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The Influence of World Crude Oil Prices and Selected Macroeconomic Factors on Stock Market by Sector in Malaysia

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Abstract

The objective of this study is to analyze the influence of macroeconomic variables (volatility foreign exchange rates, foreign exchange rate returns & inflation rates) and world crude oil price factors on stock market returns for nine selected sectors in Malaysia. By adapting the Ordinary Least Square Method (OLS) in developing the estimating modeling, the monthly-frequency time series data from September 2003 to November 2016 is used. The results showed that world crude oil prices have different influences across sectors. World crude oil prices have a positive and significant impact on the Plantation sector ($\beta = .315$, $\rho < .01$). On the contrary, it exerted a negative and significant influence on the Trade & Services ($\beta = -.076$, $\rho < .01$), Technology ($\beta = -.591$, $\rho < .01$), Real Estate ($\beta = -.184$, $\rho < .01$), Mining ($\beta = -.251$, $\rho < .01$), Industrial ($\beta = -.0327$, $\rho < .01$), Consumer Products ($\beta = -.151$, $\rho < .01$) and Construction ($\beta = -.079$, $\rho < .01$). In addition, the findings show macroeconomic variables also give different roles across sectors. In conclusion, most of the sector's returns in Malaysia are influenced by the world crude oil price factor. However, there is no doubt that macroeconomic factors such as rate volatility, foreign exchange and inflation rates can also have an impact on sector returns in Malaysia. The implication of this study is important for investors and prospective investors, as it can help in making investment decisions for a sector.

Keywords: World Crude Oil Price, Exchange Rate, Inflation Rate, Stock Market.

Introduction

The stock market can be defined as a place where governments and sectors carry out trading and selling securities activities to enhance the country's long-term capital (Arnold, 2014). In addition, the stock market is also a platform for companies to sell their shares for short-term and long-term capital and to increase their profitability (Wai & Patrick, 1973). In fact, the stock market is also one of the determinants of economic stability for a country. This is because the volatility in the stock market can reflect the economic performance of a country (Olweny & Kimani, 2011). The results of some recent studies indicate that there is a link between stock market returns and

economic growth in a country. For example, the study of Nowbutsing and Odit (2011) and Masoud (2013) in their study found evidence of a significant and positive relationship between the stock market and the country's economic growth in the short and long term. These findings are also supported by Caporale, Howells and Soliman (2004) who have also shown that the stock market can drive long-term economic growth for a country.

However, to ensure that the stock market is performing well, there are a number of factors that need to be taken into consideration so as not to affect the stock market. This is because, there are some factors that are out of control and can affect the volatility of the stock market. Among the factors that can influence the volatility of the stock market are macroeconomic variables as well as world crude oil price factors. Macroeconomic variables such as interest rates, money supply (M3), inflation rate and exchange rate can affect stock market volatility (Hunjra, Chani, Ijaz, Farooq & Khan, 2014). These macroeconomic variables can also have varying effects for each industry where there are industries that have positive and negative effects (Tursoy, Gungel & Rjoub, 2008). In addition, fluctuations in world crude oil prices may also affect the volatility of stock market returns for a country (Adaramola, 2012; Akomolafe & Jonathan, 2014).

It is generally known that macroeconomic variables and world crude oil prices can have an impact on the stock market's return for a country. There have been some recent studies that show that macroeconomic variables and world crude oil prices have a significant relationship with a country's stock market returns. Among them are the studies of Asmy, Rohilina, Hassama and Fouad (2009), Mohan and Chitradevi (2014) and Hunjra et al. (2014). According to Asmy et al. (2009) found that these macroeconomic variables could affect a country's stock market returns. However, the impact of these changes in macroeconomic variables varies with the country's stock market situation. There are countries where changes in macroeconomic variables have a positive effect on the stock market, but there are countries where the stock market has a negative effect. In addition, there are also countries where the stock market is not directly affected by changes in macroeconomic factors.

The main focus of this study is to analyze and identify among the macroeconomic variables and world crude oil prices, which variables are most likely to affect the rate of return on the capital for main sector in Malaysia (ie: Trade & Services Sector, Technology, Real Estate, Plantation, Mining, Industrial, Finance, Consumer Products and Construction). The hypothesis of this study is as follows:

H₀: There is no effect of macroeconomic variables (ie: foreign exchange rate and inflation rate) and world crude oil price factors on the returns of the nine selected main sectors in Malaysia namely Trade & Services, Technology, Real Estate, Farming, Mining, Industrial, Finance, Products Consumer and Construction.

Literature Review

According to Ibrahim (2008), foreign exchange rates are a risk factor for the Malaysian stock market. Based on previous studies, the risk of foreign exchange rates can have a negative, positive effect and does not have any effect. It is well known that there is an increase in the exchange rate which could reduce the return or profit of the investors (Imdadullah & Hayatabad, 2012). Therefore, when there is an increase in foreign exchange rates it can have a negative effect on a country's stock market (Jawaid & Haq, 2012; Imdadullah & Hayatabad, 2012). This has

further affected the stock market returns for investors investing in the country's stock market. In contrast to Aggrawal (1981) in Rahman, Sidek and Tafri (2009), as well as Mohan and Chitradevi (2014) found that an increase in foreign exchange rates could have a positive effect on the stock market. However, there have also been studies showing that foreign exchange rates have had no effect on a country's stock market returns. For example, the study of Muhammad, Rasheed and Husain, (2002), found that there was no causal relationship between exchange rates and stock prices for the countries of Pakistan, India, Bangladesh and Sri Lanka over the long term. Zubair (2013) study in Nigeria also showed similar results in which there was no significant relationship between foreign exchange rates and the Nigerian stock market index.

In addition, the inflation rate risk factor can also have three effects similar to the foreign exchange rate risk factor. These effects can be either negative, positive or negative. High inflation can negatively impact a country's stock market (Klein & Niemira, 1994; in Taulbee, 2005; Iqbal & Haider, 2005; Mohan & Chitradevi, 2014). This finding is also supported by the studies of Nishat and Shaheen (2004), Kimani and Mutuku (2013) and Michael (2014) which also suggest that high inflation rates can negatively affect the stock market. In contrast to the study of Maysami, Howe and Hamzah (2004) find evidence that inflation has a positive effect on a country's stock market. Whereas Tursoy et al. (2008) and Ozturk (2008) show that there is no relationship between inflation and the stock market.

Furthermore, in recent years many recent studies have shown that changes in world crude oil prices can also affect stock market returns. The effect can be divided into three that are positive, negative and also do not have any effect. Adaramola (2012) study found that changes in world crude oil prices have a positive impact on a stock market's short-term return and negatively on the long-term. For oil importing countries, rising crude oil prices could affect the stock market in the long run. This is in line with the study of Shafi, Hue, Idrees and Nazeer (2015) stated that oil prices had a negative effect on the stock market of oil importing countries and on the other hand, positive effects on the stock market of oil exporting countries. But contrary to Ono (2011) study, it was found that the shock in world crude oil prices did not affect the stock market in Brazil. For some sectors, rising oil prices can have a positive effect on the energy and fuel sectors (Ratti & Hasan, 2013; Nandha & Brooks, 2009). While some of the sectors that are negatively impacting the rise in world oil prices are the financial and tourism sectors (He & Zhao, 2013). Nevertheless, there are studies that suggest the impact of rising global crude oil prices on the stock market's return on the sector could be reduced. Among these is the transfer of price increases by increasing output prices (Nandha & Brooks, 2009).

Methodology

This study uses the Ordinary Least Square (OLS) approach to obtain estimates of factors influencing stock market returns for the nine main sectors in Malaysia. The reason why this OLS method was chosen is because according to Ibrahim (2008), this OLS method is the best approach to look at variable relationships over the long term. The existing assumptions in the theory of OLS such as multicollinearity, heteroscedasticity and autocorrelation have also been tested to determine whether the model is the best. In addition, this study also uses E-Views and IBM SPSS for analysis purposes to obtain accurate and accurate analysis results with the objective of the study.

The sample of this study involves data on macroeconomic variables (ie: foreign exchange rate and inflation rate), world crude oil price factors and the return of the Malaysia stock market sector from September 2003 to November 2016. In addition these data are also taken on a monthly basis that covers 159 months for that period.

The estimation model for this study is based on the theory of the Capital Asset Pricing Model (CAPM) introduced by Harry Markowitz in 1959 and the theory of Adler and Dumas (1964). In addition, this model of estimation is also based on previous studies. The estimation model developed for this study is as follows:

$$SR_{it} = \beta_0 + \beta_1 MR_t + \beta_2 VOLreer_t + \beta_3 Rreer_t + \beta_4 OILp_t + \beta_5 InFr_t + \varepsilon_t$$

Where,

SR_{it}	= Return on stock market sector i in the year t
β_0	= Constants (Risk-free rate)
MR_t	= Return of the main stock market in the year t
$VOLreer_t$	= Volatility of foreign exchange rates in the year t
$Rreer_t$	= Return on real foreign exchange rates in the year t
$OILp_t$	= Oil Price (Per Barrel) in the year t
$InFr_t$	= Inflation Rate in the year t
β_i	= Coefficient
i	= Number of sectors (= 1, 2, 3, 4, 5, 6, 7, 8 and 9)
t	= Times Series Data
ε_t	= Error

Finding and Result

Based on the results of Table 1, it is found that the Return on the Main Stock Market has a significant impact on the stock market returns for the nine related and positive sectors. Foreign exchange volatility only negatively affects the Trade & Services and Technology sectors, while positively affects the consumer product sector. Foreign exchange rate fluctuations have shown no effect on stock market returns for the nine sectors involved. In addition, the table above shows that the World Crude Oil Price has a significant impact on the stock market returns for the Trade & Services, Technology, Mining, Industrial, Consumer Products and Construction sectors, while the Real Estate sector is positive. Inflation rates, on the other hand, show a significant positive correlation between Inflation Rate and stock market returns for the Trade & Services and Technology sectors. There may be significant and negative influence on the Inflation Rate and the Plantation, Mining, Finance and Construction sectors.

Table 1. Results of regression analysis of estimation models for each sector

Variables	Constants (β_0)	Return of the Main Stock Market (β_1)	Volatility Foreign Exchange Rates(β_2)	Returns Foreign Exchange Rates (β_3)	Oil Price (β_4)	Inflation Rates (β_5)	R ²	Adj. R ²	D – W stats	F – stats (Prob)
Trade & Service	-0.877 (-16.267***)	0.897 (96.837***)	-0.001 (-2.260**)	-0.062 (-.409)	-0.076 (-9.201***)	0.009 (6.095***)	0.990	0.989	0.355	2456.058
Technology	11.404 (24.930***)	-0.709 (-9.019***)	-0.020 (-4.297***)	0.641 (0.500)	-0.591 (-8.415***)	0.029 (2.199**)	0.732	0.721	0.535	69.12
Real Estate	0.351 (1.503)	1.046 (26.075***)	-0.004 (-1.460)	-0.912 (-1.395)	-0.184 (-5.144***)	-0.008 (-1.211)	0.875	0.87	0.224	176.847
Plantation	-3.516 (-12.362***)	1.457 (29.810***)	0.004 (1.395)	0.488 (0.612)	0.315 (7.204***)	-0.018 (-2.212**)	0.926	0.923	0.23	315.011
Mining	2.933 (8.335***)	0.613 (10.132***)	-0.001 (-.287)	-0.047 (-.047)	-0.251 (-4.641***)	0.035 (3.502***)	0.529	0.51	0.417	28.462
Industrial	2.909 (31.868***)	0.717 (45.747***)	-0.001 (-1.143)	0.333 (1.301)	-0.037 (-2.634***)	-0.001 (-.476)	0.955	0.954	0.245	542.409
Finance	1.02 (10.274***)	1.153 (67.581***)	.000 (0.472)	-0.177 (-.635)	0.007 (-0.469)	-0.006 (-1.968*)	0.981	0.98	0.152	1316.407
Consumer Product	-3.541 (-19.931***)	1.437 (47.066***)	0.004 (2.347**)	-0.320 (-.644)	-0.151 (-5.527***)	-0.004 (-.806)	0.954	0.952	0.263	524.719
Construction	0.133 (0.565)	0.807 (19.990***)	-0.004 (-1.740*)	0.010 (0.015)	-0.079 (-2.195**)	-0.020 (-2.887***)	0.810	0.803	0.134	108.342

*** : Significant at the level of confidence 99%

** : Significant at the level of confidence 95%

* : Significant at the level of confidence 90%

() : Value t

For beta value, beta values exceed one ($\beta > 1$) show that the risk is higher than the return on the stock market. Whereas beta values are lower than one ($\beta < 1$) on the other hand, it shows that the stock market returns are higher than the risk. The above table shows that any change in macroeconomic variables (ie: foreign exchange rate and inflation rate) as well as the global crude oil price factor pose a low risk to investment decisions in the nine sectors involved. However, despite the low risk, it can also have a positive and negative impact on stock market returns depending on the sector.

Table 2. Summary of test hypotheses of alternative hypothesis testing for full data

Sector	$VOLr_{eert}$	Rr_{eert}	$OILp_t$	$InFr_t$
Trade & Service	Reject H_0	Accept H_0	Reject H_0	Reject H_0
Technology	Reject H_0	Accept H_0	Reject H_0	Reject H_0
Real Estate	Accept H_0	Accept H_0	Reject H_0	Accept H_0
Plantation	Accept H_0	Accept H_0	Reject H_0	Reject H_0
Mining	Accept H_0	Accept H_0	Reject H_0	Reject H_0
Industrial	Accept H_0	Accept H_0	Reject H_0	Accept H_0
Finance	Accept H_0	Accept H_0	Accept H_0	Reject H_0
Consumer Product	Reject H_0	Accept H_0	Reject H_0	Accept H_0
Construction	Reject H_0	Accept H_0	Reject H_0	Reject H_0

Conclusion

In conclusion, the results of this study may guide investors and potential investors in making their investment decisions in selecting the most risky sectors for macroeconomic variables (ie: foreign exchange rates and inflation rates) and the world crude oil price factors in different situations. The results of these investments are important in determining the profitability of the investment. If these factors are ignored in the investment decision, it is feared that the investment made will be high risk as well as affect the profitability of the investment. This has indirectly prompted investors to keep abreast of macroeconomic changes and world crude oil prices.

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