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Does Monetary Policy and Asean Stock Market Affect Jakarta Composite Index (IHSG)?

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Abstract

This study aims to analyze the effect of monetary policy and Kuala Lumpur Stock Exchange (KLSE) on the Jakarta Composite Index (IHSG) in Indonesia. The monthly secondary data from June 2005 to June 2016 is used in this analysis by using Vector Autoregressive (VAR) Model. The result shows that both exchange rate and KLSE have positive sign and significant, while BI-RATE has negative sign and significant. Based on the results, the authors suggested that the government in this case Indonesian Central Bank has to be careful in deciding the benchmark interest rate (BI-Rate) to maintain the stability of exchange rate, so that IHSG was able to show a positive trend.

Keywords: IHSG, Exchange rate, and BIRATE, KLSE,VAR indifference

Introduction

In the global economy where the economic integration becomes a choice in generating national economic activities, the national economic development cannot be separated from the economic development in the rest of the nation. In the era, the movement of goods and services and also capital can ease and freely move from a country to others by ignoring the limitation of distances. Time and space are not constraint in economic development escalation. The investment in capital markets is one of the economic activities that are able to do activities in a country or outside the country, where someone does not physically need to do the activities in purpose capital market. But he rather uses and takes advantages of the technology information in his business and economic activities.

The global financial crisis in 2008, which was triggered by the bankruptcy of Lehman Brothers in USA had led many financial institutions collapsed in many countries (Lindström & Giordano, 2016). The IMF report said that based on the experience in the past two decades, global financial occurs on average 2.5 years (IMF, 2012). Furthermore, it was said that the impact of the global financial crisis through two types of shock, namely trade shock and financial shock. The impact of the crisis changed

investor's behavior from risky to safer investment, such as in Malaysian case (Mustafa, Samsudin, Shahadan, & Yi, 2015). So far, the financial crisis which began from the developed countries has caused the lower economic growth in many developing countries and also boosted unemployment and poverty (Fîrţescu, 2012), even though some emerging market economies could easily recovered from the crisis, particularly, in Asia and Latin America (Dao, 2017).

In addition, as a result of the global financial crisis, several MENA countries (Middle East and North Africa) experienced a significant economic downturn. The stock market MENA plummeted, the price of real estate assets fell, private debt increased and the economy grow at negative level. On the other hand, in the south and east Asia, the economy is in transition economies and the countries of Latin America and the Caribbean cannot be separated from the influence of the global crisis that resulted also the MENA countries as well as various countries in Asia, primarily due to large economic integration (Neaime, 2012; Chen, et al; 2014).

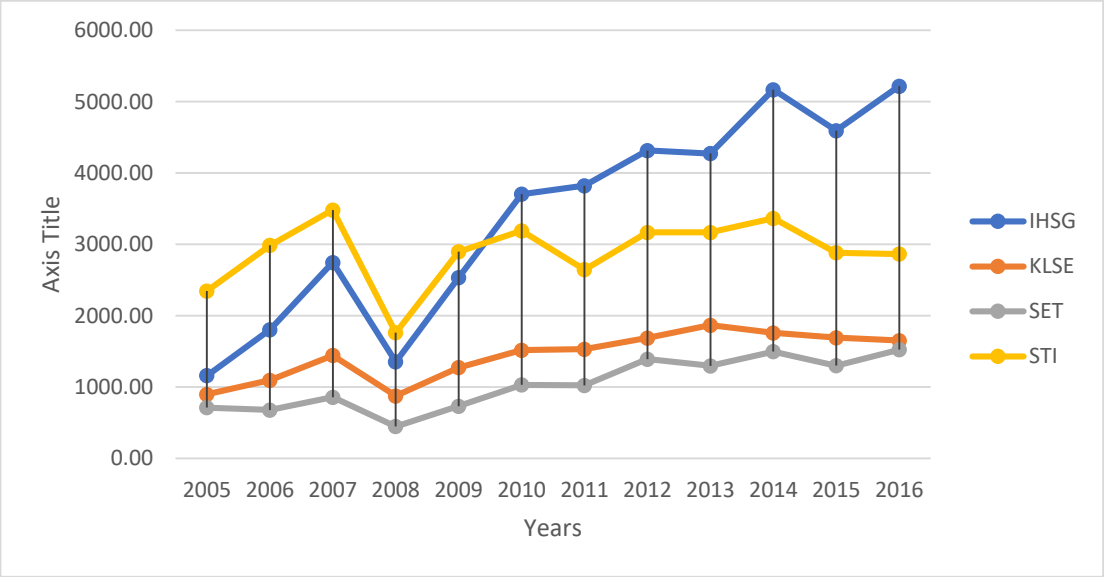


Figure 1
The Movement of Stock Price Index ASEAN Regional

The movement of stock prices regional ASEAN countries cannot be separated from the blow of the financial crisis in the United States and it is interesting to watch, whether the stock movement in the ASEAN region also affects the Jakarta Composite Index in Indonesia. Figure 1.1 shows that the overall movement of stocks ASEAN countries has a tendency to show a positive trend from 2005 to 2015, although at the start of 2007 it has decreased. Moreover, the lowest point occurred in 2008 that caused the global financial crisis triggered by the crisis financial initially in the United States alone. This figure correspond to the research conducted by Madjid and Kasim (2009), that the tests conducted by the US financial crisis in 2007 have an impact on the performance of the stock market. The result show that the performance of the stock market on average loses its strength each day in comparison with the period before the crisis. Lin (2012) also found that there is a relationship (comovement) between stock prices and exchange rate during the period of crisis.

Literature Review

Kontonikas et al (2013), discovered that there is an increase in stock returns during the crisis, when interest rate drop, but the shift in influence occurs when a crisis where the stock does not respond positively to a rate cut in times of crisis, this indicates the inability of monetary policy in maintaining the share price and economic stability. Based on research conducted by Immanuel and Satria (2014), it was found that macroeconomic variables (inflation, exchange rate and interest rate of Indonesian Central Bank) and Index of regional stocks ASEAN significantly influence over both the short and long term, but in the partial test, short-term inflation and interest rate of Indonesian Central Bank has no significant effect on the IHSG, while the exchange rate in the long term and short term significantly impact on IHSG. For ASEAN regional stocks, STI in the long term and short term has no significant effect on the IHSG, while the KLSE (Kuala Lumpur Stock Exchange), SET and PSE (Philippine Stock exchnage) in the long term and short term significantly affect IHSG.

Manurung et al (2014) analyze the effect of the macro variables and several stock indices abroad against IHSG by using VECM (Vector Error Correction) model, found that in the long run all of the variables have a long-term relationship, besides the movement of stock indices abroad in the form Dow Jones , Han Sheng and Nikkei significantly affect IHSG fluctuation. Additionally, Kowanda et al (2014) by using a model of Ordinary Least Square found that variable DJIA (Dow Jones) and STI (Street Times Index) positive and significantly impact on Stock Price Index (CSPI).

Mollick and Assefa, (2013) using GARCH analyze the effect of 2008 global financial crisis on the economy of the United States. The results show that the global crisis in 2008 led to the condition of the US economy under pressure as inflation, oil prices, the weakening exchange rate of USD against the Euro, including the price of leading shares. The same study conducted by Velinov and Chen (2015), by using the model SVAR (Structural Vector Autoregressive) analyzing the impact of the global financial crisis on the stock which discover that global financial crisis also had an impact on the BRIC countries (Brazil, Russia, India and China), consequently the US financial stress in the long run lead to the return of stocks and bonds in these countries far away from the path that it should have been, and give a significantly negative impact.

Another study conducted by Ruiz (2015) using the model SVAR (Structural Vector Autoregressive), explain that shocks of monetary policy conducted by the ECB (European Central Bank) in the form of nominal interest rates have a major impact on stock returns in Spain in the long term. On contrary, Belke and Beckman (2015), by using VAR, concluded that monetary policy issued by the Central Bank is not effective enough to affect the increasing in stock price. Whereas, Zare and Azali (2015) using Asymmetrically Cointegration Method found that in the long term there is a relationship between monetary policy, in this case the policy in raising and lowering interest rates, and stock prices.

Meanwhile, Jin and An (2016) investigated the influence of the global financial crisis on stock prices by using Volatility Impulse Response Function (VIRF), during the crisis period from 2007 to 2009, there is a significant effect of the market in the United States to the stock markets in countries BRICS (Brazil,

Russia, India, China and South Africa), although the extent of the market reaction to the different markets of other countries. In addition the level of integration of the US stock market and the BRICS cause side effects that might impact more heavily on the volatility of the stock today compared to the era of crisis. The other studies were also conducted by Lu and Sun (2016) examining the relationship between stock prices between BRICS countries with stock prices in the United States during the financial crisis by using the model of VAR and VECM, they found that there were significant effects between the exchange rate and stock returns in short-term. Besides the US stock shocks also significantly affect stock markets in Brazil, China and South Africa.

Reboredo et al (2016) investigates the relationship between stock prices and exchange rates, and the result confirms a positive relationship between exchange rates and stock prices in economy of the developing countries. Meanwhile Ferrer et al, (2016) using the method of wavelet coherence conclude that there is a long-term relationship between interest rates and stock, while others show a weak relationship, the relationship is strengthened significantly after the global financial crisis in the United States.

According to Huang et al (2016) exchange rates and interest rates negatively affect stock prices in the United States. Mensi et al (2016) using VAR Forecasting also find that there is a strong long-term relationship between stock prices in the United States and the stock price in the country of the BRICS (Brazil, Russia, India, China and South Africa), these results are similar to the results of research performed by Velinov and Chen (2015). Yarovaya and Lau (2016) conduct a study to analyze the relationship between UK stock market (UK) with the stock market in the BRICS countries (Brazil, Russia, India, China and South Africa) and MIST (Mexico, Indonesia South Korea and Turkey). The results proved that by using test cointegration the stock market in the BRICS countries and MIST is integrated in the long term.

Data and Methodology

This study use monthly data from June 2005 to December 2016 of four variables such as Indonesia Composite Index (IHSG), exchange rate, interest rate (BIRATE) and Kuala Lumpur Stock Exchange (KLSE) obtained from Central Bank of Indonesia, Bloomberg and yahoo finances.

The model used in the study is Vector Autoregressive (VAR). Vector Error Correction Model (VECM) is a model of analysis that can be used to determine the short-term behavior of a variable to the long-term ue to a permanent shock (Kostov and Lingard in ajija, 2011). In additions VECM models can also be used to find solutions to the problem of variable time series which is not stationary or spurious correlations in econometric analysis (Ajija: 2011). Analysis of long-term use Vector Error Correction Model (VECM), while the short-term analysis (dynamic) use Vector Autoregressive (VAR). Model VAR / VECM with n endogenous variables is shown by the following equation (Widarjono, 2007):

$$\Delta Yt = \beta_0 + \beta 1X1_{t-1} + \beta 2\Delta X2_{t-1} + \ldots\ldots\ldots + \beta nXn_{t-p} + \varepsilon 1t$$

$$IHSGt = \beta_0 + \beta 1ER_{t-1} + \beta 2BIRATE_{t-1} + \beta 3IHSG_{t-1} + \beta 4KLSE_{t-1} + \varepsilon t$$

$$ER_t = \beta_0 + \beta_1 ER_{t-1} + \beta_2 BIRATE_{t-1} + \beta_3 IHSG_{t-1} + \beta_4 \Delta LKLSE_{t-1} + \varepsilon t$$

$$BIRATE_t = \beta_0 + \beta_1 ER_{t-1} + \beta_2 BIRATE_{t-1} + \beta_3 IHSG_{t-1} + \beta_4 \Delta LKLSE_{t-1\ 1} + \varepsilon t$$
$$KLSE_t = \beta_0 + \beta_1 ER_{t-1} + \beta_2 BIRATE_{t-1} + \beta_3 IHSG_{t-1} + \beta_4 KLSE_{t-1\ 1} + \varepsilon t$$

Where IHSG represent Jakarta Composite Index, β0 represent the constant, ER represent exchanger rate, KLSE represent Kuala Lumpur Stock Exchange and ε is the error term. After that, the model Johansen co-integration test, impulse response function and variance decomposition have been tested to examine the short run and long run relationship between these variables.

Result and Empirical Analysis

Unit Root Test

Table 4.1
Unit Root Testing Using Philips-Perron Approach

Variable	*Level*		*First Difference*	
	PP	***Test Critical Value (10%)***	**PP**	***Test Critical Value (10%)***
IHSG	-1.745428	-3.176618	-5.082607	-3.177579
Kurs	-2.032859	-3.176618	-5.560550	-3.177579
BIRATE	-2.905840	-3.176618	-3.491198	-3.177579
KLSE	-1.646375	-3.176618	-5.824602	-3.177579

Source: Test roots units, processed using Eviews 7 (2016)

Table 4.1 displays that all variables are not stationary at level. it can be seen that each variable IHSG, *kurs* (exchange rate), BIRATE and KLSE is smaller than the critical value at the current level H_0, which means the variables are not stationary at level.

Therefore, as the variables are not stationary at level, then all of variables in the study are transformed to first difference. From the test results at first difference, all of variables are stationary, as it is demonstrated in the first difference PP analysis that all variables are greater than the critical value, so that data can be used in this study and as a result, one of the conditions for using the model of Vector Error Correction Model VECM) has been met which is data is stationary at first difference level

Lag Length Criteria

After that, lag length tested is need to be done in this research. The length of this lag will be used in the cointegration test, causality test and Vector Autoregressive (VAR) estimation model to see which lag is most suitable for the model. The result can be seen from how much a star (*) on each criterion, the numbers lag at the most widely asterisk (*) indicates the lag that is most suitable for this study.

Table 4.2
Lag Length Criteria Testing

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3092.629	NA	2.61e+16	49.15284	49.24288	49.18942
1	-2316.580	1490.507	1.51e+11	37.08857	37.53878*	37.27148*
2	-2296.215	37.82155	1.41e+11*	37.01928*	37.82965	37.34851
3	-2287.292	16.00444	1.58e+11	37.13162	38.30215	37.60717
4	-2274.228	22.60289	1.66e+11	37.17822	38.70891	37.80009
5	-2265.865	13.93867	1.88e+11	37.29944	39.19029	38.06763
6	-2250.167	25.16666	1.91e+11	37.30423	39.55525	38.21875
7	-2231.300	29.04831*	1.84e+11	37.25873	39.86991	38.31957
8	-2217.337	20.61179	1.94e+11	37.29107	40.26241	38.49823

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source : Result of research (2016)

Based on the above test results, lag 2 was selected as the optimum lag, therefore lag 2 need to be inserted in all following tests, so that all information can be inserted into the same research model.

Cointegration Test

In this study, cointegration test used was Johansen Cointegration Test. Cointegration relationship can be seen from the value of Trace Statistic and Statistic Max Eigen compared with the value of critical value in the 1-10 percent level of confidence. From Table 4.3, it can be seen that the Trace Statistic values is smaller than the critical value (29.23207 < 47.85613), and the value of the Max-Eigen is smaller than the value Statistic Critical Value on the level of trust 1-5 percent (15.25855 < 27.58434). It concluded that in the long term Stock Price Index (CSPI), Exchange Rate, BI Rate, and KLSE, does not have a balance relationship in the long term.

Table 4.3
Co-integrating Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.109950	29.23207	47.85613	0.7572
At most 1	0.062067	13.97352	29.79707	0.8421
At most 2	0.041353	5.579393	15.49471	0.7446
At most 3	0.000358	0.046964	3.841466	0.8284

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

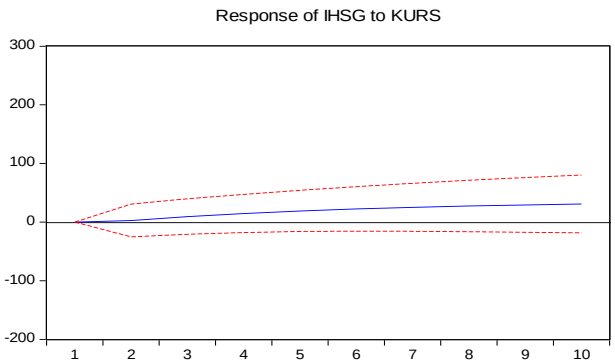
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.109950	15.25855	27.58434	0.7275
At most 1	0.062067	8.394122	21.13162	0.8780
At most 2	0.041353	5.532429	14.26460	0.6736
At most 3	0.000358	0.046964	3.841466	0.8284

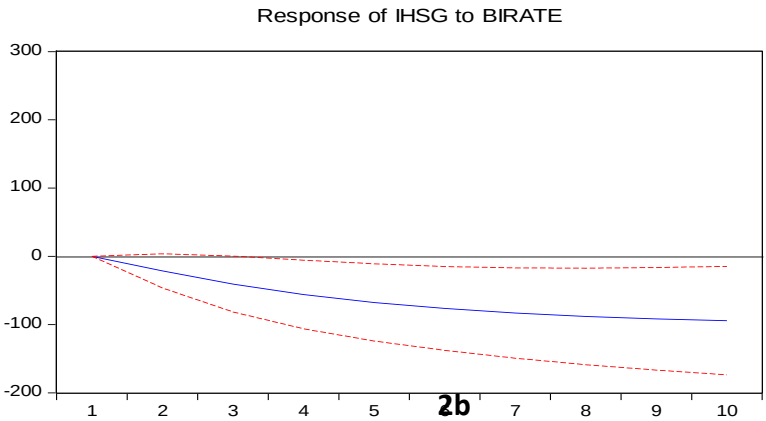
Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Because the Johansen co-integration test shows that this model does not have a long term relationship, as a result we can use model VAR in difference.

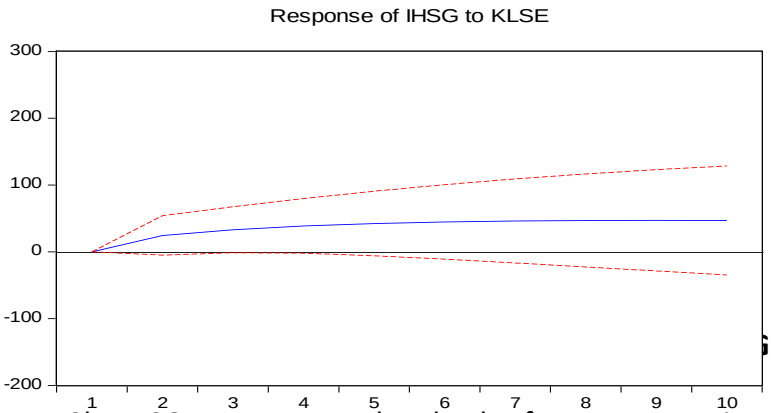
Impulse Response Function

The impulse response of IHSG are shown in Figure 2,where it contains the response of IHSG from shock all of variable. Based on the test IRF (Impulse Response Function) in Figure 2a, IHSG's response to the shock of the exchange rate tends to be positive in the second period and continues to increase and tends to be stable for up to a period of 10. This indicates that monetary policy in maintaining the stability of the rupiah against the US dollar in short-term is effective in maintaining the stability of the IHSG.





2b



From figure 2b, IHSG response to the shock of BIRATE negative and significant from first period to 10th period. It indicates if BIRATE increases then IHSG decreases significantly. On the other hand, IHSG responses to the shock of KLSE is positive, it indicates if KLSE incline, IHSG will incline, which means that KLSE and IHSG has co-movement in short run (figure 2c).

Variance Decomposition

Table 4.4
Variance Decomposition

Variance Decomposition of IHSG:					
Period	S.E.	IHSG	KURS	BIRATE	KLSE
1	164.0047	100.0000	0.000000	0.000000	0.000000
2	243.7621	98.21305	0.010612	0.771517	1.004816
3	301.5459	95.71507	0.104186	2.327443	1.853304
4	347.6490	92.76517	0.255308	4.346552	2.632968
5	386.9750	89.66672	0.444946	6.564536	3.323798
6	421.8469	86.60914	0.655276	8.811205	3.924378
7	453.4968	83.70469	0.874393	10.98515	4.435770
8	482.6369	81.01007	1.094498	13.03176	4.863680
9	509.7149	78.54703	1.310821	14.92585	5.216301
10	535.0341	76.31652	1.520633	16.66002	5.502832

Table 4.4 reports the variance decomposition result for the shocks of exchange rate, BIRATE and KLSE. We estimate the percentage of the forecast error in each variable from 1 month to 10 month. Table 4.4 reports how exchange rate shock, BIRATE shock and KLSE shock relate to Jakarta composite index (IHSG). The result show that at 10 month after shocks, the IHSG are explained by BIRATE fluctuation about 16.66 percent, KLSE fluctuation about 5,50 percent and the exchange rate fluctuation only 1,52 percent. It indicates that from all variables, BIRATE has significant influences to IHSG.

Conclusion

The significant relationship between exchange rate and Kuala Lumpur Stock Exchange (KLSE) can drive Jakarta Composite Index (IHSG) in Indonesia. While, the significant and negatively relationship with BIRATE indicates that monetary policy has been success to reduce Jakarta composite Index (IHSG) in Indonesia. Therefore, this paper explains the monetary policy accomplishment in Indonesia.

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