Oil Price Fluctuations and Stock Market Movements: An Application in Oman

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Abstract

It is indisputable that crude oil and its price fluctuations are major components that affect most of the countries' economies. Recent studies have demonstrated that beside the impact that crude oil price fluctuations have on common macroeconomic indicators like gross domestic product (GDP), inflation rates, exchange rates, unemployment rate, etc., it also has a strong influence on stock markets and their performance. This relationship has been examined in a number of settings, but it is yet to be unraveled in the Omani context. Accordingly, the main purpose of this study is to examine the possible effect of the oil price fluctuations on stock price movements. The study applies Toda and Yamamoto's (1995) Granger non-causality test on the daily Oman stock index (Muscat Securities Market Index) and oil prices between the period of 2 January 2003 and 13 March 2016. The results indicated that the oil price fluctuations have a significant impact on stock index movements. However, the stock price movements do not have a significant impact on oil prices. These findings have significant implications not only for the Omani economy but also for the economy of similar countries, particularly in the Gulf Cooperation Council (GCC) countries. The latter should carefully consider their policies and strategies regarding crude oil production and the generated income allocation as it might potentially affect the financial markets performance in these countries.

Keywords: Oil Price, Muscat Stock Exchange, Toda and Yamamoto, Oman.

JEL Classification Code: B26, C22, E44, G14.

1. Introduction

It is vital for each investor to understand that many forces impact stock prices. On one hand, there are internal factors that are directly linked to the financial performance of the company and its development. This includes the earnings' tendency, the distribution of dividends, mergers and acquisitions, innovations, the hiring strategy, etc. On the other hand, there are external factors such as gross domestic product (GDP), inflation rates, exchange rates, unemployment rate, and fluctuations in gold prices and in US Dollar (USD) value, etc. Undoubtedly, these factors have a strong and significant influence on stock markets and their performance (Siddiqui, 2014). As the relationship

between stock prices, gold prices and USD value is presented, a missing piece needs to be added, namely, the oil prices. In fact, oil price fluctuations have an impact not only on the overall economy of a country but also on the economic performance of related economies. According to Balcidar and Ozdemir (2013), oil is an important element of the economy since it is an intermediary factor that transfers wealth from oil importing countries to oil exporting countries. Hence, the change in oil price affects the global economy.

In this regards, oil price fluctuations have an effect on the macroeconomic level. Specifically, their impact is recorded on a number of economic variables including inflation, unemployment, GDP growth, interest rate, exchange rate, and financial markets, etc. On the microeconomic level, many studies have shown that oil price change has an impact on the cost of goods and services, the cost of production, the company's returns and earnings and consequently, it can alter its dividend distribution policy. Given the significance of the oil price fluctuations in most of the economies, the objective of the paper is to examine the relationship between the oil price and stock index in Oman, which is one of the main crude oil exporters in world. This study applies Toda and Yamamoto's (1995) Granger non-causality test to achieve this objective.

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The rest of the paper is organized as follows: section two reviews the prior studies in the area; section three discusses the methodology that is applied in this study and describes the variables and proxies used; section four summarizes the results of the study; and finally section five provides practical and research recommendations.

2. Literature Review

The financial literature is rich with empirical studies that link the fluctuation in oil prices and the stock market performance. A brief literature review of the studies conducted in the mentioned area in different parts of the world is presented in this section. In the context of developed countries, Jones and Kaul (1996) studied the reaction of international stock markets to oil price shocks. The study covered Canada, United Kingdom, Japan and United States, between 1960 and 1991. The authors found no relationship between the two variables.

In a similar context, Papapetrou (2001) examined the relationship between oil prices, real stock prices, interest rate, real economic activities and employment levels in Greece using a multivariate vector-autoregression (VAR). The findings revealed that oil prices are important in explaining stock price movements in Greece. Subsequently, Aloui, Jammazy, and Dakhlaoui (2008) focused on the volatility spillovers between crude oil markets and major stock markets for the period between 1989 and 2007. The authors used two different analytical approaches and found that oil price volatility has a negative impact on stock market behavior. Furthermore, Bjornland (2009) analyzed the impact of oil prices on stock market returns in Norway between 1993 and 2005. By applying structural VAR models, the author found that an increase in oil prices positively impacts the stock market returns.

In a relatively recent study, Ramos and Veiga (2013) analyzed the non-linear effects of oil price changes in stock markets. They found that oil price spikes depress international stock markets but not the opposite. In other words, drops in oil price do not necessarily increase stock market returns. This conclusion is valid for developed countries. However, emerging market returns are not sensitive to oil price variations. Regarding emerging countries, Basher and Sadorsky (2006) studied the impact of oil price changes on a large set of emerging stock market returns. They found that positive shocks to oil prices depress the emerging markets' stock prices and US dollar exchange rates in the short run. Similarly, Liao and Chen (2008) examined the effects of oil and gold prices on individual industries in the Taiwanese context by applying the threshold GARCH model (TGARCH). The study covered

the period spanning from January 1998 through December 2005 and concluded that for both the electronic and rubber industrial sub-indices, a positive impact of the fluctuation in oil prices was detected.

On the other hand, Ono (2011) examined the impact of oil prices on real stock returns for Brazil, Russia, India and China between 1999 and 2009 using VAR models. The findings showed a positive and significant impact of oil prices on real stock returns only for China, India and Russia. Adaramola (2012) has also examined the long-run and short-run dynamic effects of oil price on stock returns in Nigeria between 1985 and 2009 using Johansen cointegration test. A bi-variate model was applied and revealed a significant positive relation of stock return to oil price shocks in the short-run and a significant negative relation of stock return to oil price shocks in the long-run. Furthermore, Basher, Huang and Sadorsky (2012) studied the dynamic relationship between oil prices, exchange rates and emerging markets stock prices. They found strong evidence that oil price risk impacts stock price returns in various emerging markets. The study revealed that oil price increases have a positive impact on excess stock market returns for daily and monthly data, in emerging markets, whereas for weekly and monthly data, oil price decreases have positive and significant impacts on emerging market returns.

In a more recent study, Ansar and Asghar (2013) analyzed the impact of oil prices on the consumer price index (CPI) and Karachi Stock Exchange index (KSE-100) from 2007 through 2012 using multi regression model and found a positive relationship between oil prices, CPI and KSE-100 Index. In the Gulf Cooperation Council (GCC) context, Hammoudeh and Aleisa (2004) investigated the relationship between the GCC stock markets performance and the oil price index. The authors found a bidirectional relationship between Saudi stock returns and oil price changes while the other GCC markets are less dependent on oil price fluctuations. Similarly, Arouri and Rault (2012) examined the long run link between oil prices and stock markets in GCC using bootstrap panel cointegration techniques and seemingly unrelated regression (SUR) methods. The findings revealed that oil price increases have a positive impact on stock prices for all GCC countries except Saudi Arabia.

Moreover, Abdalla (2013) examined the impact of oil price fluctuations on stock market returns in Saudi Arabia over the period from 2007 through 2011. The author applied a bivariate vector autoregressive-generalized autoregressive conditional heteroscedasticity (VAR-GARCH) model and found a positive impact of oil price fluctuations on stock market returns. In a recent study, Al Hayky and Naim (2016) investigated the dynamic relationship between oil price and

Kuwait's stock market index between 2005 and 2015. The authors used Markov Switching model and detected that there is a positive and significant relationship between the Kuwaiti stock market index and oil price fluctuations in the period of high volatility regime while no relationship was found for the period of low volatility regime.

In summary, the above studies revealed contradicting results regarding the significance of crude oil fluctuations in predicting the stock price movements. This observation is valid for different countries regardless of the level of development/underdevelopment, or whether the country is a crude importer or exporter. Hence, it is highly required to further examine the effect of crude oil fluctuations on stock markets movement and performance in the Omani context, especially in the current era of highly volatile crude oil prices.
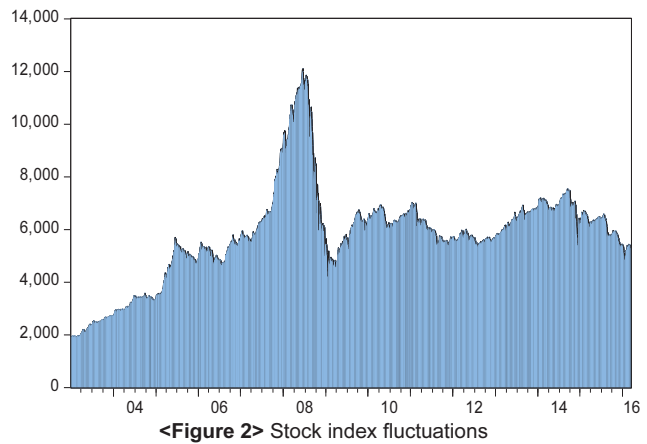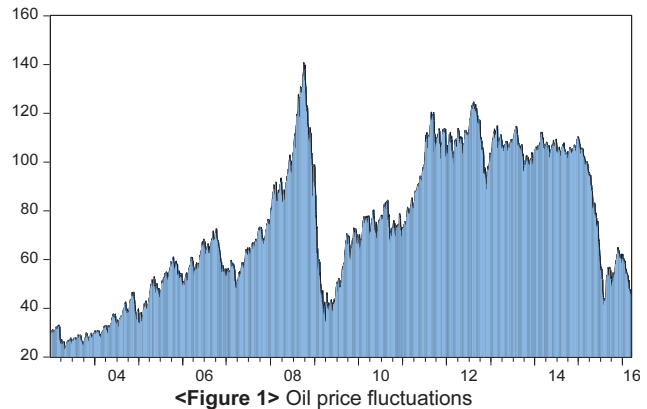
3. Methodology

The study uses two main variables for the analysis, namely, stock index and oil price for the period spanning from January 2nd, 2003 to March 13th, 2016. It is noteworthy that the stock market index in Oman is represented by Muscat securities market index (MSM30). The data is in daily frequency and it was collected from Bloomberg database. The analysis is conducted by applying Toda and Yamamoto's (1995) Granger non-causality test to examine the causality between oil price and the stock index in Oman. This method is used primarily due to its accuracy in considering the number of lags.

The descriptive summary in Table 1 shows that the average oil price during this period was $73.71 while the average index value was 5,768.96. It is remarkable that the oil price reached its highest value of 140.73 between September 22nd and 23rd, 2008. The same trend applies for the MSM30, which reached its peak around the same period of time as shown in Table 1, Figure 1 and Figure 2.

<Table 1> Descriptive analysis

	OIL	MSM30
Mean	73.71110	5768.961
Median	70.95000	5813.275
Maximum	140.7300	12109.10
Minimum	23.27000	1920.050
Std. Dev.	28.93436	1827.508
Skewness	0.038567	0.485854
Kurtosis	1.777075	4.709327
Jarque-Bera	203.8280	524.8114
Probability	0.000000	0.000000
Sum	240150.8	18795274
Sum Sq. Dev.	2726751	1.09E+10

<Figure 1> Oil price fluctuations

<Figure 2> Stock index fluctuations

4. Results

Prior to the Granger causality analysis, it is required to identify the degree of integration for all the included variables. This is performed through two main tests, namely, the Augmented Dickey Fuller (ADF) test and Phillips Perron (PP) test. The summary of the results in Table 2 indicates that oil price is non-stationary at levels, but stationary at first difference. Hence, it is integrated of order I (1). However, MSM30 is stationary at level and hence it is of order I (0). These results indicate that the Toda and Yamamoto's (1995) test is an appropriate method for the current analysis.

<Table 2> Unit root tests

	Level		First difference	
	ADF	PP	ADF	PP
Oil price	-1.845504	-1.778732	-29.12548***	-43.42720***
MSM30	-3.053447**	-3.237099**		

Note: *, **, *** refer to significance levels at 10%, 5% and 1% respectively.

Having checked the order of integration of the model variables and ensured that Toda and Yamamoto test is appropriate for this study, the latter is then applied. The results of the Granger non-causality test following Toda and Yamamoto (1995) is summarized in Table 3. The results indicate that the oil price fluctuations have a significant impact on the local stock index fluctuations. However, the stock index fluctuations do not have a significant impact on oil price movements. This is illustrated by the Chi square values that are significant at 1% for the impact of oil price on stock exchange, while not significant for the impact of stock index on oil prices. This finding is in line with those of Arouri and Rault (2012), Abdalla (2013), and Al Hayky and Naim (2016). Nevertheless, they contradict the findings of Hammoudeh and Aleisa (2004). This indicates that any major changes in the crude oil prices will potentially have a significant impact on the Muscat Stock Exchange performance. Hence, the authorities should carefully manage the crude oil production and more importantly the generated income allocation in a way that would enhance the stock market's performance.

<Table 3> Granger non-causality tests

Variables	Oil price	Stock index
Oil price	-	20.72***
MSM30	3.36	-

5. Discussion and Conclusion

The main objective of this study is to investigate the potential impact of oil price fluctuations on the stock price movements in Oman. Using Toda and Yamamoto's (1995) Granger non-causality test, the results revealed that oil price fluctuations have a significant impact on stock price indices, while stock price indices do not have any impact on oil price fluctuations.

These findings have significant contributions to the financial economics and macroeconomic theory, to the practitioners as well as to the policy makers and regulators. Particularly, these findings enrich the theory on the oil price fluctuations and its influence on the economy as a whole and specifically on the financial markets in respective countries. This is particularly significant in Oman, one of the major exporter of crude oil and gas. The country has been recently active in establishing vital substitutes to the oil and gas income, mainly through the development of marine infrastructure, agricultural production, services platforms, and above all, the financial market. The latter is a major element in the mobilization of investment funds in the country where the listed financial assets have tremendously increased over the last few years.

Though the current study brought about significant contributions, it still suffers from a number of limitations which should be considered in future studies. Primarily, this study focused on a single country, namely, Oman. This does not provide a comprehensive idea on the relationship between oil price fluctuations and the Muscat stock index in other settings. It is recommended in this regard that future studies should cover a wider area. On the other hand, this study used only two proxies for the respective variables. It is preferable at this level to use different proxies to reach a more robust research.

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