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The Impact of Oil Price Uncertainty on Stock Returns in Gulf Countries

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ABSTRACT

This study analyses the relationship between the stock market returns and the oil price volatility and its changes in six Gulf countries. We use changes in oil prices as shock while realized variance is used as proxy for volatility. After estimating an appropriate vector auto regressive model, use impulse response function and the Granger causality tests for the analysis. By employing weekly data starting from Jan-2008 to Jan-2017, study concludes that oil price variations and volatility impact the stock returns in all the Gulf stock markets.

Keywords: Gulf Cooperation Council, Stock Markets, Oil Price Shocks, Impulse Response Function, Granger Causality Test
JEL Classifications: G12, Q43, G10, C32

1. INTRODUCTION

Oil plays a vital role in the growth of an economy and changes in oil prices have significant impact on all sectors of economy including stock market. Gulf Cooperation Council (GCC) countries are the oil exporters and heavily depend on oil revenues. Any substantial variation in oil prices affects the disposal of reserves to the governments in these countries. The fluctuations in the availability of funds severely affects the performance of businesses operating in these economies. The variation in the performance is consequently reflected in the stock markets of these countries.

Beginning from pioneering paper of Hamilton (1983), there are several studies that examine the linkages between oil price and stock markets movements. However, bulk of these studies focus on developed countries' markets. As stated by Awartani and Maghyereh (2013), the effects of the energy prices on the stock markets are typically investigated with regard to the stock market performances of the developed countries whereas few studies concentrate on analyzing the effect of oil

prices in the developing markets. Dagher and El Hariri (2013) have discussed that the GCC stock markets play significant roles in their economies and oil prices significantly influences them in distinct ways. Rithuan et al. (2014) and Akoum et al. (2012) explain that the oil prices are directly related to the Gulf countries macroeconomics, which ultimately has widespread effects on the GCC stock markets.

In this background, this study analyses the effect of oil price shocks and its volatility on stock market returns of GCC countries. The oil prices shocks are measured by the log difference of oil prices whereas its realized variance is used to proxy for the volatility of oil prices. After estimating an appropriate vector autoregressive (VAR) model, the impulse response function analysis is sued to gauge the impact of oil prices on stock market returns of Gulf Cooperation Council (GCC) countries. Moreover, Granger causality tests are employed to confirm the direction of causality and support the initial findings from impulse response function analysis. We expect oil prices will impact the stock markets in these countries positively, as all the GCC countries are oil exporters and any increase in oil prices will boost the revenue for

the government which in turn will be reflected in the stock market by higher government spending.

The structure of remaining paper is as follows. Section 2 presents brief literature on oil prices and stock markets, while section 3 provides details of methodology and data used. Section 4 gives estimation results. Section 5 concludes.

2. LITERATURE REVIEW

The effect of oil price on stock market varies depending upon the origin of shock, i.e., whether the increase of oil price is a result of demand blows or supply blows in the oil market. Moreover, the increase in oil prices may negatively affect an emerging market economy that has no oil production whereas it may positively affect emerging market economies that are oil producers.

It is suggested that supply side shocks are associated with higher oil price volatility, whereas demand-side shocks explain slightly lower oil price volatility. Moreover, Hamilton (1983) debated that demand-side shock deriving from industrialization countries such as China could have a significant impact. He also observed that lack of immediate response to a significant increase in oil-demand could result to a demand-side shock. Kilian and Park (2009), on the other hand, argued that the demand-side oil price shocks influence stock prices more than the supply-side oil price shocks. Demand-side oil price shocks exercise a negative influence on stock prices due to the precautionary demand for crude oil.

Oil price may affect the stock returns positively or negatively depending upon if the country is an oil exporter or importer. We Start with the literature that shows the negative relationship between oil price and stock prices. There are several theoretical ways to explain the negative relationship between oil prices and stock market movement. In microeconomic view, firms which include oil in their production either directly or indirectly will be affected with oil price change. Therefore, the increase of oil price will affect negatively these firm's earnings. In consequence, firms will have two options either to pass this increase of production cost to consumers or reduce firms profit and dividends which are the key drive of stock price. The degree to which the stock price will be affected is dependent on the stock market efficiency. Also non-oil producing countries will suffer from rising costs faced with increasing uncertainty caused by oil price changes which negatively affect stock prices. In addition, stock price can be determined by equity pricing model which equals to the expected present values of future cash flows. As a result, raising in interest rate has a direct impact on the discount rate in this pricing model and interest rate are highly affected by oil prices. To put in another way increase in oil prices will lead to inflationary pressure and this inflation can be controlled by the central bank through increasing the interest rates. Thus high interest rates will negatively affect stock price.

Le and Chang (2011) shows that there is a positive relation between oil price and stock market returns. He explains that a rising crude oil price is linked to a growing economy mirrored in robust industry performance, which affects in a surge in oil demand. Such cases frequently occur when the economy improves from slump. As the worldwide demand boost, it leads to the rise of basic material prices. To encounter the growing demand, businesses should pick up steam and require more resources – like labor and fuel for energy needs. An excess demand for labor leads to higher wages and more spending, which certainly marks the economy look stronger.

Looking at the empirical side of the studies, Kalyanaraman (2014) analysed the cointegration relationship between oil prices and stock market in Saudi Arabia. He used Bai-Perron test and Sequential F- statistic and showed that there is one structural break in the oil data and also one structural break in TASI data. He also concluded that the model which proposes cointegration among oil and stock prices is the level shift model while other models don't recommend the presence of this cointegration. Largely the study established that the association of oil prices and stock market is positive in Saudi Arabia and suggested that all oil exporting economies would have this affirmative relation. That is for an increase in oil price will increase the country revenue and owing to that productivity and investment of the economy will also surge which raise the anticipated cash flow on their stock investment. Lastly, all these factors will clue to advanced stock valuation. Besides, inverters and policy makers could use past data of stock and oil prices to mark investment policies and judgements.

On the other hand, Ahmed and Harrathi (2013), established that oil price volatility had an adverse influence on stock market returns in Saudi Arabia. He employed VAR-BEKK specification for daily dataset for the period between January 3, 2019 and March 21, 2012. Azar (2013) concluded that oil prices have different impact on Kuwait and Saudi Arabia stock market. He established that Kuwait stock market is unaffected by oil prices blows. In contrast oil prices have non-linear effect on Saudi stock market.

Bharn and Nikolova (2010) employed EGARCH model to examine the link between oil prices and Russian stock market during three main episodes, War in Iraq 2003, September 11th terrorist attack, and the civil war in Iraq in 2006. They concluded that Russian stock market was negatively affected by all these three events.

Tudor and Anghel (2012) examined the linkages between oil prices (using BRENT and WTI) and equity markets for ten developed and underdeveloped countries including US, UK, Russia, Japan, Germany, Czech Republic, China, and Austria.

They revealed that oil prices affect stock prices by varying amounts in these countries. Russia was among the countries that had strong correlation between stock market and oil prices beside Austria and UK. Russia is one of the largest energy exporters and a rise in oil prices positively and directly affects its stock market. Ono (2011) examined the linkages between oil price variations and stock market in BRIC countries using VAR model. He concluded that India, China, and Russia stock returns had a positive relationship with oil prices and Brazil stock returns were found to have no relation with oil price movements.

Many countries focus their monetary policy on inflation stability placing an effort to the absorption of any jolts that could cause

inflationary pressures - e.g., oil price shocks -(Lescaroux and Mignon, 2008). Moreover, because of augmented productivity, investments and renewable energy sources, businesses are capable of absorbing increased production input costs without the need of price escalations (International Energy Agency, 2006). Flexibility of wages also plays a significant role on the weak influence of oil price shocks. Nordhaus (2007) argues that due to the greater wage flexibility evidence is offered that oil price effect on output is much smaller and thus oil price shocks should have minimum impact in the economy. Therefore, oil price shocks should also have minor or no effect on stock markets.

Ciner (2001) employed nonlinear causality tests and presented the evidence that oil shocks affect the stock returns in US, which is consistent with the established impact of oil on economics activity. Moreover, Arouri et al. (2012) used a GARCH model to observe the effect of oil prices on European various sectors' returns. They established that oil prices have substantial influence on various European sectors. Nevertheless, the scale and the direction of this effect vary from one sector to another specially for the countries which are oil exporter.

Kapusuzoglu, (2011) analyzed the impact of oil prices on stock prices in Turkey. Using co-integration and causality tests on daily stock prices of National 100, National 50 and National 30 Index of Istanbul Stock Exchange and international Brent oil price from January 2000 to January 2010, he established a long run relationship between stock prices and three measures of stock prices.

Some studies have examined this relationship for major European, Asian and Latin American emerging markets. The results of these studies indicate a significant relationship between oil price changes and emerging stock markets. In a popular study, Basher and Sadorsky (2006) have established a strong evidence that oil price risk impacts stock price returns in emerging markets using an international multi factor model. Less attention is paid to smaller markets, especially in GCC countries, where share trading is a relatively low.

Jones and Kaul (1996) in seminal paper established a negative effect of oil shocks on the stock prices in Canada, Japan, UK and the US.

Huang et al. (1996) examine the relationship between daily returns of oil futures and US stock returns and fond that oil futures returns lead to influence some individual oil company stock returns but have negligible impact on the broad-based market indices such as the S&P 500.

Cunado et al. (2014) established a long-run relationship between a number of stock market indicators such as liquidity and size, with macroeconomic indicators for a number of oil exporting countries in Asia, Africa, and Latin America.

Some authors conclude that the effect of oil prices on stock market varies from oil exporting countries to oil importing countries. For example, Bashar (2006), Park and Ratti (2008), Bjornland

(2009), Korhonen and Ledyaeva (2010), and Arouri and Rault (2012) established a positive relation between oil price changes and stock market returns for oil exporting countries. Moreover, some authors like Bharn and Nikolova (2010), Filis et al. (2011), Sadorsky (2012), Broadstock et al. (2012), Antonakakis and Filis (2013), and Awartani and Maghyereh (2013), argue that there is no constant relationship between oil prices and stock mark returns rather it varies from time to time, i.e., time varying.

3. METHODOLOGY AND DATA

This study employs an unrestricted VAR model to perform impulse response function analysis which is appropriate for visual inspection of the impact of oil price variations on stock returns in dynamic settings. Moreover, the Granger-causality test examines this relationship to further the analysis. The use of these techniques strengthens the results and rules out the possibility of methodology-dependent outcomes.

We use weekly data starting from Jan-2008 to Jan-2017 in our study. World oil prices are peroxide by spot prices of West Texas Intermediate (WTI). The stock market indices used for each country were ADSMI for Abu Dhabi (CABD), BHSEASI for Bahrain (CBAH), MSM30 for Oman (CMSM), DFMGI for Dubai (CDUB), SASEIDX for Saudi Arabia (CSA), KWSEIDX for Kuwait (CKWT), and QE for Qatar (CQR), We use Bloomberg historical series to obtain these data.

4. ESTIMATION AND RESULTS

4.1. The Impulse Response Analysis
An unrestricted vector autoregressive (VAR) model is estimated for generating the generalized impulse response function.[1] The generalized impulse responses in an unrestricted VAR are linear in the shocks. The one standard deviation shocks are employed to place the whole set of responses into an appropriate setting. The results are reported in Figures 1 and 2. The vertical axis is expressed in the units of the stock returns in the respective market. The solid line is a point estimate of the amount returns are expected to change following a one standard deviation impulse after the number of periods on the horizontal axis.

4.1.1. Oil price shocks
Figure 1 displays the responses of stock returns of all GCC markets to oil price shocks. The initial response of returns though is positive in all the markets, the magnitude is higher for Dubai and Abu Dhabi. Kuwaiti and Bahraini markets respond the least.

A positive shock corresponds with positive responses in all the markets in the beginning. After the realization of expectations its impact remains significant when other traders respond. It can be

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1   On the Basis of Akaike Information Criterian (AIC) by Akaike (1974), and the Schwarz Criterian (SC) by Schwarz (1978), eight lags were chosen for the estimation of VAR model. All the variables are stationary in the form used in estimation.

Figure 1: Shock to oil prices
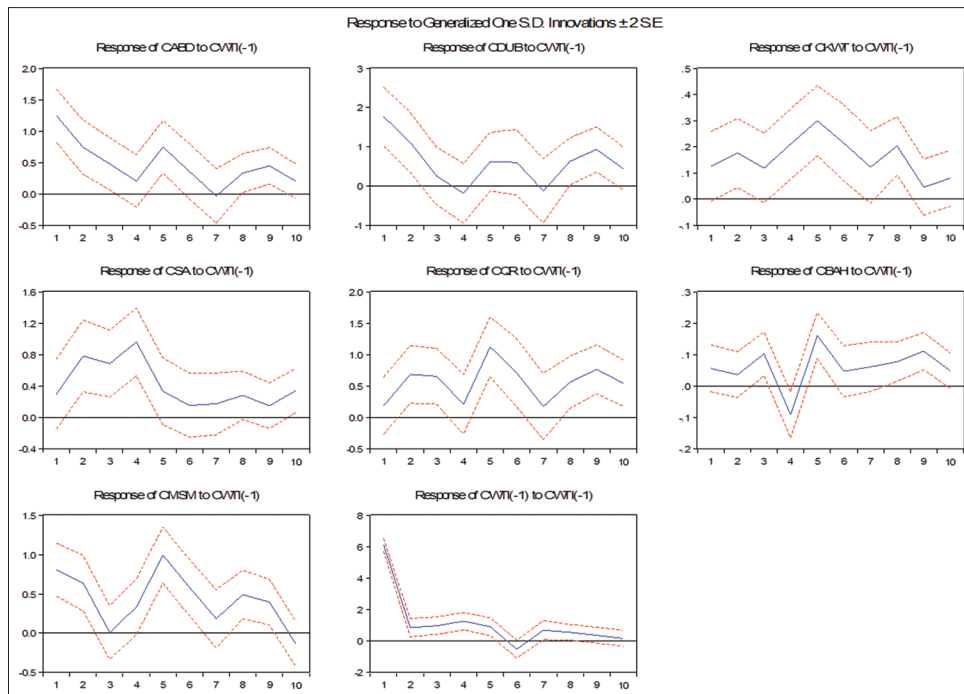
Figure 2: Shock to realized volatility in oil prices
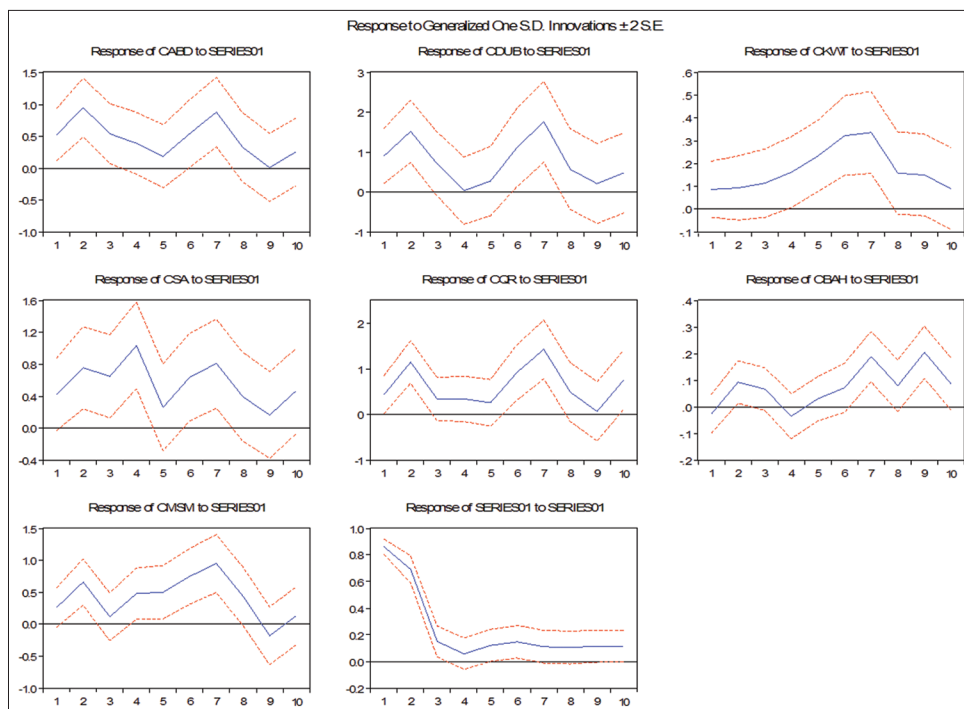
clearly seen that variation in Oil prices have significant effect on almost all the GCC stock market returns. The returns in Dubai, Abu Dhabi, and Saudi stock markets respond relatively strongly. Kuwaiti and Bahraini markets though respond positively, their magnitude is smaller. This result is significant and it is helpful in portfolio hedging.

From the overall pattern we can conclude that positive oil price shocks have positive impact on the GCC stock returns.

4.1.2. Realized oil price volatility shocks

The impact of oil price volatility measured by the realized variance of WTI crude oil spot prices is presented in Figure 2.

Since GCC markets are well integrated (Ahmad, 2011), the realized oil price volatility shock has a positive impact on almost all the stock markets. The impact in Bahrain is negligible in the beginning and positive most of the remaining period. The result is appropriate as Bahraini oil exports are the least among these

countries and subsequent effect might be a result of spillover effects from other GCC markets. Again, Dubai stock market respond the most while remaining markets respond more or less similarly. The symmetry of responses to a common shock in most of the GCC stock markets conveys an important message for a common monetary policy in the advent of a common currency these countries are planning to form, though there are setbacks to the plan (Ahmad, 2011).

4.2. Granger Causality

Table 1 presents the Granger-causality[2] test results using three measures of oil prices. The null hypothesis that variable x does not granger-cause variable y can be tested using the Wald test that follows usual asymptotic c^2 distribution under the null, as all the variables are I(0).

The null hypothesis that these three measures of oil price variations do not Granger-cause returns in the stock markets can be rejected in most of the cases on the basis of p-values reported. It can be seen that oil price variations or shocks Granger cause the returns in all the stock market of Gulf Cooperation Council countries significantly. This significance is reflected by the low p values of the Wald test. The null hypothesis that oil price variations (shocks) do not granger cause stock returns in all the markets can be rejected at below five per cent significance level. This indicates that oil plays an important role in influencing the returns in gulf countries. These findings confirm conclusion reached in earlier studies that oil effects stock markets in GCC countries.

Second column of Table 1 presents the results of Wald test when the effect of oil price volatility on stock return in GCC countries is estimated. It is clearly evident that except for Kuwait, the null hypothesis that oil price volatility does not granger cause stock return in GCC markets can be rejected at below five per cent level of significance. This indicates that besides oil price shocks, oil price volatility is also an important determinant of stock returns in GCC markets. The null hypothesis that oil price volatility does not granger cause stock returns in Kuwait can be rejected at or below five per cent significance level, which indicates that this market is immune from oil price volatilities.

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2   Granger (1969) and Sims (1972) proposed tests of causality known as Granger causality tests. A causal relation between two variables exists if one variable can help in improving the forecast of another. The variable x is said to cause y if the one-step ahead predictor of $y, \hat{y}$, based on all available information has a smaller mean square error than the predictor of y based on all the past information. However, it is not possible to determine causality purely on statistical grounds, as a priori theory must play a key role in deciding what constitutes relevant information.

Table 1: Granger causality analysis

Variable	Oil price variation Wald Test (P-value)	Oil price volatility Wald Test (P-value)
CABD	0.0000	0.0000
CDUB	0.0000	0.0000
CKWT	0.0023	0.0601
CSA	0.0001	0.0012
CQR	0.0000	0.0000
CBAH	0.0000	0.0065
CMSM	0.0000	0.0000

5. CONCLUSION

This study examines the connections between two measures of oil price changes and stock returns in GCC economies. The changes in oil prices is used as oil price shock while its realized variance is employed as a proxy for volatility. An unrestricted vector autoregressive (VAR) model is estimated for generating the generalized impulse response function. The generalized impulse responses in an unrestricted VAR are linear in the shocks. Moreover, the Granger causality tests are also performed to aid the analysis. Weekly data starting from Jan-2008 to Jan-2017 was used for the analysis for all the countries.

Our estimation results indicate that oil price shocks have significant and positive impact on returns in all the GCC stock markets. The impulse response analysis indicate that positive shocks to oil price have positive response of returns in all the markets, the magnitude is higher in Dubai and Abu Dhabi while Kuwaiti and Bahrain markets respond the least. Oil price shocks also Granger-cause returns in all the GCC stock markets. The results on the basis of realized variance of oil prices indicate that volatility has a positive impact on returns in all the stock markets in GCC countries except for Kuwait, and there is a similarity of responses in almost all the GCC markets. The realized oil price volatility also Granger causes returns in all the markets.

Finally, we can conclude that changes in oil prices and realized oil price volatility have strong impact on the returns of GCC stock markets and any variation in oil prices or its volatility is likely to impact the profitability of investors and portfolio managers. It will be interesting to gauge the impact of oil prices on sector wise returns of these countries stock markets, which could be taken care by future studies.

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