

## **THE EFFECTS OF RUPIAH CURRENCY, WORLD OIL PRICES, AND WORLD GOLD PRICE ON COMPOSITED STOCK PRICE INDEX (IHSG) IN 2016**

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### **ABSTRACT**

*This study aims to determine and analyze the effects of Indonesian Rupiah exchange rate, world oil prices, and world gold prices on IDX Composite in 2016. This research utilized Generalized Auto-Regressive Conditional Heteroscedasticity (GARCH) method on 234 daily observations throughout the whole year. This study results demonstrated that the Indonesian Rupiah exchange rate has a significant and negative impact, while the world gold and oil prices have a significant and positive impact on the IDX Composite in 2016. In addition to these results, the discovery and usage of GARCH method as the optimum econometric model found the variance of residuals of IDX Composite in 2016, which is also affected by the previous day residuals, but it is not affected by the variance of previous days residuals.*

**Keywords** : *exchange rate, world oil prices, world gold prices, IDX composite index, GARCH*

### **1. INTRODUCTION**

Indonesia's current capital market is in improving post-crisis condition; it can be seen from Indonesia's economic growth that flourishes at the level of 4.5% -5.5% and is expected to increase for the following years. With the increasing Indonesia Stock Exchange (IDX) and Capital Market index, which could be seen from the Jakarta Composite Index (JCI) closure in 2007 at level of 52.1%; 51.17% in 2008, and 68.06% in 2009, Indonesia was considered as one of the world's major investment options in 2010 so that foreign investment funds would come to Indonesia (Christanti and Mahastanti, 2011: 1). Over the last decade, JCI has an increasing trend from the range of IDR 2000 to IDR 5000; It indicates that investment activities in Indonesia stock market are very profitable.

The main goal of stock or other assets investments is to gain positive return that is generated from income (dividend in the stock investment) and capital gain. In general, higher risk is associated with higher return. When selecting an investment in the capital market, investors should consider factors that affect the stock market. According to Hotvedt and Tedder (1978:1), the total risks can be broken down into two components, namely: Unsystematic risk that represents part of asset price movement caused by the unique factors for the company or industry, and Systematic Risk, frequently called market risk, that represents part of asset price movements due to changes in the market as a whole. The market

Risk is classified into interest rate risk, equity risks, exchange rate risks, and commodity price risks (Dowd, 2002: 1).

Exchange rate is a factor affecting stock market and money market activities. The depreciation of the rupiah exchange rate against foreign currencies particularly the US dollar has a negative impact on the economy and capital markets (Sitinjak and Kurniasari, 2003: 35). Mohamad Samsul (2006:202) has stated that change on one macroeconomic variable has different impacts on stock price. It may bring positive impact to one stock, and negative impact to the other. For example, an incisive depreciation of rupiah exchange against the US dollar brings negative impacts to an import-oriented company. However, it brings positive impacts to an export-oriented company. It means that the adversely-affected stock price in the IDX decreases, but the stock price of a company that receives advantageous impacts increases. Furthermore, the JCI may receive either negative or positive impacts depending on the group with dominant impacts.

Gold investment is believed to be one of profitable commodities because its price tends to keep increasing. Gold is also a very liquid investment because it is acceptable in any regions or countries. When potential investment return in stock or bonds investments is no longer attractive and considered incapable of compensating the existing risks, the investors will divert their funds into real assets, such as precious metals or property that are considered more viable and secure (Rusbariand, Masodah, Riskayanto, and Herawati, 2012: 3). Sunariyah (2010: 4) has stated that gold is one of significant commodities that can affect stock market movement. This statement is made given that gold is an alternative investment that is relatively safe and risk-free. Gold is much used to control economy deficit in a country.

The fluctuating world crude oil price is a factor that influences a country capital market. Changes in oil prices influence the global economy and any countries' macro and microeconomics. The negative or positive relationship of the fluctuating the world crude oil price and the country's economy is defined by the economic situation in the oil exporting, processing, and importing countries (Ha Le et al., 2015; Kilian and Park, 2009, referenced in Al Hayky and Naim, 2015: 2).

For the oil exporting countries, the increasing world crude oil price becomes a distinct advantage for companies. When the oil price increases, investors invest their funds in various oil and mining commodities. In contrast, when the oil price decreases, the investors seek profits by selling their shares (Rusbariand et al., 2012: 3)

## **2. LITERATURE REVIEW**

Hotvedt and Tedder (1978) have divided the total risk into two components, i.e. Systematic risk, usually called market risk, that represents part of asset price movements caused by changes in the market as a whole, and Unsystematic risk that represents part of the asset price movement caused by unique factors in a company or industry.

Further, the market risk is classified into interest rate risk, equity risk, exchange rate risk, commodity price risk, and others (Dowd, 2002: 1). Dowd (2002: 2) has described that a volatile environment makes companies in such environment face a greater financial risks, and the volatility of the economic environment is reflected in several factors, such as Stock Market Volatility, Exchange Rate Volatility, Interest Rate Volatility, and Commodity Market volatility. Rusbariandi, et al. (2012) conducted a study on the Analysis of the Influence of Inflation Rate, World Oil Price, World Gold Price and Rupiah Rate on Jakarta Islamic Index (JII) in the IDX in January 2005 - March 2012. Independent variables of this research were inflation, worldoilprice, worldgold price and Rupiah rate, and the dependent variable was JII. The analysis method used was multiple linear regression analysis. The study concludes that the world oil price has both significant positive and negative impacts on JII. The world gold price has negative and insignificant influence on JII. Yet, the Rupiah exchange rate has negative and significant impact on JII.

Silim (2013) through his research journal entitled "The Influence of Macroeconomic Variables onThe Composite Stock Price Index at Indonesia Stock Exchange Period 2002-2011" has studiedthe influence of macroeconomic variables, such as interest rate, rupiah exchange rate on US dollar, net exports, world gold prices, as well as the impact of world oil prices on JCI using time series regression method. The study finds that the exchange rate has significant and negative impact on JCI, the world gold price has positive and significant impact on JCI, and the world oil prices also has significant and positive influence on JCI.

Lutz Kilian and Cheolbeom Park (2007) in their study entitled "The Impact of Oil Price Shocks on the U.S. Stock Market " have examined the influence of world oil prices on the level of aggregate profit of the US capital market. The research variables were world oil price level and aggregate stock return. The samples in this study were theworld oil price data derived from the period of January 1973 to September 2005.The aggregatestockreturn was calculated based on the dividends paid during the period January 1975 to September 2005.The research used vector auto-regression method. This study concludes that changes in the world oil price has two impacts on the United States capital markets. The increasing world oil price has negative impacts on the capital market when such increase is caused by the raising world oil demand due to uncertain oil availability. However, the increasing world

oil price has positive impacts on the capital market when such increase is caused by improved global economy.

Murhadi and Ernawati (2013), through their research have analyzed the influence of macroeconomic, Dow Jones Index, and Nikkei 225 Index on the JCI. The macro-economic variables in this study were the world gold prices, the world oil prices, and the rupiah exchange rate. The research used multiple regression model, where the sample studied were world oil price, world gold price, rupiah exchange rate, Nikkei 225 Index, and Dow Jones Index from 2007 to 2011. This study finds that the world gold price has significant and positive impacts on JCI, and the Rupiah exchange rate has negative and significant impacts on the JCI.

Smith (2001) has conducted a study on The Price of Gold and Stock Price Indices in the United States. The independent variable of this research was the world gold price, and the dependent variable was the stock price index in the United States. This study indicates that the world gold price has negative and insignificant impacts on the United States stock price index.

Kewal (2012) has studied the influence of inflation, interest rate, exchange rate, and Gross Domestic Product (GDP) growth on the JCI and has concluded that the exchange rate has a significant, negative influence on the JCI. This study examined 120 monthly data derived from 2000 to 2009. This research was conducted based on the theory that an increase of Rupiah value to dollar would reduce production cost, particularly the raw materials import cost.

For research purpose, hypothesis are presented as follow:

1. Rupiah exchange rate against Dollar significantly affected the JCI in 2006
2. The world gold price significantly affected the JCI in 2006
3. The world oil prices significantly affected the JCI in 2006

### **3. RESEARCH METHOD**

The research used descriptive analysis, stationary test, normality test, heteroscedasticity test, autocorrelation test, Generalized AutoRegressive Conditional Heteroscedasticity (GARCH) model analysis, best model selection test (Akaike Information Criterion (AIC) test and Schwarz Information Criterion (SIC), ARCH effect test, hypothesis test (Z-statistic test), and Bollerslev-Wooldridge process using Eviews 8 program.

Autoregressive Conditional Heteroscedasticity (ARCH) is a concept of autoregression function assuming that variance changes with time and the value of this

variance is influenced by some previous data. The idea behind this model is similar to that in autoregressive model (AR) and moving average (MA), i.e. seeing the relationship between random variable and the previous random variable. In other words, the ARCH model-based volatility (q) assumes that the variance of fluctuation data is influenced by a number of q data fluctuations of the previous data.

The Generalized AutoRegressive Conditional Heteroscedasticity (GARCH) model describes the heteroscedasticity process while estimating the coefficients of variables seen in simultaneous significance, where it is assumed that the variation of fluctuation data is influenced by a number of previous data fluctuations and a number of previous volatility data. Thus, the difference is that the ARCH model makes use of the quadratic error data of the previous period, whereas GARCH utilizes the previous period variant data to forecast the next period data. In the GARCH model the residual variant is not only influenced by the residuals of the past period, but also influenced by the residual variant of the past period.

Heteroscedasticity Consistent Covariance (Bollerslev - Wooldridge) is performed when the residual results of the optimal GARCH regression model are not normal. When the residuals are abnormal, the covariance matrix estimates will not be consistent if this process is not used, resulting in incorrect standard errors. Other parameter estimates are not affected by this process only the standard error is fixed.

#### 4. RESULT AND ANALYSIS

**Table 1. The Impact of Rupiah Currency, Oil and Gold Price to The JCI Using GARCH Method**

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	4077.358	848.3707	4.806105	0.0000
KURS__1_USD	-0.144106	0.050059	-2.878722	0.0040
LONDON_FIXING_GOLD_PRICE	1.456645	0.138955	10.48287	0.0000
WEST_TEXAS_INTERMEDIATE_	27.12440	1.051466	25.79675	0.0000
Variance Equation				
C	1940.456	306.8751	6.323275	0.0000
RESID(-1)^2	0.899077	0.253066	3.552738	0.0004
lanjutan				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
R-squared	0.382556	Mean dependent var		5030.343
Adjusted R-squared	0.374502	S.D. dependent var		297.8085
S.E. of regression	235.5321	Akaike info criterion		12.39777

Sum squared resid	12759331	Schwarz criterion	12.48636
Log likelihood	-1444.539	Hannan-Quinn criter.	12.43349
Durbin-Watson stat	0.055177		

The value of significance (p-value) of the exchange rate is smaller than  $\alpha = 5\%$ , so that  $H_0$  is rejected. It means that the exchange rate significantly influences JCI. The value of significance (p-value) of the worldgold price is smaller than  $\alpha = 5\%$ , so that  $H_0$  is rejected. It means that the world gold price significantly influences JCI. The value of significance (p-value) of the worldoilprice is smaller than  $\alpha = 5\%$ , so that  $H_0$  is rejected. It means that the worldoilprice has a significant effect on JCI.

The model above can be written in regression equation:

$$JCI = 4077.358 - 0.144106 \text{ Exchange Rate} + 1.456645 \text{ World Gold Price} + 27.12440 \text{ World Oil Price.}$$

Analysis of the model above is presented below:

- a. The influence of exchange rate is -0.144106. It means that if the rupiah exchange rate against the dollar rises by IDR 1, the JCI will decrease by -0.144106 points. This result indicates that when the rupiah exchange rate depreciates, the JCI will be weaker. This finding is in line with the studies conducted by Murhadi and Ernawati (2013), Rusbariand et al (2012), Kewal (2012) and Silim (2013). For investors, the weakening rupiah exchange rate indicates that the fundamental Indonesian economy is in a difficult situation. This negative sentiment occurs because most companies listed on the JCI are dependent on imports and foreign debt, so that when the rupiah exchange rate weakens, the companies expenses will increase and reduce profits. This situation will prompt the investors to sell their shares to avoid risks. For sure, this stock selling will weaken the JCI. During the observatiob period, the researcher found that rupiah exchange rate was maintained by Bank Indonesia at the level of IDR13,921,00 to IDR12,907,00 per US dollar.
- b. The world gold price has effect as much as 1.456645. It means that if the world gold price risesby \$1, JCI will rise by 1.456645 points. This finding supports the studies byMurhadi and Ernawati (2013), and Silim (2013). This situation occurs because the world economy always grew ever year during the observation period.
- c. The increasing economic growth will leverage the people's average income. The Indonesian per capita income in 2016 increased by 6.25%([www.bps.go.id](http://www.bps.go.id)). It shows that the Indonesian people's welfare in general increase.

- d. With such improving welfare, the people are able to diversify their investments to reduce risks. One of the advantages of gold investment is that its value tends to increase, and the owners can sell it when needed without suffering big loss.
- e. In addition, a country's foreign exchange reserves is not only the form of US Dollar but also in gold. The developed countries save a lot of golds in their foreign exchange reserves. This has been followed by developing countries since 2007 ([finance.detik.com](http://finance.detik.com)).
- f. This is fueled by concerns that if the value of US dollar declines, the gold reserves will provide hedges to the country's foreign exchange reserves. Increase in the world gold price is followed with the increasing foreign exchange reserves. This situation triggers economic growth that is reflected through the increase in JCI.

The world oil price has impact of 27.12440. It means that if the world oil price increases by \$1, the JCI will rise by 27.12440 points. This result is in line with the studies by Silim (2013), Kilian and Park (2007) and Rusbariandi et al (2012). This situation occurs because the oil price during the observation period increased due to the increasing oil demand instead of the oil decreasing supply ([www.opec.org](http://www.opec.org)). Petroleum is fuel for industrial production. The increasing oil demand indicates increasing production. IMF found that the world economy grew by 3% on average ([www.imf.org](http://www.imf.org)) and the Indonesian GDP grew by 5% in 2016. This result shows that increase to the world oil price will boost JCI.

## **5. CONCLUSION**

The use of GARCH (1.0) model as the best model shows that the residual variance of JCI is affected by the previous day residual but it is not affected by residual variance of the previous days. The absence of Asymmetric Shock symptom is not found. These results show the influence of independent variable to symmetric dependent when the independent variable rises or falls. In addition, from the hypothesis test can be deduced as follows:

1. The Rupiah exchange rate had a negative and significant impact on JCI in 2016
2. The world gold price had a positive and significant impact on JCI in 2016
3. The world oil prices had a positive and significant impact on JCI in 2016

Referring to the coefficient determination represented by adjusted R-squared value, this study concludes that the JCI movement is 37.45% affected by Rupiah exchange rate, the world gold price, and the world oil price, and the remaining is influenced by other factors.

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