Pandemic Attack and Islamic Stocks Index: A Cross Country Analysis

(Serangan Pandemik dan Indeks Saham Islam: Analisis Rentas Negara)

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ABSTRACT

The impact of Covid-19 has triggered the current global economic downturn affecting all aspects of the economy including the Islamic stock index. This study aims to determine the model for forecasting the index. The Islamic stock index is used in six countries through adopting 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 forecasting revealed the tendency of all stock prices to decline. These are associated with impacts of the Covid-19 pandemic on current and future economic performance. Investors need to assess the sector's fundamentals and the individual stocks in question, that are potential winners with propensity to recover and grow well once the market rebounds. They also need to continuously track the development of the pandemic in tandem with the economic sector and thus make the necessary adjustments at every step of the investment process.

Keywords: Islamic Stock Index; ARCH; GARCH; Covid-19; pandemic
JEL Codes: C53, C58, E37, G17, H12, H54

ABSTRAK

Covid-19 telah mencetuskan kemerosotan ekonomi global semasa yang mempengaruhi semua aspek ekonomi termasuk indeks saham Islam. Kajian ini bertujuan untuk menentukan model peramalan indeks. Indeks saham Islam digunakan di enam negara dengan menggunakan kaedah Autoregressive Condisional Heteroscedasticity - Generalized Autoregressive Condisional Heteroscedasticity (ARCH-GARCH) pada data harian sepanjang tempoh Januari 2020 hingga Oktober 2020. Tahap risiko setiap indeks didapati dipengaruhi oleh nilai baki dari hari sebelumnya. Ramalan tersebut menunjukkan kecenderungan penurunan semua harga saham. Hal ini dikaitkan dengan kesan pandemik Covid-19 terhadap prestasi ekonomi semasa dan masa hadapan. Pelabur perlu menilai asas-asas sektor dan saham individu yang dimaksudkan, yang merupakan calon pemenang dengan kecenderungan untuk pulih dan berkembang dengan baik setelah pasaran melantun. Mereka juga perlu terus mengawasi perkembangan pandemik tersebut seiring dengan sektor ekonomi dan dengan itu membuat penyesuaian yang diperlukan pada setiap langkah proses pelaburan.

Kata kunci: Indeks Saham Islam; ARCH; GARCH; Covid-19; pandemik

INTRODUCTION

Globalization affects the economic conditions of a country and the convenience afforded by it does not always positively impact the society or the nation (Jacks & Novy 2018; Masteikiene & Venckuviene 2015; Medvedev 2015). Sometimes negative externalities can arise as a result of globalization which originate from domestic economic actors' inability to compete for market opportunities (Donaldson & Walsh 2015; Radygin, Simachev, & Entov 2015). Despite the convenience that globalization provides it may also facilitate the spread of new types of diseases which may be virulent and difficult to control. The recent coronavirus (Covid-19) pandemic is a good example.

The coronavirus spread very rapidly throughout the globe due mainly to the ease of international travel facilitated by globalization (Ibn-Mohammed et al. 2020). According to the World Health Organization (2020), the Covid-19 outbreak that emerged in China's center in late December 2019, spread rapidly to 216 countries, regions, or territories, resulting in more than 8.3 million confirmed cases and 1,000,000 deaths around the world by 2020. Given the widespread and ongoing sweep of Covid-19 globally, WHO officially declared the virus a pandemic in March 2020. A pandemic can affect many sectors, such as the labor market, global supply chains, and consumer behavior thus impacting the world economy. One of the components among these sectors is the stock market (Ahmar & del Val 2020; Al-Awadhi,

Alsaifi, Al-Awadhi, & Alhammadi 2020; Shafi, Liu, & Ren 2020). Although the overall economic impact is yet to be seen, financial markets have reacted to Covid-19 by early March 2020. Recent studies have also shown that the level of risk in all countries increased drastically in March when the coronavirus spread almost throughout the globe (De Vos 2020; Kanniah, Zaman, Kaskaoutis, & Latif 2020; Zhang, Hu, & Ji 2020). The government and central bank of each country have implemented various economic policies to anticipate this impact (Djalante et al. 2020; Firano & Fatine 2020).

Recent studies that specifically and empirically examined the impact of Covid-19 on the financial and economic systems include Phan and Narayan (2020), Akhtaruzzaman, Boubaker, and Sensoy (2020), Kinateder, Campbell, and Choudhury (2021), and Hassan, Rabbani, and Abdulla (2021). Haroon and Rizvi (2020) focused on stock market liquidity while He, Sun, Zhang, and Li (2020) examined the impact of COVID-19 on different stock market sectors. Both findings indicated that several manufacturing sectors, information technology, education and health care continued to survive the pandemic. Chen, Liu, and Zhao (2020) examined the coronavirus impact on Bitcoin's returns. Wang, Zhang, Wang, and Fu (2020) studied the insurance market in China and established that the industry was negatively affected by the virus. Yue, Korkmaz, and Zhou (2020) showed that households were more likely to make changes to their investment portfolios in lieu of the pandemic. The impact of COVID-19 on stock market volatility (Zaremba, Kizys, Aharon & Demir 2020) and on stock market returns had also been studied (Al-Awadhi et al. 2020; Ali, Alam & Rizvi 2020; Baig, Butt, Haroon & Rizvi 2020; Zhang et al. 2020).

Apart from the covid-19 pandemic several studies had also examined the impacts of past disease outbreaks on the economy. This included Ebola virus (Grépin, Poirier & Fox 2020), bird flu (Ryan, Zoellner, Gradl, Palache, & Medema 2006; Turvey, Onyango, Cuite, & Hallman 2010), 1918 Spanish flu (Karlsson, Nilsson, & Pichler 2014), Severe Acute Respiratory Syndrome (SARS) (Keogh-Brown & Smith 2008), and the Middle East Respiratory Syndrome (MERS) (Ko 2021; Lee & Cho 2017; Smith, Machalaba, Seifman, Feferholtz, & Karesh 2019). Variously these diseases had impacted global health and caused wide-ranging socioeconomic disruptions.

According to existing research Covid-19 had impacted all economic and financial sectors. However, not many studies had dealt with its effect on Islamic stock. This study aims to analyze the volatility of the pandemic impact and predict its influence on the movement of Islamic stocks. This cross-country study will potentially contribute to discovering new knowledge and understanding on the behavior of Islamic stock prices during the Covid-19 period. Secondly, the study

will provide information that can assist investment in the Islamic capital market. Thirdly, it will also provide reference material for further research in similar study area.

LITERATURE REVIEW

The stock market is one of the essential sources of funding for expanding business (Bayraktar 2014). Companies can increase their source of funds by selling their company ownership in the capital market. The funds obtained are for long-term use to optimize and improve their business performance (Bose, MacDonald, & Tsoukas 2019). The company should then strive to maintain and increase investor confidence by giving their best performance in the market including the Islamic stock market (Abdulkarim, Akinlaso, Hamid, & Ali 2020). The development of the stock market leads to positive contribution for economic growth in the country (Aali-Bujari, Venegas-Martínez, & Pérez-Lechuga 2017). An efficient stock market with economic growth develops a positive relationship, both in the short and long term, through an indirect transmission mechanism between the effects of stock market development and investment (Coşkun, Seven, Ertuğrul, & Ulussever 2017; Lawal, Somoye, Babajide, & Nwanji 2018). Investors tend to invest in countries that have low unemployment rates, relatively low social inequality and income disparities, low crime rates, and relatively stable political and security conditions. Thus, the more stable the country's economic and political conditions, the better and more stable the stock market will become.

The Covid-19 pandemic, which quickly spread globally, did not initially affect the stock market. But with the rapid increase in mortality the market began to react negatively (Ashraf 2020; Khan et al. 2020; Lyócsa, Baumöhl, Výrost, & Molnár 2020). The coronavirus also triggered the decline in stock market prices especially following the World Health Organization (WHO) declaration of its pandemic status which led to negative abnormal returns in the market (Alali, 2020; Liu, Manzoor, Wang, Zhang, & Manzoor 2020). The pandemic impacted the capital market, caused changes in trading times, and transmitted negative signals (bad news), which together eventually induced investors into selling their shareholdings (Corbet, Hou, Hu, & Oxley 2020; Machmuddah, Utomo, Suhartono, Ali, & Ghulam 2020). The conditions created by the pandemic also affected stock market dynamics, causing stock exchanges around the world to decline leading to increasing inefficiency in the market (He, Liu, Wang, & Yu 2020; Lalwani & Meshram 2020; Liu et al. 2020; Ngwakwe, 2020).

Phan and Narayan (2020) studied the Corona-19 virus pandemic, which continued to increase rapidly as reflected in the upsurge in infection and mortality rate.

Affected countries began to respond by locking down economic activities and people's movement, closing travel, and implementing stimulus packages to protect the economy and prevent job losses. Their findings suggested the ways in which stock prices can react in real-time to a pandemic situation, such as the spread of discomforting news and market overreaction. With the spread of more information the public becomes better informed and will gradually comprehend the situation. As a result, the market corrects itself more broadly.

Akhtaruzzaman et al. (2020) examined the manner in which financial transmission was transpired through financial and non-financial companies between China and the G7 countries during the Covid-19 period. The empirical results showed that such companies, listed in the G7 countries, experienced significant increase in the conditional correlation between stock returns. However, the magnitude of the increase in correlation was much higher for financial companies during the Covid-19 response. The optimal hedge ratio increased significantly and in many cases was higher during the Covid-19 period.

Kinateder et al. (2021) stated that the significant degradation of mutual relations in the dominant asset class in the Covid-19 pandemic, as compared to past global financial crisis, had caused great fear among investors. The ensuing uncertainty has also resulted in gold and bonds to become safe choices for investment. Hassan et al. (2021) pointed out that the pandemic had massively affected the MENA region. Approximately 69% of the world crude oil supply comes from the region, thus resulting in a decline in crude oil prices due to attendant negative shocks. To reduce adverse effects of the pandemic, several immediate actions can be taken, such as creation of public funds to support the health system, financial support for individuals and small and medium enterprises, financial support for companies to prevent job losses, and guarantees of liquidity in the domestic market. It is also shown that Islamic finance can provide an alternative financial system in assisting communities and entrepreneurs affected by the Covid-19 pandemic.

Haroon and Rizvi (2020) analyzed the relationship between the sentiment generated by news related to the coronavirus and the equity market volatility. The ongoing coronavirus outbreak has resulted in unprecedented news coverage and an outpouring of opinion in this era of rapid information dissemination. The uncertainty that arose in financial markets led to increased volatility in prices. The study found an extraordinary amount of panic caused by news outlets associated with increased volatility in the equity market. Results based on individual economic sectors showed that news with accompanied panic contributes more to the volatility in the sector that was reported to be the most affected by the coronavirus outbreak.

He et al. (2020) used an event study approach to empirically study the market performance and trends in China's industrial response to the Covid-19 pandemic. The results showed that the pandemic had negatively impacted the transportation, mining, electricity, and environment industries. However, the manufacturing, information technology, education, and health care industries proved resilient to the pandemic. Chen et al. (2020) studied the impact of fear sentiment caused by the coronavirus pandemic on Bitcoin price dynamics. The results suggested that market volatility had been exacerbated by fearful sentiment due to increased interest in tracking the coronavirus. Further they discovered that the negative Bitcoin returns and high trading volume can be explained by the fear sentiment related to the coronavirus. Other results also proved that Bitcoin failed to act as a safe protective asset during the pandemic.

Wang et al. (2020) argued that the insurance market was very much affected by the outbreak of the Covid-19 pandemic. They discovered that commercial insurance premium income, monthly premium growth rate from year to year, insurance density, and insurance depth all decreased due to the pandemic. The negative impact on property and personal insurance were both statistically significant. Increasing the rate of social security and digital insurance could reduce the pandemic's impact on the insurance market.

Zaremba et al. (2020) analyzed government intervention aimed at limiting Covid-19 influence on stock market volatility. They found that non-pharmaceutical intervention significantly increased the volatility of the equity market. The effect was however not dependent on the role of the coronavirus pandemic itself. There are two types of measures that can be taken and are usually applied chronologically; namely, holding significantly earlier information campaigns and cancellations of public events. Both measures can make significant contribution to mitigate volatility growth.

Baig et al. (2020) investigated the impact of the Covid-19 pandemic on the microstructure of the United States equity market. The study described liquidity and volatility dynamics through an index that captured the various dimensions of the pandemic. They established that an increase in confirmed infection cases and mortality due to the coronavirus was associated with a significant increase in market liquidity and volatility. Likewise, the decline in sentiment and restrictions and the imposition of lockdown condition contributed to deteriorating liquidity and market stability.

Zhang et al. (2020) stated that the rapid spread of the Covid-19 virus had a dramatic impact on financial markets worldwide. The coronavirus had created an unprecedented level of risk affecting investors to suffer significant losses over a brief period. The study succeeded in mapping the general pattern of country-specific risk and systemic risk in global financial

markets. Additionally, policy intervention has potential consequences, such as the United States' decision to impose zero percent interest rates, unlimited easing, and the extent to which this policy could introduce further uncertainty to global financial markets.

METHODOLOGY

In this study daily data used was sourced from the Dow Jones Islamic Market World (DJIMI), Dow Jones Islamic Market Japan (DJP), Dow Jones Islamic Market China / Hong Kong Titans 30 USD (DJICHKU), Dow Jones Islamic Market India USD (DJIMIND), Dow Jones Islamic Market Canada (DJICA), and Indonesia Sharia Stock Index (ISSI). The data covered the period from January 2020 to October 2020. The stock shares were traded in the United States, Japan, China / Hong Kong, India, Canada and Indonesia. Data on the stock market index were obtained from the Investing Database and the Yahoo Finance Database.

Time series data have the characteristics of extended memory, leptokurtic and volatility clustering (Boako, Agyemang-Badu, & Frimpong, 2015). The Ordinary Least Square (OLS) model is not suitable for data characterized by volatility since it is unable to explain the conditions well given that the volatility indicates frequent changes in mean and variance values. Whereas the OLS model requires that the mean and variance values must be constant. To overcome this, Engle (1982) developed a model that can capture dynamic data with Autoregressive Conditional Heteroscedasticity (ARCH). This was further developed by Bollerslev (1986) transforming it into the Generalized Autoregressive Conditional Heteroscedasticity (GARCH).

The GARCH model is a model that can be used for forecasting using variance data in period t-1. The Box-Jenkins ARIMA model is a model that can similarly be used in forecasting but using original data for the t-1 period. The GARCH model has several assumptions that must be met; namely, the data must be stationary, and has a heteroscedasticity effect. The study adopted the Unit Root Test to conduct the stationary test, which determined the ARIMA Box-Jenkin model. If

the best model has been found, and the data contained heteroscedasticity through the ARCH-LM test, the test will continue wit the use of the ARCH-GARCH model.

The volatility value calculation refers to the standard deviation value of the square root of the ARCH / GARCH model range. The ARCH model consists of constant variance and variance that depends on volatility in the previous period. If the volatility is large, the variance at this time would similarly be large. The current variance depends on the past variance such that heteroscedasticity can be modeled while the variance changes over time. In the GARCH model, the variance consists of the constant variance while the volatility (ARCH term) and the variance depend on those in the previous period (the GARCH term). If the volatility value is much greater, the stock price will increase or decrease drastically. If the volatility value is more excellent, the price will increase or decrease drastically. The equations of the two models are given below: Where h_t is variance at time t, ξ is constant variable, e_{t-m}^2 is volatility in the previous period (ARCH term), $\propto_0$, $\propto_1$,…, $\propto_m$ are estimated coefficient of order m, k is constant variance, h_{t-r} is variance in the previous period (GARCH term), $ä_1$, $ä_2$,…,$ä_r$ is estimated coefficient of order r.

$$h_t = \zeta + \propto_0 e_t^2 + \propto_1 e_{t-1}^2 \quad ; \text{ARCH(m) model (1)}$$
$$+ \propto_2 e_{t-2}^2 + \ldots + \propto_m e_{t-m}^2$$
$$h_t = k + \delta_1 h_{t-1} + \delta_2 h_{t-2} \quad ;\text{GARCH(r,m) (2)}$$
$$+ \ldots + \delta_r h_{t-r} + \propto_1 \varepsilon_{t-1}^2$$
$$+ \propto_2 \varepsilon_{t-2}^2 + \ldots + \propto_m \varepsilon_{t-m}^2$$

RESULTS AND DISCUSSION

The stock price movement given in Figure 1 shows a downward trend. The decline occurred in early March 2020 with the spread in Covid-19 infection that also impacted Islamic stocks. Infection rate began to climb in June 2020. Several countries managed to mitigate the spread of infection through the application of policies by their respective governments.

TABLE 1. Descriptive Statistics

Variable	ISSI	DJICA	DJICHKU	DJIJP	DJIMI	DJIMIND
Mean	556.6988	2081.656	2344.647	2047.602	4350.639	2502.178
Maximum	699.45	2496.88	2769.81	2325.81	5100.11	2978.56
Minimum	393.86	1340.12	1834.34	1557.33	3111.39	1772.64
Std. Dev.	61.1722	277.625	213.2762	181.5586	453.1609	290.0177
Skewness	0.5879	-0.6417	0.0904	-0.6689	-0.5258	-0.3897
Jarque Berra	4.0861	11.8077	7.6777	2.8498	7.3668	6.8563

FIGURE 1. Stock Price Movement

TABLE 2. Correlation matrix

Variable	ISSI	DJICA	DJICHKU	DJIJP	DJIMI	DJIMIND
ISSI	1.0000	0.3186	0.5791	0.6458	0.4811	0.5914
DJICA	0.3186	1.0000	0.8804	0.7773	0.9528	0.9109
DJICKHU	0.5791	0.8804	1.0000	0.8573	0.9216	0.9237
DJIPT	0.6458	0.7773	0.8573	1.0000	0.8733	0.9293
DJIMI	0.4811	0.9528	0.9216	0.8733	1.0000	0.9626
DJIMIND	0.5914	0.9109	0.9237	0.9293	0.9626	1.0000

The descriptive statistics in Table 1 measure data concentration showing the mean as the average in the observation period, the median as the middle value, the maximum is the highest value, the minimum is the lowest value, and the standard deviation as measure of variation in data distribution. Next, Table 2 reports the Pearson correlations for each stock. Overall, we can see a high unconditional correlation for the stock price in our sample.

The stationary test used in this study is the Augmented Dickey-Fuller test (ADF-test) which serves to analyze the time series data for its mean and

variance. Because the data is not stationary at the level, it indicates that the data needs to be differencing again, so the possibility of the order d is 1. The ADF-test results in Table 3 show that the probability value is smaller than the critical value (0.0000 <0.05), which thus indicates that the data used in this study are stationary.

TABLE 3. Augmented Dickey-Fuller Test Results

Variable	1st Difference		
	ADF Statistic	t-Statistic 5%	Prob*
ISSI	-13.6682	-2.8758	0.0000
DJICA	-8.5269	-2.875	0.0000
DJICHKU	-15.7086	-2.8755	0.0000
DJIJP	-11.8879	-2.9758	0.0000
DJIMI	-7.1529	-2.8735	0.0000
DJIMIND	-17.1951	-2.8748	0.0000

Once the data was ensured as stationary, the next step was to determine the best ARIMA model to check the data; specifically, whether the data contain heteroscedasticity effects or otherwise. In this study the ARCH-LM test was used to test the effects of heteroscedasticity. After overfitting, Table 4 shows the best ARIMA (p, d, q) model chosen based on the criteria of having the smallest Akaike Info Criterion (AIC) value. The results in Table 4 shows data that contained heteroscedasticity effect since the probability value is smaller than the critical value (ARCH-LM < 0.05), thus

indicating that the data are suitable for further analysis using the GARCH model. The ARCH-GARCH model was employed to solve problems in time-series data that contain heteroscedasticity effect capable of continuing the forecasting process.

The results in Table 5 are the outcome of selecting the best GARCH model for each variable, based on the smallest AIC value and significant coefficient values. ISSI stocks are shown to have the best models of GARCH (1,1), DJICA with GARCH (1,1), DJICHKU with GARCH (1,1), DJIJP with GARCH (1,1), DJIMI with GARCH (1,1), and DJIMIND with GARCH (1,1).

The model below provides information that the volatility in the stock price index is influenced by market prices together with the standard deviation values from the previous day. The stock price model of each stock index is presented as follows.

$$\text{ISSIh}_t = 0.0000169 + 0.2741\varepsilon_{t-1^2} + 0.6933\,\text{h}_{t-1} \qquad (3)$$

$$\text{DJICAh}_t = 0.00000624 + 0.316344\,\varepsilon_{t-1^2} + 0.7103\,\text{h}_{t-1} \qquad (4)$$

$$\text{DJICHKUh}_t = 0.000051 + 0.131563\,\varepsilon_{t-1^2} + 0.701725\,\text{h}_{t-1} \qquad (5)$$

$$\text{DJIJPh}_t = 0.0000115 + 0.132371\,\varepsilon_{t-1^2} + 0.804701\,\text{h}_{t-1} \qquad (6)$$

$$\text{DJIMIh}_t = 0.00000702 + 0.301922\,\varepsilon_{t-1^2} + 0.714797\,\text{h}_{t-1} \qquad (7)$$

$$\text{DJIMINDh}_t = 0.0000124 + 0.320922\,\varepsilon_{t-1^2} + 0.699213\,\text{h}_{t-1} \qquad (8)$$

The model was tested for accuracy and errors using the ARCH-LM test on heteroscedasticity effect. The test

TABLE 4. Best ARIMA model (p, d, q)

Variable	ARIMA (*p,d,q*)	Akaike Info Criterion	ARCH-LM
ISSI	(1,1,1)	-4.7677	0.0001
DJICA	(1,1,1)	-4.857	0.0185
DJICHKU	(1,1,0)	-5.1844	0.0134
DJIJP	(0,1,2)	-5.668	0.0009
DJIMI	(3,1,0)	-5.2612	0.0033
DJIMIND	(3,1,1)	-5.112	0.0146

TABLE 5. Best Model GARCH (p,q)

	(*p,q*)	C	ARCH (*t-1*)	GARCH (t-1)	Prob.	AIC
ISSI	(1,1)	1.69E-05	0.2741	0.6933	< 0.05	-5.4212
DJICA	(1,1)	6.24E-06	0.3163	0.7103	< 0.05	-5.4217
DJICHKU	(1,1)	5.10E-05	0.1316	0.7017	< 0.05	-5.262
DJIJP	(1,1)	1.15E-05	0.1324	0.8047	< 0.05	-5.8642
DJIMI	(1,1)	7.02E-06	0.3019	0.7148	< 0.05	-5.8565
DJIMIND	(1,1)	1.24E-05	0.3209	0.6992	< 0.05	-5.6651

however revealed that the data did not contain the effect following the use of the GARCH model (Table 6).

TABLE 6. Diagnostic Test

Variable	Heteroscedasticity
ISSI	0.5641
DJIA	0.2241
DJICHKU	0.8627
DJIJP	0.9549
JIMI	0.1049
DJIMIND	0.5953

The Covid-19 pandemic is a signal for investors concerned with the movement of stocks. Signaling theory discusses the ups and downs of market prices in order to inform investors. Signaling theory explains how investors have the same information as company managers about their prospects. In reality however, managers often have better information than outside investors (Lys, Naughton, & Wang 2015; Ozturkkal 2015). Signaling theory explains the problem of market information asymmetry directed to investors as well as company managers informing them on market prospects including that for the company (Bergh, Ketchen, Orlandi, Heugens, & Boyd 2019; Taj 2016). Although developed in the labor market, signaling theory is a general phenomenon that can be applied in any market with asymmetric information, including the capital market where it can occur since it has more information than parties external to the company. Investors can use information in the form of capital market performance as a signal in assessing the company's performance.

The World Health Organization (WHO) has officially designated the Covid-19 virus as a pandemic (Djalante et al. 2020). Its rapid spread exerted profound impact in all sectors, including the global economy which displayed such volatility, and showing a downturn trend (Dwivedi et al. 2020; Rapaccini, Saccani, Kowalkowski, Paiola, & Adrodegari 2020). The uncertainty over when the pandemic will end has also led to a deep correction in the forecast for the future direction of the Islamic capital market which is felt in almost all countries. This has undoubtedly caused unrest for investors and the public, especially in rebuilding optimism amidst hampered economic flows. The efforts made by governments to maintain their national economies should be wisely appreciated by the community in managing their financial strategies. The public needs to be wiser in managing their finances, both as active investors and as lay public, who are not familiar with transaction activities in the capital market (Cao, Li, & Zhang 2015).

Several things can be accomplished in managing finances during the Covid-19 pandemic. The first is to increase emergency funds. Health experts estimated that it will take a long time for the pandemic to subside until conditions return to normalcy (Djalante et al. 2020). Investors therefore, need to allocate more to emergency funds in anticipation of eventualities. Second, periodically review the portfolio according to the investment objectives of each investor. This needs to be done, considering an investor's risk profile can change according to changing investment objectives, age, financial conditions, and market conditions (Kannadhasan 2015; H. H. Khan, Naz, Qureshi, & Ghafoor 2017). Third, pay attention to the investment momentum. If you have reviewed and rebalanced your portfolio and still have remaining funds that can
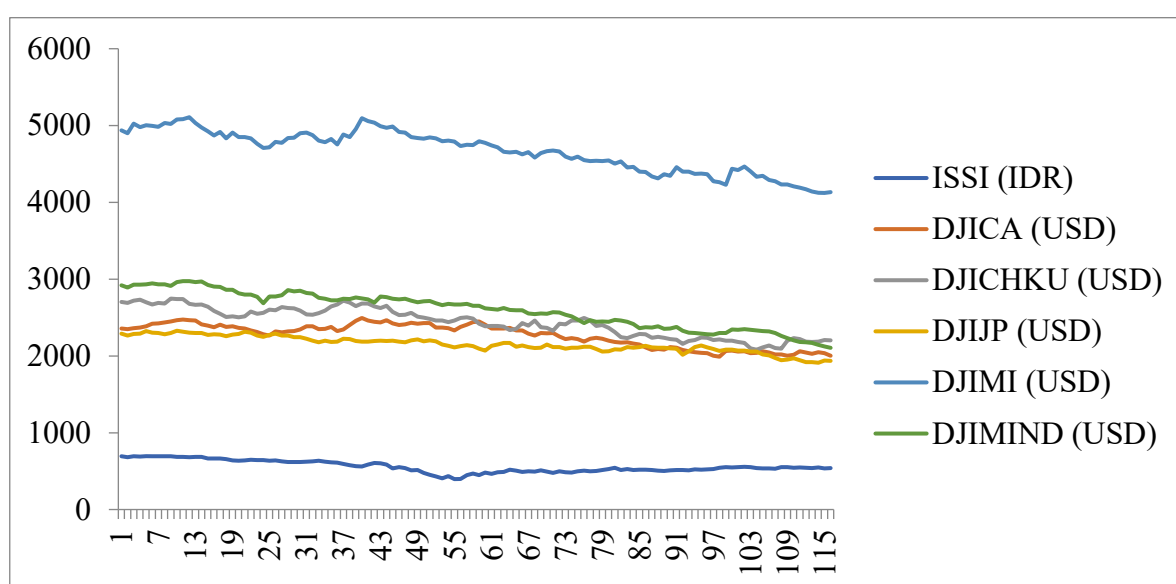

FIGURE 2. Stock Price Forecasting

be invested, it is then quite safe to start investing in momentum (Boussaidi & Dridi 2020; Zaremba, Long, & Karathanasopoulos 2019). If appropriately done with sufficient knowledge capital, buying activities will offer the opportunity to provide benefits. However, there are still concerns over some sectors that will historically tend to be defensive. By appraising the latest market conditions, investors can also take advantage of this situation to opportunistically buy stock-based investment products due to lowered stock prices and to subsequently leave when market conditions improve. Fourth, diversification is critical in investing. There are currently many other options for investing in addition to capital market instruments, such as stocks, bonds, and mutual funds (Chen & Imam 2013). Investment diversification through alternative assets widely offered by fintech platforms, such as Equity Crowdfunding (ECF), Project Financing, and Peer-to-Peer (P2P) lending, can be a good diversification option for investors. However, ensure that investors deal only in investment products and providers contract such products that have been registered and licensed.

CONCLUSION

The volatility level of each index is influenced by the degree of volatility on the previous day. In forecasting, there is the tendency for all stock prices to decline in price. This decline is inseparable from the severe impact on stock performance due to the Covid-19 pandemic. Investors need to assess the fundamental side of the sector and the individual stocks in question, deemed to be potential winners with the ability to recover and grow well when the market rebounds from the pandemic. Visiting the fundamental aspects of investment is crucial for studying the behavior of corporate response to the impact of the Covid-19 pandemic for the current and subsequent year.

Furthermore, subsequent development of the Covid-19 pandemic and the economic sector may continue to exert influence that needs to be adjusted to at every step of the investment process. The portfolio will continuously be subjected to rearrangement, and decisions adjusted for the strategy and investment position in the existing investment instruments. Valuation will also need to be considered. It is also essential to review the Price to Earnings Ratio (PER) or Price to Book Value (PBV), especially now that stock prices are generally much lower than in previous years. It may be that among the best stocks available, and with a reasonably good understanding of the prospects for future recovery, investors can decide on stocks that are currently in a reasonably cheap position.

The government should formulate the necessary policies to accelerate stock market stability by increasing the number of aid recipients in priority sectors and conducting more intensive socialization regarding the dangers and prevention of Covid-19. Additionally, policies that address relief to issuers holding loans so as to increase industrial performance through lowering of interest rates or credit restructuring. Issuers' response should be revisited for its ability to maintain company performance by protecting employees from infection. The response, from upstream to downstream, could take the form of implementing health protocols, maintaining employee performance, improving technology and its online use in all fields so that the employee's activities can be made more effective. The relevant actions needed to be taken by investors include reduction in investment losses through conducting fundamental and technical analyses, management of stock portfolios, identifying business sectors resistant to pandemic conditions, and pursuing latest information on issuers necessary for assessing the condition of the company.

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