The Relationship between Money Supply, Exchange Rates and Oil Prices with KLCI's Price

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Abstract
KLCI is a prominent stock exchange in Malaysia that tracks the performance of firms. It has gained the attention of investors since it can influence investment decisions for investors and corporations alike. This research studies the influence of money supply, oil prices, and exchange rates on the Kuala Lumpur Composite Index (KLCI). The study examines the link between the KLCI, money supply, oil prices, and exchange rates. This analysis also employed three independent variables: the money supply (M.S.), the oil price (O.P.), and the exchange rate (E.R.). Multiple linear regression techniques are applied in this research using monthly data. In addition, the normality test, descriptive analysis, regression analysis, and Augmented Dickey Fully (A.D.F.) root of unit tests are used to determine the relationship between variables. These sources provided the information: Refinitiv Eikon Datastream, Yahoo Finance, Trading Economics, and Bursa Malaysia. Specifically, the data collected between July 2012 and July 2020 will be analyzed with E-Views 11. According to the results, every independent variable influences the KLCI. However, neither the money supply nor the exchange rate was significantly impacted. Only money supply (M.S.) demonstrated a negative correlation with the KLCI. However, oil prices (O.P.) substantially impact the KLCI. This element contributes to the high performance of the KLCI. Future research should increase understanding and generate more consistent outcomes by experimenting with various data architectures and incorporating other macroeconomic variables.
Keywords: Money Supply, Exchange Rates, Oil Prices, KLCI, Price.

Introduction
On the stock exchange, both private and institutional investors trade shares. Stocks represent a company's equity and bestow voting rights and residual interest in capital gains and dividend income. Supply and demand affect the price of a stock when buyers and sellers place orders in the market. Order flow or bid-ask spreads are typically maintained to maintain a fair and orderly market. The stock market is a complex and interrelated system that major and small-scale investors populate. The first factor affecting the stock market is supply and demand. The quantity of stock someone is willing to sell is defined as supply. Whereas the quantity of stock someone is willing to purchase define as demand. When the demand for a stock exceeds the supply, the buyer increases the price to entice the seller to sell and vice versa. A temporary imbalance between supply and demand bids contributes to stock price volatility. Economic growth is necessary for a healthy stock market because it enables businesses to raise capital from the general public (Norehan and Ridzuan, 2020).

Additionally, the stock market is critical to a country's economy, and its interconnected movements are a leading indicator of economic crises such as recessions and depressions (Queku et al., 2020). According to Moussa and Delhoumi (2021), stock markets mediate between listed firms and investors in developed and emerging markets. Malaysia's stock exchange is one of the largest in Southeast Asia, with 998 listed companies offering a varied range of investment options to both domestic and foreign investors (Bursa Malaysia, 2020).

Malaysia's index has Southeast Asia's second-largest domestic market capitalization. A strong stock market suggests a healthy economy, but a long-term drop in the stock market signals economic difficulties such as recession or depression (Queku et al., 2020). According to Liang et al (2020), uncertainty in the United States has a negative effect on stock prices in eight markets. Numerous research has established a significant association between the

stock market and macroeconomic situations. On the other hand, others have uncovered features unrelated to the stock market. There were delegations from China, Japan, the Philippines, Korea, Singapore, Taiwan, Thailand, and Vietnam.
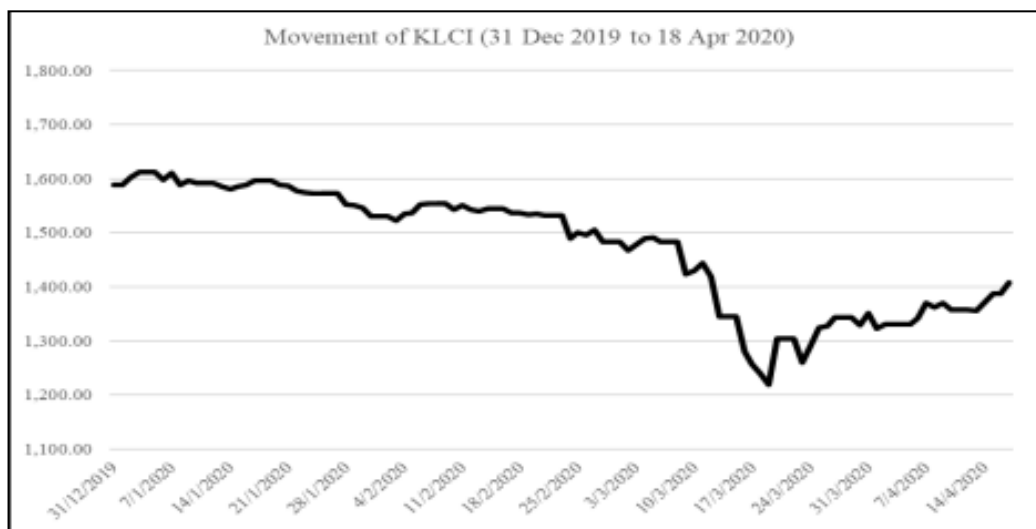

Figure 1: Movement of Kuala Lumpur Composite Index (Period: December 2019 to April 2020)
Source: Investing.com

Following the pandemic's spread, Malaysia's government imposed a Mobility Restriction Order (MCO) that would remain effective until March 31, 2020. The government has announced the second MCO internship, which will take place between April 1 and April 14, 2020, in response to the surge of COVID-19 cases. Between December 31, 2019, and April 17, 2020, the Kuala Lumpur Composite Index (KLCI) changed dramatically, as illustrated in Figure 1. Since January 2020, it has been declining, reaching a low of 1,219.71 on March 19, 2021. Every economy needs an index that is critical to the economy's growth. The stock market is strongly related to the macroeconomic climate. As a result, this study studied the relationship between the exchange rate, money supply, oil prices, and the KLCI stock market's performance. This study examines the Malaysian stock market. The stock market's response to chosen macroeconomic variables, such as money supply, exchange rate, unemployment, and oil price, was analyzed. The data demonstrate a robust and long-term link between the stock market and currency exchange rate movements (Norehan & Ridzuan, 2020). The index performs well when inflation is high.

Additionally, the exchange rate might influence foreign investment decisions in Malaysia. Cash and deposits are typically used in all transactions. Cash and other liquid assets must be quantified in terms of the country's money supply. Interest rates will fall as the money supply expands. As KLCI and three macroeconomic variables are the subjects of this study, therefore, this study has the following aims which are:
- to determine the money supply's effect on the KLCI,
- to determine the exchange rate's impact on the KLCI, and
- to determine the oil price's effect on the KLCI.

Research Background
This section discusses prior studies and prospects for the relationship between the KLCI and Malaysian macroeconomic metrics. The previous researcher's work will serve as a guide and point of reference for the current research effort. As a result, the study examines the previous researcher's theoretical framework. According to the study, various factors, such as the exchange rate, money supply, and oil prices, affect Malaysia's Kuala Lumpur Composite Index.

Kuala Lumpur Composite Index (KLCI)
The FTSE Bursa Malaysia KLCI has replaced the original Kuala Lumpur Composite Index. It was a market capitalization-weighted index of the thirty largest firms listed on Bursa Malaysia. Only companies that meet the requirements of the FTSE Bursa Malaysia are eligible for listing. A widely established index-calculating technique boosted transparency and made the index more tradeable. Linck and Decourt (2016) assert that stock competition is highly susceptible to various factors, including economic index. By pooling funds from many investors, the stock market gives capital to publicly traded corporations. By their very nature, Stock prices are understood to respond to macroeconomic conditions (Chen et al., 1986). In other publications, Garcia and Liu (1999) discovered that stock market expansion is a multifaceted phenomenon.

The economy is constantly changing, as DiMartino and Duca (2007) proved by examining how the stock market and economy in the United States, the United Kingdom, Japan, France, and Germany altered through time. Prior to that, Ibrahim (1999) examined dynamic interactions between stock prices and macroeconomic variables using bivariate and multivariate cointegration, concluding that the stock market was inefficient regarding information. Khalid and Khan (2017) have studied index performance and economic variables, examining the Pakistan stock market index's long- and short-term effects on interest rates, currency exchange rates, and inflation rates.

Money Supply (M.S)
In contrast, one of the most powerful weapons available to national central banks for affecting actual economic activity is the money supply. The term money supply refers to a country's total amount of currency, expressed in units. The money includes coins, banknotes, paper money, traveler's checks, and checkable deposits. The stock market is frequently regarded as the most crucial indication of the economy's health and progress, as it greatly impacts and precedes it. Several research studies have been conducted on the money supply and the KLCI. Ouma and Muriu (2014) examined the macroeconomic environment in Kenya's impact on stock returns and discovered that money supply and inflation are long-term favorable for an index. Chia and Lim (2015) demonstrate that money shocks benefit the economy and that the money supply and the stock market exhibit a favorable link in their analysis of the Sri Lankan market. In a study of the Jordanian market, Ibrahim and Sohail (2018) found a favorable association between the money supply and the stock market.

Meanwhile, Adu (2012) showed that lower exchange rate volatility has a more significant impact on the trade balance than higher volatility and that the money supply level, interest rates, and stock prices are causally related. The model demonstrates how the money supply and interest rate affect the index return unequally. The results indicate that the money supply

affected some stock market swings, whereas the stock market affected money supply estimates.

Exchange Rate (E.R)

Bahmani-Oskooee and Saha (2019) concluded that exchange rate changes had an asymmetric effect on the S&P 500 index using an asymmetric ARDL model. Chang et al (2019) conducted a similar analysis and discovered the asymmetric impact of macroeconomic variables on the Pakistani stock market. Their findings indicate that the financial crisis altered the asymmetric relationship between macroeconomic indices and indices. Meanwhile, Najaf & Najaf (2016) discovered that changes in exchange rates affect stock prices via Granger causality. The study found a weaker association between currency and index volatility but concluded that it considerably affected the financial system. Increases in share prices might draw capital inflows, resulting in a rise in the exchange rate. Simultaneously, a decline in stock prices would result in a loss of wealth for domestic investors, lowering money demand and interest rates and resulting in capital outflows and currency devaluation (Ozcelebi & Yildirim, 2016).

According to Kse et al (2010), the Turkish financial market assessed the relationship between share price and exchange rate. The findings imply that the exchange rate and the stock market are one-way. They recommended that the government consider the beginning levels of stock indices when making exchange rate policy decisions. The exchange rate can be used to forecast the stock market's evolution. When the local currency's value falls, it draws more international investors, allowing them to purchase stocks at a lesser cost. They profit if the exchange rate rises again by selling the stock. Investors should be cautious of currency fluctuations affecting equities market results. Linck and Decourt (2016); Chia and Lim (2015); Kibria et al (2014) feel that there is a positive correlation between the exchange rate and the stock market. Exchange rates are detrimental to the stock market; Ouma and Muriu (2014) found that the coefficients for the association between two stock price indexes and the exchange rate were significantly negative.

Oil Prices (O.P)

Numerous studies have examined the effect of oil prices on overall stock market results. The findings exhibit an inverse relationship between the oil price and the stock market. Increased oil prices indicate a transfer of capital from oil-importing to oil-exporting countries, as oil-importing countries spend the additional funds to meet their domestic oil demands. According to Davoudi et al (2018), all European countries except Norway are badly affected by oil shocks. However, the volatility of oil prices has little effect on the U.S. stock market.

The influence of market changes varies by industry. According to various studies, positive change improves the performance of oil-related companies such as oil, gas, and mining. Increased oil prices result in a positive outcome in the U.S. and Japan (Hatemi-J et al., 2016). In Germany's example, rising oil costs resulted in the economy's contraction, as the stock market was depressed as prices decreased. Similarly, Shafi et al (2015) discovered that changes in oil prices helped oil-exporting countries' stock markets while harming oil-importing countries' stock markets. According to the argument, higher oil prices indicate economic expansion and growth, which results in robust demand in a favorable US-Japan relationship.

Additionally, Marashdeh and Afandi (2017) investigated the effect of oil prices on the stock market used by the world's top oil producers in the United States, Saudi Arabia, and Russia from January 2000 to May 2015. They examined oil prices, interest rates, inflation, the output of crude oil, and stock market returns. For instance, the share price of an industry is determined by demand and production costs, which are impacted by oil output and prices. The relationship between oil's price and its worth is still debatable. The relationship between oil prices and the stock market is adverse in certain nations but beneficial in others like the G.C.C. and Malaysia. Kisswani and Elian (2017) found no conclusive correlation between oil prices and the stock market. This is because various sectors face varying degrees of risk.

Research Methodology
This study employs a quantitative technique that collects and analyzes secondary data statistically. The empirical research in this work uses monthly time series data spanning eight years before and throughout the Covid-19 epidemic (July 2012 to July 2020). These periods were chosen to examine the impact of events preceding and during the pandemic. This study gathered data on the KLCI, oil prices, money supply, and currency rates from Bursa Malaysia, Yahoo Finance, Trading Economics, and Refinitiv Eikon DataStream. The table below summarises the data used in this investigation.

Table 1
Data Summary

Variables	Abbreviation	Proxy	Remark
KLCI prices	KLCI	KLCI price index	Dependent variable
Money supply	M.S	M3	Independent variable
Exchange rate (E.R)	E.R	Nominal effective E.R.	Independent variable
Oil prices (O.P)	O.P	Crude Oil price	Independent variable

The following hypothesis statements developed for this study are stated as follows
  H0:   *There are no significant relationships between independent variables (money supply, exchange rate, and oil prices) and KLCI price in Malaysia*
  H1:   *There is a significant relationship between independent variables (money supply, exchange rate, and oil prices) and KLCI price in Malaysia*

First, we analyze the data based on descriptive statistics that measure the central tendency and dispersion. Descriptive statistics focus on the maximum, minimum, mean, and standard deviation. Besides, the explanation of data is expected to provide a preliminary overview of the problem under this study.

Second, to avoid erroneous results, we test the variables for stationarity. To improve the accuracy and dependability of the models built, having stationary data is necessary for designing significant outcomes in time series analysis. The unit root test helps determine whether a time series variable is non-stationary and possesses a unit root.

Third, the data are tested using normality and Pearson analysis. This analysis is being carried out to detect the normal distribution of error terms at a 5% significance level. Besides, we also check if there is any correlation between the respective independent variables. The correlation results range from -1.0 to +1.0 to assess the weak or strong variation in one

variable as another variable varies. Lastly, this study employed a multiple regression approach to analyzing the time-series data to determine the impact of KLCI's price on the money supply, exchange rate, and oil prices. The generic model below is proposed to study the effect of these variables on KLCI's prices:

KLCIi = β_0 + β_1MS$_i$ + β_2ER$_i$ + β_3OP$_i$ + ε_i
$\qquad$ Where,
$\qquad$ KLCI = Kuala Lumpur Composite Index,
$\qquad$ β_0 = constant
$\qquad$ β_1 to β_3 = coefficient of variables
$\qquad$ MS= money supply
$\qquad$ ER = exchange rate
$\qquad$ OP = Oil price
$\qquad$ ε_i = error term

The above table summarizes that the dependent and independent variables are KLCI, MS, E.R., and O.P. The constant value and error term or residual represents β_0 and ε_i, respectively. Meanwhile, the $\beta1$, $\beta2$, and $\beta3$ refer to the beta coefficient of each independent variable. The beta coefficient reflects the impact on the dependent variable, which might be positive or negative.

Findings and Discussion
This section discusses the analyses conducted and provides an overview of the data gathered during the investigation. Multiple regression elucidates the dependent variable's variation by utilizing many dependent variables. It will define and describe the links between independent and dependent variables. All data tests are necessary, including descriptive analysis, static analysis, normality testing, correlation testing, and regression testing. This article examines the relationship between the Kuala Lumpur Composite Index and Malaysia's dependent variables.

The money supply (M.S.), the exchange rate (E.R.), and the oil price (O.P.) are the study's independent variables. The entirety of the test will aid the researcher in responding to the research questions supplied by the entire test will assist the researcher in answering the research questions generated from the Research Objectives (R.O.) earlier, as follows:

RO1 = To evaluate the impact of money supply on KLCI
RO2 = To assess the impact of the exchange rate on KLCI
RO3 = To evaluate the impact of oil prices on KLCI

Descriptive Analysis
Table 2
Descriptive Statistics for the Impact of Money Supply, Oil Price, and Exchange Rate on KLCI

Items	KLCI	Money Supply	Exchange Rate	Oil Price
Mean	1709.610	1347.410	91.79515	251.1536
Median	1709.640	1353.000	89.41000	249.5300
Skewness	-0.574042	0.890033	0.425623	-0.162317
Kurtosis	3.601874	4.836674	1.701519	2.207157

According to the table above, the data was normally distributed. The skewness values for all variables range between 3 and +3, and the kurtosis values range between 10 and +10. On average, the KLCI is 1709.610, while the exchange rate is an average of 91.79515. At 1709.640, the KLCI has the highest median, followed by money supply (1353), oil price (249.53), and exchange rate (89.41). The remaining countries recorded amounts of 1347.410 (money supply) and 251.1536 (oil price).

Unit Root Test
Table 3
Result of Unit Root Test – Augmented Dickey-Fuller (A.D.F.)

Variable	Level	1st Different
KLCI	0.2535	0.0000**
Money Supply	0.9997	0.0000**
Oil Price	0.4109	0.0000**
Exchange Rate	0.6662	0.0000**

As demonstrated in Table 3, the data used for this analysis are stationary based on the extended Dickey-Fuller test (A.D.F. test) for the unit root test. We reject the null hypothesis at the 5% level of significance. All first-level variables are significant when their p-value is less than 5% of the significance level.

Pearson Correlation Analysis
Table 4
Pearson Correlation Analysis

Correlation Probability	Money Supply	Oil Price	Exchange Rate
KLCI	-0.461999	0.478759	0.470311
	0.0000	0.0000	0.0000

According to the above, the KLCI positively links the oil price and the exchange rate but is negatively associated with the money supply. This suggests that the KLCI's only negative component is Money Supply. It may be concluded that all three independent variables have a linear connection with the KLCI. The p-values demonstrate that the money supply, oil price,

and exchange rate are significant at 0.0000, less than 5%.

Multiple Regression Analysis

Table 5

Result of Multiple Regression

Variable	Coefficient	Std. Error	t-Statistic	Probability
KLCI	1571.1760	329.4177	4.7696	0.0000
Money Supply	-0.1138	0.0730	-1.5597	0.1222
Oil Price	0.4744	0.2124	2.2333	0.0279
Exchange Rate	1.8808	2.9854	0.6300	0.5302

According to the results above, only two variables, namely money supply and oil price, significantly affect KLCI with a p-value less than 5%. U Assuming all other variables are constant, the following model was developed for this study:

KLCI=1571.176 + (-0.1138) MS+0.4744OP + 1.8808 ER + Ɛ

The Money Supply (M.S.) coefficient is -0.1138. According to this statistic, a 1% rise in the money supply (M.S.) translates into a -0.1138 percent fall in the KLCI. In comparison, the price of crude oil has a coefficient of 0.4744. This statistic indicates that a 1% increase in the price of oil results in a 0.474405 percent increase in the KLCI.

The exchange rate has a coefficient of 1.880794, which indicates that for every one percent increase in the exchange rate, the KLCI climbs by 1.880794 percent. This number rejects the null hypothesis, implying that the exchange rate has little effect on the KLCI. At 0.5302, only the exchange rate has a p-value more significant than the 5% significance level.

The analysis indicates that all three independent variables are related to the dependent variable, KLCI. However, the p-value shows only oil price has a positive significance with KLCI while money supply and exchange rate are both insignificant.

Conclusion and Recommendation

The conclusion and recommendation of this paper will be discussed in the following sections.

Conclusion

This empirical study aimed to enrich the existing literature by examining the effects of money supply, oil price, and exchange rate on KLCI. Based on the insights, the money supply positively impacts KLCI. However, the oil price and stock market quote negatively correlate with KLCI. The result of the study agrees with the results of the studies by (Gay, 2008; Adam and Tweneboah, 2008).

Based on the preceding explanation, there appears to be enough evidence to establish a link between the money supply and the KLCI. At a 5% level, the money supply is a key macroeconomic variable affecting the Kuala Lumpur Composite Index (KLCI). This indicates

that the economy will expand faster. This conclusion is supported by research by Sohail (2018), who found that the money supply in Sri Lanka positively impacts the stock market.

The results indicate a significant and positive relationship between the oil price and the KLCI rate at the 5% level of confidence. It corresponds to (Davoudi et al., 2018; Hatemi-J et al., 2016). Al-Hajj et al. (2018) dispute the conclusions.

Based on the results, there is a significant relationship between the exchange rate and the KLCI. Coefficient correlation showed a positive relationship between the two variables. This result is consistent with Linck and Decourt's (2016); Chia and Lim's (2015) results.

This research contributes to the corpus of knowledge by enhancing investors' knowledge. According to the study, the exchange rate, the money supply, and oil prices are all long-term indicators of the KLCI's performance. Thus, as active investors, they have the potential to earn significant returns before the variables reach their long-term equilibrium points. In other words, the characteristics used can provide light on stock market success. Additional research on the relationship impact would be beneficial, specifically whether stock price movements can cause commodity price changes or cause stock price movements.

Recommendation
Future studies should consider more independent factors such as inflation, interest rates, and real wages. The researcher would have a complete picture of these elements included. This is because when more independent variables are included, the result is more robust and accurate. More information or facts can be obtained when the relationship between the variables is examined.

It is suggested that researchers experiment with different data formats in the future, such as quarterly, monthly, or weekly data. This is because different independent variables can have different sensitivities at different frequencies. Secondary data collection, on the other hand, is always a challenge. When collecting data, many researchers face a challenge or a limitation. As a result, the researcher may need to assess and overcome this limitation while collecting secondary data.

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