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Stock market, Covid-19 and oil price crash: evidence from selected OPEC countries

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Introduction

For global economy crude oil is important source of energy. Price of crude oil is affected by various factors such as public emergencies, deviation in supply and demand of oil, political instability, war and natural disaster.

Oil exporting countries are very sensitive to oil price changes as their economies are dependent on oil exports .These countries aggregate demand, government expenditure, revenues and earnings are highly affected by the oil price fluctuations.

Oil price shocks in the periods of recent outbreak leads fluctuations of the global business cycle this leads have a significant impact on the relationship of oil prices and stock market prices in oil-exporting countries.

Oil price change effect on stock market return can be explained by various channels. Such as, Stock valuation channel, Monetary channel and fiscal channel.

The study will investigate the dynamic interaction among stock market price, oil price and exchange rate by employing the (VAR),Impulse response function and Variance decomposition for selected OPEC Middle East countries having greater proportion of oil reserves proportion to total reserves.

Rational of the study

In case of OPEC nations, when oil prices decline during crisis, it exert negative pressure on exchange rate ,this situation is damaging when oil exporting country having less foreign reserve. The sample consists of four Middle East economies on the criteria of higher proportion of oil compare to total OPEC reserve. As oil price is important determinant of volatility in exchange rate. As major world currencies are denominated in USD rates, instability is oil market threaten the investor due to variation in exchange rate as mostly trade in oil market is in USD rate. That's why interaction of stock market, oil price is important during pandemic.

This paper will contribute in literature related to response of stock market and exchange rate due to oil price slump during COVID-19.Objectives of this study are three fold. Firstly, to check the association between stock market price and world crude oil price of selected Middle East OPEC economies before and during pandemic. Secondly, to check impact of oil price crash (oil glut) on stock market index. Lastly, to analyze how stock market index behave with exchange rate variation of selected Middle East OPEC nations incorporating the effect of oil price market.

Literature Review

Fillis et al.(2011) did study on oil importing and oil exporting countries and empirically assess how these economies respond when there is sudden change in oil price and how origin of shocks are important determinant to evaluate the size of correlation between stock market and oil price. Fluctuation in oil prices by OPEC nations, leads change in energy prices for consumer countries that further adversely affect the production. This leads adversely effect the labor demand .As economy production and stock market is strongly related that further negatively affect the stock market.

Emmanuel (2010) conclude that oil price change significantly affect the exchange rate through international trade channel. Reboredo (2012) concluded that decrease in oil prices is strongly linked with depreciation of UD dollar and vice versa case exist. There is asymmetric relationship among oil price, exchange rate and stock prices as positive effects outweighs the negative effects of oil price. It was concluded that there exist association among oil price, exchange rate and stock prices only in the long run. .It was empirically assessed that change in oil price affect the stock prices and exchange rate. Moreover, in short run change in stock price cause change in exchange rate. When oil price increase ,leads appreciation in exchange rate . However, in short run when oil volatility variables are used, oil price shocks lead to depreciation of domestic currency. Depreciation of domestic currency, increase competeveness of exports goods in global arena hence increase the foreign revenue that leads increase in stock prices.

Proposed Model

In order to inspect the response of different variables to oil price slump during COVID-19 we are employing the **VAR** model. In this model all variable consider as endogenous variables, it is used to test endogeneity of the variables.

Shock to one variable not only influence that variable but also transmitted to other endogenous variable involved in model .**Impulse response function** help to trace out the dynamic effect on current and future values of endogenous variables due to any shock. IRF allows us to examine the dynamic shocks in oil prices during COVID-19 and in exchange rate, and their impact on stock index. Basically, it creates the chain of reaction in other endogenous variables involve in model due to any innovation in VAR setup.

Variance decomposition method examines the proportion of variation of dependent variable by its own lagged values and other variable involve in the model. It tells you how much variability in dependent variable is explained by the independent variable due to any shock .Through the dynamic structure of VAR, a shock to sth variable will directly affect that variable, but it also transmitted to other variable through dynamic channel. Variance decompositions determine how much of the shocks forecast error variance in dependent variable by incorporating the innovations in each exogenous variable in the system.

Data

In this study, we use daily data of four stock indices of Middle East OPEC nations and there exchange rate with world crude oil price. The data is collected from Investing.com for the duration of 4 months starting from 1 October to 27 February 2019, covers before COVID-19 while period starting from 1 march to 25 June 2020 duration of 4 moths, covers COVID-19 period. The sample consists of four Middle East economies on the criteria of higher proportion of oil compare to total OPEC reserve . All exchange rate (forex rate) are relative to US dollar (US dollar/ local currency).All variables in log form.

Data Visualization

Table: 4.2.1 Descriptive statistics during COVID-19

| Financial Markets	Mean	Minimum	Maximum	Kurtosis	Skewness
World Crude oil price	1.3872354	–2.0000000	1.6737579	52.2805602	–6.8418819
Stock Index Iraq	2.6487752	2.6083763	2.7414983	3.2342187	1.4190833
Stock Index Kuwait	1.9849600	1.9389698	2.0716243	3.1586074	1.5984654
Stock Index Saudi Arabia	2.9766749	2.9109497	3.0149445	–0.8368245	–0.4561261
Stock Index United Arab Emirates	3.6105573	3.5215761	3.6818000	0.9466859	–0.5343431

It is evident from the table that oil price having higher kurtosis and negatively skewed.it means oil price data is not normally distributed. Iraq and Kuwait having positively skewed data while Saudi Arabia and UAE having negatively skewed data.

Data Visualization

During Covid-19 Stock Indices
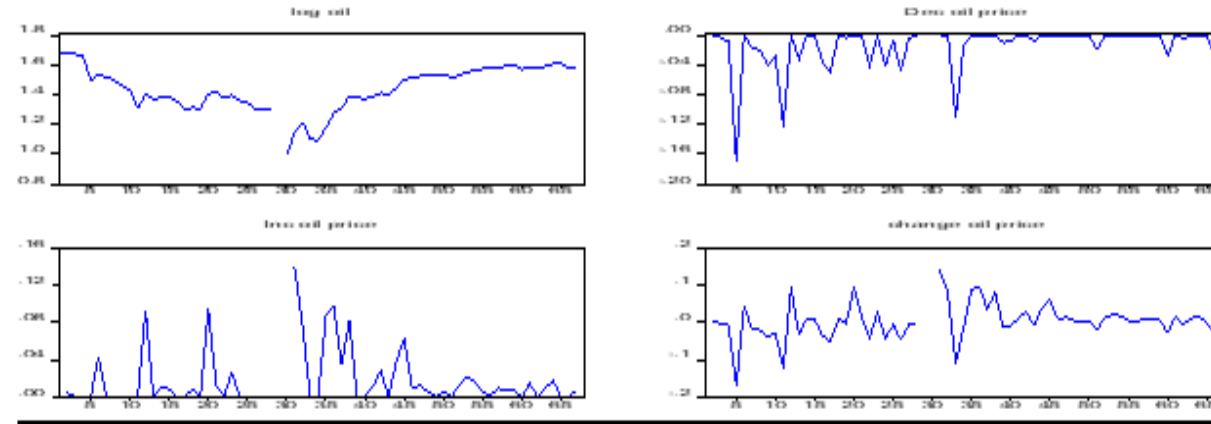
Before Covid-19 Stock Indices
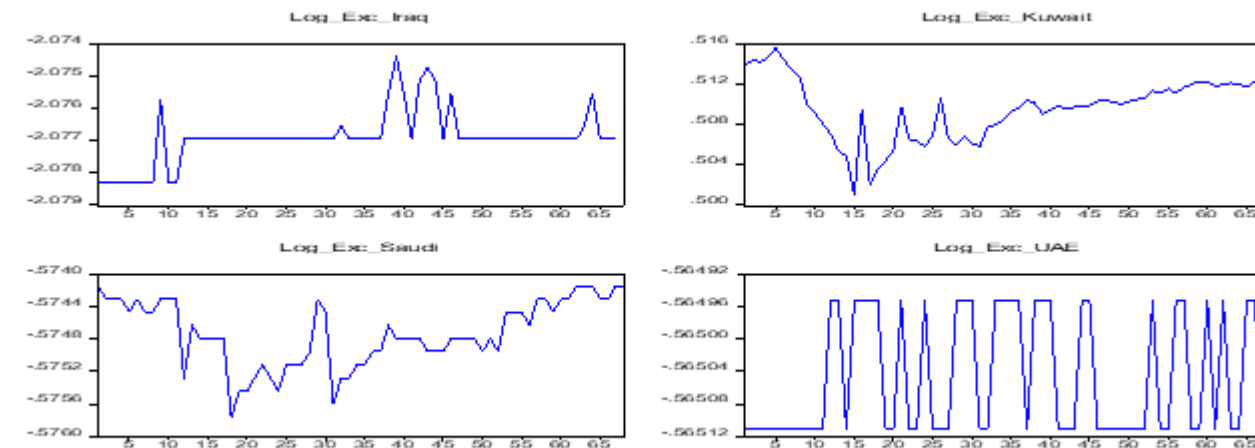
Findings

Due to oil price shocks different OPEC markets behave differently. Mostly oil price shocks impact OPEC indices negatively and adversely affect the exchange rate.

To check association among variables, It was empirically analyzed by VAR that Lag value of index influence the current index value. Moreover, lag oil of oil influence the current value of oil. In case of Iraq and Saudi Arabia lag oil price has influence on current stock index.

By employing IRF, Stock index of Iraq decrease due to oil shocks and exchange rate first constant that having negative values due to oil shocks. Stock index also respond negatively due to exchange rate during COVID-19 period.

In case of Kuwait, stock index and exchange rate shows cyclical increasing and decreasing trend due to oil price shocks. While same trend of index can be seen in respond to exchange rate shocks. The relatively weak response in the exchange rate can partly be understood by the quick policy tightening in term of pegging the exchange abroad following the same oil price shock.

Findings

In case of Saudi Arabia, major oil exporter in Middle East. Firstly Stock index decrease and then becoming negative due to oil price shocks. Initially exchange rate increased but after 2nd period start decreasing in response to oil price shocks. While Saudi index shows decreasing trend in case of exchange rate shocks.

In Variance decomposition analysis, 10 day forecast period is selected as it is daily data. Starting period shows short run while after 5 days it is consider as long run. In the long run , about 15 % of the variance in the forecast error of stock index of Iraq seems to be explained by a unit shock oil price. Above 45% of the variance in the forecast error of oil price seems to be explained by a unit shock stock index.
In case of Saudi Arabia, In the long run, about 45% of the variance in the forecast error of oil price seems to be explained by a unit shock stock index. About 5% of the variance in the forecast error of exchange rate seems to be explained by a unit oil price. In case of UAE, In the long run, about 5% of the variance in the forecast error of stock index seems to be explained by a unit shock in oil price.

Conclusion

This paper analyses the effect of oil price before and during COVID-19 on exchange rate and stock indices of OPEC nations. From VAR, it is evident that in both periods lag price of oil effect the current oil price, while lag price of index affect the current index price. Before outbreak the oil price influence the stock index of Iraq and Saudi Arabia positively. From IRF, in all countries, before pandemic oil price influence positively to indices. During pandemic oil price shock affect negatively especially severely affect Saudi Arabia, as it is largest oil exporter in OPEC.

This is supported by Albulescu ,(2020) as the infection increases that leads significant decline in stock market returns. This phenomenon is explained by "Dutch Disease". When there is decrease in oil price, that leads less revenue for the oil exporting countries (Riman,2013).From IRF, it was deduced that in all countries exchange rate decrease due oil price shocks. Decrease in exchange rate further influence the economy badly, this makes appreciation in exchange rate, make export less competitive and enhance the import. Increase in imports compare to export cause decline in balance in payments hence decrease the foreign revenue that leads decrease in stock prices supported by Adebiyi et al.,(2009).

Recommendations

This study focus on sensitivity of Middle East stock indices due to oil price change during pandemic. This study will be helpful for the international investors who are willing to buy and sell the stock in OPEC Middle East indices by managing their portfolios. This study also beneficial for domestic investor, to have understanding of relationship between crude oil and stock price before and during COVID-19 for sake of investment in OPEC markets.

Drawback of the study

- ✓ Due to lack of data, less countries are included in the study .
- ✓ Duration of study can be increased.
- ✓ More macroeconomic variables can be added.
- ✓ Volatility in stock market can be studied.