A CRITICAL ANALYSIS OF ECONOMIC RECOVERY IN MALAYSIA AFTER THE COVID-19 OUTBREAK

Sofian Rosbi[1], Yusuf Haji-Othman[2]

[1]Ph.D Student, [2]Associate Professor, Center for Islamic Finance and Research (CIFER), Universiti Islam Antarabangsa Sultan Abdul Halim Mu'adzam Shah (UniSHAMS), 09300 Kuala Ketil, Kedah, Malaysia

Abstract

This paper aims to analyze the economic recovery status for post-outbreak of Coronavirus disease (COVID-19) using two indicators: Kuala Lumpur Composite Index (KLCI) and the currency exchange rate for Malaysian Ringgit. The COVID-19 is a pandemic that is considered an infectious disease caused by a newly discovered coronavirus in 2019. This pandemic affected the worldwide population, including the Asian region. Therefore, it is crucial to analyze the significant effect of post-COVID-19 on the economy, including the stock market and the currency exchange rate. This study implemented correlation analysis between changes of KLSI and MYR currency exchange rate. The daily observation periods involved in this study are from 1st April 2020 until 30th July 2020. There are 76 daily observations engaged in this study. The Pearson correlation was selected as a statistical measure that calculates the linear correlation between two variables. The correlation coefficient value is 0.204 indicating a positive correlation between KLCI and the ringgit exchange rate. Both of these variables indicate Malaysia is recovering with a positive environment for the economic situation. The findings of this study will provide knowledge to the body of literature, including giving positive feedback to investors to have better confidence in Malaysia's economic situation after the COVID-19 lockdown. The implication of this study is that it will assist the government in monitoring the business environment to prevent economic collapse condition.

Keywords: Coronavirus disease (COVID-19), Pearson correlation, KLCI, Malaysian Ringgit Currency, Economic condition.

Introduction

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. The symptoms of COVID-19 are fever or chills, cough, shortness of breath or difficulty breathing, fatigue, headache and other symptoms. The COVID-19 pandemic caused by the Severe Acute Respiratory Syndrome (SARS)-CoV-2 virus is one of the most significant health, social, financial and political crises of the 21st century (Linh *et al*., 2020). Therefore, the person involved in these symptoms is encouraged to self-quarantine and always avoid going to the crowded place, maintaining at least 1-meter distances from others, and avoiding close contact with other people.

The COVID-19 affected 213 countries and territories worldwide and two international conveyances (World Health Organization, 2020). Malaysia is one of the countries affected by

COVID-19. In Malaysia, the first COVID-19 disease was detected in early 2020. The world has experienced many types of viruses such as SARS, H1N1, and others, but the COVID-19 virus is still investigating to find a suitable vaccine. Therefore, to protect the spread of the COVID-19 virus, the government of Malaysia performed a lockdown approach for movement control order (MCO) in 18 Mac 2020. The main objective of MCO is to reduce the spread of the COVID-19 virus among Malaysian citizens. COVID-19 virus is spread very fast and easy to transfer from one person to another. Implementation of MCO can reduce the daily activities with only those who work in essential industries are allowed to work. In contrast, employees whose work could be conducted from home are encouraged to work from home (Feng and Savani, 2020; Noonan and Glass, 2012).

The lockdown approach has a significant impact on the industries in Malaysia, especially on the financial sectors. A study by Abu Bakar and Rosbi (2020a) regarding the effects of COVID-19 on the equity market and currency exchange indicated the negative value becomes dominant during the COVID-19 outbreak period. At the same time, changes for currency exchange rate also show a mean with a negative value, -0.087. Therefore, this study gives a new insight by investigating the economic recovery status for post occurrence of Coronavirus disease (COVID-19) towards equity market, namely Kuala Lumpur Composite Index (KLCI) and currency exchange rate for Malaysia Ringgit.

The government of Malaysia has introduced many schemes to recover the economic condition in Malaysia, such as Financial Relief Scheme. This scheme has granted a 6-month moratorium to all customers. Besides that, the Government of Malaysia also announced Prihatin Rakyat Economic Stimulus Package 2020 (PRIHATIN Package) worth RM250 billion (Povera, 2020). PRIHATIN Package aims to protect the welfare of the people and support businesses, including Small and Medium Enterprises and strengthen the country's economy to weather the effects of the COVID-19 pandemic.

Literature Review

COVID-19 outbreak erupted in December 2019 in the city of Wuhan, Hubei province, China and spread rapidly via a human-to-human transmission (Wen *et al*., 2020). Wuhan is a central transportation hub in China, located on the crossroads between the railway line linking Beijing and Guangzhou and the Yangtze River linking Chongqing and Shanghai (Wen *et al*., 2020; Zhong *et al.*, 2020). The location of Wuhan with crowded peoples is accessible for the COVID-19 virus to spread quickly. The COVID-19 virus was spread very fast, and until now, no vaccine is yet available.

Since the outbreak of the COVID-19 in 2019, the cases have increased drastically. As World Health Organization (2020) reported, the number of COVID-19 worldwide is 40 665 438 cases, with 1 121 843 deaths (WHO, 2020). These numbers have continually increased for the following days, and all countries are at very high risk. Apart from many steps taken to control the COVID-19, lockdown had been a primary strategy adopted by countries (Kashyap and Raghuvanshi, 2020). According to Inui *et al*. (2020), the approach to minimize the spread of the COVID-19 virus might be relatively complex because many patients did not show apparent symptoms (Sumaedi *et al.,* 2020).

The lockdown is a strategy to reduce the number of infected and slow down the spread of COVID-19 among people. But, the lockdown has an impact on all industries worldwide. Thus, Zhang *et al.* (2020) investigate the effect of macroeconomy and agri-food in China. They found that the macroeconomy and agri-food systems are hit significantly by the COVID-19 pandemic, with GDP was decreased by 6.8% in the first quarter of 2020. In other countries also show the negative impact of COVID-19. For example, Sandeep Kumar et al. (2020) mention that the effects of COVID-19 on the economy in India have been highly disruptive. Anh and Gan (2020) examine the Vietnam stock market before and during the nationwide lockdown are performed in opposing ways. They also found that the financial sector was hardest hit on the Vietnam stock market during the COVID-19 outbreak. Abu Bakar and Rosbi (2020b) show COVID-19 pandemic creates panic among the public that contributes to lower demand in the tourism industry in Malaysia.

Besides the negative impact of COVID-19, Nagel (2020) investigates whether the COVID-19 pandemic has led to an acceleration of the digital transformation in the workplace. The findings show an increase of people working from home offices and that many people believe the digital transformation of work has accelerated in response to the COVID-19 pandemic. Moreover, the importance of traditional jobs as a secure source of income has decreased, and digital forms of work as a safe source of income have increased because of the COVID-19 pandemic. Workers believe that digital work will play a more important role as a secure source of income in the future than traditional jobs.

Methodology

This study aims to evaluate the economic condition in Malaysia after the outbreak of COVID-19. This study selected the Kuala Lumpur Composite Index (KLCI) as the leading indicator and the Malaysian Ringgit currency exchange rate as the second indicator. The data were retrieved from the Bloomberg database in gaining all daily observation values. In this study, normality and correlation tests were performed to develop robust and reliable conclusions about the current economic condition in Malaysia after the outbreak of COVID-19.

Normality characteristic is one of the requirements to perform a parametric statistical test. Therefore, normality checking for actual data is an essential element in this study. The normality characteristic of real data distribution is shown in Equation (1).

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} \quad \text{.. (1)}$$

The parameters in Equation (1) are described as follow:
μ : Mean of real data for x-variable.
σ : Standard deviation for data distribution of x-variable.

Then, this study evaluated the association between indicators to analyze the economic situation in Malaysia. This paper using Pearson correlation for the statistical method of correlation analysis

between two variables. The value of Pearson correlation is between the value of -1 and 1. Absolute zero value indicates no relationship. Meanwhile, an absolute value of 1 shows there is a strong correlation among focus variables. The Pearson correlation was calculated using Equation (2).

$$\rho_{X,Y} = \frac{\text{cov}(X,Y)}{\sigma_X \sigma_Y} \qquad\qquad (2)$$

The variables in Equation (2) are explained as below:

$\text{cov}(X,Y)$: Covariance between x-variable and y-variable.

σ_X : Standard deviation for data distribution of x-variable.

σ_Y : Standard deviation for data distribution of y-variable.

The Pearson correlation can be re-arranged to use the mean and expectation approach as shown in Equation (3).

$$\rho_{X,Y} = \frac{\text{E}\left[(X - \mu_X)(Y - \mu_Y)\right]}{\sigma_X \sigma_Y} \qquad\qquad (3)$$

For the sample of Pearson correlation, the calculation procedure follows Equation (4).

$$\tau_{xy} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2}\sqrt{\sum_{i=1}^{n}(y_i - \bar{y})^2}} \qquad\qquad (4)$$

n : sample size,

x_i : x-variable at observation period i, $\bar{x}$: Mean for x-variable,

y_i : y-variable at observation period i, $\bar{y}$: Mean for y-variable.

Findings

The main objective of this study is to analyze the economic condition in Malaysia after post-COVID-19. There are two leading indicators: the Kuala Lumpur Composite Index (KLCI) and the Malaysian ringgit currency exchange rate. Figure 1 shows the behavior of the index value for KLCI. The observation is using daily intervals starting from 1st April 2020 until 30th July 2020. There are 76 daily observations involved in this study. The value of KLCI on 1st April 2020 is 1322.66 points. The last observation on 30th July 2020 shows KLCI value is 1603.75 point. The data shows significant improvements of KLCI point that indicates a good economic situation in Malaysia.
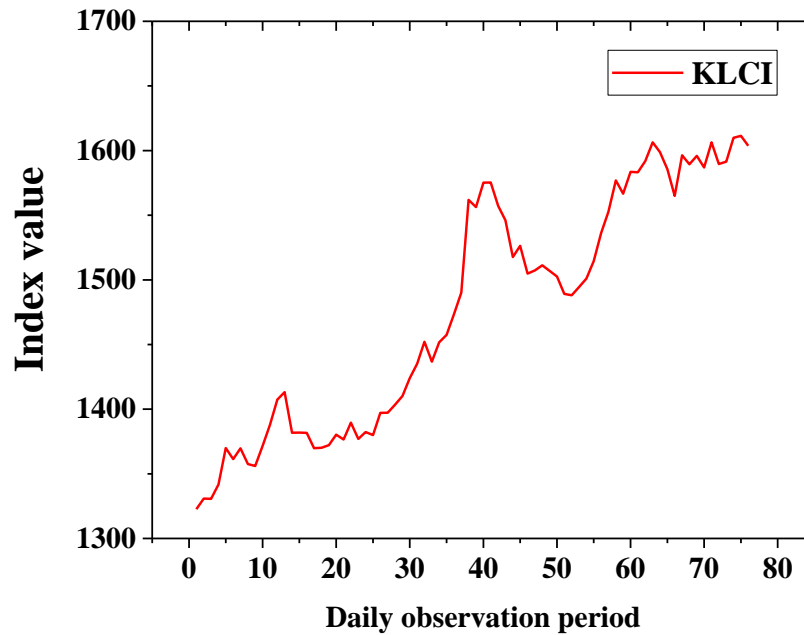
Figure 1: KLCI value on post-COVID19

Next, in analyzing the statistical method for KLCI behavior, this study calculated the rate of changes for KLCI point using Equation (5).

$$Changes\ of\ KLCI = \left(\frac{P_{i+1} - P_i}{P_i}\right) \times 100\% \quad \text{...........................} \quad (5)$$

Where,

P_{i+1} ; Value of KLCI on daily observation period $i+1$.

P_i ; Value of KLCI on daily observation period i.

Figure 2 shows the rate of the changes of KLCI in the post-COVID-19 period. The data were examined thoroughly with the outlier detection process. The maximum value of KLCI change is 7th April 2020 (5th observation) with a value of 2.104 percentages. The minimum value of KLCI change is on 21st April 2020 (14th observation) with a value of -2.221 percentages.
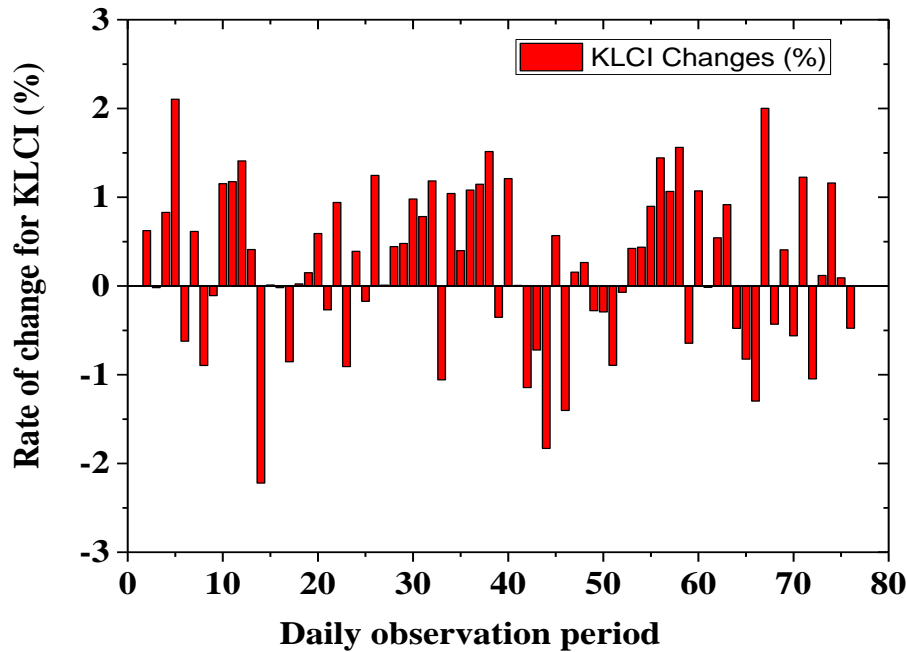
Figure 2: Changes of KLCI value on post-COVID19

Next, this study performed a statistical normality test to determine the distribution of data for KLCI changes. The Shapiro-Wilk normality test was selected as a statistical test to evaluate data distribution for KLCI changes.

The statistical normality test was performed using the Shapiro-Wilk approach. Table 1 shows descriptive statistics for data of KLCI changes. The mean value is 0.218 percentages, the median value is 0.264, and the variance is 0.805. Table 2 shows the Shapiro Wilk test for normality. The p-value is 0.539, which is greater than chosen alpha of 0.05. Therefore, this study failed to reject the null hypothesis. The distribution of KLCI changes data follows a normal distribution. Figures 3 and 4 show the distribution follow normal distribution from graphical testing.

Table 1: Descriptive statistics for data of KLCI changes

		Statistic	Std. Error
KLCI	Mean	.2185214	.10359400
	Median	.2640553	
	Variance	.805	
	Std. Deviation	.89715034	
	Skewness	-.305	.277
	Kurtosis	-.231	.548

Table 2: Test of Normality

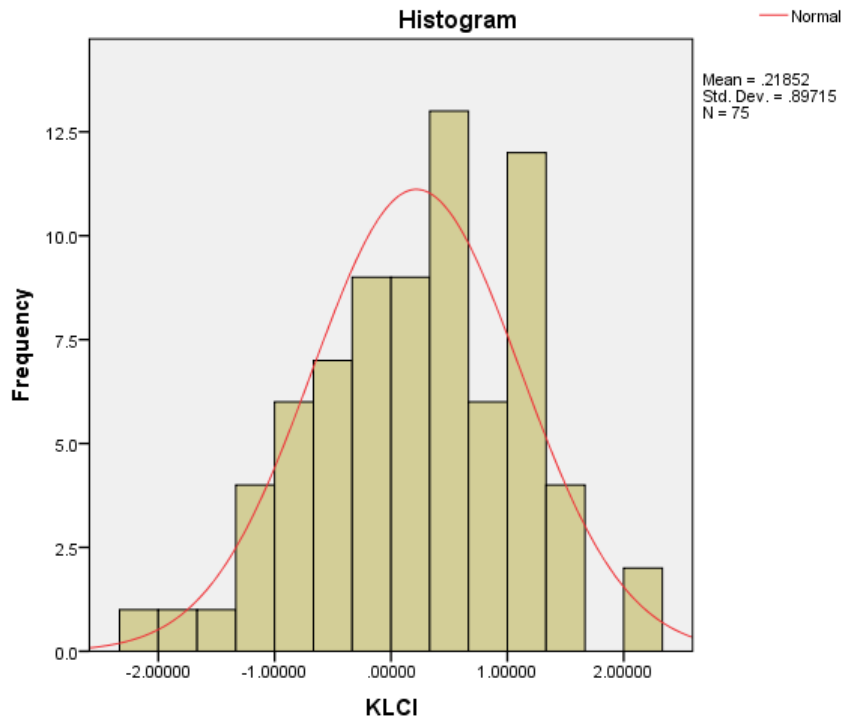|	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
KLCI	.069	75	.200[*]	.985	75	.539

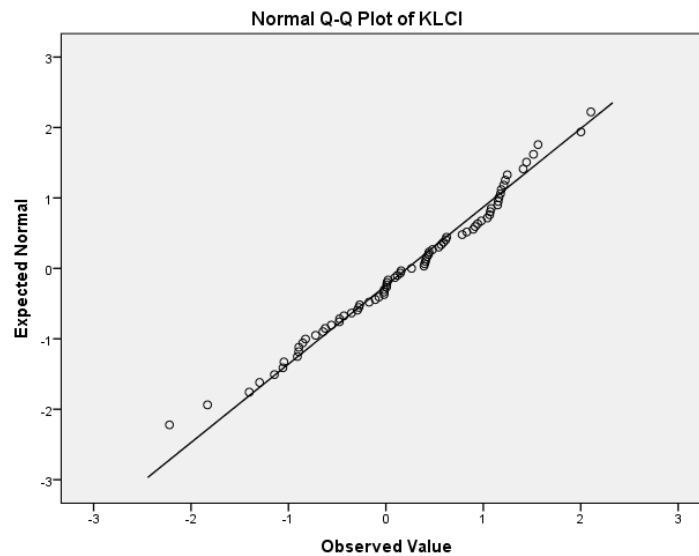Figure 3: Histogram for KLCI changes

Figure 4: Normal Q-Q plot for data KLCI changes

Then, this study also analyzed distribution data for changes in the currency exchange rate. Figure 5 shows the dynamic movement of the currency exchange rate for the Malaysian Ringgit (MYR). The observation is using daily intervals starting from 1st April 2020 until 30th July 2020. There are 76 daily observations involved in this study. The value of the currency exchange rate on 1st April 2020 is 0.299 USD for each MYR. The last observation on 30th July 20202 shows currency exchange rate is 0.236 USD for each MYR. The data shows significant improvements of currency exchange rate that proved an ideal economic situation in Malaysia.
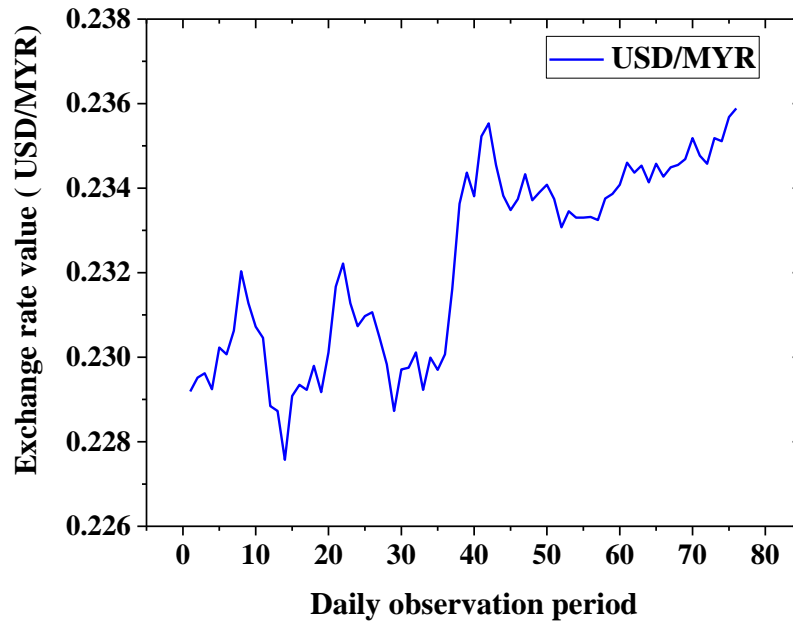

Figure 5: Dynamic behavior of currency exchange rate of Malaysian Ringgit

Furthermore, in analyzing the statistical method for the currency exchange rate for Malaysia Ringgit, this study calculated the rate of currency exchange rate using Equation (6).

$$Changes\ of\ exchange\ rate = \left(\frac{E_{i+1} - E_i}{E_i} \right) \times 100\% \quad \text{.. (6)}$$

Where,

E_{i+1} : Value of MYR currency exchange rate on daily observation period $i+1$.

E_i : Value of MYR currency exchange rate on daily observation period i.

Figure 6 shows the changes in the MYR currency exchange rate in the post-COVID-19 period. The data were examined thoroughly with the outlier detection process. The maximum value of MYR currency exchange rate changes is on 4th June 2020 (38th observation) with a value of 0.871 percentages. The minimum value of MYR currency exchange rate changes is on 17th April 2020 (12th observation) with a value of -0.700 percentages.
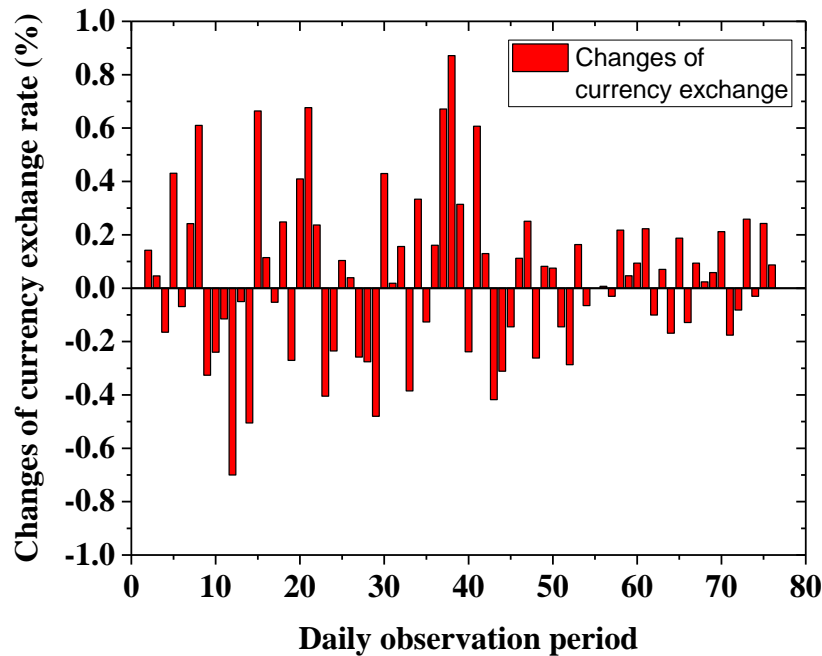
Figure 6: Changes of MYR currency exchange rate on post-COVID19

Then, this study performed a statistical normality test to determine the distribution of data for MYR currency exchange rate changes. The Shapiro-Wilk normality test was selected as a statistical test to evaluate data distribution for MYR currency exchange rate changes.

The statistical normality test was performed using the Shapiro-Wilk approach. Table 3 shows descriptive statistics for data of changes for MYR currency exchange rate. The mean value is 0.039 percentages, the median value is 0.046, and the variance is 0.09. Table 4 shows the Shapiro Wilk test for normality for actual data distribution. The p-value is 0.404 that larger than chosen alpha of 0.05. Therefore, this study failed to reject the null hypothesis. The distribution of MYR currency exchange rate changes follows the normal distribution. Figures 3 and 4 show the distribution follow normal distribution from graphical testing.

Table 3. Normality test for changes of MYR exchange rate data

		Statistic	Std. Error
MYR	Mean	.0388596	.03458794
	Median	.0459242	
	Variance	.090	
	Std. Deviation	.29954037	
	Minimum	-.70026	
	Maximum	.87145	
	Skewness	.349	.277

				.416	.548
Kurtosis					

Table 4. Tests of normality for actual data of MYR exchange rate changes

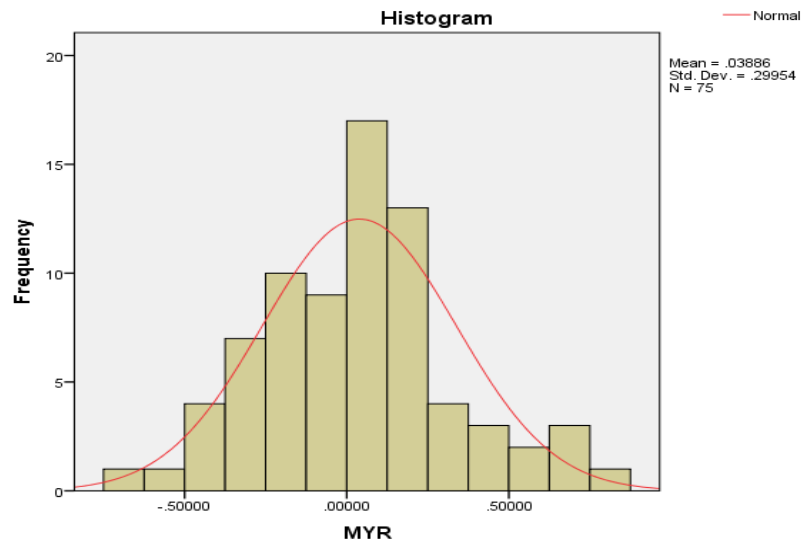|	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MYR	.085	75	.200[*]	.983	75	.404

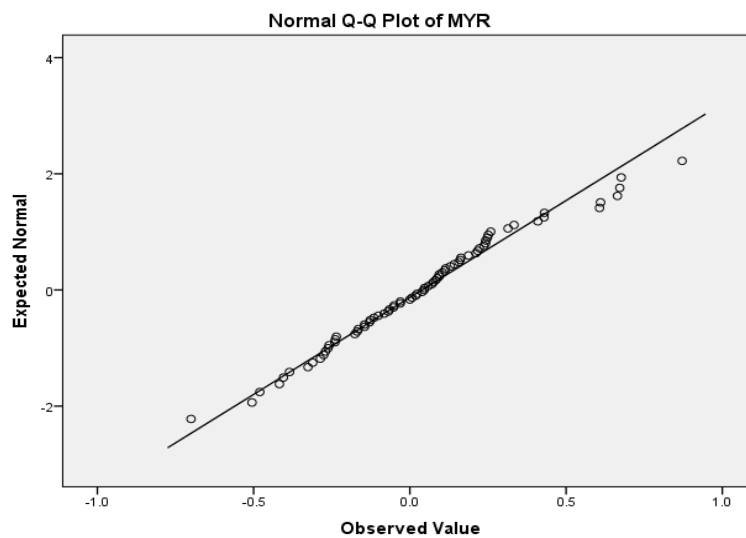Figure 7. Histogram of changes for MYR currency exchange rate

Figure 8. Normal Q-Q plot of changes for MYR currency exchange rate

Next, this study evaluated the correlation strength between two indicators: changes in KLCI and MYR currency exchange rate. Figure 9 shows the distribution between these two variables. The blue line shows the forecasting line that indicates the relationship between two indicators.
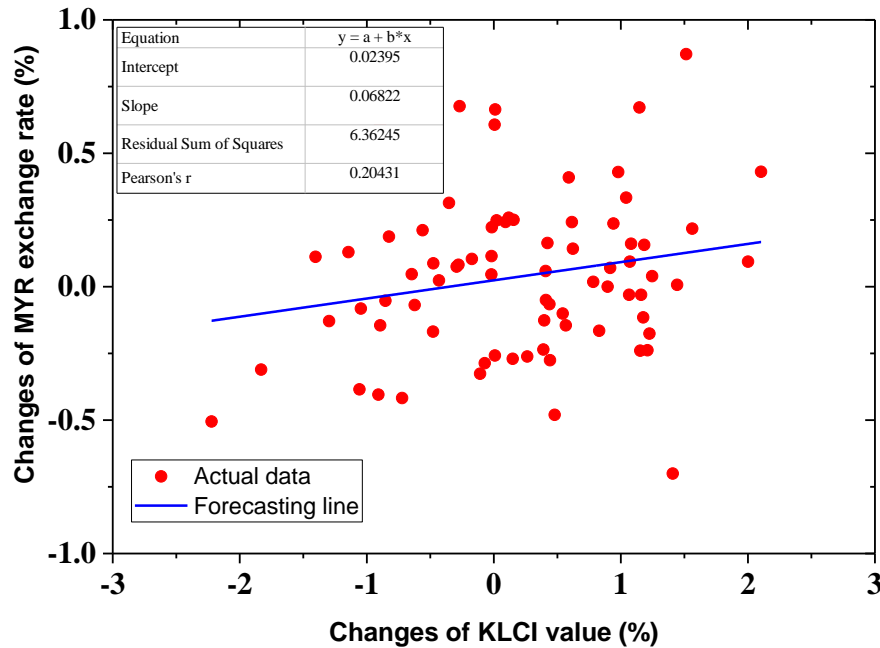

Figure 8. Scatter plot for correlation between two variables

Furthermore, Table 5 shows the Pearson correlation coefficient between KLCI value and MYR currency exchange rate changes. The correlation coefficient value is 0.204 that indicates a positive relationship between the two variables. The significant value is 0.079 that is less than chosen alpha of 0.1. Therefore, there is a significant correlation between changes in KLCI and MYR exchange rate. This finding shows Malaysia's economy indicates a positive recovery after the outbreak of COVID-19 in the year 2020.

Table 5. Pearson correlation analysis between two variables

		KLCI	MYR
KLCI	Pearson Correlation	1	.204
	Sig. (2-tailed)		.079
	N	75	75

Conclusion

This study aims to analyze the effect of COVID-19 on the economy and their current status towards the Malaysian economy. This study is essential to give information to the public in increasing awareness about the Malaysian economy. The main findings from this analysis are:

(i) There are two leading indicators: the Kuala Lumpur Composite Index (KLCI) and the Malaysian ringgit currency exchange rate. The observations in this study are using daily intervals starting from 1st April 2020 until 30th July 2020. There are 76 daily observations involved in this study.

(ii) The data shows significant improvements of currency exchange rate that proved a good economic situation in Malaysia. At the same time, increment in KLCI shows good progress of financial position in Malaysia.

(iii) The Shapiro Wilk test implemented for normality checking with a p-value is 0.539 that larger than chosen alpha of 0.05. The distribution of KLCI changes data follows the normal distribution. Next, the p-value of the Shapiro Wilk normality test is 0.404 that larger than chosen alpha of 0.05. The distribution of MYR currency exchange rate changes data follows the normal distribution.

(iv) The correlation coefficient value is 0.204 that indicates a positive relationship between the two variables. The significant value is 0.079 that is less than chosen alpha of 0.1. Therefore, there is a significant correlation between changes in KLCI and MYR exchange rate. This finding shows Malaysia's economy indicates a positive recovery after the outbreak of COVID-19 in the year 2020.

This study gives contribution to the body of knowledge in the economy of Malaysia. In addition, the findings help investors to have the confidence to invest in the stock market in Malaysia.

Corresponding Author

Dr. Mohd Sofian Bin Mohammad Rosbi,
Senior Lecturer,
Faculty of Applied and Human Sciences,
Universiti Malaysia Perlis
Email: sofian@unimap.edu.my

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