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## Ere Outbreak in Malaysia: Macroeconomic Factors and Variability in Exchange Rates

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### Abstract

**Purpose** – To examine the impact of macroeconomic factors on exchange rate fluctuations in Malaysia during the quarter before the onset of the COVID-19 pandemic in early 2020.

**Design/methodology/approach** – Data used in this study was collected on a quarterly basis, spanning from January 2009 to December 2019, and comprising 44 observations. The dependent variable of the study was the exchange rate, while the explanatory variables were the employment rate, balance of payments, budget deficit, tax rate, and corruption rate. Predictions were made using the Ordinary Least Squares (OLS) method.

**Findings** – The findings revealed that only two variables, the tax rate and budget deficit, had a negative relationship with the exchange rate. The link between the exchange rate and other variables, such as the budget deficit, employment rate, and corruption rate, was found to be weak.

**Originality/value** – This research makes a valuable contribution to the existing literature on the connection between exchange rates and macroeconomic factors in Malaysia. Furthermore, this study provides relevant insights for investors and business owners during their decision-making process.

**Keywords:** Exchange Rate, Macroeconomic Factors, Covid-19, Corruption, Balance of Payments

### Introduction

The price of one country's currency in relation to another country's currency is known as the exchange rate. For many years, a debate on the factors that influence the variability of the exchange rate has been widely discussed by a number of scholars (Isard, 1980; Nicita, 2013; Patosa & Cruz, 2012; Umar et. al., 2019; Mohamed et al., 2021; Abdul & Muhammad, 2022). Changes in the exchange rate can be affected by the money supply, unemployment, inflation, and interest rates, making it vital to the economic health of any country that allows free trade of goods and services. The volume of imports and exports is also affected by the exchange rate, which in turn affects the country's macroeconomics. The success of a country's international trade depends on how stable or unpredictable the exchange rate is.

Depreciation of the Malaysian ringgit against the US dollar has been observed since the month of March 2018, when it reached a low of RM3.862 per USD. The monthly fluctuations depicted in Figure 1 are attributable to several factors, one of which is political instability. In the year 2020, the real effective exchange rate in Malaysia has stated at 84.6 per cent. However, in the year 2014, the raised issue of the Malaysia Ringgit is about currency vulnerabilities, when it started depreciating in late 2014. On December 1, 2014, the Ringgit had its most substantial two-day depreciation since the 1997-1998 Asian financial crisis, from 3.3465 per U.S. Dollar, falling 2.4 percent to 3.4300 to the U.S. Dollar at closing. Then, it stated that Ringgit had dropped for four consecutive weeks in the year's longest losing stretch so far, in June 2015 (Mohamed et al., 2021)

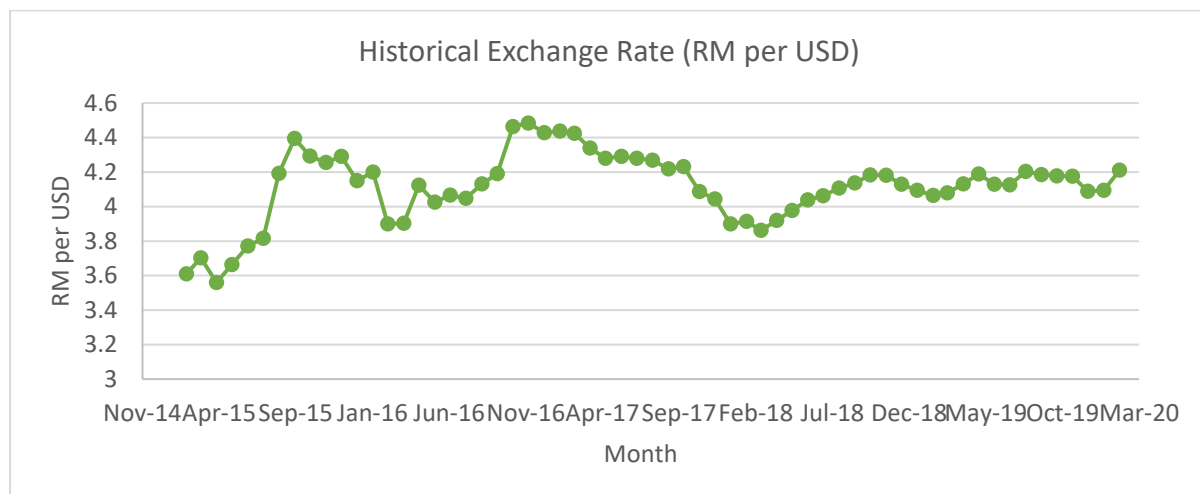


Figure 1: Monthly Historical Exchange Rate from February 2015 to February 2020

The major reason for the drop in Ringgit's value due to oil's lower value. In Malaysia, oil is the main export and affected the currency due to declining the Brent crude oil pricing. When the oil supply exceeded the demand, the oil price will reduce because of the high production of oil in the US. At the same time, Bank Negara did not peg the MYR and let the capital institution control Malaysia. This reason because the exchange rate regime can aid the country in adopting the changes value of the Ringgit (Mohamed et al. 2021). Malaysia is a developing country, and thus exchange rate has become crucial for huge import and export systems.

### Literature Review

The focus of this study on macroeconomic variables consists of a balance of payment, employment rate, budget, corruption and tax. The balance of payment is a display of the outflow and inflow of foreign currencies. Hence, the outflow and inflows are caused by international trade and services (Makin, 2006). The balance of payments is based on its current account and financial account. The exchange rate is a key determinant of the balance of payments position of any country. Moreover, if it is fully utilized, it can be acting as a nominal anchor for price stability. When the exchange rate fluctuates, it will have a direct effect on the demand and supply of goods, investment, employment as well as distribution of income and wealth. For employment rate, it is the amount of people employed based on the population of a certain country. The service sector used manpower in its operation which is a problem because the services cannot be stored and idle time while working will affect

negatively the organization. If Malaysia's currency depreciates there will be an increased demand for the country's goods in foreign countries which leads to more production in this country and leads to more employment and so on. The government of Malaysia should spend their income within the amount of tax collected. If their expenditure is more than their revenue, the government will cover their loss by borrowing or using their federal bank reserve. These actions will affect the confidence of foreign investors in Malaysia. The problem exists when the government is unable to raise its income through taxes, government should borrow from other countries. Hence, the foreign debt and budget deficit will contribute to financial turbulence which will cause exchange rate fluctuation.

Moreover, due to corruption matters, this situation exists because of a poor standard of living and poverty in a county. In addition, rich people practice corruption to gain wealth just because of greed, to gain power over people in society and to have an advantage in political parties. Hence, existing of corruption, this form of economic system will be fraudulent and the cost of doing business in a country will increase. For example, in a construction company, the materials used will be cheap and have low durability, the duration of the operating procedures will be longer, and projects will be incomplete because of bureaucratic delays between government officials. Corruption also results in insecurity and the international trade cost will be distorted because of bribes (Ramasamy & Abar, 2015). Some other studies had proven there has an effect on the macroeconomic exchange towards the currency (Galati & Ho, 2003). Other than that, (Mavi & Sharma, 1981; Oladipupo, 2011) stated that the exchange rate has a negative effect on the balance of payment in a country. Furthermore, a study by Demir (2010); Hua (2007) findings shows that the exchange rate has a negative effect on employment growth. Next, a study by Huang (2003) also quoted that high corruption can decrease the value of the currency and another stated that a budget deficit in a country can affect the exchange rate (Srivyal and Venkata, 2008). Moreover, a study by Xu (2010) mentioned that tax policy can affect an exchange rate.

In 2008, there was a global financial crisis that happened because of a bubble in the housing market in the US that affected globally including Malaysia. This country had been implemented a floating exchange rate since July 2005 that enables the currency to move by the market (Ahmad, 2013). Furthermore, Malaysia began to appreciate its currency slightly in early 2012, quoted at RM3.0583 per USD (BNM, 2013). This happened although Malaysia decide to unpeg its currency in 2005. But, ten years after the unpegging, the Ringgit was slowly depreciating. This situation happened due to the changing of leadership, the Prime Minister of Malaysia, and also the unstable political sentiment that happened every year.

In 2016, the ringgit had depreciated to RM4.486 per USD (Bank Negara Malaysia, 2016). The depreciation of the Ringgit is a concern for multinational firms, policymakers, investors, importers, exporters, foreign students, and the tourist that had been affected by this situation. The study selected different variables to determine the effect of the exchange rate in Malaysia (Ramasamy and Abar, 2015). The macroeconomic variables consist of a balance of payment, employment, budget, corruption and tax. Therefore, the study highlighted the investigation of macroeconomic factors that affected the Ringgit exchange. On the other hand, this study is related to contributions to which macroeconomic factors that exchange rate will follow the trends, hence, will help enhance importers' and exporters' returns. The rest of the paper is organized and structured as follows; the next section provides a summary review of the literature. Section three describes the methodology used for this study. Section four discusses interpretations of results and findings. Lastly, the conclusion and recommendations for future research.

A study by Quadry and Crossing (2017) on the Malaysian determination of the exchange rate and recent depreciation, had found a negative long-run relationship between the MYRGBP and differential money supply, and a positive long-run relationship against the world crude oil price. Moreover, the consistent study by Maurya (2017) on the factors affecting the exchange rate and its impact on the economy of India with a study by Ramasamy and Abar (2015) on the three countries about the influence of macroeconomic variables towards exchange rate, findings indicate macroeconomic variables have significantly influenced the exchange rates except for employment and budget deficit. The variables of the study consist of the exchange rate, gross fiscal deficit, money supply, current account deficit, GDP, import, and export. Furthermore, a study on the impact of the exchange rate on the balance of payments in Nigeria by Oladipupo (2011) shows that there is a negative relationship between the exchange rate and the balance of payments. The study applied Ordinary Least Square (OLS) method and findings show an exchange rate has a significant and negative relationship with the balance of payments. Hence, an increase in the exchange rate will decrease the balance of payments position. This study has parallel with Kaur Mavi and Sharma (1981) in their study of determinants of the balance of payments in India shows an exchange rate has a negative relationship. Even though a short-term exchange rate has beneficial to the balance of payments, there is no effective way in correcting a government deficit. However, a contradicted results study by Ahmad et al (2014) on the impact of the exchange rate on the balance of payments in Pakistan, where the finding has a positive relationship and significance on the balance of payments. Therefore, the stability fluctuation of the exchange rate is able to encourage and improve the balance of payments to the bank of Pakistan. This will create a positive environment.

According to Demir (2010), in the study of volatility of the exchange rate and employment growth in Turkey based on the 500 manufacturing firms from 1983 until 2005, results found that appreciating real exchange rate has a negative relationship and significantly on employment growth. This study is also consistent with Hua (2007), the real exchange rate and manufacturing employment in China based on 29 Chinese provinces for the period 1993 until 2002. The findings show a real appreciation of the renminbi when a result has a significant and negative relationship with Chinese manufacturing employment. This occurred due to an increase in real appreciation of the renminbi, at the same time it will increase the cost of labour. Next, the study by Sun and Kim (2018) on the effect of exchange rate depreciation on the US economy from the year 1973 until 2007, results show the exchange rate has expansionary effects on the US industrial, manufacturing and employment for a year and fade over time.

Huang (2003) in the study role of corruption in monetary policies for developed countries, results show high corruption country, will decrease in value of fixed rates or currency. Hence, the country needs to reduce corruption to increase its currency value. In order to investigate, it needs to set out the relationship between corruption, law and order, bureaucracy and the real exchange rate (Bahmani and Nasir, 2002). Based on the data for corruption rate that is collected from International Country Risk while for productivity is collected from Penn World Table, findings show a country experiencing a high degree of corruption or less law, and order tends to experience a real depreciation in their currency. Moreover, Sohu et. al (2019), study on the impact of corruption on the exchange rate in Pakistan using the time series panel data from the year 2002 until 2016, results show CPI have a significant effect on the real exchange rate.

Furthermore, in a study by Su and Su (2003) on the impact of budget deficit on currency value in Asian and European Countries, based on the results of the direct or indirect effect of the budget on the exchange rate, there is no direct relationship between budget deficit and currency. Moreover, the results are also different within the countries. On the other hand, in the study by Nyahoho (2006) on the relationship between the deficit and the exchange rate of OECD countries, there was a weak result on the increase of budget deficit, and the government debt will have depreciation on the exchange rate. In addition, a study by Sriviyal and Venkata (2008) on the interaction of the budget deficit of India, results reveal there is bi-directional causality between budget deficit and nominal effective exchange rates relationship using Co-integration approach and Variance Error Correction Models (VECM) for the period 1970-2002. However, there are insignificant findings between budget deficit and GDP, money supply and CPI. It is also observed that the GDP Granger causes a budget deficit whereas a budget deficit does not.

Furthermore, a study by Auray et. al (2018) on tax reform and real exchange rate dynamics shows that changes in the short run on the capital income tax determine the fixed exchange rate in a country and resulting a good open economy model. A study by Chen et. al (2020) is consistent with a previous study, based on the data of households and firms, findings show tax policy can be used to correct the local currency pricing in the open economy. Furthermore, the study by Kwasi Obeng et. al (2011) on the effect of import and tariff revenue in Ghana, the findings show changes in real exchange rate contribute positively to changes in import tax revenue in Ghana. Moreover, Daly and Kearney's (1998) study on the fiscal policy on the foreign exchange value of a country's currency, findings show the exchange rate response to a tax finance fiscal expansion causes an initial appreciation in five countries such as Australia, France, Germany, Italy, and the USA

### **Data and Methodology**

This section will explain the sample, sources of data and analysis used in this study. To examine the factor of macroeconomic that affected the exchange rate in a country, the study is based on a quarterly basis ranging from January 2009 to December 2019 with a total of 44 observations. The quarterly data for exchange rates, the balance of payment, budget deficit and tax rate were collected from Thomson Reuters DataStream and Bank Negara while for employment rate was collected from the Department of Statistics Malaysia. For dependent variable is an exchange rate while the independent variables consist of a balance of payment, corruption rate, budget deficit or surplus, employment rate and tax rate. Multiple regression analysis is applied to measure the relationship among variables. Several analyses were conducted to fill the study objectives. First, all collected data is analyzed by the descriptive to see the summary statistics such as the minimum and maximum numbers of variables, and the most volatile variables that contribute to the exchange rate. Next is the correlation matrix that is used to examine the correlation among the variables. Lastly, this study applied the Ordinary Least Square (OLS) regression to determine the effects of macroeconomic factors towards the exchange rate. The regression model to be tested in this study was:

$$Y_t = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon_t \quad (\text{Equation 1})$$

Where,

- $Y_t$  = Exchange rate in Malaysia
- $X_1$  = Balance of payment
- $X_2$  = Employment rate
- $X_3$  = Budget deficit/surplus
- $X_4$  = Corruption rate
- $X_5$  = Tax rate

Moreover, this paper also applied a diagnostic test to check the OLS regression model. This includes the stationary, normality, multicollinearity and auto-correlation test. To test the multicollinearity problem Variance of Inflation Factor (VIF) was used. A VIF greater than 10 explained a multicollinearity problem (Montgomery, Peck, & Vining, 2012). The d-statistics that are lower than the dL indicate an autocorrelation, whereas the d-statistics that are greater than dU indicate no autocorrelation (Durbin and Watson, 1971). This test is conducted to confirm the estimation of the data whether there are not equal, effective and consistent so that the set model will be free from econometric issues.

### Findings

This section presents the results of the empirical analysis. Table 1 highlights the summary statistics on the variables for the eleven years consisting of 44 observations. The main theme measurement states an average exchange rate value was 3.617 and the median was 3.518. The dispersion test showed that 4.44 reached the highest value and that the lowest value was 2.982. This finding led to a broader standard deviation of 0.488. The balance of payment ( $X_1$ ) has an average value of 13921.61, and the recorded median value is 12291. The balance of payment data is range from 978 to 28352. The standard deviation is 8006.63. Next, the average employment rate ( $X_2$ ) is 66.56 and ranges from a low of 62.60 to a high of 69.6. The median is recorded at 67.6 and the standard deviation is 2.109. Furthermore, the mean value for budget ( $X_3$ ) is -4.082. The maximum and minimum values range between -3 and -6.7. The median value is -3.7 and the standard deviation is 1.125. For corruption ( $X_4$ ), the mean value is 48.09 meanwhile, the range value is between 43 to 53. The median is 49 and the standard deviation is 3.094. Lastly, the mean value for tax ( $X_5$ ) is 24.55 and the median is 25. The range value for tax is from 24 to 25 and the standard deviation is 0.504.

Table 1  
*Descriptive Analysis*

	Y	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>
Mean	3.617	13921.610	66.557	-4.082	48.091	24.545
Median	3.519	12291.000	67.600	-3.700	49.000	25.000
Maximum	4.440	28352.000	69.600	-3.000	53.000	25.000
Minimum	2.982	978.000	62.600	-6.700	43.000	24.000
Std. Dev.	0.488	8006.628	2.109	1.125	3.094	0.504
Observation	44	44	44	44	44	44

Table 2 reports the Pearson Correlation Matrix between the variables. There is a mixed correlation derived from the matrix for each of the variables. The strongest correlation is extracted from the correlation of budget with a positive relationship on the employment coefficient of 0.891. This is followed by the same independent variables with a correlation of corruption of 0.704 and a correlation of corruption towards a correlation Budget of 0.670. The following correlation is Tax towards correlation balance of payments with 0.536, followed by correlation Employment 0.574 and correlation budget 0.542 respectively. The two weakest correlations resulting from the exchange rate on its independent variables are the correlation of corruption towards tax 0.331 and followed by correlation of corruption 0.270.

Table 2  
*Results of Correlation Matrix*

	Y	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>
Y	1.0000					
X <sub>1</sub>	-0.4088	1.0000				
X <sub>2</sub>	0.5741	-0.7339	1.0000			
X <sub>3</sub>	0.5422	-0.7583	0.8906	1.0000		
X <sub>4</sub>	0.2698	-0.5842	0.7042	0.6700	1.0000	-0.3310
X <sub>5</sub>	-0.9168	0.5361	-0.6714	-0.6907	-0.3310	1.0000

Table 3 represents an analysis and results for the regression. The R-squared through the various macroeconomic variables that as a balance of payments, employment rate, corruption index and a tax rate that affected an exchange rate show that the dependent variable was explained by the independent was more than 85%. However, this can be related to some weak correlation of the independents towards the correlation matrix analysis at the beginning. From the results, only budget and tax rates have a negative and significant effect towards the exchange rate. This indicates an inverse relationship with an exchange rate. The p-value of a budget is 0.0519 which is less than a ten per cent significant level, and this finding is supported by Nyahoho (2006), who study on the relationship between the deficit and exchange rate of OECD countries. Thus, the study shows that there was a weak result on the increase of budget deficit and government debt will have depreciation on the exchange rate. This study is consistent with Srivyal and Venkata (2008), a study in India reveals that there is a bi-directional causality between budget deficit and nominal effective exchange rates. The p-value of the tax is 0.000 which is less than a five per cent significance level, this finding is consistent with Obeng et. al (2011) where the study shows that changes in real exchange rate contribute significantly and positively to changes in import tax revenue in Ghana. Moreover, the exchange rate response to a tax finance fiscal expansion causes an initial appreciation in five countries such as Australia, France, Germany, Italy and the USA (Daly & Kearney, 1998).

Conversely, the balance of payments, employment rate and corruption have a positive relationship but are insignificant to the exchange rate. The balance of payments results are consistent with a study by Kaur Mavi & Sharma (1981) where the exchange rate has an insignificant effect in India over time. However, for employment rate, there has contradicting results with Hua (2007); Demir (2020), where their employment rate effect significantly exchange rate. This is due to both studies using different currencies and samples of data where Hua (2007) uses the renminbi currency while Demir (2010) uses the Lira currency according to each country. The study on corruption also contradicted the results of Bahmani



& Nasir (2002), maybe due to different samples of data being more widely consisting of 65 countries and Sohu et al (2019), using different currencies such as Pakistan and Indian rupees.

For a diagnostic test on multicollinearity, all the independent variables show a centred VIF ranging from 2.1 to 6.0 which indicates that there is no multicollinearity problem relying on the data. The auto-correlation test shows the value is 0.9081 which is more than a 5 per cent significance level, thus the model has no serial correlation. Next, the p-value for the heteroscedasticity test is 0.2624 which is more than a 5 per cent level of significance and has constant variance.

Table 3

*Results of Regression*

Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
C	25.01888	3.299963	7.581566	0.0000	
X <sub>1</sub>	4.05E-06	5.73E-06	0.707380	0.4836	2.4759
X <sub>2</sub>	0.034117	0.033656	1.013699	0.3171	5.9318
X <sub>3</sub>	-0.127970	0.063749	-2.007404	0.0519**	6.0623
X <sub>4</sub>	0.009311	0.014210	0.655230	0.5163	2.2766
X <sub>5</sub>	-1.006242	0.085771	-11.73176	0.0000*	2.1980
R-squared	0.8647		Durbin-Watson Stat	1.0658	
Adjusted R-squared	0.8469		Jarque-Bera's p-value	0.1970	
F-statistic	48.5956		Heteroscedasticity	0.2624	
Prob (F-statistic)	0.0000		Serial Correlation	0.9081	

Notes: \*p < 0.05, \*\*p < 0.10

**Conclusion**

The main contribution of this paper is to aid investors and business owners in making informed decisions. The study offers insights into the long-term movements of exchange rates and emphasizes the importance of taking appropriate action to mitigate the impact of these movements. For investors and companies engaged in the import and export market, making sound decisions is crucial to reducing risks and increasing profits. From the finding, results show the budget deficit and tax rate have a significant effect on the exchange rate. Although tax rate and budget deficit are the fiscal policy made by the government every year, the investor and business owner can gain benefits by using good strategies in making a profit. For an investor, by implementing innovative and good strategic decision-making, the investors and companies could boost the economy in Malaysia, and even make the currency of the Ringgit Malaysia appreciate, by focusing to invest in government tax reduction companies and business sectors that the government are focusing on for that year. In addition, firms can benefit from this result by spending their tax relief and government funding on improving their productivity for example buying more assets or machinery to increase productivity. Next, they can predict the company's spending based on fiscal policy announcement every year by the government whether they should focus on imported product or domestic product and areas that the government are focusing on that year. In addition, the study's findings suggest that companies can benefit from focusing on a country's tax rate and government budget to avoid risks and take advantage of exchange rate fluctuations. The study also highlights how external factors affect exchange rate fluctuations in Malaysia, impacting stakeholders such as investors, government, and companies. Further research is needed to

strengthen these findings, possibly by using additional tests or models to determine the relationship between variables. Additionally, the study focuses on specific sectors that influence exchange rates, and future research could explore alternative perspectives and consider a longer sample duration, particularly given the impact of the pandemic on the country.

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