry in Malaysia was RM426.18 billion, which accounted for about 25% of the Bursa Malaysia's market capitalization (Securities Commission Malaysia, 2018). The number of funds launched also increased to 650 funds in 2018, compared to 644 funds in 2017. According to the Securities Commission (SC), there were 80 fund management companies (FMCs) in Malaysia as of 2018, compared to 55 FMC as of end-2017.

Since most of the Malaysian population are Muslims, the Muslims started to demand for mutual funds that meet their religious objectives. (Bani Atta & Mazuki 2019b). In the early 1993, the Arab-Malaysian Unit Trust launched the first Islamic mutual funds, namely Tabung Ittikal (Marzuki & Worthington, 2014).

Malaysia contributed 31.7 percent or USD36.5 billion of assets under management from the USD105.5 billion global Islamic funds (COMCEC, 2018). The advanced Islamic financial market supports this achievement. In 2017, the Malaysian Securities Commission launched its Islamic Fund and Wealth Management Blueprint, which charts the strategic path for the Islamic fund industry over the medium and long term and maps strategies and recommendations to improve the country's competitive edge. The blueprint aims to accelerate Malaysia's initiative to be the global hub for

Islamic funds and establish Malaysia as a regional center for sustainable and responsible investment and Islamic wealth management services.

DATA AND METHODOLOGY

Sample

We use daily data from Bloomberg covering the period from January 2000 to October 2020. Table 1 shows that our initial sample covers 267 Malaysian equity mutual funds. We consider funds that were launched before January 2019 and whose monthly Net Asset Value is available until October 2020. Then, as shown in Table 1, the final sample covers 170 Malaysian equity mutual funds, 87 funds are IMFs and 83 are CMFs. The literature shows that the performance of different types of funds (for example, domestic and international equity funds, and fixed interest funds) are not the same as they have different types of assets as their portfolio composition and require different benchmarks to assess their portfolios performance. Therefore, to ensure that the sample is homogeneous, we limit our sample selection to Malaysian domestic equity funds only. The choice of benchmarks is important in measuring the performance of mutual funds. This study uses both Islamic and conventional market benchmarks, FTSE Sharia All-World and FTSE All-World collected from the World Bank database (World Bank, 2021). These benchmarks contain three segments of markets, developed, advanced emerging, and emerging markets. We use three-month treasury bills as risk-free rates collected from the Securities Commission of Malaysia's website (Securities Commission of Malaysia, 2021). The risk factors are retrieved from the Fama and French website library data ([Fama and French, 2021](#)).

Table I: Sample of IMF and CMF as of October 2020

Type	Total Equity Funds	Sample of equity funds	% included
IMF	135	88	65
CMF	132	82	62
All funds	267	170	63

Note: The table reports the total number of equity Islamic and conventional funds, and number of sample used as October 2020. IMF is a Islamic mutual fund and CMF is a conventional mutual fund.

Timeline of events and method

This study considered two critical crises. The first crisis used are similar to Marzuki & Worthington (2017), that is, the global financial crisis (GFC) from July 2007 to February 2009. In addition, the study extended to cover the new viral pandemic (Covid-19). We consider the crisis to start from March 2020, when the Malaysian Government announced the first Movement Control Order (MCO) on 18 March 2020 (The Malay Mail, 2020). The MCO was also known as "lockdown" or "partial lockdown" to the local and international media.

We use three dummy variables. Both represented the different crises (DGFC for Global Finance Crises, and DCOV for Covid-19). DGFC equals 1 for the period from July 2007 to February 2009 and zero otherwise. DCOV equals 1 for the period from March 2020 to October 2020. The third dummy variable represented the Islamic mutual funds (DIMF). DIMF equals 1 if the fund is an Islamic fund and zero otherwise. Then we run panel regression models on the period from January 2000 to October 2020. First, to test the performance of IMFs we use dummy variable representative DIMFs. Then to test how IMFs perform during the crises, we multiply each crisis dummy variable by dummy DIMF, which result in two new variables (DGFC* DIMF, and DCOV*DIMF).

Crisis and fund performance

To assess the comparative performance, we analyze the complete period from January 2000 to October 2020 using the Jensen Alpha one-factor model and the Carhart Four-Factor model.

One-factor model (Jensen, 1968)

Jensen Alpha is the most and commonly employed in the literature. This model is based mainly on the theoretical Capital Asset Pricing Model (CAPM). In his seminal work, Jensen (1968) clearly explained how to measure risk-adjusted abnormal performance in markets, which uses Jensen's alpha to capture the abnormal excess return of active funds. An active fund return over the risk-free

rate is regressed on the excess return of the market proxy portfolio. One-Factor model is estimated using panel regression model as follows:

$$R_{i,t} - R_{f,t} = \alpha_0 + \beta_1(R_{m,t} - R_{f,t}) + \beta_2DIMF_i + \beta_3DGFC_{i,t} + \beta_4DCOV_{i,t} + \beta_5DR_{m,t} + \beta_6DGFC_{i,t} \times DIMF_i + \beta_7DCOV_{i,t} \times DIMF_i + \beta_8DR_{m,t} \times DIMF_i + \varepsilon_{i,t} \quad (1)$$

Where:

- $R_{i,t}$ is the average monthly return on the equity fund over the measurement period.
- α_i is Jensen alpha which measures the fund's average abnormal return over the return on the market proxy fund performance to the market returns $R_{m,t}$.
- $R_{f,t}$ is the risk-free rate (three-month Malaysian treasury bill).
- $R_{m,t}$ is the market returns which either FTSE global Sariah or FTSE All-World index.
- IMF_i is the dummy variable equal to 1 if the fund is an Islamic mutual fund and 0 otherwise.
- $DGFC_{i,t}$ is a dummy variable equal to 1 for the Global Finance Crisis period and 0 otherwise.
- $DCOV_{i,t}$ is a dummy variable equal to 1 for the Covid-19 period and 0 otherwise.
- $DR_{m,t}$ is defined as 1, if the contemporaneous observation of the market benchmark is negative and defined as zero otherwise.
- β_i is interpreted as measuring a fund's market risk exposure beta coefficient for the mutual funds and $\varepsilon_{i,t}$ is the random error of the equity fund portfolio.

Four-factor (Carhart, 1997) model

Besides the single-factor model, we further examine performance by using the Carhart four-factor model (1997). These multifactor models give a much better sense of how mutual funds risk exposures differ from one another. At the same time, many studies find that the single-index model is not adequate in explaining mutual fund performance. Carhart four-factor model (1997) is estimated using panel regression model as follows:

$$R_{i,t} - R_{f,t} = \alpha_0 + \beta_1(R_{m,t} - R_{f,t}) + \beta_2DIMF_i + \beta_3DGFC_{i,t} + \beta_4DCOV_{i,t} + \beta_5DR_{m,t} + \beta_6DGFC_{i,t} \times DIMF_i + \beta_7DCOV_{i,t} \times DIMF_i + \beta_8DR_{m,t} \times DIMF_i + \beta_9SMB_t + \beta_{10}HML_t + \beta_{11}MOM_t + \varepsilon_{i,t} \quad (2)$$

Where:

- $R_{i,t}$ is the average monthly fund returns.
- $R_{f,t}$ is the risk-free rate.
- $R_{m,t}$ is the FTSE all world market returns.
- SMB is the fund allocation size estimator.
- HML is the fund allocation, book-to-market estimator.
- MOM is the fund allocation to the momentum estimator.
- β_i measure the sensitivity between the market and the fund, if positive and significant then the fund is highly associated with the market movement.
- α_i measures stock selection ability, if positive and significant, then the fund has superior stock selection ability.
- $\varepsilon_{i,t}$ is the random error of a mutual fund portfolio.

Other variables are as defined in Equation (1). The factors for the four-factor models are not easily available, so this thesis used the data available on the Fama and French website, which, in turn, employs the FTSE All-World database to construct monthly for the four-factor model (Hammami & Oueslati, 2017).

RESULTS AND DISCUSSION

Descriptive statistics and correlation matrix

To check the heteroscedasticity and autocorrelation problem, we run the Breusch/Cook Weisberg test and the Durbin-Watson test respectively. The Breusch/Cook Weisberg test for heteroscedasticity shows H_0 : constant variance, meaning there is no heteroscedasticity, and $\text{prob} > \chi^2$ is 0.1460, more than 0.05 suggesting that the null hypothesis cannot be rejected. For the autocorrelation problem,

the Durbin-Watson statistic has a value of 2.1021 very close to 2 which means that no autocorrelation in the sample.

Table 2 shows the descriptive statistics of the data used in the study. Panel A of Table 2 presents the descriptive statistics of daily returns of IMFs and CMFs, market benchmarks, and other risk factors from 2000 to 2020. As shown in Panel A, the empirical characteristics of negative skewness, excess kurtosis, and non-normality in most portfolio returns are the dominant features of the data. It also reports the mean, median, maximum, minimum, and standard deviation for excess market return, fund returns for IMFs and CMFs. S.D is standard deviation, SMB is small-minus-big, HML is high-minus-low and MOM is momentum. Data shows that the IMFs portfolio has positive average returns (0.0017), but the CMFs portfolio has negative average returns (-0.0028). In addition, CMFs have more return volatility than IMFs (CMFs, 0.0104 and IMFs, 0.0086), which indicates that CMFs are riskier than IMFs. Panel B of Table 2 presents the mean returns and standard deviation of IMF and CMF portfolios during the three crises. The portfolios are equally weighted. It shows that both types of funds underperform market benchmarks during the crises. However, IMFs exhibit lower returns compared to CMFs during these three crisis periods. In addition, the standard deviation of IMFs is lower than the standard deviation of CMFs, which means IMFs have lower risk during all crises.

Table two also show the ADF test and PP test. To test the unit root, we use two tests; The augmented Dickey-Fuller (ADF) and Phillips–Perron test (PP). Both tests must be negative, the more negative it is, the stronger the rejection of the hypothesis that there is a unit root at some confidence level, and the critical value is -3.41. Table II show that all ADF test and PP test amounts are negative and more than the critical value, which means there is no unit root in the sample.

Table 1: Descriptive statistics and unit root test

	IMF	CMF	FTSE Islamic	FTSE all world	SMB	HML	MOM	TB		
<i>Panel A: Descriptive statistics of IMF, CMF, Markets, and risk factors</i>										
Number	87	83	----	----	---	----	---	---		
Mean	0.0017	-0.0028	0.0061	-0.0022	-0.0322	0.3351	0.0022	0.0271		
Med.	0.0161	0.0152	0.0022	0.0013	-0.0400	0.2100	0.2600	0.0300		
Min.	-0.2744	-0.2352	-0.1416	-0.1341	-0.9401	-0.7302	-0.9101	0.0013		
Max.	0.2076	0.1980	0.1262	0.2571	0.8602	0.4201	0.9403	0.0522		
S.D.	0.0406	0.0444	0.0226	0.0392	0.2481	0.2711	0.2690	0.0090		
Kurt.	8.0121	8.8481	6.1682	6.8702	14.0710	12.4581	31.2511	1.7531		
Skew	-0.1124	-0.8572	-0.9712	-0.9052	-0.2161	-0.2792	-0.0901	-0.9381		
p-value	0.0101	0.0110	0.0000	0.0000	0.0260	0.0300	0.0200	0.0000		
ADF	-5.752	-6.170	-6.921	-6.885	-5.901	-7.815	-7.914	-7.123		
PP	-4.967	-4.890	-5.091	-5.121	-5.340	-6.183	-7.190	-6.916		
<i>Panel B: Descriptive statistics of IMF and CMF by crisis</i>										
			<i>GFC Crisis</i>				<i>Covid-19</i>			
			IMF	CMF	FTSE Islamic	FTSE All	IMF	CMF	FTSE Islamic	FTS E All
			-	-	-	-	-	-	-	-
			0.039	-0.039	-0.003	-0.003	-0.038	-0.041	-0.004	0.005
			0.011	0.024	0.001	0.009	0.014	0.029	0.001	0.001
Breusch-Pagan / Cook-Weisberg Test for Heteroscedasticity. H0: Constant variance Chi2 (1) = 1.81 Prob > chi2 = 0.1460										
Durbin-Watson test for Autocorrelation. (2.1021)										

Notes: In panel A, the table reports the summary statistics and unit root test results of Islamic and conventional mutual funds that were collected from the Bloomberg database, both market returns that were collected from World Bank Data, and three risk factors. IMF is an Islamic mutual fund, CMF is a conventional mutual fund, SMB is a Small minus big "Size factor", HML is a High minus Low "Value factor", and MOM is a Momentum Factor. ADF is Augmented Dickey–Fuller test and PP is the Phillips–Perron test both are used to check the stationarity. *, **, *** indicate the significance levels at the 10%, 5%, and 1%, respectively. In panel B, the table reports the summary statistics for IMF and CMF during each crisis separately., GFC is the global finance crisis, and Covid-19 is the corona virus pandemic.

Figure 1 shows the returns of IMFs and CMFs during the whole sample period. It appears that the IMFs perform better than CMF during up and down market before 2008. After 2008, IMFs perform better in bear market and worse in boom market conditions.

Figure 1: IMFs and CMFs returns during the crises

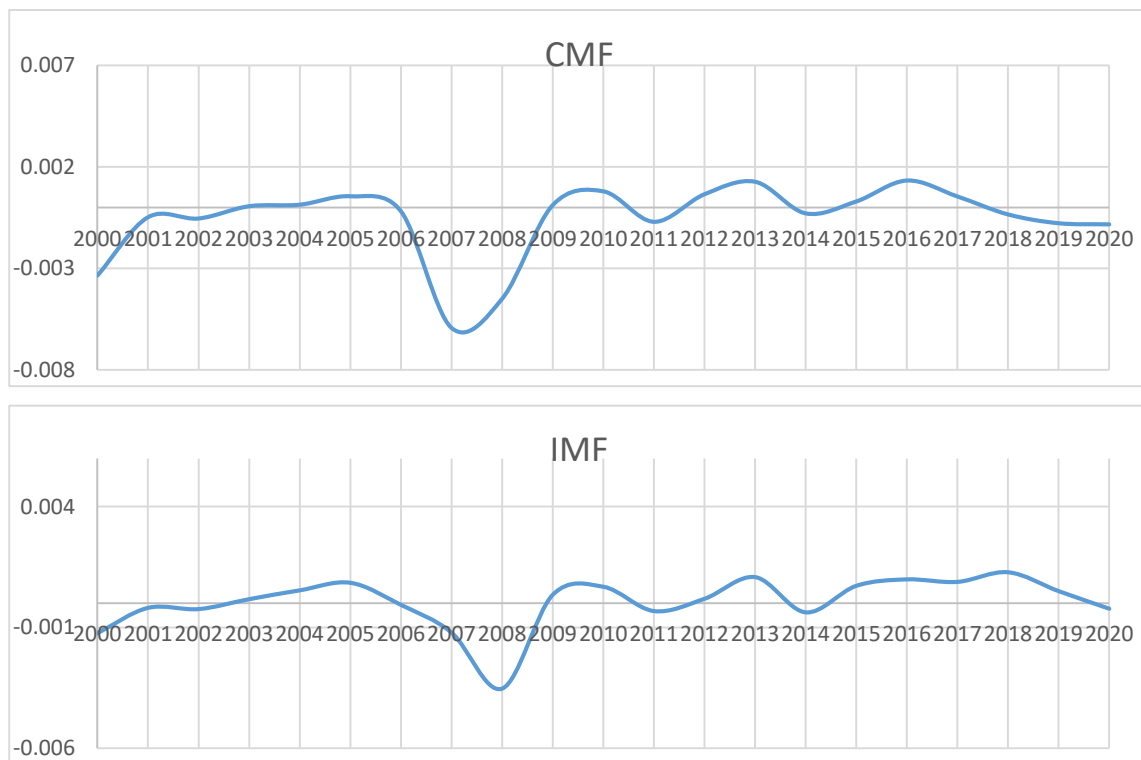


Table 3 presents Spearman rank and Pearson product-moment correlations for the returns of IMFs and CMFs, benchmark returns (FTSE Islamic and FTSE All World), Carhart risk factors, and the risk-free rate. The value in the parenthesis is the p-value. Both IMFs and CMFs portfolio returns indicate a low correlation with returns of both Islamic and conventional benchmarks. However, the market indices closely correlate with each other, with significantly high positive correlation coefficients. In addition, the correlation between the risk factors is relatively low and unlikely to lead to a multicollinearity problem in the OLS regressions.

Table 3: Correlation matrix

	IMF	CMF	FTSE Islamic	FTSE All World	SMB	HML	MOM	TB
IMF	1.000	-0.014* (0.001)	-0.003* (0.035)	-0.033* (0.003)	0.021 (0.061)	0.016* (0.036)	-0.024* (0.014)	-0.017* (0.031)
CMF	-0.013* (0.000)	1.000	0.003* (0.001)	-0.003* (0.021)	0.010* (0.036)	0.002 (0.632)	-0.003 (0.532)	-0.016 (0.002)*
FTSE Islamic	0.002* (0.002)	0.002* (0.004)	1.000	0.661* (0.002)	0.042* (0.034)	0.052* (0.003)	-0.026* (0.003)	-0.122* (0.003)
FTSE All World	0.006* (0.012)	0.004* (0.014)	0.681* (0.000)	1.000	0.037* (0.011)	0.056* (0.002)	-0.051* (0.011)	-0.127* (0.003)
SMB	0.012* (0.032)	0.011* (0.041)	0.032 (0.055)	0.045* (0.000)	1.000	0.043* (0.011)	-0.031* (0.020)	-0.035 (0.245)
HML	0.007* (0.031)	0.001 (0.561)	0.202* (0.000)	0.103* (0.000)	-0.072* (0.000)	1.000	-0.316* (0.044)	0.157 (0.231)

MOM	-0.007 (0.229)	-0.001 (0.321)	-0.076 (0.510)	-0.106 (0.610)	-0.069* (0.000)	-0.474* (0.000)	1.000	-0.235 (0.258)
TB	-0.018* (0.000)	-0.014* (0.001)	-0.115* (0.000)	-0.045* (0.000)	-0.024 (0.439)	0.105* (0.011)	-0.026 (0.138)	1.000

Note: The table presents Spearman rank and Pearson product-moment correlations for the returns of IMFs and CMFs, benchmark returns (FTSE Islamic and FTSE All-World), Carhart risk factors, and the risk-free rate. The value in the parenthesis is the p-value. *, **, *** indicate the significance levels at the 10%, 5%, and 1%, respectively.

Table 4 summarizes the regression results using one-factor and four-factor models on the four dummy variables, risk factors, and the market benchmarks (FTSE Global Islamic and FTSE All-World). The study uses one-factor and four-factor to test how market and mutual funds perform during crises and compare between IMFs and CMFs. The crisis periods are GCC (July 2007 to February 2009), and Covid-19 pandemic (March 2020 to October 2020)

Table 4: The regressions result

Variables	One-Factor Model				Four-Factor Model	
	Model 1 (FTSE-Sharia index)		Model 2 (FTSE-All World index)		Model 3 (FTSE-All World index)	
	Random effects	Fixed effects	Random effects	Fixed effects	Random effects	Fixed effects
Constant	-0.0301	-0.0330	-0.0365	-0.0298	-0.0379	-0.0299
Std.err.	0.0006	0.0004	0.0008	0.0005	0.0006	0.0005
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Market	0.1081	0.1282	0.2110	0.2122	0.1140	0.2119
Std.err.	0.0001	0.0010	0.0013	0.0011	0.0015	0.0012
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DR_m	-0.0029	-0.0030	-0.0026	-0.0024	-0.0030	-0.0021
Std.err.	0.0004	0.0003	0.0006	0.0004	0.0004	0.0003
p-value	0.5731	0.5242	0.4760	0.4541	0.5020	0.4563
DIMF	0.0010	0.0012	0.0001	0.0002	0.0002	0.0001
Std.err.	0.0001	0.0002	0.0010	0.0003	0.0005	0.0002
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DGFC	-0.0017	-0.0015	-0.0018	-0.0014	-0.0017	-0.0015
Std.err.	0.0003	0.0006	0.0009	0.0006	0.0010	0.0007
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DCOV	-0.0009	-0.0008	-0.0014	-0.0011	-0.0012	-0.0010
Std.err.	0.0002	0.0007	0.0012	0.0008	0.0013	0.0008
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DGFC × DIMF	-0.0011	-0.0009	-0.0010	-0.0008	-0.0011	-0.0008
Std.err.	0.0003	0.0006	0.0011	0.0008	0.0011	0.0009
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DCOVID × DIMF	-0.0005	-0.0002	-0.0009	-0.0006	-0.0008	-0.0006
Std.err.	0.0021	0.0001	0.0011	0.0002	0.0009	0.0001
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DRM × DIMF	0.0006	0.0007	0.0003	0.0005	0.0004	0.0005
Std.err.	0.0005	0.0004	0.0004	0.0003	0.0005	0.0004
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SMB	----	----	----	----	-0.0005	-0.0003
Std.err.	----	----	----	----	0.0008	0.0002
p-value	----	----	----	----	0.1803	0.1700
HML	----	----	----	----	-0.0006	-0.0001
Std.err.	----	----	----	----	0.0010	0.0003
p-value	----	----	----	----	0.0004	0.0000
MOM	----	----	----	----	0.0005	0.0007
Std.err.	----	----	----	----	0.0011	0.0003
p-value	----	----	----	----	0.9789	0.9840
Adj. R ²	43%	45%	56%	59%	53%	57%

Note: IMF_i is the dummy variable equal 1 if the fund is Islamic mutual fund and 0 otherwise; $DGFC_{i,t}$ is dummy variable equal 1 for the Global Finance Crisis period and 0 otherwise; $DCOV_{i,t}$ is dummy variable equal 1 for the Covid-19 period and 0 otherwise; $DR_{m,t}$ is defined as 1, if the

contemporaneous observation of the market benchmark is negative and defined as zero otherwise. .
 *, **, *** indicate the significance levels at the 10%, 5%, and 1%, respectively.

The results show that the mutual funds in Malaysia underperformed the market, either using one-factor or four-factor models. Alpha coefficients were significantly negative; one-factor (Islamic benchmark, -0.0330 and conventional benchmark, -0.0298) and four-factor (-0.0299). Meanwhile, the estimators for the DIMF are positive and significantly different from zero at the 5 percent level. One-factor model for Islamic and conventional benchmarks are 0.0012 and 0.0002, respectively, and four-factor model is 0.0001, which implies that the IMF significantly outperformed the CMF during the whole sample. The results also show that the dummy variable representing losing markets exhibit insignificant coefficients, either using one-factor or four-factor models. The insignificant coefficients imply that mutual funds in Malaysia do not perform better than the market when market returns are negative. However, the estimator for this interaction between dummy losing market and dummy IMF ($DR_{m,t} \times DIMF_i$) is positive and significantly different from zero at the 5 percent level either using one-factor or four-factor models. For example, one-factor model using Islamic and conventional benchmarks are 0.0007 and 0.0005, respectively, and four-factor model is 0.0005. The positive and significant results for this interaction implies that even though the IMF portfolio does not outperform the market during losing periods, it significantly outperformed the CMF during bearish markets.

The both dummy variables representing the crisis periods show a significant and negative relationship using Islamic or conventional market indexes. For example, DGFC are -0.0015 and -0.0014 using Islamic and conventional benchmarks, respectively; and DCOV are -0.0008 and -0.0011 using Islamic and conventional benchmarks, respectively. The higher effect was during GFC crisis while the lowest was during Covid-19 crisis. That implies that Malaysian mutual funds underperform the market during the crisis period. Meanwhile, the results of the dummy variables that represented the difference in IMFs performance during the crises are significantly negative as well. However, the results were better than the overall sample either using Islamic or conventional market index (DGFC \times DIMF: -0.0009 and -0.0008) and (DCOV \times DIMF: -0.0002 and -0.0006). The results indicate that the IMFs perform better during the crisis period.

On four-factor analysis, the results of the both dummy crisis variables are similar to the results of the one-factor model. It was significantly negative (DGFC -0.0015, and DCOV -0.0010). Similarly, the highest effect was during the GFC crisis while the lower was during the Covid-19 crisis. In addition, the results of dummy variables that represented the difference in IMFs performance during the crises are similar to the results of the one-factor model. It was significantly negative (DGFC \times DIMF -0.0008, and DCOV \times DIMF -0.0006). In terms of size preference and momentum strategy, the SMB and MOM factor loadings are -0.0003 and 0.0007, respectively. Interestingly, the HML factor is statistically significant with a coefficient value of -0.0001, suggesting that mutual funds display a preference for growth-to-value stock.

DISCUSSION

The results indicate that during the bearish periods, regardless of the type of market benchmarks used, IMFs and CMFs portfolios are affected by the crises. The both dummy variables (DGFC, and DCOV) show a significantly negative relationship with the mutual fund daily returns; however, DIMF shows a positive relationship with funds returns. The findings indicate the IMFs outperformed the market benchmarks for both one-factor or four-factor models. One of the significant implications is that Shariah screening does not impose a significant cost on IMF investors. Meanwhile, the same results found in the losing market (negative returns), mutual funds in Malaysia do not perform better than the market when market returns are negative. However, in the same market state, IMF performs better than its counterpart, CMF.

Results during the crisis periods confirm that the IMFs perform better than the CMFs according to both one-factor and four-factor models analyzed. This suggests the reactions of IMF towards the three major crisis periods are different. That is, IMFs are more immune to financial crises. This appears when the crisis dummy variables are multiplied by the Islamic fund dummy variable, although the relationship between these variables (DGFC \times DIMF, and DCOV \times DIMF) and performance was negative, it was less declining compared to the crisis dummy variables. This might

be due to the application of Shariah screening on the performance of IMF where it screens out high-risk companies and invests in companies that promote environmental, social, and governance activities. Our results are consistent with Abdullah et al. (2007), Marzuki & Worthington (2014), and Mansor et al. (2019) who find that IMFs outperform CMFs during bearish economic conditions. However, our findings contradict Hoepner et al. (2011) who find that IMFs significantly perform worse than the equity market during AFC but are not affected at all in GCC. Our results about the Covid-19 pandemic are similar to the USA and European evidence provided by Pastor & Vorsatz (2020) and Mirza et al. (2020).

Robustness tests

We repeat our analysis using the time series method with both one-factor and four-factor models for the robustness test. In this analysis, we divide the sample period into two crisis periods as follows:

1. The global financial crisis (GFC) starts from July 2007 to February 2009.
2. The coronavirus crisis (Covid-19) starts from March 2020 to October 2020.

First, we run time series regression using one and four factors models for the whole period from January 2000 to October 2020. Second, we run time series regression for periods before, during, and after each crisis using one and four factors models, respectively. We run the analysis on three portfolios: the IMF, CMF and difference portfolio between the IMF and CMF (IMF-CMF).

The results indicate that during the bearish periods, regardless of the type of market benchmarks used, IMFs and CMFs portfolios are affected by the crises. Both portfolios show negative average daily returns. However, the return performance of IMFs during crisis periods are slightly better than that of the CMFs. The outperformance of IMF implies that Sharia screening does not impose a significant cost on IMF investors. In addition, the coefficient of difference portfolio (IMF-CMF) is significant for all models, suggesting the reactions of IMF and CMF investors towards the three major crisis periods are different. That is, both types of funds behave differently, and IMFs are more immune to financial crises.

CONCLUSION AND IMPLICATIONS

The paper investigates the performance of IMFs and CMFs in Malaysia by evaluating the daily aggregate performance of the two types of funds during significant financial crises (GCC), in addition, to contribute by adding the viral crisis (Covid-19) which erupted between January 2000 to December 2020 period. This study provides unique evidence on what impact a global contagious disease can have on investment funds.

Our main results show that both IMFs and CMFs in Malaysia are generally affected by the financial and viral crises. When we compare the performance between IMFs and CMFs, it is interesting to find that IMFs are generally able to outperform during the whole sample and losing market (negative market returns). This means that Shariah screening does not impose a significant cost on Malaysian IMF investors. In addition, that implying market movements have a direct impact on the mutual fund industry in Malaysia. Concerning the crisis periods, mutual funds returns are negative during the bearish periods, meaning that the funds' returns follow the market movements and are directly impacted by the crises. The IMFs, however, are less affected than the CMFs during the three crises, based on both one-factor and four-factor models. That means that IMFs are generally less risky than CMFs during the bearish period.

The study gives relevant information for investors, especially those investing in IMFs, and where no penalty is incurred for investing in these funds. Moreover, this information is likely to benefit regulators, market players, and investors who plan to diversify their portfolio investments in a potentially emerging market country with characteristics similar to Malaysia. Our findings enhance the understanding of the impacts of the global health crisis on economic activity, and the mutual funds industry. Moreover, our study offers insights for policymakers and governments into the relationship dynamics of COVID-19 that would help them be more cautious in taking preventive measures against the health crisis. The results presented from this study open the way for researchers to expand research horizons regarding viral epidemics. The results could encourage investment in IMFs since can be concluded that the predictability in IMF returns is higher than that

for CMF returns. IMFs can provide a haven for investors during times of immense global and financial stress.

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