

## THE WORLD OIL PRICE MOVEMENTS AND STOCK RETURNS IN SEVERAL SOUTHEAST ASIA'S CAPITAL MARKETS

Hersugondo<sup>1,2</sup>, Robiyanto<sup>1</sup>, Sugeng Wahyudi<sup>3</sup> and Harjum Muharam<sup>4</sup>

**Abstract:** This study was conducted on the basis that there is an inconsistency in the study results on the effects of world oil price change on stock market return. This study, therefore, examined the effects of world oil price changes on the stock market returns in Southeast Asia including Indonesia Stock Exchange, Kuala Lumpur Stock Exchange, Singapore Stock Exchange, Philippines Stock Exchange and Stock Exchange of Thailand. Data used in this study was the composite stock price index on the capital markets and WTI crude oil prices during the period of January 2003 to December 2013. The data was analyzed by using the Generalized Autoregressive Conditional Heteroscedasticity or GARCH (1,1). The results of this study indicated that world oil price changes only give significant effects on the Malaysian capital market as represented by the Kuala Lumpur Composite Index (KLCI) and the Thai capital market as represented by the SET index.

**JEL Classification:** G10, G15.

**Keywords:** West Texas Intermediate (WTI), GARCH, Capital Markets in the ASEAN Region.

### 1. INTRODUCTION

Investment can be made either directly or indirectly, with the hope in time the capital owners (investors) receive some benefit from the capital investment (Levišauskait, 2010). Investment at the present time is not only dominated by investment in financial market, but also commodity market. Today, commodity market is highly developed market and the price movement in this market is also able to affect the stock price movement in the capital market. The existence of investments made by investors on various asset classes also creates a link between commodity market with capital market (Morales, 2009).

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<sup>1</sup> Ph.D. stud. Diponegoro Univ., Fac of Economics and Business Depart. of Financial Management, Indonesia, E-mails: hersugondo@unisbank.ac.id, gondoarum65@gmail.com; robiyanto76@gmail.com

<sup>2</sup> Lecturer in Faculty of Economics and Business Stikubank University, Semarang, Indonesia.

<sup>3</sup> Profesor in Department of Financial Management. Faculty of Economics and Business Diponegoro, University, Semarang, Indonesia.

<sup>4</sup> Ph.D. and Assistant Profesor in Department of Financial Management. Faculty of Economics and Business Diponegoro University, Semarang, Indonesia, E-mail: hardjum@gmail.com

One of the main commodities that affect the stock price movement in capital market in general and portfolio management in particular is oil. Fischel (1989) suggested that the risks due to changes in oil price are essential for portfolio management. It is based on the thought that oil is one of the main energy source used by industries. Even oil is also a strategic commodity for the global economy (Hussin *et al.*, 2013b; Hussin *et al.*, 2013a; Le and Chang, 2011) and the price of energy in the form of oil can affect the world economy (Papież and Śmiech, 2012). However, the results of researches on the effects of oil on capital market in general and stock in particular are still quite diverse; for example, a research done by Le and Chang (2011) found that changes in oil price do not affect stock market in Japan. This finding was confirmed by a research by Papież and Śmiech (2012) which concluded that there is a significant influence of changes in world oil price on the S & P 500 index. In addition, Basit (2013) also found no correlation between oil and stock market in Pakistan.

Meanwhile, researches by Abdelaziz *et al.* (2008); Patel (2012); Jubinski and Lipton (2013); Hussin *et al.* (2013a); Hussin *et al.* (2013b) found the opposite results. Abdelaziz *et al.* (2008) found the correlation between oil and stock markets in Egypt, Oman, Saudi Arabia and Kuwait. Patel's research (2012) which used India capital market as its object of study, is also consistent with such a finding. In a research conducted using the S & P 500 index, Jubinski and Lipton (2013) also found that changes in world oil prices have a significant effect on the stock market return as represented by the S & P 500 index. Researches by Hussin *et al.* (2013a); and Hussin *et al.* (2013b) which also reinforced such findings, suggested that changes in oil price have short-term and long-term impacts on the FTSE Bursa Malaysia Emas Shariah Index (FBMES).

In regard to the inconsistency in the research results on the effects of world oil price changes on capital markets stocks, a study of the effects of oil price changes on stock market return is also necessary to conduct. This study was conducted to assess the effects of world oil price changes on the stock market returns in Southeast Asia such including Indonesia Stock Exchange, Kuala Lumpur Stock Exchange, Singapore Stock Exchange, Philippines Stock Exchange, and Stock Exchange of Thailand.

## **2. RELEVANT LITERATURE**

Malkiel (2011) argued that there are two world oil prices which are used internationally, namely West Texas Intermediate and Brent North Sea/Europe Brent. West Texas Intermediate is the benchmark oil price in the United States, while Brent North Sea is the benchmark oil price in Europe. In practice, West Texas Intermediate often becomes the main reference in international oil prices.

Due to the oil price shock in the 1970s, many researches are intended to assess the effects of oil price changes on real economic variables. Most studies have found

that oil price shock affect the economic activities of developed and developing countries (Fischel, 1989). Such studies are done again after the drastic oil price increase in the years before the global financial crisis in 2008 which was caused by the high demand for oil from Asia and geopolitical risks in the Middle East (Masih *et al.*, 2010).

The oil price increase has relatively varied effects on the economy in general and capital markets in particular. On the oil-exporting economies, the increase in oil prices has a positive impact, but on the oil-importing and consuming economies, the impact of oil price increase is negative. Meanwhile, the empirical studies carried out to assess the effects of changes in world oil prices in the capital markets have been conducted by many researchers. A research by Le and Chang (2011) concluded that changes in oil prices do not affect stock market in Japan. A research by Papież and Śmiech (2012) also found a similar result. In their research, Papież and Śmiech (2012) suggested that there is no impact of changes in world oil prices on the S&P 500 index. Basit (2013), who examined the effects of changes in world oil prices on the stock market in Pakistan, also found a similar result.

On the contrary, a lot of studies have found that there is a significant correlation between changes in world oil prices and stock markets. Researches done by Abdelaziz *et al.*, 2008; Patel, 2012; Jubinski and Lipton, 2013; Hussin *et al.*, 2013a; Hussin *et al.*, 2013b found confirmed such a correlation. Abdelaziz *et al.* (2008) found that there is a relationship between oil and stock markets in Egypt, Oman, Saudi Arabia and Kuwait. Patel (2012), who used India capital market as his object of study, also found results that are consistent with such findings. In a study conducted using the S&P 500 index, Jubinski and Lipton (2013) also found that changes in world oil prices have a significant effect on the stock market return as represented by the S&P 500 index. The results of research by Hussin *et al.* (2013a); and Hussin *et al.* (2013b) reinforced this finding by concluding that changes in oil prices have short-term and long-term impacts on the FTSE Bursa Malaysia Emas Shariah Index (FBMES).

### **3. DATA**

The data used in this study was the monthly WTI crude oil closing prices and stock index closing prices on the stock markets during the period of January 2003 to December 2013. The data of monthly WTI crude oil closing prices was obtained from the US Energy Information Administration, while the data of composite stock price index needed in this study was collected from the monthly closing data of the Indonesia Stock Exchange (JCI), the Kuala Lumpur Stock Exchange (KLCI), the Singapore Stock Exchange STI (Strait Times Index), the Philippines Stock Exchange PSEI and The Stock Exchange of Thailand (SET) from January 2003 to December 2013. The data was obtained entirely from the Capital Market Statistics published by the Financial Services Authority (FSA).

#### 4. OPERATIONAL DEFINITION OF VARIABLES

There are two variables used in this study, namely WTI crude oil return and stock market return. The WTI crude oil return was measured using ratio measurement scale with the following formula:

$$R_{WTI,t} = \left[ \frac{WTI_t - WTI_{t-1}}{WTI_{t-1}} \right] \quad (1)$$

where:

$WTI_t$  = the closing price of WTI oil spot in month  $t$

$WTI_{t-1}$  = the closing price of WTI oil spot in month  $t - 1$

The same thing also applies to the variable of return stock market which was measured using a ratio measurement scale with the following formula:

$$R_{m,t} = \left[ \frac{Composite_t - Composite_{t-1}}{Composite_{t-1}} \right] \quad (2)$$

where:

$Composite_t$  = the Closing Stock Price Index at the Stock Exchange studied in month  $t$

$Composite_{t-1}$  = the Closing Stock Price Index at the Stock Exchange studied in month  $t-1$

#### 5. ANALYSIS TECHNIQUE

The data analysis was done by using the Generalized Autoregressive Conditional Heteroscedasticity/GARCH (1,1). The GARCH model, which is the development of ARCH model, was developed by Bollerslev in 1986. This model was built in order to avoid the excessively high order in ARCH model, based on the principle of parsimony or choosing a simpler model to guarantee positive variances.

The equation used is as follows:

$$R_{m,t} = \alpha + \beta_1 R_{WTI,t} + \varepsilon_t \quad (3)$$

with

$$\varepsilon_t \varepsilon_t = \Phi_{t-1} + \dots + \Phi_t \varepsilon_{t-p} + \eta_t \quad (4)$$

$$\eta_t = \sigma_t \varepsilon_t \quad (5)$$

$$\sigma_{2t} = \alpha_0 + \alpha_1 \eta_{2t-1} + \dots + \alpha_p \eta_{2t-p} + \beta_1 \sigma_{2t-1} + \dots + \beta_q \sigma_{2t-q} \quad (6)$$

and  $\epsilon_t$  is independent and identical distributed  $N(0,1)$  and does not depend on the past state of  $\eta_{t-p}$ .

$R_{m,t}$  = the Return of capital markets studied in the period  $t$

$R_{WTI,t}$  = the Return of WTI crude oil in the period  $t$

Prior to the GARCH analysis, the stationarity test was first done by using the Augmented Dickey-Fuller Test/ADF (Greene, 2003; Enders, 2009).

## 6. RESULTS AND DISCUSSION

### 6.1. Stationarity Test Results

Data stationarity test is conducted by using Augmented Dickey-Fuller (ADF) Test Statistics. For GARCH analysis, the stationarity of data is important. If the ADF Test Statistics show that the data used do not follow the stationarity principle, hence it needs a treatment which is called as first differencing, followed by second differencing if the data still do not follow the stationarity principle. The stationary test results can be seen in Table 1.

**Table 1**  
**Stationarity Test Result of Data**

<i>Specification</i>	<i>Level</i>
WTI	-8,869594*
IHSG	-9,229721*
STI	-8,949736*
SET	-9,514737*
PSEI	-11,17431*
KLCI	-12,26893*

*Source:* Indonesia Financial Service Authority (Indonesia FSA) and the US Energy Information Administration, processed data.

*Note:* \*Significant at the level of significance of 1%

Based on Table 1, it can be seen that all the data used in this study have a significant ADF level with the significance level of 1%. So, it can be concluded that all the data used in this study are stationary data and there was not found any indication for unit root. Therefore, it is not necessary to conduct further treatment specific for this data, meaning this data can be directly analyzed by using GARCH. (Posedel, 2005) claimed that for the data which can be analyzed directly without any further treatment, GARCH (1,1) is a proper analysis tool to use. Therefore, this study used the GARCH (1,1).

## 6.2. Results Analysis of the GARCH (1,1)

The results analysis of the GARCH (1,1) show that some capital market follow the GARCH process which is shows through the significant of variance equation. Hence the models proposed in this study were appropriated, also supported by the ADF Test Statistics.

This section discussed the results of GARCH (1,1) analysis which can be seen in Table 2.

**Table 2**  
**Results Analysis of the GARCH (1,1)**

	<i>Constant</i>	<i>WTI</i>	<i>Resid(-1)^2</i>	<i>GARCH(-1)</i>
JCI	0,023012***	-0,088432	0,455880***	-0,044506
KLCI	0,014679***	0,085800**	0,296887**	-0,170552
PSEI	0,015074***	0,053423	-0,057350	0,467846
SET	0,010098	0,123800*	0,253303**	0,587452***
STI	0,008013*	0,072037	0,251098***	0,644687***

Source: Indonesia Financial Service Authority (FSA) and the US Energy Information Administration, processed data.

Specification:

\* Significant at 10% significance level

\*\* Significant at the 5% significance level

\*\*\* Significant at 1% significance level

Based on Table 2, changes in world oil prices (WTI) have no significant effect on the IHSG return. The coefficient of WTI effect is negative, indicating that the greater the rate of WTI oil price change, the lower the JCI return. This is quite reasonable because Indonesia is an oil importer so that its balance of trade depends on world oil price. The increase in world oil prices would increase the fuel subsidy borne by Indonesia which, in turn, will affect the stability of its macro-economic and industrial sectors in general.

The changes in world oil prices (WTI) have no significant effect on the PSEI and STI returns. In contrast to the negative coefficient of WTI effect on JCI return, the coefficient of WTI effect on PSEI and STI returns is positive, indicating the potential for a positive correlation between WTI and PSEI and STI returns. Meanwhile, changes in world oil prices (WTI) have a significant positive effect on KLCI and SET returns. This shows that the higher the level of the world oil price change, the more the increase in KLCI and SET returns.

## 7. CONCLUSIONS

Changes in world oil prices only have a significant impact on the returns of Malaysia capital market (KLCI) and Thailand capital market (SET) with a positive effect.

There is no significant effect of changes in world oil prices on the stock market return in the Indonesia Stock Exchange, but the coefficient regression indicates a potential negative effect. Furthermore, there is no significant effect of changes in world oil prices on the stock market return in Singapore and the Philippines despite the positive regression coefficient.

Recommendations, since there is a time difference due to the geographical location of WTI trading center at the New York Mercantile Exchange (NYMEX), the changes in NYMEX trading closing sessions can be a reference point for stock investors in Southeast Asia. Investors in Indonesia Stock Exchange need to pay attention to the changes in world oil prices in their stock investment because the changes in world oil prices have potential negative effects on the stock returns in Indonesia Stock Exchange. If the WTI closing price on the NYMEX shows an increase, it is better for the investors in Indonesian Stock Exchange to avoid stock transaction as it potentially results in a stock price decline. In contrast, investors in Malaysia and Thailand capital markets can make transactions since the WTI closing price tend to increase stock returns in Malaysia and Thailand capital markets.

Future Research Agenda, researchers who are interested in studying the same field can develop a more robust analysis method so that the results found in this study receive support from similar studies which use different analytical methods. They can also assess the effects of other commodities on capital markets in the ASEAN region.

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