THE EFFECT OF GLOBAL PANDEMIC COVID-19 AND ECONOMIC INDICATORS ON FTSE BURSA MALAYSIA KLCI STOCK RETURNS VOLATILITY: AN EXPLORATORY SEQUENTIAL MIXED METHODS APPROACH

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ABSTRACT

Malaysia's stock markets experienced significant declines as the virus spread throughout the global pandemic of COVID-19. This study was undertaken to investigate the global pandemic COVID-19 and Malaysia stock market volatility during the Movement Control Order from 18 March 2020 until 30 September 2022 using a mixed method of quantitative and qualitative data. The Exponential Generalized Autoregressive Conditional Heteroskedastic (EGARCH) methodology was employed to analyse identified quantitative variables and understand stock return patterns, along with a qualitative exploratory sequential mixed methods approach to investigate the phenomenon. The EGARCH empirical finding reveals statistically positive coefficients and highlights substantial continuity in Malaysia's stock market return volatility, besides negative shocks and significance between the variables in considering uneven volatility and their impact on FTSE Bursa Malaysia KLCI stock returns, except for Malaysia's gold price.

INTRODUCTION

The global pandemic of the new coronavirus, known as COVID-19, in 2020 caused economic and financial devastation that far outstripped any previous significant public health disaster. It all began in China, and a little over a quarter of a year later, it spread to more than 200 other nations, causing an enormous number of illnesses and fatalities. With new cases being reported in several different places, the pandemic has apparently been contained to a lesser extent in certain nations than in others. According to the World Health Organization (WHO), the United States has recorded more than 28 million confirmed cases as of December 2020. The pandemic has been declared as a worldwide emergency because of the threat that the virus poses to public health. Moreover, it has not yet hit its

tipping point (Gao et al., 2022). It eventually resulted in a flood of news and views, besides coverage and analysis that was directly caused by the enormous human and economic impacts. To tackle these, the government undertook harsh official measures including border controls, city blockades, stay-at-home instructions, and lockdowns.

It is obvious now that not only public health but also all countries were impacted, as they were forced to shut down their trades and economies while the government struggled to prepare for the possibility and develop a backup plan for the economy. The pandemic ruined the economy with ripple effects, including declined asset prices, increased uncertainty for both foreign and local businesses, and interruptions to global supply networks that have led to local food shortages (Yousef, 2020). As a direct consequence, more than one-third of the world's population has been quarantined, not to mention international commerce and tourism being seriously restricted at borders following widespread cancellations of aeroplane flights (Ayittey et al., 2020).

Ever since the pandemic began, there has been a clear shift in attention on several international financial markets. It is not far-fetched to assume that fear and anxiety are the driving forces underlying this market change (Kusumahadi & Permana, 2021). The fall in stock prices may illustrate how investor fear leads to irrational behaviour, which in turn exposes the investors' underlying biases. Since investor concern often leads to a reduction in stock prices, the possible outcomes could be erratic stock market behaviour and a trend for stock prices to move in opposite directions (Isidore & Christie, 2018).

As a result, it should come as no surprise that the countries afflicted with COVID-19 recorded falling stock markets since the virus outbreak in late January 2020 until March 2022. Figure 1 below clearly shows each affected country's economy as a direct result of the spread of COVID-19. These poor results should serve as a wake-up call to all global economic participants. Stock market fluctuations are commonly regarded as the leading economic indicators since they frequently anticipate changes in other indicators (Bodie et al., 2013). Meanwhile, the recent decrease in market performance may have larger economic consequences. Stock returns are generally volatile, whereby they move in value over time quickly and unexpectedly (Soon et al., 2024; Kusumahadi & Permana, 2021). Therefore, major changes in one period may be followed by even greater changes again in another, or smaller changes can be followed by bigger changes (Hill et al., 2011).

Figure 1

FTSE Bursa Malaysia KLCI and Global Pandemic Covid-19 Daily Infected Cases from January 2020 until March 2022
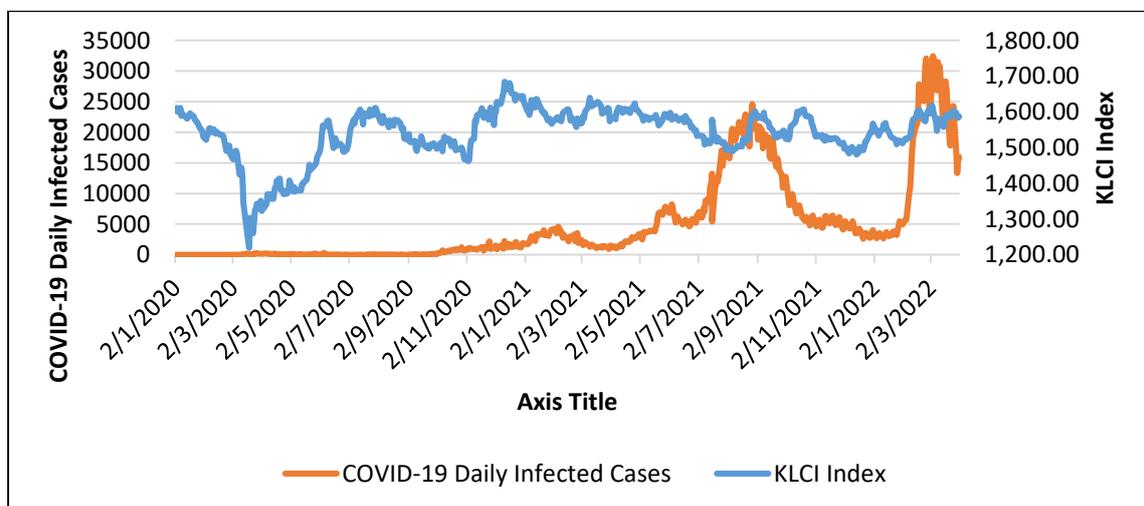
Source. Compiled from the official portal of the Ministry of Health Malaysia and Blomberg Terminal.

LITERATURE REVIEW

Stock Market Volatility during the Pandemic

Stock markets are interrelated and interdependent. Throughout any financial crisis, investigators will discover the existing significant cross-market connections. As trade and finance are usually involved in a country's economic integration, a financial crisis in one nation might reduce commerce, foreign direct investment, and other capital movements internationally (Morales & Andreosso-O'Callaghan, 2012). Financial market integration then determines crisis spreads that are integrated and contagious. For instance, using the dynamic conditional correlation - generalized autoregressive conditional heteroskedasticity, Chiang et al. (2007) found a fall throughout the 1996-2003 crisis for nine Asian markets. This was expected, given that these stock markets are typically susceptible to systematic risk. Stock market movements increasingly relate to infectious illness epidemics, which may lower investor confidence, thus affecting investment choices and stock market values (Liu et al., 2020).

According to Ramiah (2013), major events also have different effects on stock markets all over the world. Stock prices fluctuate over time depending on current events at the time and may be driven by both internal and external factors (Kusumahadi & Permana, 2021). Albulescu (2020) examined the impact of the COVID-19 official announcement on the financial volatility and compared the effect of COVID-19 data numbers reported in and outside China. They found a positive impact of stock market volatility on the new cases outside China, and increased financial volatility, possibly brought by the spread of coronavirus.

Ashraf (2020) analysed the reaction of the financial market using 64 data on stock market returns to the COVID-19 daily confirmed cases and fatalities. The study employed vector autoregression models to analyse the dynamic relationship between COVID-19 developments and stock market behaviour. The stock market was found to have a negative impact on the daily increase in confirmed cases of COVID-19. In addition, the stock market reacted more persistently to the increase in recorded cases rather than the fatalities.

Dating back to the 1900s, Baker et al. (2020) analysed major stock market movements for overall volatility in 1985 using a text-based algorithm. Stock market volatility has been stronger during the COVID-19 pandemic than during the 1918–1919 Spanish flu pandemic, as well as the 1957–1958 and 1968 influenza pandemics. The stock market responded significantly stronger during the COVID-19 pandemic as compared to previous pandemics because the government had imposed restrictions on economic activity and implemented social distancing.

Another study by Zeren and Hizarci (2020) that employed a cointegration test found a correlation between daily cases and some country stock markets in the connection between COVID-19 daily total cases and total deaths. The stock markets of some countries showed no effect on the presence of mortality.

Besides, Liu et al. (2020) employed an event study method in major affected countries like Germany, Italy, Japan, Singapore, Korea, the United States, and the United Kingdom during the COVID-19 outbreak. They examined 21 significant stock markets and observed that the global financial market has been influenced by the contagious viruses. On the other hand, higher rates of negative unexpected returns were recorded in Asia than in any other country.

To find out fall and volatility, Ali et al. (2020) analysed the response of financial markets in China, Europe, and the United States during the spread of COVID-19 using Exponential GARCH models. They discovered that the market environment suddenly became alarmed by the COVID-19 transitioning from an epidemic to a pandemic. Even safer commodities like gold returns have turned negative as COVID-19 spread to the US. In the same vein, Papadamou et al. (2020) investigated the effect of Google trend synthetic stock markets in the USA, Asia, Australia, and Europe using panel vector autoregression, Results in both studies indicated a clear causal positive correlation between stock

market implied volatility and Google trend measures for COVID-19. Investors may be recommended to simultaneously conduct active trading on markets using electronic platforms and look for trends in Google analytics, thanks to the automated trading made possible by the rising use of technology around the globe.

Meanwhile, Uddin et al. (2021) investigated the direct and indirect impact of COVID-19 on the stock market volatility using Exponential GARCH models. They also examined how certain economic variables might assist in reducing volatility in 34 developed and developing countries. It was concluded that resilience scores for both developed and developing countries may minimise the stock market volatility.

Vo et al. (2022) analysed the effects of the COVID-19 pandemic on the stock markets of Asia-Pacific countries from January 2020 (the start of the pandemic) until January 2022, as well as the effect of volatility that changed between 2020 (the first year of the pandemic) and early 2021 until early 2022. Their study employing panel vector autoregression concluded that when using COVID-19 control measures, countries in the Asia-Pacific region experienced reduced market volatility. In addition, they reported a significant decrease in the impact of the daily announcement of confirmed cases and the actions taken to control COVID-19 on market volatility at both country and regional levels since 2021.

Furthermore, Engelhardt et al. (2021) studied whether governmental and societal trust among citizens can affect the stock market volatility. Upon analysing financial market returns from 47 countries during the COVID-19 crisis, they found that the pandemic and the infectious virus caused an increase in volatility and uncertainty in the global stock market. They also found lower stock market volatility for high-trust countries based on the recorded COVID-19 case declaration.

Elsewhere, David et al. (2021) compared the growth in the number of reported cases of four pandemics and the various financial stock markets in the first 79 days using an empirical test of error correction terms and cointegration. The findings revealed a considerable impact of the shocks brought on by the illnesses on the stock returns. Most of the indices were hit with significant initial shocks because of the impetus caused by each illness epidemic.

Cheng et al. (2022) later examined the volatility network of 19 stock markets' connectedness from 2016 to 2020 with an emphasis on the effects of the COVID-19 epidemic at various phases of its growth. The vector autoregression findings indicated that the COVID-19 outbreaks in late February to early March 2020 across Europe and America have increased the overall volatility of the connectivity network.

In addition, the stock market's response to COVID-19 had a significant leverage effect in both the US and China. The Wavelet analysis showed the impact of the early phase of the outbreak on the U.S stock market and the volatility of the oil price (Gao et al., 2022). The U.S stock market collapsed in March 2020.

RESEARCH METHODOLOGY

Research Design and Data Quantification

This research paper employed a mixed method of quantitative and qualitative data in deriving the COVID-19 global pandemic and Malaysian stock market volatility. Quantitative secondary data were retrieved from Bloomberg Terminal and Ministry of Health of Malaysia to conclude the Malaysia stock market frequency and magnitude changes as a result of the Covid-19 daily cases, COVID-19 recovery rate, COVID-19 death rate, investor sentiment, government policy, foreign exchange rate, Malaysia gold price and world crude oil price. The daily Monday to Friday secondary data was retrieved from the enforcement of Malaysia's first Movement Control Order (MCO) from March 18, 2020, until September 30, 2022. Table 2 shows the quantification of independent and dependent variables in this study.

Table 1

The Quantification of the Study Variables

Variables	Quantification	Unit of Measurement	Source
FTSE Bursa Malaysia KLCI	Top 30 companies' market capitalisation listed on the Bursa Malaysia Main Board $\frac{\text{Stock Price}_{t+1} - \text{Stock Price}_t}{\text{Stock Price}_t}$	Percentage	Blomberg Terminal
COVID-19 daily cases			Kementerian
COVID-19 recovery rate	Statistical data by the Ministry of Health of Malaysia	Number of Cases	Kesihatan Malaysia
COVID-19 death rate			
Investor sentiment	Market turnover rate	Rate	Blomberg Terminal
Government policy	Malaysian government policy announcement related to Covid-19 on day t + 10 days = 1 other wise otherwise 0	Dummy variable	News
Foreign exchange rate	The market quotation price of 1 USD to MYR	Rate	
Malaysia gold price	The forces of demand and supply of the Malaysian gold price	Per ounce (MYR)	Blomberg Terminal
Brent crude oil price	The force of demand and supply of physical world crude oil price	Per barrel (USD)	

On the qualitative basis, a focus group interview of 30 respondents was conducted to obtain more in-depth information on their perceptions, insights, attitudes, experiences, and beliefs in explaining the tendency and substance of Malaysia's stock market movement during and post the COVID-19 global pandemic. The selection criteria for the 30 respondents in this research were 10 years of investment background, investment during and post-COVID-19 global pandemic, and an investment portfolio of RM100,000 worth of Malaysian stocks.

Inferential Statistics

The integration order of each study variable was examined with the unit root, as shown in Table 1, to prevent invalidity in the analysis. According to Gujarati and Porter (2010), when the mean, variance, and covariance of a series remain constant across the study periods, it indicates that the study variables are stationary. Stationarity is essential for deriving accurate results, as opposed to analyses involving non-stationary variables. Most economists will argue that a macroeconomic time series contains a unit root and that its fluctuations over time may suggest a non-stationary trend. Meanwhile, Cerqueira et al. (2020) mentioned that it is equally important to have a stationary time series, called spurious regression, to avoid biased results. Hence, the Augmented Dickey-Fuller (ADF) test was used to analyse the stationarity of the variables, i.e., whether a series was integrated of order I(0) or I(1) with three common variations in Equation 1, Equation 2 and Equation 3. The stationarity of variables at order I(0) implies that the series was stationary in its level form and I (1) refers to a non-stationary time series at its level that became stationary after first differencing.

No intercept $\Delta Y_t = \beta_1 Y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + u_t$ Equation (1)

With intercept $= \Delta Y_t = \beta_0 + \beta_1 Y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + u_t$ Equation (2)

With intercept and trend $= \Delta Y_t = \beta_0 + \beta_1 Y_{t-1} + \gamma t + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + u_t$ Equation (3)

This paper employed the Generalized Autoregressive Conditional Heteroskedasticity Regression (GARCH) model developed and extended by Bollerslev (1986) to examine the time-varying nature of volatility. In the GARCH model (*p, q*), the *p* parameter is the lagged past volatility at time *t* to capture the past volatility persistence, whereas the *q* parameter is the lagged squared error to capture the impact of past errors' forecast on the momentum of current time *t* volatility. The modelling equation in this study was developed as in Equation 4:

$$\sigma^2_{t-j} = \omega + \sum_{i=1}^{p} \alpha_i \varepsilon^2_{t-i} + \sum_{j=1}^{q} \beta_j \alpha^2_{t-j} + \sum_{k=1}^{m} \gamma_k X^2_{t-k} \qquad \text{Equation (4)}$$

where σ^2_t is the conditional variance of the time series at time t, ω is the long-term average volatility and ε^2_{t-i} represents the difference between the observed value and the predicted value at that time step. Moreover, to access the objective of this study, γ_k denotes the coefficients for the squared study variables values as in Table 1, and X^2_{t-k} derives the behavioural impact on the Malaysian stock market volatility. The existence of the GRACH volatility effect will continue in the Exponential Generalized Autoregressive Conditional Heteroskedastic (EGARCH) for the identification of the important variables of Covid-19 and economic indicators in explaining the leverage effect.

The Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) model, introduced by Nelson in 1991, is an extension of the widely known GARCH model. It is specifically designed for analysing time series data, with a focus on identifying aspects such as ARCH effects, leverage, and volatility persistence. The generalised aspect of EGARCH emphasises its ability to account for both positively and negatively signed shocks. This feature is particularly relevant when examining the effects of variables like COVID-19 and economic indicators on the returns of the FTSE Bursa Malaysia KLCI stock. Evidently, one notable strength of the EGARCH model lies in its capacity to capture asymmetries (parameterised by γ) in the response of volatility to positive and negative shocks. The coefficient provides insight into whether the time series exhibits symmetrical or asymmetrical volatility behaviour. If $\gamma = 0$, volatility is symmetrical; when $\gamma < 0$, negative returns increase volatility, and when $\gamma > 0$, positive returns bring on increased volatility. Nevertheless, when γ is positive and significant, it signifies that positive shocks exert a greater influence on volatility in comparison to negative shocks. Conversely, a negative γ implies a stronger impact of negative shocks on volatility. Therefore, the EGARCH model is a valuable tool for understanding and predicting behaviour in the presence of various shocks and economic indicators.

Statistical Results

This research comprehensively examined the enduring volatility between the global COVID-19 pandemic variables and economic factors in relation to the FTSE Bursa Malaysia KLCI stock returns. The study, spanning from March 18, 2020, to March 31, 2022, incorporated a robust dataset comprising 501 data points. To fortify the model against potential econometric issues, the unit root analysis employed the ADF unit root test. Table 2 presents the results of the ADF unit root test, illustrating the t-statistics for the key factors under investigation.

Table 2

Augmented Dickey-Fuller Unit Root Test

Factors	At Level		First Difference	
	Intercept	Trend and intercept	Intercept	Trend and intercept
FTSE Bursa Malaysia KLCI	-4.270685***	-3.991798***	-25.14651***	-25.26749***
COVID-19 daily cases	-3.825643***	-3.825643***	-3.735525***	-3.688594***
COVID-19 recovery rate	-3.544935***	-4.701778***	-3.483456***	-3.397191*
COVID-19 death rate	-2.001979	-2.105724	-23.62740***	-23.60729***
Investor sentiment	-9.970794***	-9.961125***	-19.42891***	-19.41278***
Government policy	-4.830653***	-4.878663***	-16.43266***	-16.41603***
Foreign exchange rate	2.797329*	-2.399140	-21.64292***	-21.75593***
Malaysia gold price	-3.483982***	-3.446655**	-22.41411***	-22.40372***
Brent crude oil price	-0.937007	-3.909088**	-21.12114***	-21.10188***

Notes. *, **, *** indicate the rejection of the null hypothesis at 10%, 5%, 1% significance levels. Lag lengths for the Augmented Dickey–Fuller unit root are based on Schwarz Information Criterion.

Table 2 provides a comprehensive overview of the Augmented Dickey-Fuller (ADF) unit root test results. The data showcases the time series attributes of global COVID-19 pandemic variables, economic factors, and FTSE Bursa Malaysia KLCI stock returns. Notably, these variables exhibited stationarity and demonstrated an absence of unit root problems at the first difference. Consequently, compelling evidence emerged, supporting the assertion that all study variables attained stationarity at the first difference level. This critical finding bolsters the foundation for subsequent analyses. Moreover, within the framework of the ADF test, Sargan and Bhargava (1983) presented an array of optimal finite sample tests for assessing unit roots in various time series scenarios. Specifically, these statistics here scrutinised the null hypothesis of a unit root against one-sided alternatives, taking into account first-order autoregressive models. Such examination helps to ascertain whether the process in question skews towards explosiveness or maintains stability under the alternative hypothesis.
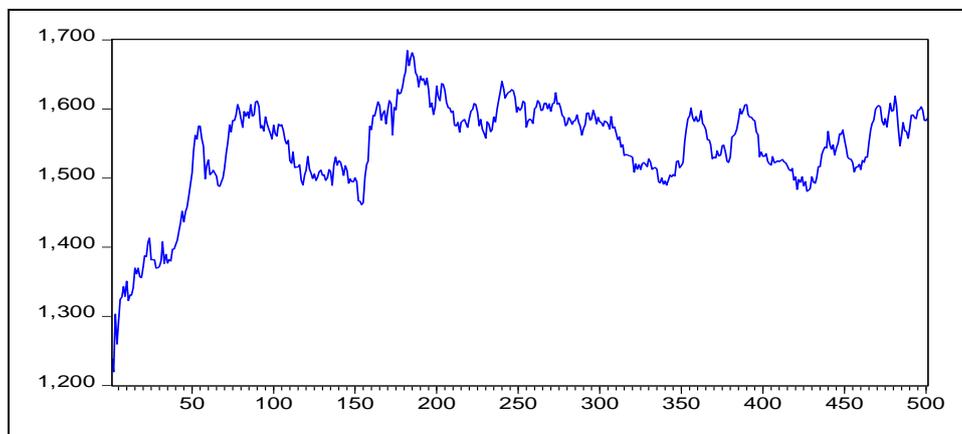
Figure 2

FTSE Bursa Malaysia KLCI

Figure 2 illustrates an increasing trend in the FTSE Bursa Malaysia KLCI stock returns, indicating a stochastic or non-stationary behaviour where the time series data followed a random walk model and did not revert to a constant mean over time. To address the objective of this study, log differencing of the FTSE Bursa Malaysia KLCI stock returns data was proposed to achieve stationarity and to capture

the time-varying volatility, particularly in relation to the clustering of extreme values in FTSE Bursa Malaysia KLCI stock returns.

Figure 3

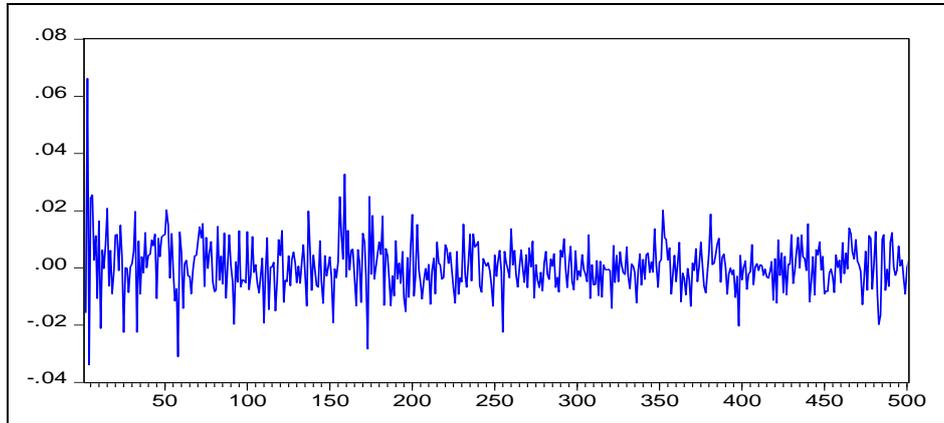*Log-differenced FTSE Bursa Malaysia KLCI Stock Returns*

Figure 3 demonstrates the presence of volatility clustering within the series. This phenomenon is characterised by periods of large changes being succeeded by further large changes, as well as periods of small changes followed by further small changes.

Table 3

ARCH Heteroskedasticity Test

	Coefficient		Prob.
F-statistic	37.61344	Prob. F	0.0000
Obs*R-squared	35.10780	Prob. Chi-Square(1)	0.0000

The ARCH heteroskedasticity test in Table 3 demonstrates significant ARCH effects, with the F-statistic of 37.61344 and p-value of 0.0000, leading to the rejection of the null hypothesis. Autoregressive conditional heteroskedasticity did not exist in the residual errors. Furthermore, the Obs *R-squared value of 35.10780 with a p-value of 0.0000 for the chi-squared test further confirmed the presence of significant ARCH effects. Therefore, the substantial evidence of the ARCH effect indicated heteroskedasticity fulfilling the conditions of the GARCH and EGARCH modelling.

Table 4

Generalized Autoregressive Conditional Heteroskedasticity Regression (1,1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	54.00174	16.43411	3.285954	0.0010***
KLCI (-1)	0.965256	0.010580	91.23782	0.0000***
Variance Equation				
ω	12.74004	4.344660	2.932345	0.0034***
α	0.051054	0.019227	2.655310	0.0079***
β	0.863635	0.034579	24.97582	0.0000***

Notes. *, **, *** indicates the rejection of the null hypothesis at 10%, 5%, 1% significance levels.

The GARCH (1,1) model in Table 4 reveals statistically significant volatility clustering at the one per cent confidence level, as indicated by a positive coefficient of 54.00174. The constant term represents the average stock return, signifying the expected value of the log-differenced FTSE Bursa Malaysia KLCI stock returns. Moreover, the past values of the FTSE Bursa Malaysia KLCI stock returns demonstrated significant behaviour and patterns at the one per cent level, with a positive coefficient of 0.965256.

On the other hand, the variance equation for time-varying volatility was also significant in explaining volatility clustering with a constant term of 12.74004, a component dependent on the past error term of 0.051054 (ε_{t-i}^2), and a past value component of 0.863635 (σ_{t-j}^2). This finding clearly establishes the presence of time-varying conditional volatility of returns in the FTSE Bursa Malaysia KLCI stock returns. Furthermore, it highlights a substantial persistence in volatility shocks, as denoted by the sum of the ARCH and GARCH parameters ($\alpha + \beta$). This implies that the impact of today's shock continues to influence variance forecasts for an extended period into the future. Therefore, the Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) model will be employed to examine the influence of the identified COVID-19 variables and economic indicators on explaining volatility shocks during the COVID-19 pandemic period in Malaysia.

Table 5

Exponential Generalized Autoregressive Conditional Heteroskedasticity

Variable	Coefficient of γ	Std. Error	z-Statistic	Prob.
Dependent: FTSE Bursa Malaysia KLCI stock return				
COVID-19 daily cases	0.010089	9.87E-05	16.20591	0.0000***
COVID-19 recovery rate	0.000899	0.000135	15.60421	0.0000***
COVID-19 death rate	-0.121094	0.007443	-13.65243	0.0000***
Investor sentiment	-0.006878	1.29E-08	10.07841	0.0000***
Government policy	-0.014428	1.920307	-16.25401	0.0000***
Foreign exchange rate	-0.008619	11.08061	-59.03507	0.0000***
Malaysia gold price	-0.139441	0.003087	1.193041	0.2329
Brent crude oil price	-0.139441	0.049001	22.59990	0.0000***

Notes. *, **, *** indicates the rejection of the null hypothesis at 10%, 5%, 1% significance levels.

Table 5 illustrates the empirical findings of the EGARCH (1,1) model, revealing the significance of at least a 1% level for all study variables in capturing asymmetric volatility and their impact on FTSE Bursa Malaysia KLCI stock returns, except for the Malaysian gold price. Respective news announcements related to the study variables were seen to exert varying effects on volatility. Specifically, the COVID-19 daily cases and COVID-19 recovery rate exhibited positive coefficients of 0.010089 and 0.000899, respectively. These coefficients reflect positive shocks or good news of unexpected positive deviations from the anticipated behaviour of FTSE Bursa Malaysia KLCI stock returns, leading to an increase in conditional volatility. In essence, good news developments would contribute to heightened volatility.

Conversely, the empirical results revealed factors such as the COVID-19 death rate, investor sentiment, government policy, foreign exchange rate, and Brent crude oil price that exerted a negative shock indicative of adverse news. This then led to a reduction in the conditional volatility of FTSE Bursa Malaysia KLCI stock returns that represented unexpected negative deviations from the anticipated or usual behaviour. In particular, the Malaysian gold price showed insignificance in elucidating the presence of volatility clustering in relation to FTSE Bursa Malaysia KLCI stock returns.

Apart from that, a panel stock market trader of twelve respondents participated in a focus group interview through an exploratory sequential mixed methods approach. This session was dedicated to in-

depth discussions and debates concerning the empirical findings presented in Table 5 about the EGARCH (1,1) analysis and its implications for volatility clustering in relation to FTSE Bursa Malaysia KLCI stock returns. The insights garnered from this interactive session, as outlined in Table 6, shed light on the behavioural nuances that underlie the qualitative perspective. This qualitative dataset contributes significantly to a deeper comprehension of the observed patterns and trends, providing a more nuanced perspective on the intricate volatility clustering dynamics within the finance literature.

Table 6

Exploratory Sequential Mixed Methods Approach - Focus Group Interview

Factors	Probability and Coefficient of γ	Stock Market Trader Responses
COVID-19 daily cases	Significant and positive shocks	Supported: High daily COVID-19 cases led to increased uncertainty and fear among investors. The positive news, such as a reduction in infected cases, affected investor sentiment and confidence, and consequently, had positive effects on stock prices.
COVID-19 recovery rate	Significant and positive shocks	Supported: A higher recovery rate boosted investor confidence and sentiment. It signalled the government in managing the pandemic, potentially leading to increased optimism about the economic recovery and consequently, positive effects on stock prices.
COVID-19 death rate	Significant and negative shocks	Partially Supported: A high death rate led to changes in consumer behaviour. Consumers became more cautious and conservative in their spending habits, particularly on essential goods and services (evident during the pandemic period). This could directly impact companies' revenues and, subsequently, their stock prices over the short term. The respondents responded that there would only be a short-term impact as the Malaysian government ceased announcing the death rate thereafter.
Investor sentiment	Significant and negative shocks	Supported: Investor sentiment led to rapid and extreme fluctuations in stock prices during the COVID-19. Negative sentiment resulted in sharp declines over short periods, given the panic sell and uncertainty. Furthermore, the fundamental analysis readjusted the equity prices to reflect the book value when the storm had settled down.
Government policy	Significant and negative shocks	Not Supported: Government policies on COVID-19, such as stimulus packages and monetary policies, had a substantial impact on the stock market's reaction. Stimulus measures could inject liquidity into the economy, potentially leading to an increase in stock prices, which took a longer duration to yield results compared to its short-term impact. However, the political instability during the lockdown had a detrimental effect on government policies, which in turn had a negative and prolonged impact on the economy.

(continued)

Factors	Probability and Coefficient of γ	Stock Market Trader Responses
Foreign exchange rate	Significant and negative shocks	Supported: The respondent argued that a prolonged weakened currency value could impact a company's competitiveness in the global market, which translated into a negative coefficient.
Malaysia gold price	Insignificant	Not supported: Investment in gold has often been considered a safe-haven asset key that explains investors' switch from equity investment, its impact on stock prices due to the market dynamics and return to equity investment after a price storm.
Brent crude oil price	Significant and negative shocks	Supported: The respondents supported the empirical findings that Malaysia, being a significant oil exporter that is heavily reliant on oil revenues, experienced a prolonged impact on its economy. This, in turn, was reflected in the equity market, which gauges the Malaysian economy over the long term.

CONCLUSION AND RECOMMENDATION

This research delves into the global impact of the COVID-19 pandemic on the Malaysian stock market's return, employing a comprehensive mixed-method approach that integrates both quantitative and qualitative data. The pervasive uncertainty induced by the COVID-19 crisis has had profound repercussions on the world's economies and investor decision making, within this challenging context, the FTSE Bursa Malaysia KLCI exhibited noteworthy trends characterised by both rising returns and stochastic behaviour. This study, which aimed to unravel the intricacies of these phenomena, shed light on the multifaceted dynamics that unfolded during the pandemic, thereby contributing valuable insights to the understanding of the interplay between global health crises and financial markets.

The empirical findings of the EGARCH model, which scrutinised the time-varying characteristics of volatility, revealed compelling insights. This study discerned the existence of time-varying conditional volatility within the returns of the FTSE Bursa Malaysia KLCI stock. Notably, there was a discernible persistence in volatility following positive shocks in the study variables of COVID-19 daily cases and COVID-19 recovery rate. On the other hand, the COVID-19 death rate, investor sentiment, government policy, foreign exchange rate and Brent crude oil price signified a negative shock toward the returns of the FTSE Bursa Malaysia KLCI. The significant study variables demonstrated statistical significance in capturing asymmetric volatility and exerting their influence on FTSE Bursa Malaysia KLCI stock returns. Furthermore, the COVID-19 daily cases and COVID-19 recoveries indicated positive shocks or good news of unexpected positive deviations from the anticipated behaviour of FTSE Bursa Malaysia KLCI stock returns, leading to an increase in conditional volatility. Meanwhile, the COVID-19 death rate, investor sentiment, government policy, foreign exchange rate, and Brent crude oil price exerted a negative shock indicative of adverse news. This phenomenon resulted in declining conditional volatility of FTSE Bursa Malaysia KLCI stock returns, which signified unexpected negative deviations from the anticipated or typical behaviour. This reduction in volatility suggests a departure from the norm, highlighting instances where the market experiences unexpected downturns that may not align with the prevailing expectations.

Besides, the exploratory sequential mixed methods approach aimed to enhance qualitative insights to a more comprehensive understanding of the phenomenon. Therefore, a focus group comprising 30

respondents was conducted to obtain a nuanced and in-depth understanding of perceptions, insights, attitudes, experiences, and beliefs related to the dynamics of the Malaysian stock market during and after the global COVID-19 pandemic. The tapping into the collective wisdom of diverse participants enabled the researchers to uncover valuable insights that significantly unravel the intricacies of the Malaysian stock market's behaviour amid the extraordinary circumstances brought about by the global health crisis, as findings are illustrated in a coherent manner in Table 6.

Overall, the empirical findings of this study hold immense and unparalleled importance for policymakers, investors, and businesses in making financial market investment decisions. Furthermore, the results are of critical significance to the FTSE Bursa Malaysia KLCI stock markets, offering profound insights that can drive strategic initiatives aimed at fortifying and stabilising the stock market. The empirical findings indicate that all the studied variables are significantly important, with the exception of the gold price. These findings are enriched with insightful experiences gathered from investors, which, in turn, provide recommendations to help policymakers mitigate the effects of future crises on stock market volatility. These include implementing real-time monitoring systems to swiftly detect market anomalies during a disease pandemic and developing comprehensive and robust strategies that contribute to the enduring stability and resilience of the stock market in the face of unprecedented challenges like the global COVID-19 pandemic.

In addition, the qualitative significance underscores the importance of variables during the COVID-19 pandemic in understanding Malaysia's stock market volatility. This holistic approach contributes to a deeper comprehension of the phenomenon, recognising both quantitative metrics and qualitative nuances. As a recommendation for future research endeavours, it is suggested that one broaden the scope by incorporating additional variables into the analytical model. Extending the study period to encompass phases before, during, and after the pandemic would offer a more comprehensive perspective on the multifaceted and evolving nature of stock market volatility over time. This expanded approach could provide a more nuanced understanding of the complexities inherent in the stock market dynamics.

LIMITATION OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH

This study encounters several limitations that must be considered when interpreting the empirical findings. Firstly, this empirical analysis conducted during the global COVID-19 pandemic may not accurately reflect typical economic conditions or market behaviours. The unprecedented and volatile nature of the pandemic has likely influenced financial markets in ways that are not representative of normal circumstances. Secondly, this study employed an exploratory sequential mixed methods approach, with qualitative data via a focus group interview serving merely as supplementary support to the quantitative empirical findings. The quantitative methods, though, provide a robust framework for statistical validation, but may not capture the full complexity of human behaviours and subjective market sentiments. Thirdly, the scope of this study was confined to cases within Malaysia, therefore, the findings may not be generalisable to other countries or regions that have different economic structures, financial systems, or pandemic responses.

In light of the limitations, several avenues for future research are recommended to enhance the understanding of the stock market return behaviour during the pandemic disease. In the context of behavioural finance literature, future research could integrate a more significant qualitative component to establish a new theory of the pandemic disease stock market phenomena. This may involve

conducting detailed interviews or focus groups with market stakeholders to gain deeper insights into the motivations and perceptions that drive financial decisions. On the other hand, considering the localised nature of this study to Malaysia, extending the research to include multiple countries or conducting comparative studies between regions could provide valuable insights into stock market return behaviour. Lastly, given the broad scope of this study, future research could focus on specific sectors within the financial markets to ascertain if certain industries are more susceptible to the impacts of global disruptions like a pandemic disease.

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