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DOES KLCI INFLUENCE FEDERAL GOVERNMENT'S REVENUE? EVIDENCE FROM 1990 UNTIL 2019

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ABSTRACT

Kuala Lumpur Composite Index (KLCI) pursues this empirical study with the objective to examine the effect of stock market's performance as proxied on Malaysia's government revenue for the past 30 years. In particular, the study is stream lined towards investigating the strength of relationship between these two economic variables. Within the framework of Keynesian income theory and theory of stock market development, this paper deploys Engle-Granger co integration (1987) test to estimate the model using yearly secondary data from 1990 till 2019. The findings lend support to the presence of significant short term relationship running from KLCI to federal government's revenue but there is an absence of long-term relationship between them. We also observe a strong positive correlation between KLCI and federal government's revenue. It is very clear to us that the listed firms at Bursa Malaysia are playing important roles not only in propelling Malaysia's economic growth but also in channeling tax revenue for government coffers. Malaysia truly needs a good dynamic tax system that can benefit tax payer and also support business growth in the long run.

INTRODUCTION

A stock exchange or equity exchange is a financial marketplace where both stock traders and stockbrokers are transacting among themselves. By definition, the stock exchange is considered as a secondary market for existing shareholders to buy or sell their shares. Besides being an important economic leading indicator, the stock exchange renders a platform for its listed companies to gain easy access to capital funding such as through the initial public offering (IPO), right issues and even bond financing. With regard to the development of Malaysian stock exchange it was incorporated in 1976 and later listed in its own exchange in 2005. Known as Bursa Malaysia Securities

Berhad it is now one of the largest bourses in Southeast Asia encompassing of more than 900 local and foreign companies across 50 different economic activities. Today, Bursa Malaysia helps the listing of large-capital companies, emerging companies and even small-medium enterprises (SMEs).

Being an industrialized developing country for a good number of years, Malaysia has been successful in promoting quality foreign direct investment (FDI) through its efficient work force and pro-market policies. Malaysia has also been enjoying sound transfer of technologies from its foreign investors into many strategic sectors, particularly manufacturing and oil & gas industries. However, dependency on FDI alone to support economic growth is inadequate and therefore an internal source of business financing within a country must be sought. This is how the stock exchange comes into play to support the future growth of its listed companies. In the light of global financial innovation, Malaysia has taken a pragmatic approach by introducing *sukuk* (Shariah-compliant bond) financing product in one of its capital markets.To enhance the breadth and depth of investment and financing options, Bursa Malaysia now offers a listing platform for *sukuk* and other Islamic debt securities(Haron& Ibrahim, 2012).

Empirically, the focus of this study is to examinethe impact of performance of Kuala Lumpur Composite Index (KLCI) on Malaysia's government revenue, spanning from1990 till 2019. By definition the KLCI is a capitalization-weighted stock market index which is made up of 30 largest companies by market capitalization on the Bursa Malaysia. Hence this stock market index actually represents the performance of top quality companies in Malaysia that pay hefty tax bills to the federal government. A steady growth in government revenue is an indication of good fiscal management which in turn would attract foreign investors to come in. As such, the KLCI is an important leading indicator that can harness not only the market confidence but also Malaysia's long-term competitiveness. It is therefore important to find out the strength of the relationship between these two variables in both short-run and in the long-run.

LITERATURE REVIEW

Economic growth is an important agenda for every country in the world. A significant number of earlier studies have tried to understand the driving force behind growth in gross domestic product (GDP) in both developed and developing countries. The focus on each argument would never run away from how a nation reaps its wealth and its key determinants. Consequently, the relationship between economic growth and financial market development has been researched considerably.

A large number of studies have documented this relationship. Beck et al (2000) demonstrate that financial markets and fiscal policy are linked in many ways. Alesina et al (2002) investigate the effects of fiscal policy on investment using panel data from OECD countries, their study concludes the negative effect of public spending on profits, and investment is higher than the negative effect of various types of taxes imposed by countries. On the contrary, Golob

(1995) investigates the impact of tax reforms on the financial market and his findings show that changes in tax laws can foster a more productive economy and influence financial markets in several ways. However, his study also supports the notion that a higher tax rate affects stock market returns negatively.

Illievski (2015) uses a panel data set of 96 countries over the period 1990-2008 to investigate the relationship between stock market total value traded and tax revenue. He concludes that as the stock market activity increases (relative to GDP), this signals that more financial resources for investments are available and the effect of total stock market value traded on tax revenue is positive and statistically significant. In general, the stock market positively influences the government's ability to raise tax revenue.

Levin (1991) deploys an endogenous growth model in which he claims that the stock market and the tax policy mutually affect the country's economic growth. In his model, impeding financial market activity lowers per capita economic growth rate.

The work of Lavelle (2004) and Sobel (1994) clearly indicate that public and private sectors interact in the stock market for the acquisition of funds. Armijo (1999) along with Obstfeld and Taylor (2004) also point out that liberal capital market policies do provide national governments with access to funding through foreign investments. Imran (2009) outlines the factors that have an impact on stock market performance - expansion in the country's economic activities, strengthening of the exchange rate, and decrease in lending interest rates and improvement in recovery of outstanding loans.

Jensen (2008) encapsulates further that investors respond to liberal economic policies based on the capability of the stock market to finance their projects. The market sentiment would not be conducive in the event of contractionary fiscal and monetary policies or when the stock market capitalization is relatively low. This is further substantiated by Garcia and Liu (1999) who explain that volatility in economic policies has a significant impact on the performance of the stock market. They reason out that unexpected changes in monetary policy, fiscal policy, exchange rate policy, and trade policy would influence the profit situations of corporations and ultimately dampen the government's revenue.

Pardy (1992) supports the assertions that macroeconomic and fiscal policies are the determining factors of success or failure of the equity market. Thus, stable macroeconomic policies enhance business activities which motivate them to access the equity market for a more sustained level of growth and propensity for greater tax revenue for government coffers.

Studies by Tobin (1969) concludes that changes in fiscal policy do have some outcome on the rate of interests which influence investors to revalue their portfolio and subsequently affect stock market development.Furthermore, Tobin (1969) points to the fact that there is a significant correlation between

the stock market return and the economic sectors in a country. He asserts that budget deficits lead to monetary growth and this would have important implications on stock returns. In short, fiscal policy decisions matters in stock market development. A similar study by Blanchard (1981) also asserts that discretionary fiscal policy or nondiscretionary may affect stock market returns due to associated policy lags.

Studies conducted by Rogalski and Vinso (1977);Darrat and Brocato (1994); Bordo and Wheelock (2004); and Laopodis (2006) explain that changes in fiscal policy particularly taxes would definitely affect the capital asset pricing. For example, if government increases its tax rates while public expenditure remains unchanged, investors would refrain from investing further in the stock market resulting in lower stock market returns and compelling investors to restructure their portfolio.

Humpe and Macmillan (2009) point out that government monetary policy affects the stock market by increasing household wealth. For instance, increasing the money supply leads to lower interest rates thus making stock market investment more attractive than investing in bonds. Bahmani-Oskooee and Sohrabian (1992) together with Granger, Huang, and Yang (2000) stress that a rise in stock prices increases the domestic wealth of investors and facilitates a rise in the demand for money. Consequently, with the rise of interest rate, there will be more capital influx into the domestic economy and domestic currency will appreciate. More interestingly, Kasman (2003) has proven that stock market indices move together with the exchange rate in the long run.

Based on the Efficient Market Hypothesis (EMH), Gan et al (2006) confirm that the stock market index does not reflect changes in the macroeconomic variables. In support of EMH, Barro (1974), Samuelson (1965) and Mandelbrot (1963) argue that fiscal policy actions have no effect on stock market activity since the market agents have fully incorporated all publicly available information including fiscal policy information in their decision making. Prominent studies by Fama (1970; 1991) and Davidson and Froyen, (1982) inconclusively confirm that stock prices fully reflect all publicly available information. In addition, Cooper (1974) and Rozeff (1974) reiterate that changes in the money supply should not have any impact on stock market development. However, empirical studies by Robert (2008), Wong bampo and Sharma (2002) and Diacogiannis et al (2001) have shown that changes in stock prices are linked with macroeconomic variables in advanced countries. In addition, Mayasami and Sims (2002) together with Nasseh and Strauss (2000) advocate that macroeconomic variables, namely inflation rate, money supply, and exchange rate do influence stock prices.

DATA & METHODOLOGY

The study uses time-series econometrics in modelling they early secondary data from 1990 through 2019. The KLCI and government revenue datasets are obtained from Bank Negara Malaysia (BNM) Statistical Bulletin. This 30-year period is considered ideal as it covers almost six economic cycles with

two major economic crises.The ordinary least square (OLS) regression and Engle-Granger 2 steps co integration procedure are employed to investigate the relationship between government revenue and the KLCI. The OLS long-run regression acts as the baseline estimation, whilst the co integration test is the best estimation tool in modelling these non-stationary time series data. Using a number of testing methods, we can later prove that the linear combination of these two non-stationary variables might be stationary.

Dependent and independent variables

The federal government revenue is an economic variable that supports Malaysia's economic growth for the fiscal year.The government revenue is made up of total tax collections (direct and indirect taxes) plus other non-tax revenues. In this study, the government revenue is our variable of interest and it is imperative to look at how it has been sustaining Malaysia's economic growth over the past 30 years. As part of the model specification process, the KLCI is assigned as the controlled variable (or independent variable) that directly influences the federal government revenue.

Estimation methods

Based upon the Keynesian income theory (Keynes, 1936) and theory of stock market development (World Bank, 2000), this study employs Ordinary Least Squares (OLS) linear regression function as a baseline analysis followed byEngle-Granger Co integration test (henceforth, EG). The use of EG methodology is warrant because the observed variables in this study might have a stochastic trend in time series. This is an attempt to measure the equilibrium and dynamic relationships between federal government revenue and KLCI. As such, our model specification is base on Keynesian income model whereby we hypothesize that KLCI directly influences federal government revenue in both short run and long run. Empirically, our bi-variate models expressed as follows:

$$\text{Govt Rev}_t = \alpha + \text{KLCI}_t + \varepsilon_t (t=1,2,\ldots N=T) \quad \ldots\ldots\ldots (1)$$

where:

α =Intercept of the regression model
GovtRev_t = Government Revenue at time t
KLCI_t= Kuala Lumpur Composite Index at time t
ε_t= Error term (assumed to be normally distributed)

EMPIRICAL RESULTS

We regress government revenues on the KLCI over30-year observation from 1990 through 2019. This section provides detailed explanations on the empirical findings from both OLS regression analysis and EG test. The diagnostics tests are also reported and elaborated in this section.

Descriptive statistics and pearson correlation analysis

Figure 1 below shows the movements of both KLCI and government revenue over a 30-year period. It is clear that both variables are moving in unison and have been significantly affected by two economic crises – Asian Debt Crisis 1997-1998 and Global Financial Crisis of 2007-2008. The former led to the intervention of International Monetary Funds (IMF) to rejuvenate the regional economy. The economic activities in Asia started picking up after the affected countries subscribed to the IMF's prescriptions. As for the global financial crisis which was initially triggered by the sub-prime crisis in the United States, signs of strong economic recovery were only observed between 2012 and 2016 after a series of central bank interventions into the banking systems. Looking at these two line charts, we can see how volatile and vulnerable the two variables have been for the past 30 years. Any dramatic changes in international financial markets involving fiscal and monetary policies would most definitely affect the risk appetite of international traders and investors.

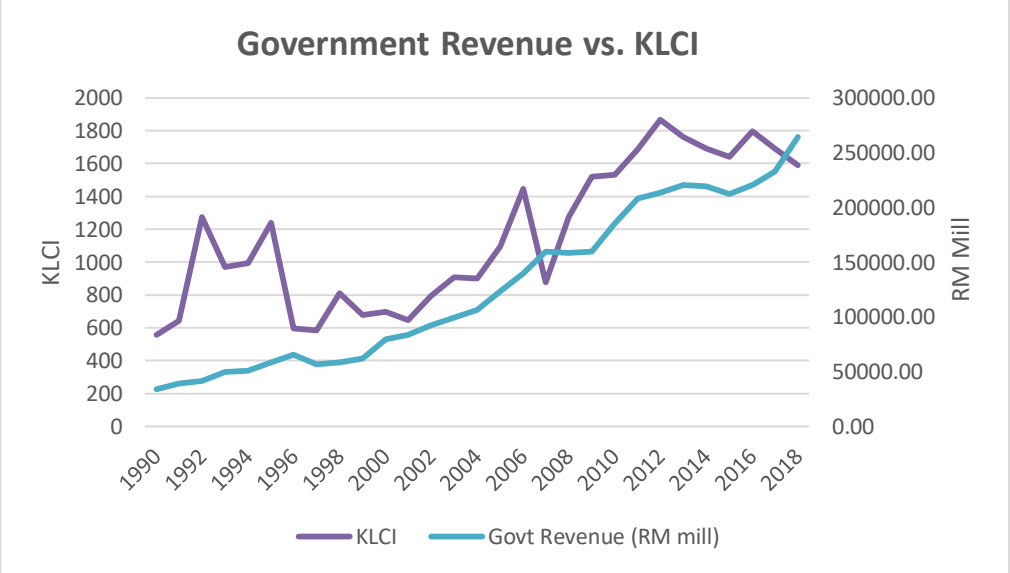

Figure 1. Movements of KLCI and government revenue over a 30-year period

Figure 2 demonstrates a comparative analysis involving annual changes in KLCI versus government revenue over the observed period. Due to the lag effect, a significant drop in government revenue was only noticed in 1998 after the stock market plunge in 1997. The Malaysian began to show a sign of recovery in 1999 but the stock market lost its momentum in year 2000. The same pattern was repeated during global financial crisis 2007-2008.

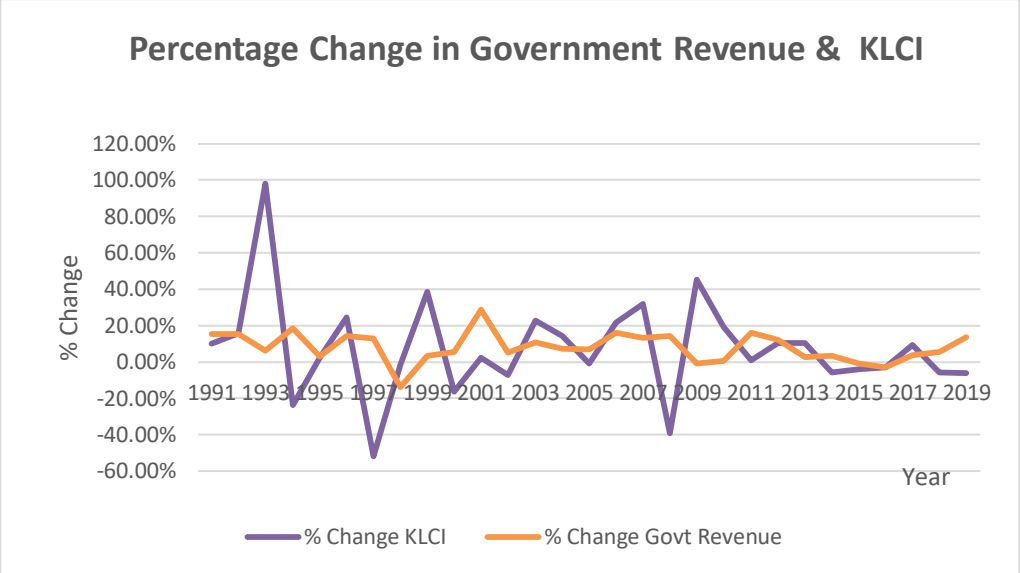

Figure 2. Percentage change in KLCI vs. Government Revenue

As shown in Table 1 below, the mean KLCIis registered at 1142 points and its best performance was recorded in 2012 at 1867 points.Unlike KLCI the federal government revenue seems less volatile and continues to grow steadily with its mean settles at RM124.18 billion.During the 30-year period, the government revenue reached its peak in 2019 with the final total collection of RM264.4 billion. On the annual percentage change basis, the mean of percentage change in government revenue is slightly higher than its counter part. Interestingly, both variables demonstrate positive upward momentum over time. In terms of variability, the higher standard deviation in KLCI justifies its unpredictability as compared to the government revenue. The higher max-min spread in the KLCI also supports its variability.

Table 1. Descriptive Statistics of KLCI and Federal Govenment Revenue

Variable	Mean	Std. Deviation	Max	Min
KLCI (Index)	1142	449.09	1867	505.92
Govt Revenue (RM billion)	124.188	73.724	264.415	29.521
Change KLCI (%)	7.33	27.19	98.04	-51.98
Change Govt Rev (%)	8.16	8.24	28.62	-13.73

From Table 2 below, it is apparent that there is a significant positive correlation between federal government revenue and the stock market index as proxied by KLCI. Given the high value of correlation coefficient of 0.8659,

the degree of positive association between these two variables is definitely strong.

Table 2. Pearson Correlation Coefficients (N=30)
Ho: Rho = <0.0001 (p-value)

Variable	Govt Rev
Govt Rev	1.00
KLCI	0.8659 (<0.0001)

OLS Regression analysis

Our baseline analysis is base on this long run regression and the empirical results in Table 3 show a significant positive relationship between government revenue and KLCI at 1 percent level. This preliminary finding is in line with our expectation. Also the coefficient of determination or the model's R-squared is well above the 70% level implyingan excellent goodness-of-fit for this estimated model.

Table 3. Parameter Estimates of Long-run Regression
Dependent Variable: Govt Rev

Variable	DF	Parameter Estimate	Standard Error	t value	Pr > t
Intercept	1	-38195	19004	-2.01	0.0542
KLCI	1	142.151	15.517	9.16*	<0.0001
R-Squared	0.749	Adj R-Square	0.741		

*significant at 1% level

Engle-Granger co integration test

The results from the long run regression provide us with the baseline assessment on the postulated model. It is now evident that KLCI is the legitimate leading variable coupled with a significant relationship with the variable of interest. The analysis is further augmented via the deployment of EG test that could potentially captures the short-term and long-term relationships in the model. The procedures in the EG test are strictly followed and all the basic requirements for this test must be fulfilled before we present the final findings. First, all data series must go through the unit root test via Augmented Dickey-Fuller procedure and the test results show they are integrated at first difference or I(1). The similar test is also applied to the long-run residuals and the results show they have no unit root. Next, a cointegrating regression is executed and this error-correction model (ECM) is found efficient at lag 1. The empirical estimates of the model as presented in Table 4.

Table 4. Parameter Estimates of ECM(1)
Dependent Variable: Govt Revenue (GR)

Variable	DF	Parameter Estimate	Standard Error	t value	Pr > t
Intercept	1	5174.31	2309.21	2.24	0.0346
ldGR	1	0.3422	0.2113	1.62	0.1184
lr	1	0.0314	0.0591	0.53	0.6003
ldKLCI	1	15.33	7.8608	1.95	0.0629*
R-Squared	0.210	Adj R-Square	0.111		

*significant at 10%

Recall that our hypothesis predicts a significant relationship between government revenue and KLCI. However, the regression results only support a significant positive short-run dynamic relation between government revenue and KLCI. In other words, the short-run changes in KLCI do exert significant positive effects on government revenue. Since the p-value of the error-correction term (as denoted by lr) is higher than the α of 5%, we fail to reject the null hypothesis of absence of long-term relationship between the two variables.

Table 5. Test of First and Second Moment Specification (White test)

DF	Chi-Square	Prob>ChiSq
9	5.22	0.8145

With respect to the diagnostic tests, the high p-values in Table 5 (White test) and Table 6 (Autocorrelation test) strongly support our null hypothesis of homo scedasticity and absence of serial correlations between the residuals respectively. In summary, based upon the long-run regression and EG test, there seems to be a stable short-run relationship between federal government revenue and the KLCI.

Table 6. Autocorrelation Test

Durbin-Watson D	1.835
Pr< DW	0.2783
Pr>DW	0.7217
No. Observations	28
1st Order Autocorrelation	-0.056

CONCLUSION

As anticipated, the performance of listed firms at Bursa Malaysia does exert significant influence on federal government's revenue over the 30-year period. There are two important findings that we would like to highlight from this study. Our first finding reveals a strong positive correlation and significant relationship between KLCI and federal government's revenue as shown by the long run regression. This empirical evidence implies that an upward movement of KLCI will support an increase in federal government's revenue through corporate tax bills, which at the later process translated into a positive growth in national income. Our findings are consistent with the work of Taha (2013). Secondly, the empirical results from the co-integrating regression support the presence of significant short term relationship running from KLCI to federal government's revenue but there is an absence of long-term relationship between them. It is now evident that the listed firms at Bursa Malaysia are playing important roles not only in propelling Malaysia's economic growth but also in channeling tax revenue for government coffers. Malaysian government needs a good dynamic tax system which can both encourage the business growth and benefit the tax payers in the long run.

As a whole, it is imperative to ensure that the financial healths of these listed firms at Bursa Malaysia are well taken care of so that they would continue to support the economic growth of Malaysia. For an industrialized developing country like Malaysia, a sustainable economic growth which is driven by strong domestic aggregate demand would reflect our economic resilience plus investor confidence. It is government's primary duty to promote quality investment into our productive economic sectors, particularly in manufacturing and services industries. As such, government must hold a very clear objective of optimizing economic resources and promoting operational efficiencies at all levels.

In view of the challenges put up by Covid-19 pandemic around the world, an unprecedented approach in understanding the global economy is deemed desirable. Enlarging the sample size across countries and employing a more robust technique in model estimation are strongly suggested. Expanding the country-specifics and combining this variable of interest with other relevant macroeconomic variables will not only improve this model but also help contribute towards better understanding and development of new knowledge in fiscal management. It is hope that future studies will look into these suggestions so that a new perspective or a new policy approach can be established for policy makers and business community.

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