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IMPACT OF OIL PRICES ON BOURSA KUWAIT

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Abstract

Given Kuwait's economic dependency on oil exports, analyzing the effects of oil prices fluctuations on the emerging Boursa Kuwait is crucial. The main purpose of this study is to investigate the long-run and short-run relationships between Kuwait's oil prices and Boursa Kuwait's performance utilizing recent data of the premier index, which was established in 2018. After applying the stationarity tests on the daily data from 2018 to 2022, the empirical Johansen's cointegration method revealed the absence of long-run relationship between oil prices and stock market returns when an optimal lag two of the Schwarz information criterion was used. In the short term, the autoregressive model showed that oil prices' past lag can predict the Kuwait's oil prices and premier index, whereas the past lag values of the premier index can predict the premier index but not oil prices. The vector autoregressive coefficients in the short-run findings is that the capital market policymakers may need to revise their financial strategies by observing Kuwait's oil production, which affects the economy and the performance of the listed companies in Boursa Kuwait. Moreover, portfolio managers may need to revise their hedging investment policies based on the effect of oil prices.

Keywords: Oil Prices, Bourse Kuwait, Premier Index, Index Prices, Cointegration, VAR

JEL Classifications: G1, G11, G15, G20

1. Introduction

Many studies have investigated the connection between changes in oil prices and stock market performance. While some have shown that oil price shocks influence listed companies' expected earnings (Jones and Kaul, 1996), others have demonstrated that the effects of oil price changes on stock markets differ across oil-exporting and oil-importing states (Bouoiyour *et al.* 2017).

Oil exports comprise a sizable share of Kuwait's economy. In 1938, Kuwait's first oil well was drilled in the Burgan Oil Field by the Kuwait Petroleum Company, beginning the Kuwaiti economy's shift toward dependency on the oil sector. Commercial crude oil exports from Burgan began in 1946. In 1960, Kuwait became a founding member of the Organisation of the Petroleum Exporting Countries, and ranked fourth among the member countries in terms of daily oil production in 2021 (The Organisation of the Petroleum Countries, n.d.). In 2022, Kuwait's oil revenue was 16,217 million Kuwaiti dinars, representing 87% of total government revenue (Central Bank of Kuwait, 2022). Nevertheless, the Kuwaiti government is planning to diversify its sources of income from non-oil sectors (Council of Ministers General Secretariat, n.d.).

In 2018, Boursa Kuwait's new private ownership introduced the premier index to represent listed companies that meet the highest requirements, that is, companies with high liquidity, market capitalisations above 78 million Kuwaiti dinars (for the past two years), and at least two years of operations before being listed on Boursa Kuwait. Additionally, Boursa Kuwait index was amalgamated with several other indices.

The impact of oil price fluctuations in developed markets have always been a significant research area. Recently, this topic has gained increased attention among researchers, particularly concerning major oil-exporting countries like Kuwait. Hence, the aim of this study of is to measure the effects of Kuwait oil prices on Boursa Kuwait return by applying Vector autoregression (VAR) model by using both Boursa Kuwait and Kuwait's daily oil prices from 2018 to 2022. The result should be of a significance to capital market policy makers and investors.

This paper is organised as follows: Section 2 presents the literature review pertinent to this study, Section 3 outlines the data and methodologies used, whereas Section 4 discusses the results and findings. Finally, Section 5 concludes this paper.

2. Literature review

Studies on the relationship between oil price changes and stock markets in developed economies have revealed that changes in oil prices can have both favourable and unfavourable effects on stock market performance. Studies presenting a favourable relationship include El-Sharif *et al.* (2005), Cong *et al.* (2008), Filis *et al.* (2011), Nath Sahu *et al.* (2014), and Fang *et al.* (2018). Meanwhile, scholars such as Jones and Kaul (1996), Miller and Ratti (2009), Saif Ghouri (2006), Chen (2010), Bhat *et al.* (2014), and Aye (2015), reported an unfavourable relationship. Basher *et al.* (2012) investigated the link between oil prices and emerging stock markets by applying a VAR model using monthly data from 1988 to 2008. They found that positive oil price shocks were negatively related to emerging stock market prices. Using VAR on monthly data from 1986 to 2005, Park and Ratti (2008) found a significant impact of crude oil prices on the stock returns of oil-exporting countries. Meanwhile, Marashdeh and Afandi (2017) concluded that the nature of the impact depended on whether a country was oil-importing or oil-exporting. Gil-Alana and Yaya (2014) found a positive relationship between crude oil prices and the Nigerian stock market's All-Share Index and reported that oil price increases improved Nigeria's income.

Using daily data from 3 January 2000 to 9 December 2015, Kisswani and Elian (2017) applied a nonlinear cointegration methodology to examine the asymmetric long-run dynamics between the Brent and West Texas Intermediate nominal spot crude oil prices and the sectoral indices of the Kuwait stock market; they found long-run relationships between oil prices and Kuwaiti stock market sectors' indices. Azar and Basmajian (2013) used Kuwaiti and Saudi markets' daily data from 2012 to 2018 and the generalised autoregressive conditional heteroskedasticity model; after including independent variables of regional and American stock market effects, the oil prices did not affect the Kuwaiti market. Alshihab and Alshammari (2020) applied an error correction model to Kuwait's market monthly data from 2000 to 2020 and found a long-run effect of macroeconomic factors on stock market returns; in addition, oil price changes only had a short-run effect on stock market returns. In contrast, we applied a linear VAR model to the daily data of Boursa Kuwait's premium index and Kuwait's oil prices.

Sharma *et al.* (2018) investigated the link between crude oil future prices, the Nifty index, and the energy index in the Indian stock market using weekly data from 2010 to 2017; no long-run link was evident between the variables, and their VAR model indicated that the energy index could be interpreted using the independent variables of oil prices and the Nifty index. Using daily data from 2000 to 2017 and applying a VAR methodology, Rahman (2020) investigated the link between oil prices and the Saudi stock market. The researcher found a long-run positive association between crude oil prices and stock market index prices but no short-run association. Alamgir and Amin (2021) used monthly data from four South Asian countries (Bangladesh, India, Pakistan, and Sri Lanka) from 1997 to 2018 and a nonlinear autoregressive distributed lag model to examine the relationship between world oil prices and the stock market indices of these countries; they reported a positive relationship between oil prices and related markets. Moreover, by employing the SVAR model on the monthly data from 1999 to 2019, Alharbi (2023) found a positive relationship between oil price shocks and Saudi Stock Market returns, which tends to be higher over time. In addition, Bouri *et al*. (2023) demonstrated that the impact of oil implied volatility on the Gulf Cooperation Council (GCC) stocks variation was slightly higher during the COVID-19 and more notable during bull markets.

3. Data and methodology

This study used a VAR model to examine the linkages between oil prices and Boursa Kuwait. For longer observations, daily data were chosen. The data for Kuwait's oil prices and Boursa Kuwait's premier index were observed from January 2018 to March 2022, and obtained from Boursa Kuwait's website. The EViews 10 software was used for statistical analysis.

The premier index consists of 31 companies listed on Boursa Kuwait with large market capitalisations and high liquidity. [1] VAR variables are explained by their own lagged variables.

The closing premium index prices and Kuwait's oil prices are in local currency, and the rate of return is calculated as the logarithm of successive prices to avoid non-stationarity in index and oil prices raw data as shown in Equation (1).

$$Rt = Ln\,(Pt\,/\,Pt-1)\times 100 \qquad (1)$$

where Rt is the premier index or oil prices' rate of return, Pt is either of the current prices, and $Pt-1$ is either of yesterday's prices. The means, standard deviations, skewness, kurtosis, and normality test of Jarque–Bera are presented in the Results section. The stationarity of the two variables was confirmed with a unit root test; subsequently, the VAR model was examined.

3.1. Unit root test

In the absence of a unit root property, a variable's time series data is considered stationary. To measure data stationarity, we used the augmented Dickey–Fuller (Dickey and Fuller, 1979) [2] and Phillips–Perron (Phillips and Perron, 1988) [3] unit root tests, which are widely applied. Selection of lag criterion and testing cointegration were applied to determine the use of the VAR model, as described below.

3.2. Lag selection

The final prediction error, Akaike information criterion, Schwarz information criterion, and Hannan–Quinn information criterion are the most common lag selection criteria used in the literature. The symmetric lag model of Schwarz (1978) information criterion [4] was used to determine the appropriate lag for the VAR model in this study.

3.3. Johansen Cointegration Test

The Johansen cointegration test (Johansen, 1988) [5] was used to specify the long-run relationship between the investigated variables if their time series were non-stationary. The test measures the causality direction between Kuwait oil prices and the premier index of Boursa Kuwait using daily data. It provides two statistics—trace and maximum eigenvalues—to specify the cointegrating vectors number showing the presence of a long-run relationship between Kuwait's oil prices and

[1] For more details, see: https://www.boursakuwait.com.kw/ar/
[2] Dickey-Fuller's (1979) equation was used.
[3] Phillips-Perron's (1988) equation was used.
[4] Schwarz's (1978) equation was used.
[5] As Johansen's (1988) methodology is widely used and well known among the scientific community, it is unnecessary to detail it here.

the premier index.

3.4. Vector Autoregressive Model

VAR models significantly identify and predict the dynamic behaviour of economic and financial time series data. Sims (1980) proposed a VAR model to deal with each variable as a linear operation of its own lagged value and as linear operations of all different variables' lagged values (if the data are stationary). As the values of trace and maximum eigenvalues showed no cointegration vector, this study employed an unrestricted VAR model to measure the link between Kuwait's oil prices and the premier index for the daily data from January 2018 to March 2022. The information transmission speed among the system variables was tested to understand the effective nature of the relationship between Kuwait's oil prices and Boursa Kuwait premier index. Generally, the mathematical representation of the VAR model is provided in Equation 2, where y_t is the variables matrix, a_0 is the intercepts matrix, and a_0 and $\in_t$ are the variables coefficients and residual white noise matrices, respectively.

$$y_t = a_0 + \sum_{i=1}^{N} a_t \, y_{t-1} + \in_t \tag{2}$$

From Equation 2, Kuwait's oil prices are mathematically represented in Equation 3, where C denotes the coefficient that determine the influence of the lagged variable as follows:

$$\begin{aligned} Kuwait's\ Oil\ Prices &= C(1) \times Kuwait's\ Oil\ Prices(-1) + C(2) \times Kuwait's\ Oil\ Prices(-2) \\ &+ C(3) \times Premier\ Index(-1) + C(4) \times Premier\ Index(-2) + C(5) \end{aligned} \tag{3}$$

Similarly, Equation 4 variables estimates the premier index. These equations were employed in Eviews10 software to obtain the findings of this study.

$$\begin{aligned} Premier\ Index &= C(6) \times Kuwait's\ Oil\ Prices(-1) + C(7) \times Kuwait's\ Oil\ Prices(-2) \\ &+ C(8) \times Premier\ Index(-1) + C(9) \times Premier\ Index(-2) + C(10) \end{aligned} \tag{4}$$

4. Results and Discussion

This section presents the summary statistics, stationarity tests results, lag selection criteria results, cointegration test results, and VAR model results. Table 1 lists the summary statistics. The mean daily returns of Kuwait's oil prices and premier index were positive. The standard deviation (0.271) of daily oil returns reflects the fluctuations in these prices during the COVID-19 period (2020–2021). The standard deviation (0.189) of the returns of the premier index value is less volatile than that of the returns of Kuwait's oil prices. The values of 0 for skewness and 3 for kurtosis mean that these values are not normally distributed. The Jarque–Bera test was used to check the normality of the return on the two variables; the resulting probability value was 0.00, disproving daily data normality.

Removing the unit root from the data required differencing the data. Table 2 presents the two variables' stationarity results based on the augmented Dickey–Fuller and Philips–Perron tests; the first differenced series was chosen and the results at the 1% level show the data to be stationary. The Schwarz information criterion results in Table 3 yielded a lag order of 2 as an optimal length for VAR model, which is in line with the results for the sequential modified likelihood-ratio test statistic and the Hannan–Quinn information criterion.

Table 1. Daily statistics for Kuwait's oil prices and premier index during 2018–2022

Variables	Kuwait Oil Prices	Premier Index
Mean	3.966405	8.622641
Median	3.981362	8.587232
Maximum	4.525152	9.111780
Minimum	2.203869	8.276568
Standard deviation	0.270913	0.189744
Skewness	−1.289792	0.328231
Kurtosis	6.841459	2.245944
Jarque–Bera	1372.985	64.09569
Probability	0.000000	0.000000
Sum	6104.297	13270.25
Sum squared deviation	112.8799	55.37223

Table 2. Results of the unit roots tests

Method	Statistic	Prob.**
Augmented Dickey–Fuller–Fisher's exact chi-square	190.754	0.0000
Philips–Perron–Fisher's exact chi-square	191.268	0.0000

Table 3. Lag order selection criteria for the VAR model

Lag	LogL	LR	FPE	AIC	SIC	HQ
0	473.4278	NA	0.001850	−0.616649	−0.609674	−0.614053
1	8144.833	15312.71	8.16e-08	−10.64596	−10.62503	−10.63817
2	8164.249	38.70524*	7.99e-08	−10.66612	−10.63125*	−10.65314*
3	8168.763	8.986221	7.99e-08*	−10.66679*	−10.61797	−10.64862
4	8170.215	2.886926	8.02e-08	−10.66346	−10.60069	−10.64010
5	8172.959	5.447572	8.03e-08	−10.66182	−10.58509	−10.63326

Note: * Indicates the lag order selected by the Schwarz information criterion. AIC: Akaike information criterion; FPE: final prediction error; HQ: Hannan–Quinn information criterion; LR: sequential modified likelihood-ratio test statistic (each test at the 5% level); SIC: Schwarz information criterion.

After confirming data stationarity, we conducted the Johansen cointegration test. The results, presented in Table 4, showed no cointegrating relationship between Kuwait's oil prices and the premier index, as indicated by the statistics of maximum eigenvalue and trace test. Therefore, these two time series variables had no long-run relationship, implying that one variable could not be forecast based on the other, which hindered the application of a vector error correction model.

An unrestricted VAR model was used to examine the presence of a short-run relationship and the interaction between these two variables. To assess how the independent variables' previous values described the dependent variables, the lag values of the former two were considered. Table 5 shows the VAR model results for the two variables (rows: independent variables; columns: dependent variables), revealing that Kuwait's oil prices were an outcome of their own lag value, $Kuwait's\ oil\ prices\ (-1)$. The premier index prices were also the outcome of their own lag values, $premier\ index\ (-1)$ and $premier\ index\ (-2)$, apart from the previous lag values, $Kuwait's\ oil\ prices\ (-1)$ and $Kuwait's\ oil\ prices\ (-2)$. Therefore, Kuwait's oil prices remained unaffected by the premier index's previous lag values. In the current study, the premier index was affected by oil prices' past values, indicating the expected short-run influence of Kuwait's oil prices on the premier index. The VAR model fit is also shown in Table 5, where adjusted R^2 values for the two equations exceeded 98%.

This short-run effect of oil prices on the Kuwait stock market is similar to the results of Alshihab and Alshammari (2020), who found Kuwait's stock market changes are affected by the changes of oil prices on the short term and the result of Alqattan and Alhayky (2016), who found a positive effect of the oil price fluctuations varying among the GCC stock markets. Moreover, this study's findings are consistent with Cheikh *et al.* (2021) results, where Boursa Kuwait responds asymmetrically to rising and falling oil prices, unlike the stock markets in Oman, Qatar, and Saudi Arabia, which are particularly sensitive only to declines in oil prices.

In addition, the findings of this study indicate that Kuwait's oil prices are unaffected by the premier index of Boursa Kuwait, aligning with the conclusions of Echchabi and Azouzi (2017), who show that Oman oil prices are unaffected by the Muscat Securities Market index.

Table 4. Cointegration statistics results

Unrestricted cointegration rank test (trace)				
Hypothesised		**Trace**	**0.05**	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.*
None	0.007110	10.98977	15.49471	0.2121
At most 1	3.32E-05	0.050970	3.841466	0.8214
Unrestricted cointegration rank test (maximum eigenvalue)				
Hypothesised		**Max-Eigen**	**0.05**	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.*
None	0.007110	10.93880	14.26460	0.1573
At most 1	3.32E-05	0.050970	3.841466	0.8214

Note: * Indicates that the trace test shows no cointegration at the 0.05 level. The max-eigenvalue test indicates no cointegration at the 0.05 level. Trend assumption: Linear deterministic trend. Series: CRUDE OIL PRICES, PREMIER INDEX. Lags interval (in first differences): 1 to 2.

Table 5. Results of the vector autoregressive model

	Crude oil prices	**Premier index**
CRUDE OIL PRICES (−1)	1.015863	0.017693
	(0.02433)	(0.00789)
	[41.7544]	[2.24339]
	0.0000*	0.0353*
CRUDEOIL PRICES (−2)	−0.028215	−0.016742
	(0.02403)	(0.00779)
	[−1.17410]	[−2.14913]
	0.2404	0.0420**
PREMIER INDEX (−1)	−0.044550	1.154080
	(0.07783)	(0.02523)
	[−0.57243]	[45.7447]
	0,5671	0.0000*
PREMIER INDEX (−2)	0.054689	−0.154817
	(0.07795)	(0.02527)
	[0.70158]	[−6.12665]
	0.4830	0.0000*
C	−0.037640	0.002933
	(0.03558)	(0.01153)
	[−1.05796]	[0.25435]
	0.2902	0.8106
R^2	0.987087	0.997357
Adjusted R^2	0.987054	0.997350
Sum square residuals	1.390447	0.146117
Standard error equation	0.030146	0.009772
F-statistic	29239.69	144345.4
Log likelihood	3199.541	4928.698
Akaike information criterion	−4.162268	−6.415241
Schwarz information criterion	−4.144886	−6.397859
Mean dependent	3.968914	8.622967
Standard deviation dependent	0.264946	0.189845
Durbin–Watson stat	2.0643	1.9881
Determinant residual covariance	8.68E-08	
Determinant residual covariance	8.62E-08	
Log likelihood	8128.244	
Akaike information criterion	−10.57752	
Schwarz information criterion	−10.54275	
Number of coefficients	10	

Table 5. Continued

Values obtained using Equation 3			
R^2	0.987087	Mean dependent variable	3.968914
Adjusted R^2	0.987054	Std. deviation dependent variable	0.264946
Std. error of regression	0.030146	Sum squared residual	1.390447
Durbin–Watson stat	2.064317		
Table 7. Values obtained using Equation 4			
R^2	0.997352	Mean dependent variable	8.622934
Adjusted R^2	0.997345	Std. dev. dependent variable	0.189787
Std. error of regression	0.009780	Sum squared residual	0.146429
Durbin–Watson stat	1.988191		

Note: * Indicates significant at the 1% level; ** significant at the 5% level.

Therefore, the findings showed the lack of a long-run influence of Kuwait's changing oil prices on Boursa Kuwait's stock market performance, in contrast to the presence of a short-run influence. This evidence of the two variables' short-run relationship provides an opportunity to engage in stock market portfolio hedging against rising or falling prices of oil, as indicated by VAR coefficients' positive and negative signs. Policymakers should track changes in oil production and their effects on stock market performance in the short-term by evaluating stock market prices when they remarkably increase or decrease in response to oil prices.

It is also worth noting that the study period includes the COVID-19 period from 2020 to 2021. It is important to have a normal period for the purpose of comparing the results with those obtained during this period.

5. Conclusion

The findings revealed that there is room to improve the predictability of the premier index by including lags of Kuwait's oil prices. Notably, the findings suggest that portfolio managers should consider the short-term effects of Kuwait's oil prices on Boursa Kuwait when formulating their hedging policies on both the buy and sell sides. They can do so by monitoring VAR coefficients to identify significant sign changes in these prices. Similarly, Kuwait's oil prices have implications for capital market policymakers: they should remember that Boursa Kuwait's performance is affected by changes in oil production and prices when assigning government revenue and total government spending.

This study contributes to existing empirical academic studies on Boursa Kuwait by investigating the relationship between oil prices and the premier index. However, the study is limited in that the results were derived from the period between 2018 and 2022 which includes COVID-19 period; future studies could examine the subsequent normal period to compare with this result. Additionally, this analysis could be extended in the future to include Boursa Kuwait's other main indexes and sectoral indices to investigate the long- and short-run effects of Kuwait's oil prices. A comparison with other stock markets in the region may also reveal how such markets are affected by oil prices in the long and short runs.

References

Alamgir, F. and Amin, S. B., 2021. The nexus between oil price and stock market: evidence from South Asia. *Energy Reports,* 7, pp. 693-703. https://doi.org/10.1016/j.egyr.2021.01.027

Alqattan, A. and Alhayky, A., 2016. Impact of oil prices on stock markets: evidence from Gulf Cooperation Council (GCC) financial markets. *Amity Journal of Finance*, 1, pp. 1-8.

Alharbi, A. M., 2023. Oil shocks, monetary policy, and stock returns: a case oil-based economy. *International Journal of Energy Economics and Policy*, 13(6), 56-63. https://doi.org/10.32479/ijeep.13624

Alshihab, S. and Alshammari, N., 2020. Are Kuwaiti stock returns affected by fluctuations in oil prices? *International Journal of Financial Research*, 11(6), pp. 1-9. https://doi.org/10.5430/ijfr.v11n6p1

Aye, G. C., 2015. Does oil price uncertainty matter for stock returns in South Africa? *Investment Management and Financial Innovations*, 12, pp. 179-188.

Azar, S. A. and Basmajian, L., 2013. Oil prices and the Kuwaiti and the Saudi Stock markets: the contrast. *International Journal of Economics and Finance*, 3, pp. 294-304.

Basher, S. A., Haug, A. A., and Sadorsky, P., 2012. Oil prices, exchange rates and emerging stock markets. *Energy Economics*, 34(1), pp. 227-240. https://doi.org/10.1016/j.eneco.2011.10.005

Bhat, S. A., Nain, Z., and Kamaiah, B., 2014. Linear and nonlinear causal nexus between oil price changes and stock returns in India: an empirical assessment. *IUP Journal of Applied Economics*, 13, p. 27.

Bouoiyour, J., Selmi, R., Shahzad, S. J. H., and Shahbaz, M., 2017. Response of stock returns to oil price shocks: evidence from oil importing and exporting countries. *Journal of Economic Integration*, 32(4), pp. 913-936. https://doi.org/10.11130/jei.2017.32.4.913

Bouri, E., Hammoud, R., and Abou Kassm, C., 2023. The effect of oil implied volatility and geopolitical risk on GCC stock sectors under various market conditions. *Energy Economics*, *120*, p.106617. https://doi.org/10.1016/j.eneco.2023.106617

Cheikh, N. B., Naceur, S.B., Kanaan, O. and Rault, C., 2021. Investigating the asymmetric impact of oil prices on GCC stock markets. *Economic Modelling*, *102*, p.105589. https://doi.org/10.1016/j.econmod.2021.105589

Central Bank of Kuwait, 2022. *Economic Report*, [online] Available at: <https://www.cbk.gov.kw/en/statistics-and-publication/annual-publications/economic-reports> [Accessed on 20 May 2024].

Chen, S.-S., 2010. Do higher oil prices push the stock market into bear territory? *Energy Economics*, 32(2), pp. 490-495. https://doi.org/10.1016/j.eneco.2009.08.018

Cong, R., Wei, Y.-M. W., Jiao, J. L., and Fan, Y., 2008. Relationships between oil price shocks and stock market: an empirical analysis from China. *Energy Policy*, 36(9), pp. 3544-3553. https://doi.org/10.1016/j.enpol.2008.06.006

Council of Ministers General Secretariat, n.d. *Main Website*. [online] Available at: <https://www.cmgs.gov.kw> [Accessed on 20 May 2024].

Dickey, D. A. and Fuller, W. A., 1979. Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366a), pp. 427-431. https://doi.org/10.1080/01621459.1979.10482531

Echchabi, A. and Azouzi, D., 2017. Oil price fluctuations and stock market movements: an application in Oman. *Journal of Asian Finance, Economics and Business*, 4(2), pp. 19-23. https://doi.org/10.13106/jafeb.2017.vol4.no2.1

El-Sharif, I., Brown, D., Burton, B., Nixon, B., and Russell, A., 2005. Evidence on the nature and extent of the relationship between oil prices and equity values in the UK. *Energy Economics*, 27(6), pp. 819-830. https://doi.org/10.1016/j.eneco.2005.09.002

Fang, S., Lu, X., and Egan, P. G., 2018. Reinvestigating the oil price–stock market nexus: evidence from Chinese industry stock returns. *China and World Economy*, 26(3), pp. 43-62. https://doi.org/10.1111/cwe.12242

Filis, G., Degiannakis, S., and Floros, C., 2011. Dynamic correlation between stock market and oil prices: the case of oil-importing and oil-exporting countries. *International Review of Financial Analysis*, 20(3), pp. 152-164. https://doi.org/10.1016/j.irfa.2011.02.014

Gil-Alana, L. A. and Yaya, O. S., 2014. The relationship between oil prices and the Nigerian stock market. an analysis based on fractional integration and cointegration. Energy Economics, 46, pp. 328-333. https://doi.org/10.1016/j.eneco.2014.10.001

Johansen, S., 1988. Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, 12(2-3), pp. 231-254. https://doi.org/10.1016/0165-1889(88)90041-3

Jones, C. M. and Kaul, G., 1996. Oil and the stock markets. *Journal of Finance*, 51(2), pp. 463-491. https://doi.org/10.1111/j.1540-6261.1996.tb02691.x

Kisswani, K. M. and Elian, M. I., 2017. *Do oil prices affect Kuwait sectoral stock prices? non-linear cointegration evidence*. Working Paper No. 1141.Economic Research Forum.

Marashdeh, H. and Afandi, A., 2017. Oil price shocks and stock market returns in the three largest oil-producing countries. *International Journal of Energy Economics and Policy*, 7, pp. 312-322.

Miller, J. I. and Ratti, R. A., 2009. Crude oil and stock markets: stability, instability, and bubbles. *Energy Economics*, 31(4), pp. 559-568. https://doi.org/10.1016/j.eneco.2009.01.009

Nath Sahu, T., Bandopadhyay, K., and Mondal, D., 2014. An empirical study on the dynamic relationship between oil prices and Indian stock market. *Managerial Finance*, 40(2), pp. 200-215. https://doi.org/10.1108/MF-06-2013-0131

Park, J. and Ratti, R. A., 2008. Oil price shocks and stock markets in the U.S. and 13 European countries. *Energy Economics*, 30(5), pp. 2587-2608. https://doi.org/10.1016/j.eneco.2008.04.003

Phillips, P. C. B. and Perron, P., 1988. Testing for a unit root in time series regression. *Biometrika*, 75(2), pp. 335-346. https://doi.org/10.1093/biomet/75.2.335

Rahman, A., 2020. Long run association of stock prices and crude oil prices: evidence from Saudi Arabia. *International Journal of Energy Economics and Policy,* 10(2), pp. 124-131. https://doi.org/10.32479/ijeep.8881

Saif Ghouri, S., 2006. Assessment of the relationship between oil prices and US oil stocks. *Energy Policy*, 34(17), pp. 3327-3333. https://doi.org/10.1016/j.enpol.2005.07.007

Schwarz, G., 1978. Estimating the dimension of a model. *Annals of Statistics*, 6(2), pp. 461-464. https://doi.org/10.1214/aos/1176344136

Sharma, A., Giri, S., Vardhan, H., Surange, S., Shetty, R., and Shetty, V., 2018. Relationship between crude oil prices and stock market: evidence from India. *International Journal of Energy Economics and Policy*, 8(4), pp. 331-337.

Sims, C. A., 1980. Macroeconomics and reality. *Econometrica*, 48(1), pp. 1-48. https://doi.org/10.2307/1912017

The Organisation of the Petroleum Countries, n.d. *Member Countries,* [online] Available at: <https://www.opec.org/opec_web/en/about_us/25.htm> [Accessed on 20 May 2024].