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Journal of Advanced Research in Business and Management Studies

Journal homepage:
https://karyailham.com.my/index.php/arbms/index
ISSN: 2462-1935

The Short-Run and Long-Run Effects of Covid-19 and Macroeconomic Factors on Stock Market Performance In Malaysia

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ARTICLE INF

Article history:
Received 8 July 2025
Received in revised form 12 August 2025
Accepted 20 August 2025
Available online 7 September 2025

Keywords:
Stock market performance; Covid-19; macroeconomic factors

ABSTRACT

Stock market performance is commonly viewed as an indicator of the economic health, reflecting on investor confidence and the economic stability. The stock market is influenced by various domestic and international factors. In particular, the recent Covid-19 pandemic has severely weakened the stock market performance, specifically in Malaysia. Thus, the objective of this study is to evaluate the impact of Covid-19 and macroeconomics factors (economic growth, interest rate, FDI, exchange rate and inflation) on the Malaysian stock market performance between 2013 and 2023. The ARDL tests reveal that inflation continues to have a significant and positive relationship with KLCI in both short run and long run. In contrast, economic growth and Covid-19 pandemic reveal a significant and negative relationship in both periods. This study contributes to the existing literature by examining the long-term post recovery effect of Covid-19 on the Malaysian stock market performance. Thus, the results of this study could assist the policy makers in designing and strengthening the policies related to the Malaysian stock market for the benefits of the country

1. Introduction

Stock market performance is widely regarded as a barometer of the economic health, it is a reflection on investor's confidence, economic stability and how well a country's fiscal and monetary policies have worked. One of the crucial mechanisms by which the stock markets play an important role to promote the economic growth is through providing a platform for flow of capital into productive enterprises and then promoting business expansion along with generating job and wealth for investors and shareholders [1-3].

The equity market performance however is responsive to the movements of macroeconomic variables such as economic growth [4-6], inflation [7-9], interest rates [10,11], exchange rates [12,13]

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https://doi.org/10.37934/arbms.40.1.136149

and foreign direct investment (FDI) [14,15]. Prior studies have proven that these macroeconomic variables influence the stock market performance, positively and negatively. Thus, the understanding of how these stimuli affect the stock market would assist the policymakers and market players in developing more accurate and effective policies.

The Covid-19 pandemic has impacted almost all sectors of the economy and financial markets since late 2019. Of particular interest, past studies have revealed several devastations impacts of Covid-19 on stock markets [13,16,17]. The firms' performance was also severely weakened and had to partially or fully close or pause production due to the measures that involved the implementation of lock-down. The decline in demand has diminished profits for most of the industries. Many legal issues were experienced by firms causing the reduction in the expected stock returns and increase in their volatility.

In Malaysia, FTSE KLCI, which is the main indicator of stock market performance, has experienced a downward movement to 1,207.80 points on 19 March 2020 (from 1,602.5 points on 2 January 2020); after a day the Movement Control Order (MCO) was implemented. The MCO has restricted the economic activities including the public movements; that finally adversely impacted the business activities and profitability. The reduction in business profits has resulted in the reduction of share prices of the listed companies. In addition, few months after the MCO has been implemented, the FTSE KLCI dropped by 4.63%. This marked the worst performance over the last four years for Bursa Malaysia.

According to a study by Zhang, Hu and Ji [18], the pandemic has induced the economic uncertainties which have raised the investor risk perception to almost unmanageable levels resulting in the investor withdrawal from the stock market. This resulted in high volatility of the FTSE KLCI, and had some of the sharpest declines in the initial phases of the pandemic. Al-Awadhi *et al*., [19] argue that the negative effects of Covid-19 on equity markets was escalated in the emerging economies where financial market structure was more exposed to external shocks.

The decline in the stock market performance has an adverse effect on an economy, ranging from individual investor to the whole financial system services [20]. This is because the equity markets serve as a platform for the capital formation; they give firms the opportunity to raise money for expansion while also giving investors the opportunity to accumulate returns on their investment. Economic weakness often manifests itself when stock markets perform poorly; a poor performance of the stock markets generally signals weakness in the underlying economic activity, affecting investor confidence, reducing capital flows and dampening economic activity [21]. Poor stock market performance means that with falling wealth, investors' incomes are limited, business expansion is restricted and unemployment rises. Amongst other, Baker *et al*., [22] highlights the fact that poor performance for equity market often distorts the stability of the economy, especially in emerging markets where the investor confidence reacts sensitively to external shocks and volatility.

Although there are quite a number of studies conducted in Malaysia on the impact of Covid-19 and macroeconomics factors on the stock market performance, but, this present study is performed using a longer time period that is from 2013 to 2023. The latest studies such as Harun [23] and Choo *et al*., [24] are short-term focus (2020 to 2022) and examined the early-stage impact of pandemic on the Bursa Malaysia's performance. Thus, longer period of study would provide an analysis of the long-run post-pandemic impact on the market recovery. Using the FTSE KLCI as the indicator for the Malaysian stock market performance, this single-country study is aimed at analyzing the impacts of Covid-19 and macroeconomic variables between 2013 and 2023. This study contributes to the current literature by identifying the key macroeconomics and health-related factors that influence the Malaysian stock market performance, assisting investors and policymakers in making informed decisions that would support the sustainable economic development.

The structure of this study is set as follows. Section 2 discusses the methodology which comprises of the data sources, definitions of variables and methods employed to answer the research question. Section 3 presents the results and discussions on the findings. Finally, Section 4 concludes the overall study.

2.Methodology

This is a single country study that focuses only on Malaysia. The 11 years quarterly-data spans from 2013 to 2023. The data deployed in this study is extracted from the Bursa Malaysia's website, Bank Negara Malaysia (BNM) and Bloomberg LP Terminal.

2.1 Definition of Variables

This section covers the variables utilized in this study, such as the dependent variable (KLCI) and the independent variables (Covid-19, GDP, inflation, exchange rate, interest rate and FDI). These variables are selected following the recommendations made by previous studies in this field.

2.1.2 Dependent variable: stock market performance (KLCI)

The performance of the stock market is assessed by the FTSE Kuala Lumpur Composite Index or KLCI [25-28]. This index incorporates of 30 largest (by the market capitalization) and most liquid companies, that are taken as references; which are listed on Bursa Malaysia. In addition, KLCI is widely used by investors, analysts and policymakers to track the capital market performance. Moreover, it also gives useful information of investment returns and the state of economic health of a country [29].

2.1.3 The independent variables

This section discusses on the independent variables that have been chosen which are Covid-19, GDP, inflation, interest rate, exchange rate and FDI.

2.1.3.1 Covid-19 (COV)

The pandemic was started in December 2019 and widely affected various areas in the economy including the equity market. This paper utilizes dummy variable to assess the pandemic's impact on the stock market performance. This dummy variable takes the value of 1 for the post-pandemic (2020-2023) and 0 for the pre-pandemic (2013-2019). Based on the previous studies, Covid-19 has adversely impacted the stock market performance in multiple countries, including Malaysia [22,16,17]. Thus, this study asserts the following hypothesis:

H1: The Covid-19 negatively affect the stock market performance.

2.1.3.2 Economic growth (GDP)

The next factor influencing the stock market performance is the economic growth. This variable is quantified by the gross domestic product (GDP). This variable is expressed as a log transformation of GDP [30]. Several empirical works have established a positive relationship between the growth in GDP and stock markets performance which asserts that as economy develops, confidence of investors and stock returns also tends to increase as well [31,32]. The results of these studies show that the increase in economic growth goes with the increase in performance of the stock market. Hence, the predictable correlation is as follows:

H2: The economic growth significantly improves the performance of the stock market.

2.1.3.3 Inflation (INF)

The third component that influences the stock market performance is the inflation. This factor is measured using the consumer price index (CPI) [27]. The stock market performance will be negatively affected from higher inflation rates because of the increased volatility in the market, and also the decreasing in the purchasing power of the consumer [33,34]. Thus, in this study, we hypothesized the following relationship:

H3: There is an adverse relationship between stock market performance and inflation.

2.1.3.4 Interest rate (OPR)

The next factor included in the regression model is the interest rate. This variable is measured using the overnight policy rate (OPR) [35], which is the key interest rate set by the BNM to influence the economic activities, inflation and the behaviour of the stock market. Any changes to the OPR level may also impact the cost of borrowing, expenditure by the consumer and investment. The past studies on the relationship between OPR and stock markets show that these two variables are strongly correlated. This is so because OPR is normally correlated with the borrowing costs hence; if this rate is decreased, stock markets will benefit because the borrowing for investment has become cheaper [10,11]. Furthermore, a high OPR raises the borrowing costs and thus deviates from the market efficiency [36,37]. Consequently, the hypothesis is:

H4: There is a negative correlation between interest rates and the performance of the stock market

2.1.3.5 Exchange rate (EXR)

This study also incorporates the exchange rate to capture the existence and nature of the relationship between Malaysia's currency rate and the performance of its stock market. This study employs the official exchange rate stated in ringgit Malaysia (RM) relative to USD [27]. In addition, few studies suggest that the appreciation or a higher value of Malaysian ringgit (RM) poses a positive impact on the stock market performance [12,38]. These studies agree that higher value of RM increases the investors' confidence, boost demand on the stock investment and finally to the appreciation of stock prices. Therefore, the expected relationship is as follows:

H5: There is a negative relationship between exchange rate and stock market performance.

2.1.3.6 Foreign Direct Investment (FDI)

Foreign direct investment (FDI) is the last independent variable entered into the regression model. This variable is represented by the log transformation of FDI [39,14]. On the empirical evidences, few studies have found that higher level of FDI enhances the stock market performance [14]. The findings indicate that the foreign investments result in the transfer of capital, technology and management skills that when introduced into the economy and corporate entities, can improve corporate performance and the stock market returns. Thus, the hypothesis is as follows:
H6: There is a positive relationship between FDI and stock market performance.

2.2 Research Framework

This section outlines the research framework of this study. As indicated in Figure 1, the research framework shows the relationship between the stock market performance (KLCI) and its determinants which are Covid-19 (COV), economic growth (GDP), interest rate (OPR), foreign direct investment (FDI), inflation (INF) and exchange rate (EXR).

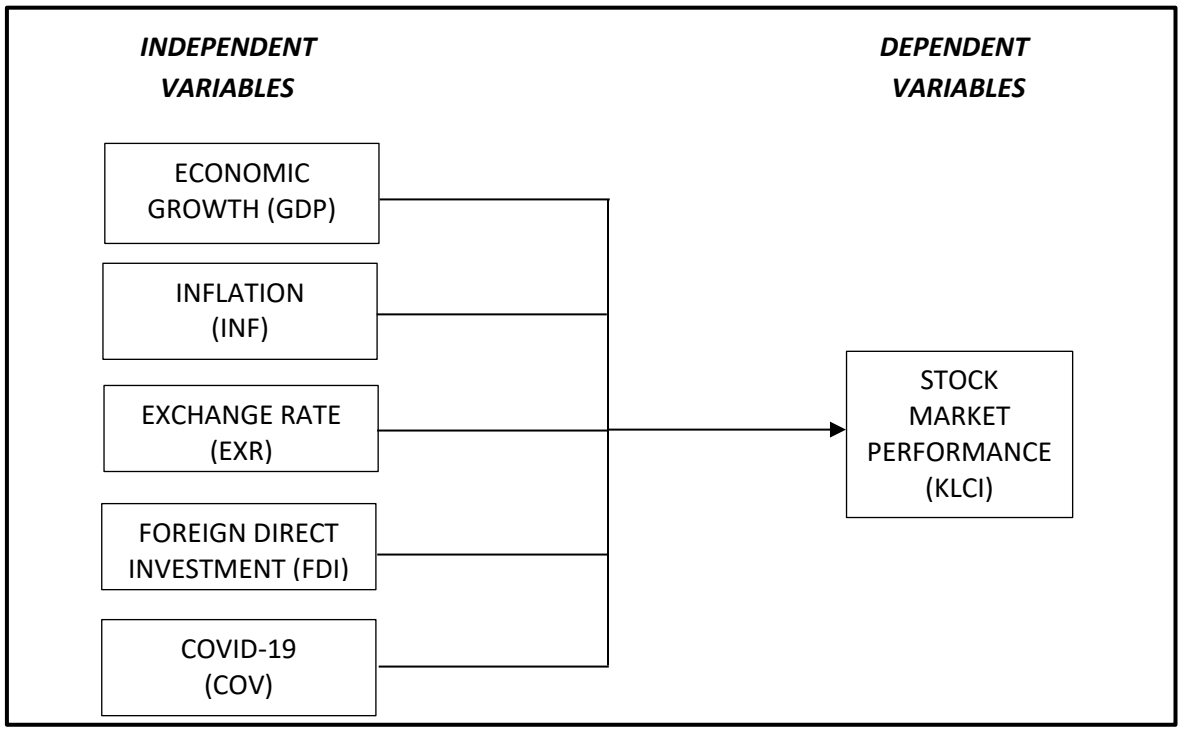


Fig. 1. Conceptual framework for the determinants of stock market performance

Previous research shows that the stock market performance is expected to be adversely affected by Covid-19, inflation, interest rates and exchange rates. It is also predicted a positive association between economic growth, FDI and stock market performance.

2.3 Model Description

This study was conducted in Malaysia from March 2013 to December 2023. Employing the quarterly data, the empirical analysis would provide an analysis of the influence of macroeconomic factors (inflation, GDP, FDI and interest rates) and Covid-19 on the KLCI over the past decade. The Autoregressive Distributed Lag (ARDL) method is used to examine the short run and long run

dynamics of the selected variables in influencing KLCI, which could offer valuable insights for both investors and policymakers. Equation (1) represents the model used in this study:

$$KLCI_t = \beta_0 + \beta_1 FDI_t + \beta_2 OPR_t + \beta_3 GDP_t + \beta_4 INF_t + \beta_5 COV_t + \varepsilon_t \quad (1)$$

Where:

- t is the period of time
- KLCI is the FTSE Kuala Lumpur Composite Index
- COV is the dummy variable for Covid-19 pandemic
- GDP is Gross Domestic Product
- INF is Inflation
- OPR is Overnight Policy Rate
- EXR is Exchange Rate
- FDI is Foreign Direct Investment
- ϵ-Epsilon is the error term

To achieve the objective stated earlier, following the method introduced by Pesaran [40] and Pesaran, Shin and Smith [41], the ARDL test is performed. This method comprises of five steps, which are (i) bound test, (ii) long-run relationship, (iii) short-run relationship, (iv) diagnostic test and (v) Cumulative Sum of the Recursive Model (CUSUM) and the Cumulative Sum of Squares of the Recursive Model (CUSUMSQ). Prior to the ARDL test, a unit root test should be performed to investigate whether the variables are stationary. Thus, the following hypotheses are presented:

H_0 : has a unit root (non-stationary)
H_1 : no unit root (stationary)

Based on the hypothesis, if the variable is significant at the [I(0)] level, the null hypothesis is accepted. However, if the variable is significant at the first difference [I(1)], the alternative hypothesis is accepted, and the ARDL test can proceed. The ARDL test begins with a bounds test, which assesses whether there is a long-term relationship between the dependent variable (DV) and at least one independent variable (IV). If the F-statistic value exceeds the I(1) critical value, it indicates the presence of a long-term relationship between the IV and DV.

Following this, a long-term test is conducted, and the equation for this test is presented below.

$$KLCI_t = \beta_0 + \beta_1 KLCI_{t-1} + \beta_2 FDI_{t-1} + \beta_3 OPR_{t-1} + \beta_4 GDP_{t-1} + \beta_5 INF_{t-1} + \beta_6 COV_{t-1} + \beta_{7,i} \sum_{i=1}^{p} \Delta KLCI_{t-i} + \beta_{8,i} \sum_{i=1}^{q1} \Delta FDI_{t-i} + \beta_{9,i} \sum_{i=1}^{q2} \Delta OPR_{t-i} + \beta_{10,i} \sum_{i=1}^{q3} \Delta GDP_{t-i} + \beta_{11,i} \sum_{i=1}^{q4} \Delta INF_{t-i} + \beta_{12} \sum_{i=1}^{q5} \Delta COV_{t-i} + \beta U_t \quad (2)$$

whereas Δ referring to the first stage of differentiation equation (2), it can be considered as the ARDL model which uses p, q_1, q_2, q_3, q_4 and q_5. The following is a hypothesis for a long-term relationship.

H_0 : Long-run relationship does not exist (β_1=0 and β_2=β_3=β_4=β_5=β_6=0)
H_1 : Long-run relationship exists (β_1≠0 and β_2≠β_3≠β_4≠β_5≠β_6≠0)

In line with the hypotheses, if the t-statistic exceeds the t-critical value, the null hypothesis is accepted, which suggests that there is no long-term association between the variables. On the other

hand, if the t-critical value is greater than the t-statistic, the null hypothesis is rejected, indicating the presence of a long-run relationship between the selected variables [42]. Next, the Error Correction Model (ECM) test is performed to examine the model's long-term error correction. Moreover, the ECM model also assesses the short-run relationships between the variables. Therefore, Equation (3) represented below is the ECM model equation for this study.

$$KLCI_t = \mu + \sum_{i-1}^{p} \delta \, \Delta KLCI_{t-i} + \sum_{j-1}^{q1} \alpha_j \, \Delta FDI_{t-j} + \sum_{k-1}^{q2} \sigma_k \, \Delta OPR_{t-k} + \sum_{l-1}^{q3} \omega_l \, \Delta GDP_{t-l} + \sum_{m-1}^{q4} \infty_m \, \Delta INF_{t-m} + \sum_{n-1}^{q5} \gamma_n \, \Delta COV_{t-n} + ECM_{t-1} + \varepsilon_t \quad (3)$$

Where:

- δ, α, σ, ω, ∞ and ϒ- the dynamic coefficient in the short term
- μ - speed of adjustment for long-term error correction.

3. Results

This chapter presents this study's findings. Discussions are made on the descriptive statistics, correlation analysis and findings on the regression analysis.

3.1 Descriptive Statistics Analysis

This section discusses the descriptive statistics of the variables employed in this study. The discussion comprises of the analysis of values of mean, minimum, maximum, and standard deviation as presented in Table 1.

Table 1
Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
KLCI	44	1350.89	1882.71	1643.536	146.1136
COV	44	0	1	0.36364	0.486607
GDP	44	-16.9	16.2	4.19318	4.721618
OPR	44	1.75	3.25	2.79545	0.539899
INF	44	-1.9	4.9	2.01136	1.535202
EXR	44	3.097	4.695	4.04251	0.43358
FDI	44	-837	27716	10032.55	5802.242
N	44				

Table 1 presents a summary of the descriptive analysis for the determinants of Malaysian stock market performance which is the KLCI, a benchmark index, during 2013–2023. In this analysis, the discussion is also made on the characteristics of key macroeconomic indicators (that are the economic growth (GDP), interest rate (OPR), inflation (INF), exchange rate (EXR) and foreign direct investment (FDI) and Covid-19 (COV) pandemic. The sample size (N) is 44, which refers to the total number of observations used in this analysis.

The KLCI serves as the dependent variable, the value of this variable is ranged between 1350.89 to 1882.71 with a mean value of 1643.54 and standard deviation of 146.11; which represent moderate variabilities in the stock market performance throughout this period. This variation may have resulted from both local and global factors. The dummy variable COV that represents the Covid-19 pandemic takes the value of 1 (post-pandemic) and 0 (pre-pandemic). GDP growth rate ranged

from -16.90% to 16.20%, with mean value of 4.19% and standard deviation of 4.72%; which indicating a wide dispersion in the economic growth. The OPR, which ranged from 1.75% to 3.25%, has a mean of 2.80% and a standard deviation of 0.54%, showing that BNM has adjusted the interest rates moderately during the studied period, potentially to manage inflation and stabilize the economy.

Inflation rates covered the values between -1.9% and 4.9%, with an average inflation rate at 2.01% and standard deviation at 1.54%. Deflation, negative inflation rates, often occur during periods of economic stagnation and falling demand for goods. The exchange rate fluctuated from 3.097 MYR/USD to 4.695 MYR/USD with a mean of 4.04 MYR/USD and the standard derivation of 0.43 MYR/USD. The minor volatility is due to the adjustment in Malaysia's balance of trade and its external economy. FDI was highly dispersed, with a notable variation that ranged from -RM837 million (net outflows) to RM27.7 billion, a reasonably mean of RM10 billion and a large standard deviation of RM5,802.24 million. The variability suggests a significant inflows and outflows, that likely due to global economic situations or investor sentiment.

3.2 Correlation Analysis

This section presents the discussion on the results of Pearson correlation, which examining the strength and direction of the associations between the variables employed in this study. Table 2 reveals that the Covid-19 pandemic has a high and negative correlation with KLCI, with its biggest recorded negative correlation of -0.809. A moderate negative relationship (-0.699) is also existed between the exchange rate (EXR) and KLCI. The OPR exhibited a moderate positive association (0.512) with the KLCI. Other variables, including GDP (0.178), inflation (0.169), and FDI (0.127), exhibited weak and non-significant correlations with KLCI. This would indicate that these variables did not have any significant influence on the equity market's performance during the research period.

Table 2
Pearson Correlation Matrix

	Measure	KLCI	COV	GDP	INF	OPR	EXR	FDI
KLCI	Pearson Correlation	1	-.809**	0.178	0.169	.512**	-.699**	0.127
	Sig. (2-tailed)		0.000	0.222	0.245	0.000	0.000	0.385
	N		49	49	49	49	49	49
COV	Pearson Correlation	-.809**	1	-.252	-.112	-.797**	.550**	-.138
	Sig. (2-tailed)	0.000		0.081	0.443	0.000	0.000	0.346
	N	49		49	49	49	49	49
GDP	Pearson Correlation	0.178	-.252	1	.652**	.310	-.097	.328*
	Sig. (2-tailed)	0.222	0.081		0.000	0.032	0.506	0.021
	N	49	49		49	49	49	49
INF	Pearson Correlation	0.169	-.112	.652**	1	.145	-.045	.435**
	Sig. (2-tailed)	0.245	0.443	0.000		0.320	0.757	0.002
	N	49	49	49		49	49	49
OPR	Pearson Correlation	.512**	-.797**	.310	.145	1	-.288*	.225
	Sig. (2-tailed)	0.000	0.000	0.032	0.320		0.045	0.119
	N	49	49	49	49		49	49

Table 2 ***(Continued)***

EXR	Pearson Correlation	-.699**	.550**	-.097	-.045	-.288*	1	-.037
	Sig. (2-tailed)	0.000	0.000	0.506	0.757	0.045		0.803
	N	49	49	49	49	49		49
FDI	Pearson Correlation	0.127	-.138	.328*	.435**	.225	-.037	1
	Sig. (2-tailed)	0.385	0.346	0.021	0.002	0.119	0.803	
	N	49	49	49	49	49	49	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

3.3 Results and Discussion

Table 3 presents the results of the unit root test for all variables. For the intercept, none of the variables are significant at I(0), but all become significant at I(1), at a 1% significance level. Regarding the trend, all variables are not significant at I(0), except for KLCI, which is significant at the 5% level. At I(1), all variables are significant at the 1% and 5% levels. These results indicate that the null hypothesis, which suggests the presence of a unit root (non-stationarity), is rejected, and the alternative hypothesis is accepted.

Table 3
Unit Root Test

Variable	Intercept		Trend	
	I(0)	I(1)	I(0)	I(1)
KLCI	-1.0870	-9.0325***	-4.1310**	-8.9374***
	(0.7122)	(0.0000)	(0.0115)	(0.0000)
FDI	-1.0644	-6.2353***	-2.9743	-6.9932***
	(0.7209)	(0.0000)	(0.1521)	(0.0000)
OPR	-1.8071	-3.6515***	-2.0150	-3.6311**
	(0.3721)	(0.0087)	(0.5764)	(0.0390)
GDP	-1.9621	-5.8842***	-1.9458	-5.8015***
	(0.3017)	(0.0000)	(0.6117)	(0.0001)
INF	-2.253	-6.5877***	-2.5399	-6.5097***
	(0.1167)	(0.0000)	(0.3085)	(0.0000)
COV	-0.7278	-6.4807***	-2.0644	-6.4323***
	(0.8288)	(0.0000)	(0.5503)	(0.0000)

Notes: ( ) refer to probability; *** and ** refer to significant levels at 1% and 5%.

ARDL test was performed, and Table 4 presents the results of the bounds test. The F-statistic value was 4.6474, which is significant at the 1% level. Thus, the alternative hypothesis is accepted, indicating the presence of at least one variable with a long-term relationship to the KLCI.

Table 4
Bound Test

F-statistic	4.6474***	
Significant level	I(0)	I(1)
10%	2.08	3
5%	2.39	3.38
1%	3.06	4.15

Note: *** refer to significant level at 1%

Table 5 presents the long-term results of the study. The findings indicate that inflation (INF) has a positive long-term relationship with the KLCI, while Covid-19, the Overnight Policy Rate (OPR), and GDP exhibit negative long-term relationships with the KLCI. Specifically, a 1% increase in inflation is associated with a 0.0341% rise in the KLCI at a 10% significance level. Conversely, a 1% increase in the OPR leads to a 0.0994% decline in the KLCI at a 5% significance level. Similarly, a 1% increase in GDP results in a 0.0183% decrease in the KLCI, significant at a 10% level. Lastly, a 1% increase in Covid-19 cases corresponds to a 0.3134% decline in the KLCI in the long term, significant at a 1% level.

These results suggest that inflation serves as a key driver for the KLCI in the long term, potentially reflecting investor optimism in rising prices. According to Acheampong and Boateng [43], stocks can often view as a hedge against the rising prices, since the firms returns and asset values rise with price levels, contrasting to the fixed-income instruments whose real value declines during the inflationary period. On the other hand, the negative relationship between the KLCI and variables such as OPR, GDP, and Covid-19 cases underscores the impact of restrictive monetary policy, slower economic growth, and pandemic-related disruptions on market performance (44,45). This finding is also supported by previous studies, which demonstrate that higher interest rates tend to lower stock prices as debt becomes less cheap for companies and investors have a more appealing choice, fixed income securities [49,50]. The significant link between Covid-19 and the KLCI shows the substantial detrimental impact of the global health crises on the long-term capital markets performance [44].

Table 5
Long-term relationship

Variable	Coefficient	t-statistic	Prob.
FDI	0.0739	1.4131	0.1738
OPR	-0.0994**	-2.2788	0.0344
GDP	-0.0183*	-2.0613	0.0532
INF	0.0341*	1.9966	0.0604
COV	-0.3134***	-5.9235	0.0000
C	7.4901***	27.2096	0.0000

Note: *, ** and *** refer to significant levels at 10%, 5% and 1%

Table 6 presents the results for the short run. The study also reveals that the long-term error correction for this model is 0.5666, indicating that it takes approximately two months for the error to be corrected. This suggests a relatively quick adjustment process toward equilibrium in response to any short-term deviations. In terms of the short-term analysis, the findings show that FDI and inflation (INF) have a positive relationship with the KLCI, while GDP, OPR and COV exhibit a negative short-term relationship with the KLCI. Specifically, a 1% increase in FDI leads to a 0.1022% rise in the KLCI, with a significance level of 1%. Similarly, a 1% increase in INF results in a 0.0122% increase in the KLCI, significant at the 5% level in the short term.

However, a 1% increase in OPR at lag 1 causes the KLCI to decrease by 0.0746%, significant at the 10% level in the short term. This suggests that an increase in interest rates can have an immediate but somewhat weaker negative effect on market performance. For GDP, a 1% increase results in a 0.0066% decline in the KLCI, indicating a very modest negative short-term effect. Conversely, a 1% increase in COV cases leads to a 0.2193% decrease in the KLCI, with both variables showing a significance level of 1%. This indicates that the impact of the pandemic on the market remains substantial, even in the short run.

These results highlight the dynamic nature of short-term and long-term relationships between macroeconomic variables and the KLCI. While FDI and INF positively influence the KLCI in the short term [46,47]; GDP, OPR and COV exert a negative impact (48-51]. The significant negative relationship

with Covid-19 suggests that market sentiment is still highly sensitive to the ongoing effects of the pandemic [51].

Table 6
Short-term relationship

Variable	Coefficient	t-statistic	Prob.
D(FDI)	0.1022***	8.0905	0.0000
D(OPR)	-0.0253	-0.7585	0.4574
D(OPR(-1))	0.0746*	2.0397	0.0555
D(GDP)	-0.0066***	-4.6015	0.0002
D(INF)	0.0112**	2.1240	0.0470
D(COV)	-0.2193***	-7.4045	0.0000
CointEq(-1)	-0.5666***	-6.5426	0.0000

Note: *, ** and *** refer to significant levels at 10%, 5% and 1%

According to Goodell and Huynh [51], the significant negative link between Covid-19 and stock market performance indicates that the market sentiment is still highly affected by the recent global health crisis. In addition, the quick correction to long-term equilibrium recommends that the market responds rapidly to realign the low performance caused by these short-term fluctuations. Thus, the results of this study highlight the importance of taking into consideration of both short-term fluctuations and long-term adjustments when examining the stock market behaviour, particularly in the rapid changing of global economy.

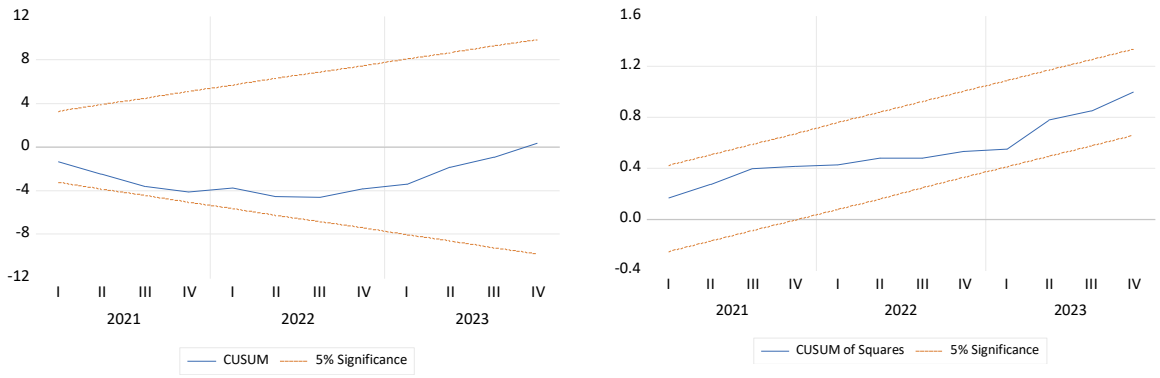
Table 7 illustrates the results of this diagnostic test to check the robustness of the model. The findings for all tests (normality, correlation, heteroskedasticity and Ramsey RESET) show an insignificant result. This indicates that the model developed (Equation 1) is robust and reliable. Furthermore, it also reveals that the assumptions underpinning the model, such as the absence of multicollinearity, the presence of homoscedasticity and the distribution of residuals, hold. Besides, the Ramsey RESET test shows no specification errors that supports the model's structural robustness. As a conclusion, the results for diagnostic tests have confirm that the model used in this study is valid and robust, which is also suitable to test the long-run and short-run dynamics of the factors influencing the Malaysian stock market performance.

Table 7
Diagnostic test

Test	F-stat	Prob.
Jarque-Bera (Normality test)	0.1191	0.9422
LM test (Correlation)	0.6636	0.5265
Heteroskedasticity	0.9180	0.5755
Ramsey RESET	0.2015	0.6589

Finally, the results of the Cumulative Sum of the Recursive Model (CUSUM) and the Cumulative Sum of Squares of the Recursive Model (CUSUMSQ) tests are shown in Figure 2. The CUSUM and CUSUMSQ plots are within the 5% significance level, which indicate the stability of the model. The graphs show that the parameters of the model do not experience any significant structural changes over time, which then supporting the model's reliability in examining the relationship between the selected variables. The stability noted in both CUSUM and CUSUMSQ tests also recommends that the model is able to accurately capture the relationships among the variables without being influenced by shifts or outliers in the data. These results strengthen the earlier conclusions made by the robustness tests to ensure that the model can be used for making an informed decision or policy

recommendations. Thus, the CUSUM and CUSUMSQ tests have confirmed the model's long-term applicability and its ability to offer consistent results.



(a) CUSUM (b) CUSUMSQ

Fig. 2. CUSUM and CUSUMSQ

4. Conclusions

This study aims at analysing the impact of Covid-19 and macroeconomic factors on the stock market performance in Malaysia from 2013 to 2023. The analysis indicates that the impacts of the examined variables on KLCI are consistent for both short run and long run estimations. On the positive impacts, inflation continues to have a significant and positive relationship, demonstrating that price movements promote the stock market performance in both horizons. In contrast, economic growth and Covid-19 pandemic reveal a significant and negative relationship in both periods, reflecting detrimental consequences of slower economic activity and health crisis on the stock market activities. The results of this study may assist the policymakers, investors and analysts in developing the appropriate strategies and policies related to the Bursa Malaysia. In supporting the government initiative to build a more resilient economy, a well develop stock market is needed to promote a sustainable growth and stability in view of the fast-growing global economy.

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