SAUDI CRUDE OIL AND THE GCC STOCK MARKETS: EFFECT OF COVID-19 OUTBREAK?

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Abstract:

This study aims to explore the dynamic connections between Saudi crude oil prices and GCC (Gulf Cooperation Council) equity markets during the COVID-19 outbreak. To represent the Saudi oil market, we utilize the Saudi Aramco share price, while the equity markets of GCC economies are approximated using the DFM General Equity, MSCI Qatar Equity, Kuwait Main Market 50, MSCI Oman Equity, and Bahrain All Share Equity indices, respectively. The data used in our analysis spans from December 31, 2019, to July 31, 2022. The empirical findings of our research indicate that there is no discernible relationship between Saudi crude oil and the Bahrain equity market, both in the short and long term. However, for the other markets examined, we observe a mix of linkages in both the short and long run. Furthermore, our study reveals that the Oman stock market exhibits the most significant influence on the observed dynamics, while the Bahrain equity market appears to be the most responsive to external shocks.

Keywords:

Crude oil, GCC economy, COVID-19, Stock markets.

1. INTRODUCTION

Saudi Arabia, as the world's second-largest exporter of crude oil, naturally holds a significant role in shaping the dynamic interconnections and spillover effects within the consortium of six Middle Eastern nations known as the GCC. The price per barrel of crude oil experiences fluctuations globally, impacting economies across the board. The GCC has emerged as a crucial player in the world's rapidly growing economies and serves as a bridge linking the Eastern and Western segments of the global market (Hussain & Rehman, 2023).

In terms of oil reserves, Saudi Arabia boasts the largest, followed by Kuwait and the UAE, while Qatar possesses abundant gas reserves. Oman and Bahrain have relatively smaller reserves, with the UAE reporting a high rate of oil extraction from its reserves. According to an IMF working paper, the GCC collectively accounts for 34% of the world's oil exports, as reported by the US Energy Information Administration in 2018. Analysing the co-movements of crude oil with other markets can offer valuable insights into how the GCC's potential for diversifying its non-energy sectors can be harnessed through strategic investments to achieve sustainable economic growth.

Moreover, fluctuations in Saudi oil prices can significantly impact investors' portfolios, particularly those with exposure to assets influenced by oil prices, such as energy sector stocks, given oil's pivotal role as a global commodity. In such cases, diversification across various asset categories, particularly non-energy sectors and cross-border economies, becomes crucial for investors to hedge against volatility. Rising oil prices can benefit commodity investments, while declining prices can have adverse effects (Hussain & Rehman, 2023).

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It's worth noting that oil price fluctuations can also affect the exchange rates of currencies in oil-exporting countries, potentially impacting the returns on foreign investments denominated in those currencies. Additionally, one of the critical impacts of crude oil price movements is on inflation expectations, which, in turn, can influence interest rates. If rising oil prices contribute to expectations of higher inflation, central banks may respond by raising interest rates. In summary, the reactions in Saudi Arabian crude oil prices can have ripple effects on the stock markets of GCC economies.

2. RESEARCH OBJECTIVE

The primary aim of this research is to examine and assess how changes in the price of Saudi crude oil impact the stock markets in the GCC countries. Analysing the evolving relationships between oil and equity markets offers valuable insights for implementing a range of policies, including strategies for investments, portfolio management, risk reduction through diversification, hedging, and informed policymaking. This study seeks to address the following key research inquiries:

- Is there a transfer of volatility from Saudi crude oil to the GCC stock markets during the COVID-19 crisis, and if so, what is the extent of this transfer?
- Does the dynamic connection of volatility among these markets change as we shift from the short-term to the medium-term and from the medium-term to the long-term?

This research paper explores the transmission of crude oil effects to GCC equity markets, as represented by MSCI major equity indices.

It aims to provide insights into how COVID-19 has affected the evolving relationships between crude oil and equity markets. This investigation is conducted through a comprehensive battery of tests designed to assess their interconnectivity.

The results of the dynamic conditional correlation (DCC) analysis indicate that the Bahrain market remains distinct in that it does not exhibit spillovers from Saudi crude oil, neither in the short term nor in the long term. Notably, Saudi Aramco's crude oil plays a dominant role in these examined markets, serving as the most significant net transmitter of the associated shocks when compared to the network connections.

Furthermore, according to the model proposed by Barunik and Krehlik (2018), it is revealed that the medium -term time frame demonstrates the least degree of connectedness, while the long run exhibits the highest level of linkages among these markets.

3. LITERATURE REVIEW

We provide a summary of the current literature on prior research regarding the transmission or dynamic connections among different asset classes in Table 1:

Following an exhaustive analysis of relevant existing literature encompassing numerous variables, asset classes, economies, and markets, we have gained insights into how this study addresses the gap between prior research and the current state of knowledge. Our examination has revealed that there is a noticeable absence of studies focused on investigating the interconnections between the Saudi Arabian crude oil market and the remaining GCC equity markets during the period of the COVID-19 pandemic.

Table 1. Example of a numerated table.

Studies	Assets class / Markets	Data period	Methods	Findings
(Malhotra et al., 2023)	Commodity and financial market	February 24,2022- July 31,2022 (daily)	DCC GARCH, Diebold &Yilmaz (2012) and BK (2018)	Dynamic connectedness exists between agri based commodities and stock market of selected countries.
(Ouyang et al., 2023)	Global stock market	2006 – 2022 (Daily)	VAR & NARDL	Various impact at short medium and long-term cycles, majorly Asian market received highest risk.
(Yousaf et al., 2022)	Islamic stock, oil, gold, bond, and real estate in GCC	2004-2021 (Daily)	BEKK GARCH	Significant dynamic linkages between GCC stock returns and selected markets.
(Sarwar et al., 2020)	Crude Oil and Stock Market in Karachi, Shanghai, Bombay	1997-2014 (Daily)	BEKK GARCH	Bidirectional spillover in Karachi, unidirectional in case of Shanghai and mixed in case of Mumbai

Source: Author's.

Furthermore, this study extends the contributions made by previous research by categorizing the spillover effects, identifying major and minor net-receiving and net-transmitting economies across various timeframes, including the short, medium, and long term. Our research is poised to provide valuable insights for investors in navigating these interconnected markets during one of the most unprecedented global crises in history.

To investigate how the influence of the Saudi oil market extends to other GCC nations, we analyze daily logarithmic prices spanning from December 31, 2019, to July 31, 2022. For empirical analysis, we utilize the primary MSCI equity indices for each respective country, while for Saudi Arabia, we rely on the share price of Saudi Aramco as a proxy for movements in the Saudi oil price. The major equity indices representing the UAE, Qatar, Kuwait, Oman, and Bahrain are also included in our study. A detailed description of the constituent series can be found in Table 2 below:

4. RESULTS AND DISCUSSION

In this section, we provide descriptive statistics and present the empirical findings derived from the DCC (Dynamic Conditional Correlation) analysis, as well as the models proposed by Diebold and Yilmaz (2012) and Barunik and Krehlik (2018). Table 3 compiles essential elements of descriptive statistics. It is noteworthy that all series display positive average returns, except for the Kuwait equity market. The Omani market achieves the highest average return at 0.0009, while the UAE equity market exhibits the highest level of volatility. Each market under scrutiny demonstrates negative skewness and adheres to a leptokurtic distribution, confirming that the returns from these markets do not follow a normal distribution pattern. Furthermore, the Augmented Dickey-Fuller (ADF) test is applied to assess stationarity, revealing that each series is indeed stationary.

Table 2. Description of the selected equity indices of GCC countries.

Variables	Country	Indices	Source
Crude Oil	Saudi Arabia	Saudi Aramco	Bloomberg
DFM General Equity	UAE	DFMGI	
MSCI Qatar Equity	Qatar	MIQA00000PQA	
Kuwait Main Market 50	Kuwait	BMK50	
MSCI Oman Equity	Oman	MIOM00000POM	
Bahrain All Share Equity	Bahrain	BAX	

Source: Author's.

Table 3. Descriptive Statistics of examined markets.

Variables	Country	N	Min	Max	Mean	Std.Dev	Skewness	Kurtosis	ADF test
Saudi Aramco Crude Oil price	Saudi Arabia	467	-0.1518	0.0941	0.0001	0.0167	-2.4993	27.6354	0.000***
DFM General Equity	UAE	467	-1.2511	1.2470	0.0004	0.0861	-0.0947	186.6788	0.000***
MSCI Qatar Equity	Qatar	467	-1.2657	1.2603	0.0003	0.0839	-0.1159	216.7581	0.000***
BKP Kuwait Premier market	Kuwait	467	-0.2870	0.2523	-0.0001	0.0260	-3.6889	70.3045	0.0100**
MSCI Oman Equity	Oman	467	-0.2504	0.2648	0.0009	0.0220	-0.5496	86.8087	0.0000***
Bahrain All Share Equity	Bahrain	467	-0.0946	0.0426	0.0004	0.0090	-3.3727	32.8791	0.0050***

Source: Author's.

4.1. Diebold & Yilmaz (2012) model

While the DCC model helps us comprehend the short-term and long-term spillover within different asset classes, it does not provide insights into the extent or magnitude of this spillover effect, as noted by Yadav et al. in 2022. To address this aspect, we subsequently apply the Diebold & Yilmaz (2012) model to unravel this puzzle.

Table 4 displays the outcomes derived from the Diebold & Yilmaz (2012) model. In this table, "From" denotes the shock received from the network connection, while "To" signifies the transmission of the shock to the markets under examination. When considering the recipients of the shock, it is notable that the Bahrain equity market experiences the most significant shock or volatility (14.3%) from the network connection, followed by the Omani market (11.4%). In contrast, Saudi Aramco's crude oil demonstrates the lowest reception of the shock at 9.59%.

4.2. Barunik and Krehlik (2018) Model

The Diebold & Yilmaz (2012) model provides insights into the average connectedness, regardless of fluctuations in asset classes, which doesn't offer a precise depiction of the differing impact from one market to another. For a more comprehensive understanding of frequency-based connections across various timeframes, we utilize the Barunik and Krehlik (2018) model, as presented in Table 5. In this table, short-term, medium-term, and long-term connectedness.

Considering the observed connections across short, medium, and long-term periods, it becomes evident that investors and portfolio managers who hold diversified assets across various equity markets should carefully assess the spillover effects and interconnections. Because various factors exert influence differently at different times, markets react in distinct ways, resulting in time-varying linkages between them. Consequently, the extent of spillover may vary from the short term to the medium term and from the medium term to the long term.

Table 4. Results of Diebold & Yilmaz (2012) model.

	Saudi. Aramco	UAE	Qatar	Kuwait	Oman	Bahrain	FROM
Saudi Aramco	42.46	13.87	4.61	12.24	16.29	10.53	9.59
UAE	4.87	35.83	23.63	16.39	13.72	5.56	10.7
Qatar	12.46	35.5	41.86	0.87	4.09	5.22	9.69
Kuwait	14.56	10.68	0.87	40.25	28.6	5.04	9.96
Oman	26.29	13.65	2.88	14.92	31.6	10.66	11.4
Bahrain	23.66	13.76	2.56	21.17	24.87	13.99	14.3
TO	13.64	14.58	5.76	10.93	14.59	6.17	65.67
Net	4.04	3.88	-3.93	0.97	3.19	-8.16	

Source: Author's.

Table 5. Result of Barunik and Krehlik (2018).

	Saudi. Aramco	UAE	Qatar	Kuwait	Oman	Bahrain	FROM
Saudi Aramco	40.53	13.85	4.57	11.64	16.19	10.38	10.04
UAE	4.8	31.63	19.62	16.32	13.6	5.29	10.57
Qatar	12.21	26.3	31.78	0.84	3.86	4.69	8.49
Kuwait	13.65	10.63	0.86	38.88	28.38	4.54	10.29
Oman	26.19	13.59	2.82	14.9	31.56	10.63	12.07
Bahrain	23.58	13.68	2.54	21.13	24.66	13.95	15.17
TO	14.25	13.83	5.39	11.49	15.36	6.3	66.62
	Saudi Aramco	UAE	Qatar	Kuwait	Oman	Bahrain	FROM

Source: Author's.

According to the Barunik and Krehlik (2018) model, the medium term exhibits the least degree of interconnectedness at 50.38%, whereas the long run demonstrates the highest level of linkages at 66.62%. Therefore, investors may find it advantageous to manage their risk during the medium term, as overall linkage is lower during this period. These findings align with the conclusions drawn by Hussain and Rehman (2023).

5. CONCLUSION

Our findings provide answers to the research question, revealing that there is indeed a spillover effect from Saudi crude oil to the equity markets of the UAE, Qatar, and Kuwait, but this effect is only observed in the long run. Furthermore, the Oman market experiences spillover from Saudi crude oil in both the short run and the long run. In contrast, the Bahrain market stands out as it does not exhibit spillover effects from Saudi crude oil in either the short run or the long run.

In addition, our analysis shows that Saudi Aramco's crude oil and the equity markets of the UAE, Kuwait, and Oman serve as net transmitters of shocks, while the equity markets of Qatar and Oman act as net receivers of these shocks. Specifically, Saudi Aramco's crude oil plays a dominant role in the network connection as the largest transmitter of shocks.

Furthermore, according to the Barunik and Krehlik (2018) model, the medium term demonstrates the least level of interconnectedness at 50.38%, while the long run displays the highest degree of linkages at 66.62%. These findings align with the conclusions drawn by Hussain and Rehman (2023).

The empirical results offer policy implications across three dimensions: for investors, policy analysts, and portfolio managers. First, investors may base their investment decisions on the major MSCI equity indexes representing the core of the GCC economy and the critical commodity, crude oil, represented by the world's major oil exporter. Second, the Bahrain All Share Equity market appears to be a favourable option for diversification since it does not exhibit spillover connections with Saudi crude oil in both the short and long run. Third, investors or portfolio managers may consider diversifying their funds in the medium term, as the extent of spillover is lower than in the long run.

While this study delves into an examination of the spillover effects from Saudi crude oil to the stock markets of GCC economies, it is essential to acknowledge its limitations. Future research could expand its scope by considering other groups of economies such as MENA, MINT, Asian economies, and G7 nations. Furthermore, it could broaden its analysis by incorporating various asset classes, including non-renewable energy, renewable energy markets, and metal markets, among others.

6. LITERATURE

Hussain, M., Bashir, U. & Rehman, R.U. Exchange Rate and Stock Prices Volatility Connectedness and Spillover during Pandemic Induced-Crises: Evidence from BRICS Countries. Asia-Pac Financ Markets (2023). https://doi.org/10.1007/s10690-023-09411-0

Today in Energy, In 2018, the United States consumed more energy than ever before. https://www.eia.gov/todayinenergy/detail.php?id=39092 (accessed: December 2022).

Jozef Baruník, Tomáš Křehlík, Measuring the Frequency Dynamics of Financial Connectedness and Systemic Risk, Journal of Financial Econometrics, Volume 16, Issue 2, Spring 2018, Pages 271–296, https://doi.org/10.1093/jjfinec/nby001

Malhotra, G., Yadav, M.P., Tandon, P. and Sinha, N. (2023), "An investigation on dynamic connectedness of commodity market with financial market during the Russia–Ukraine invasion", Benchmarking: An International Journal, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/BIJ-11-2022-0727

Ouyang, Z., Zhou, X., & Lai, Y. (2023). Global stock markets risk contagion: Evidence from multilayer connectedness networks in the frequency domain. The North American Journal of Economics and Finance, 68, 101973. https://doi.org/10.1016/j.najef.2023.101973

Yousaf, I., Beljid, M., Chaibi, A., & Ajlouni, A. AL. (2022). Do volatility spillover and hedging among GCC stock markets and global factors vary from normal to turbulent periods? Evidence from the global financial crisis and Covid-19 pandemic crisis. Pacific Basin Finance Journal, 73(April), 101764. https://doi.org/10.1016/j.pacfin.2022.101764

Sarwar, S., Kumar, A., & Tingqiu, C. (2020). Analyzing volatility spillovers between oil market and Asian stock markets. Resources Policy, 66(February), 101608. https://doi.org/10.1016/j.resourpol.2020.101608

Diebold, F.X. and Yilmaz, K. (2012) Better to Give than to Receive: Predictive Directional Measurement of Volatility Spillovers. International Journal of Forecasting, 28, 57-66. https://doi.org/10.1016/j.ijforecast.2011.02.006