

Original Paper

Relationship between Macroeconomic Variables and Stock Market: Case Study from Malaysia

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Abstract

This study investigate the relationship between macroeconomic variables and FTSE Bursa Malaysia KLCI, the samples are divided into 2 groups such as foreign macroeconomic variables and local macroeconomic variables, foreign macroeconomic variables consist of Gold Bullion LBM price and Dow Jones Index, meanwhile local macroeconomic variables consist of Consumer Price Index, Base Lending Rate, Exchange Rate. This study employs data from Jan 2000 to Dec 2013 which contains a monthly data set of 168 observations. There are 3 methodologies used in this study to investigate the relationship, the first test is Unit Root test which used to test the stationary of each variable, the results indicate that all the variables are stationary in first difference, this is important to use stationary variables because if the variables are not stationary, it might lead to spurious regression. The second methodology is Johansen & Juselius Co-integration test to investigate the long run relationship among these variables, the results show that the foreign macroeconomic variables and local macroeconomic variables have long run relationship with KLCI and significant. Next, this study will investigate the short run relationship between macroeconomic variables and KLCI, the results indicate that Gold, BLR and CPI can granger cause KLCI and significant at 1%, 5% significance level respectively.

Keywords

foreign macroeconomic variables, local macroeconomic variables, unit Root test, Johansen & Juselius Co-integration test, granger

1. Introduction

The stock market is one of the sources that play an important role in contributing to the economic growth of a country. Government, industry, central bank and investor of the country are vital to keep a close watch on the happenings of the stock market. According to Zukarnain and Sofian (2012), the stock market should be theoretically closely linked with the macroeconomic variables of the country because stock prices are the discounted present value of expected future cash flows. Therefore, there were a few numbers of studies that have been conducted to determine the existence of the relationship between macroeconomic variable and stock market.

The Malaysia stock market was formerly known as Kuala Lumpur Stock Exchange (KLSE) and was renamed to Bursa Malaysia Berhad at year 2004. This is the only stock exchange in Malaysia and there are total 909 companies (as at 3-Mar-2014) which were listed on it inclusive of 800 companies listed in main market and 109 companies listed in ACE market. All the 909 companies are located at different sectors in Bursa as there are total of 14 sectors in Bursa Malaysia such as Closed-End Funds, Construction, Consumer Products, Finances, Hotels, Industrial Products, IPC, Mining, Plantations, Properties, REITs, SPAC, Technology, Trading and Services. Kuala Lumpur Composite Index (KLCI) is a part of Bursa Malaysia in representing the top 30 companies and is recognized as Malaysia stock market index since 1986 and now it is known as FTSE Bursa Malaysia KLCI.

There are many important macroeconomic variables to represent the economic growth of a country such as GDP, CPI, interest rate, money supply and others. They are similar with the stock market where both also are important to the country growth. Therefore it is worthy for us to determine whether the macroeconomic variable can explain the stock market or vice versa.

The knowledge of the factors which can influence the behavior of stock market and macroeconomic variables has attracted the attention not only from investors but also to the policy makers for a long time but it is still hardly to determine whether which macroeconomic variables can influence the stock market directly. For investors such as retail investors or institutional investors, by knowing the relationship between the macroeconomic variables and stock market can help them appropriately forecast stock price movement, whereas for government sector such as policy makers, it is important for them to identify the relationship between stock market and macroeconomic variables because they can use the stock market as a leading indicator to predict future macroeconomic variables if the stock market leads macroeconomic variables.

This study not only include with the local macroeconomic variables but also with foreign macroeconomic variables in order to study the effect of it towards Malaysia stock market. The local macroeconomic variables adopted in this study are as CPI, ER and BLR, whereas for foreign macroeconomic variables adopted in this study are Dow Jones Industrial Average (DJIA) and Gold.

2. Problem Statement

Recently, there are many studies to investigate the relationship between stock market and the country macroeconomic variables. The main reason is because the stock market has been recognized to have a prominent role in a country economic performance. It is very crucial for investors in the equity market, bank in the financial institution as well as policy makers to discover the relationship between macroeconomic variables and the movement of the stock market because it can help investors and financial institutors to forecast the stock price movement by discovering the relationship and well diversified their investment portfolio in order to increase the return for them. Besides that, it is important for policy makers to discover the relationship between them as well because the policy makers need to estimate the impact of the government policies and predict the future movement of the stock market meanwhile the policy makers can use it for risk management practices. Thus, if the stock market volatility leads the macroeconomic variables volatility, they can use the stock market as a leading indicator to predict the future movement of the country macroeconomic variables.

Even though, there are quite a number of empirical studies on the relationship between macroeconomic variables and stock market but most of these studies focused on the developed countries such as Europe countries over the last several years and less studies on the developing countries such as Indonesia, Thailand, Malaysia, China, India, Cambodia, Vietnam, Philippine and others. Specifically, how do these developing countries stock market react to the changes in the macroeconomic variables still remain as an interesting area for researchers to study. This study will concentrate on Malaysia stock market reaction to the changes of the macroeconomic variables.

Most of the previous studies used Money Supply M2 or M3 (Zukarnain & Sofian, 2012; Syed, Zamri, & Lai, 2011; etc.), Exchange Rate USD/MYR (Mirza & Hashem, 2013; Mohamed, Wisam, Aris, & Md Fouad, 2009; etc) and Industrial Production Index GDP (Caroline, Rosle, Vivin & Victoria, 2011; Zukarnain & Sofian, 2012; etc.) as their macroeconomic variables but this study extend the previous literature to address the question whether local and foreign macroeconomic variables affect the stock market by using a set of different combination of local and foreign macroeconomic variable such as Exchange Rate (MYR/SGD), Gold Bullion LBM and Dow Jones Industrial Average (DJIA) which is seldom used in other studies. The main purpose of using MYR/SGD, Gold Bullion LBM and Dow Jones index as independence variables because they lead an important part in affecting the economics of a country. The currency of Malaysia Ringgit toward Singapore dollar has fallen to a new low rate in this year, this will influence the economic growth of our country because when our currency has depreciated, our purchasing power towards foreign goods will be reduced and this means that we need to use more money to purchase foreign goods compare to the past. In the world of gold price, it has reached to a new high price in this year, this might cause the people to invest in gold for hedging purposes instead of investing money in the stock market. Besides that, our stock market is being influenced by the US stock market and when the US market drop, usually by the next day Malaysia stock market will drop as well,

this is mainly because previously our country currency is pegged to US dollar, so the US country economic can influence our country to a certain extent.

3. Methodology

Data are collected from January 2000 to December 2013 using monthly data; the period of this study is 14 years. There are total 1008 observations used in this study, out of total 1008 observations, there are 168 observations for each variable. Monthly data is adopted in study instead of quarterly data is to increase the accuracy of the finding as well as to avoid the problem of thin trading and price limits of a stock market. 3 tests are conducted such as unit root test, Johansen & Juselius co-integration test and granger causality test, each of them is testing in different perspective.

3.1 Unit Root Test

Unit root test is to tests whether a time series variable is non stationary using an autoregressive model and aimed at establishing the order of integration of each variable. If the variables are not stationary, then it can be proved that the standard assumptions for asymptotic analysis will not be valid. And it might lead to spurious regression. According to Seyed, Zamri and Lai (2011), if a model consists of non-stationary variables, the usual test statistic either T test or F test would not have the standard distribution. The second type of unit root test is Phillips-Perron (PP) test, which is used to test the null hypothesis that a time series is integrated of order 1. PP test use non parametric statistical methods and avoid the use of adding lagged difference terms as in ADF test (Mohamed et al., 2009; Mohd Yahya et al., 2012; Praphan & Subhash, 2002).

3.2 Johansen Co-integration Test

The Johansen & Juselius test is to determine whether the linear combination of the series have a long run equilibrium relationship or not, if there is co-integration relationship among these variables, a linear combination of the integrated series is stationary.

3.3 Granger Causality Tests

This study will investigate the causal relations between Malaysia stock market index and macroeconomic variables which mentioned early by using Granger Causality test which proposed by Granger (1969) and these variables might be used predict each other if the causal relationship existed. There are 2 steps in the Granger Causality testing. Firstly, stationary data is needed rather than non-stationary data, afterward, granger methodology which is sensitive to the lag length is used to test the stationary property of the data (Chong & Tai, 1999). If stock market can granger cause macroeconomic variable, so it will be very useful to policy maker in order to forecast the macroeconomic and investor in seek for higher return (Zukarnain & Sofian, 2012).

4. Findings

4.1 Normality Test

Normality test is important for most statistical test, if it is deviate from normality, it will show inaccurate results for the rest of the testing. Result has shown as below:

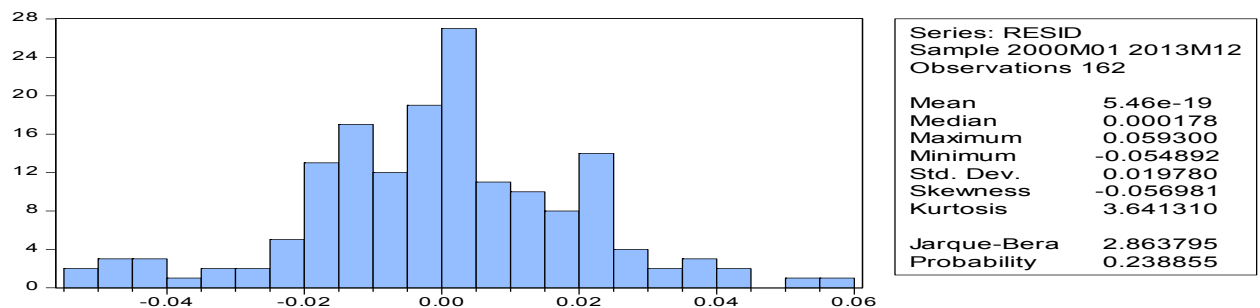


Figure 1. Jarque-Bera Normality Test

The P-value for Jarque-Bera is 0.238855, it is > 0.01 , so do not reject H_0 . Thus this shows that the error term is normally distributed and can continue to perform other tests on these data because it has been proven that the residual is in normality distributed.

4.2 Unit Root Test

This study has employed Augmented Dickey-Fuller and Phillips-Perron to test for stationary for each variable. The results are shows in Table 1.

Table 1. Unit Root Test Results for Foreign Macroeconomic Variables

Variables	Level		First Difference	
	ADF	PP	ADF	PP
LogDJI	0.8207 (-0.783809)	0.7172 (-1.095553)	0.0000*** (-12.09507)	0.0000*** (-12.13273)
LogGold	0.7858 (-0.901757)	0.7881 (-0.894528)	0.0000*** (-14.58257)	0.0000*** (-14.58257)

Value based on MacKinnon (1996) one-sided p-values.

The value in parenthesis refers to t-statistic.

***, ** and * indicate significant at 1%, 5% and 10% respectively.

Based on the above tables, all the variables are not significant, therefore we cannot reject H_0 and they are not stationary and contain unit root in both ADF test and PP test. However, when proceed to first difference, all the variables are significant at 1% and therefore reject H_0 and this can conclude that all the variables are stationary and do not contain root.

4.3 Johansen & Juselius Co-Integration Test

The samples are divided into 2 groups to test the co-integration relationship between local macroeconomic variables and Malaysia stock market as well as between foreign macroeconomic variables and Malaysia stock market. The results are show in Table 2.

Table 2. Maximum Eigen. Value Test

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigen. value	Statistic	Critical Value	Prob.*
None **	0.131152	22.91565	21.13162	0.0278
At most 1	0.050768	8.492551	14.26460	0.3308
At most 2	0.008108	1.327031	3.841466	0.2493

Max eigen. value test indicates 1 co-integrating equation at the 0.05 level.

** denotes rejection of the hypothesis at the 0.05 level.

* MacKinnon-Haug-Michelis (1999) p-values.

The results also show maximum eigen. value are significance at 5% in $r=0$, meaning that the co-integration relationship does exists among the Malaysia stock market and local macroeconomic variables, there is at least 1 macroeconomic that can influence Malaysia stock market in long run.

4.4 Granger Causality Test

It is used to check the causality relationship and determine the direction of this causality effect. Results are show in below:

Causality test result among KLCI and foreign macroeconomic variables:

Table 3. Causality Test among KLCI and Foreign Macroeconomic Variables

Null Hypothesis:	Obs	F-Statistic	Prob.
KLCI does not Granger Cause GOLD	166	1.70920	0.1843
GOLD does not Granger Cause KLCI		6.19372	0.0026**
DJI does not Granger Cause GOLD	166	0.77930	0.4605
GOLD does not Granger Cause DJI		4.10085	0.0183**
DJI does not Granger Cause KLCI	166	3.04318	0.0504
KLCI does not Granger Cause DJI		2.77351	0.0654

** Significant at 1% significant level.

* Significant at 5% significant level.

Causality test among KLCI and local macroeconomic variables:

Table 4. Causality Test among KLCI and Local Macroeconomic Variables

Null Hypothesis:	Obs	F-Statistic	Prob.
CPI does not Granger Cause BLR	166	1.00523	0.3682
BLR does not Granger Cause CPI		1.24261	0.2914
ER does not Granger Cause BLR	166	0.00639	0.9936
BLR does not Granger Cause ER		1.74383	0.1781
KLCI does not Granger Cause BLR	166	1.83364	0.1632
BLR does not Granger Cause KLCI		3.86950	0.0228*
ER does not Granger Cause CPI	166	0.88259	0.4157
CPI does not Granger Cause ER		7.66582	0.0007**
KLCI does not Granger Cause CPI	166	4.24062	0.0160*
CPI does not Granger Cause KLCI		4.09796	0.0184*
KLCI does not Granger Cause ER	166	6.00038	0.0031**
ER does not Granger Cause KLCI		1.16739	0.3138

** Significant at 1% significant level.

* Significant at 5% significant level.

5. Conclusion

As a conclusion, the results from this study found that these variables are stationary at the first difference in ADF test and PP test, this shows that all the variables employed in this study are stationary. Meanwhile, from the results of Johansen & Juselius Co-integration test, all the macroeconomic variables were significantly has long run relationship with KLCI. Moreover, in the Granger causality test, only Gold, BLR and CPI were found can significantly granger cause KLCI at 1% and 5% significance level. DJI and ER found no short run relationship with KLCI. Meanwhile, KLCI was found can significantly granger cause ER and CPI at 1% and 5% respectively. Future researchers are encouraged to add other methodology such as variance decomposition or OLS to have a more clearly information of these variable's behavior. Different approach of granger cause such as Wald test and VAR can be use in their study; this can increase the validity and consistency of the results.

References

- Chong, S. K., & Tai, S. S. (1999). Cointegration and causality between macroeconomic variables and stock market returns. *Global Finance Journal*, 10(1), 71-81.
[https://doi.org/10.1016/S1044-0283\(99\)00006-X](https://doi.org/10.1016/S1044-0283(99)00006-X)
- Granger causality. (n.d.). Retrieved March 27, 2014, from
https://en.wikipedia.org/wiki/Granger_causality
- Mohamed, A., Wisam, R., Aris, H., & Mohamed, F. (2009). Effects of macroeconomic variables on stock prices in Malaysia: An approach of error correction model. *Munich Personal RePEc Archive*.
- Mohd, Y. M. H., Fidlizan, M., Mohd, F. A., & Salwah, A. A. (2012). Macroeconomic variables and Malaysia Islamic stock market: A time series analysis. *Journal of Business Studies Quarterly*, 3(4), 1-13.
- Prapahan, W., & Subhash, C. S. (2002). Stock Market and macroeconomic fundamental dynamic interactions: ASEAN-5 countries. *Journal of Asian Economics*, 13, 27-51.
[https://doi.org/10.1016/S1049-0078\(01\)00111-7](https://doi.org/10.1016/S1049-0078(01)00111-7)
- Seyed, M. H., Zamri, A., & Yew, W. L. (2011). The role of macroeconomic variables on stock market index in China and India. *International Journal of Economics and Finance*, 3(6).
- Zukarnain, Z., & Sofian, S. (2012). Empirical evidence on the relationship between stock market volatility and macroeconomic volatility in Malaysia. *Journal of Business Studies Quarterly*, 4(2), 61-71.