WORLD OIL PRICE VOLATILITY AND STOCK RETURNS FLUCTUATIONS: EVIDENCE FROM SOUTHEAST ASIAN EQUITY MARKETS

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ABSTRACT: *The existence of inconsistent research results on the effect of changes in world oil prices on the capital market return shows the need for a study on the effect of oil price changes on the stock market return. Therefore, this study examines the effect of the change on world oil prices on the stock market return located in Southeast Asia such as the Indonesia Stock Exchange, Kuala Lumpur Stock Exchange, Singapore Stock Exchange, Philippines Stock Exchange and the Stock Exchange of Thailand. The data used in this study is a composite price index data on the capital market being observed, and West Texas Intermediate/ WTI crude oil prices in the period of January 2003 to December 2013. Data are analyzed using Generalized Autoregressive Conditional Heteroscedasticity / GARCH (1, 1). The results of this study show that changes of the world oil prices only have a significant impact on the Malaysian capital market, represented by the Kuala Lumpur Composite Index/ KLCI, and the Thai capital market, represented by the SET Index.*

Keywords: West Texas Intermediate, GARCH, Capital Markets in ASEAN Region.

1. INTRODUCTION

Investment activities are capital investment activities either directly or indirectly, in the hope in due course the owners of capital (or investors) will get some benefit from the results of their investment. Investment at the present time is not only dominated by investments in financial markets alone, but has penetrated to the commodity markets. Today's commodity markets are evolving and price movements in these commodity markets are also capable of affecting the movement of stock prices in the stock markets. The existence of the investments made by the investors in different varieties of asset classes also creates a link between commodity markets and capital markets [1]. One of the main commodities that affect the movement of stock prices in the stock market in general and in the portfolio management in particular is oil. In [2], the author suggests that the risk due to changes in oil prices is essential for portfolio management. It is based on the idea that oil is one of the main energy source used by the industry. Even oil is also a strategic commodity for the global economy [3-5] and the price of energy in the form of oil can affect the world economy [6]. However, the results of research on the effects of oil on the capital markets in general, and the stock markets in particular are still quite varied, for example research conducted by [5] finding that changes in world oil prices do not affect the stock market in Japan. This finding is supporting research conducted by [6] which concludes that there is no effect of changes in world oil prices to the S&P500 index. The same result is found by [7] who finds that there is no relationship between the oil and the stock market in Pakistan.

Meanwhile, the research conducted [8-10] finds the opposite results. [8] finds that there is a relationship between the oil and the stock market in Egypt, Oman, Saudi Arabia and Kuwait. Others [10], also finds that his research results are consistent with this finding by using the Indian capital market as an object of the study. In the research carried out by using the S&P500 index [9], also find that changes in world oil prices have a significant impact on the stock market return as represented by the S&P500 index. The research results of others [3-4], confirm this by concluding that the world oil price changes affect the short-term and long-term against the

FTSE Bursa Malaysia Emas Shariah Index (FBMES). The existence of inconsistent research results on the effect of changes in world oil prices on the capital market return also shows the need for a study on the effect of oil price changes on the stock market return. Therefore, this study examines the effect of the change on world oil prices on the stock market return located in Southeast Asia such as the Indonesia Stock Exchange, Kuala Lumpur Stock Exchange, Singapore Stock Exchange, Philippines Stock Exchange and the Stock Exchange of Thailand.

2. LITERATURE REVIEW

Malkiel argues that there are two world oil prices, which are used internationally [11]. They are the price of West Texas Intermediate and Brent North Sea (Brent North Sea / Europe Brent). The West Texas Intermediate is the benchmark oil price in the United States, while the Brent North Sea is a benchmark price in Europe. In practice, the price of West Texas Intermediate often becomes the main reference in international oil prices. After the oil price shocks in the 1970s, much research was done to assess the effect of oil price changes on real economic variables. Most of these studies find that shocks to oil prices will affect the economic activities of developed and developing countries [2]. The studies then bloom again after the oil price increases very dramatically in the years leading up to the 2008 global financial crisis due to the high demand for oil from Asia and the geopolitical risks occurring in the Middle East [12]. The impact of rising oil prices is relatively varied on the economy in general and on the capital markets in particular. In the economy of oil-exporting countries, the increase in oil prices has a positive impact, but for the importing countries and consumers of oil, the effect of the oil price increase is negative. Meanwhile, the empirical studies conducted to assess the effect of changes in world oil prices in the capital market have been done by many researchers. The research conducted elsrwhere [5], concludes that the world oil price changes do not affect the stock market in Japan. The research conducted by some [6], also finds the same thing. In their research, authors state that there is no effect of oil price changes to the S&P500 index. Similar findings are obtained

elsewhere [7], who studied the effect of the change of the world oil prices on the stock market in Pakistan.

At the same time, there are many studies which find that there are influences and/or significant relationships between the world oil price changes and the stock market. The research conducted by others [8, 3-5, 9-10] find the these results. Abdelaziz *et. al*. [8], find that there is a relationship between the oil price changes and the stock market in Egypt, Oman, Saudi Arabia and Kuwait. Patel [10], also finds that his research results are consistent with these findings by using the Indian capital market as an object of his study. In the research carried out by using the S&P500 index, Jubinski *et. al*. [9], also find that changes in the world oil prices have a significant impact on the stock market return as it is represented by the S&P500 index. The research results of others [3-4], confirm this by concluding that the world oil price changes, both in the short-term and in the long-term, affect the FTSE Bursa Malaysia Emas Shariah Index (FBMES).

3. METHODOLOGY

The data required in this research are the data for the monthly closing price of West Texas Intermediate crude oil and the data for the monthly closing stock price index in the capital markets studied in the period of January 2003 to December 2013. The data for the monthly closing price of West Texas Intermediate (WTI) crude oil is obtained from the US Energy Information Administration. The data for the composite stock price index required in this research are the data for the closing months of the Indonesia Stock Exchange Composite Index (JCI), KLCI at the Kuala Lumpur Stock Exchange, the Straits Times Index on the Singapore Stock Exchange, PSEI in Philippines Stock Exchange and the Stock Exchange of Thailand SET in the period of January 2003 until December 2013. These data are entirely derived from the Capital Market Statistics published by the Financial Services Authority (FSA).

There are two variables used in this research, namely the WTI crude oil return, and the stock market return. The WTI crude oil return is measured by the ratio of the measurement scale. It is calculated by the following formula:

$$R_{WTIt} = \frac{WTI_t - WTI_{t-1}}{WTI_{t-1}}$$

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 applies to the stock market return variable measured by the ratio of the measurement scale. The stock market return being studied is measured by the ratio of the measurement scale, and calculated using the following formula:

$$Rm_t = \frac{Composite_t - Composite_{t-1}}{Composite_{t-1}}$$

Where:

Composite $_t$ = the closing stock price index at the stock exchange studied in month t. Composite $_{t-1}$ = the closing price index at the stock exchange studied in month $t-1$.

The data analysis is performed by using the Generalized Autoregressive Conditional Heteroscedasticity / GARCH (1, 1). The Model of Generalized Autoregressive Conditional Heteroskedasticity (GARCH) is developed by [13] which is the development of the ARCH model. This model is built to avoid too high order in ARCH models that are based on the principle of parsimony or choose a simple model, so it will ensure the variance is always positive. The equation used is as follows:

$Rm_t = \alpha + \beta_1 R_{WTh} + \varepsilon_t$

Where:

Rm_t = the return of capital markets studied in month t. R_{WTh} = the return of WTI crude oil in month t.

$\varepsilon_t = \phi_{t-1} + \ldots + \phi_t \varepsilon_{t-q} + \eta_t$. $\eta_t = \sigma_t \varepsilon_t$
$\sigma^2_t = \alpha_0 + \alpha_1 \eta^2_{t-1} + \ldots + \alpha_q \eta^2_{t-q} + \beta_1 \sigma^2_{t-1} + \ldots + \beta_q \sigma^2_{t-1}$.
ε_t = independent and identical distributed N (0, 1) and independent from the past state of η^2_{t-q}.

Before the GARCH analysis, the stationarity test data is performed by using the Augmented Dickey-Fuller Test / ADF [14-23].

4. RESULTS AND DISCUSSION

In the following Table 1, we can see the stationary test results of data.

Table 1: Stationary Test Result of Data

No.	Variable	Output (significant at 10% level)
1.	WTI	-8.87*
2.	JCI	-9.23*
3.	STI	-8.95*
4.	SET	-9.51*
5.	PSEI	-11.17*
6.	KLCI	-12.27*

Source: EViews (v. 9.1).

Based on Table 1, it can be seen that all the data used in this study has a significant value at a level of 10%. Hence, it is concluded that all the data used in this study are stationary and they are not indicated by the presence of a unit root. Therefore, no further treatment is necessary specifically for this data and this data can be directly analyzed by using GARCH analysis technique. For data that can be analyzed directly without any further treatment, analysis of GARCH (1, 1) is a proper analysis to be used [24]. Therefore, this study uses analysis of GARCH (1, 1) Model.

This section will discuss the results of the analysis of GARCH (1, 1) Model. The summary of the results of the analysis of GARCH (1, 1) Model can be seen in Table 2 below (Source: EViews (v. 9.1)).

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

	Constant	WTI	Resid (-1)^2	GARCH (-1)
JCI	0.02**	-0.09	0.46	-0.04
KLCI	0.01***	0.09	0.30	-0.17
PSEI	0.01***	0.06	-0.06	0.47
SET	0.01***	0.25	0.25	0.59
STI	0.01***	0.25	0.25	0.64

* Significant at 10% level.
** Significant at 5% level.
*** Significant at 1% level.

Changes in world oil prices (WTI) have no significant effect on the return of JCI. The WTI influence coefficient is negative indicating that the greater the rate of change in the WTI oil price the lower the JCI return will be. This is quite reasonable because Indonesia is an importer of oil and its trade balance will depend on world oil prices, especially the increase in world oil prices would cause the fuel subsidy born by Indonesia will swell, and it will ultimately have an impact on Indonesia's macroeconomic stability and the industrial sectors in general. Changes in world oil prices (WTI) have no significant effect on the returns of PSEI and STI. Unlike the influence coefficient of WTI to the JCI return which has negative sign, the influence coefficient of WTI to the returns of PSEI and STI is positive which indicates the existence of potential positive relationship between WTI and the returns of PSEI and STI. Meanwhile, the changes in world oil prices (WTI) have a significant positive effect on the returns of KLCI and SET. This suggests that the higher the level of change in the world oil prices, the higher the returns of KLCI and SET will be.

5. CONCLUSIONS
Changes in world oil prices only have a significant impact on the Malaysian capital market return (KLCI) and the capital markets of Thailand (SET) with a positive influence. There is no significant effect of changes in world oil prices on the stock market return in the Indonesia Stock Exchange, but the sign on the regression coefficients indicate a potential negative effect. Furthermore, it is found that there is no significant effect of changes in world oil prices on the stock market return in Singapore and the Philippines despite their signs of regression coefficient are positive.
Because of the time difference of trade due to the geographical location of WTI trading on the New York Mercantile Exchange (NYMEX), the change in the closing session on the NYMEX trading can be a reference for stock investors in Southeast Asia. Investors in Indonesia Stock Exchange need to pay attention to changes in world oil prices in the stock investing due to changes in world oil prices have potential negative affect to stock returns in the Indonesia Stock Exchange. If the closing price on the NYMEX WTI shows better improvement of the equity, the investors in Indonesia Stock Exchange need to avoid stock transaction that can potentially lead to a decrease in the share price. Meanwhile, the investors in the capital markets of Malaysia and Thailand can make transactions, due to the closing price of WTI which tends to rise may increase stock returns in the capital markets of Malaysia and Thailand.

The researchers interested in assessing the same field can develop a more robust analysis method to examine the same field so that the results found in this study can receive support by using different analytical methods. The impacts of other commodities can also be examined towards the capital markets in the ASEAN region.

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