Alhakimi, Saif Sallam; Sharaf-Addin, Hussein Hussein Hamood

Article

Investigating the impact of oil prices changes on financial market efficiency in Saudi Arabia for the period (1980-2018) : ARDL approach

Reference: Alhakimi, Saif Sallam/Sharaf-Addin, Hussein Hussein Hamood (2022). Investigating the impact of oil prices changes on financial market efficiency in Saudi Arabia for the period (1980-2018) : ARDL approach. In: International Journal of Energy Economics and Policy 12 (1), S. 420 - 426.
https://econjournals.com/index.php/ijeep/article/download/12769/6629.
doi:10.32479/ijeep.12769.

International Journal of Energy Economics and Policy

ISSN: 2146-4553

available at http: www.econjournals.com

International Journal of Energy Economics and Policy, 2022, 12(1), 420-426.

Investigating the Impact of Oil Prices Changes on Financial Market Efficiency in Saudi Arabia for the Period (1980-2018): ARDL Approach

Saif Sallam Alhakimi[1]*, Hussein Hussein Hamood Sharaf-Addin[2]

[1]University of Bisha, KSA and University of Hodeidah, Yemen, [2]University of Bisha, KSA and Thamar University, Yemen.
*Email: saifalhakimi61@gmail.com

Received: 10 November 2021 **Accepted:** 31 December 2021 **DOI:** https://doi.org/10.32479/ijeep.12769

ABSTRACT

The impact of macroeconomic variables on the financial market efficiency has been a hot topic for decades. Thus, this study investigates the effect of oil price changes on the financial market performance using the estimation of Auto-Regressive Distributed Lag (ARDL) technique in Saudi Arabia for the period 1980-2018. The results revealed a long-run causality between the exchange rate, return on investment, and oil prices towards the financial market efficiency. However, only inflation and return on investment have causality effects on financial market efficiency in the short run. In addition, the exchange rate and oil price do not have causality running to economic market efficiency. Thus, both the short-run and long-run causality effects should be considered as guidelines to be followed by policymakers to avoid any misleading macroeconomic strategies in future strategic planning. The speed of adjustment reported from estimating the Conditional Error Correction Regression is (−0.114527). Also, the model was found stable from using both the CUSUM and CUSUMQ statistics.

Keywords: Oil Price, Cointegration, ARDL, Financial Market Efficiency, Economic Growth
JEL Classifications: G10, Q43, F31

1. INTRODUCTION

An efficient financial market is characterized by prices that reflect all available public information, a lack of bubbles, the capacity to manage risks through hedging, and the tendency to allocate savings to their most productive investment use (Tobin, 1984). This characterization is based on Tobin's 1984 definition of financial efficiency. In more technical terms, these characteristics are (1) information arbitrage efficiency, (2) fundamental valuation efficiency, (3) total insurance efficiency, and (4) functional efficiency. Omitted in the neoclassical growth model, the role of financial markets for economic growth was raised by Schumpeter (1911), Goldsmith (1969), and King and Levine (1993). The importance of this issue rests on the question of causality: is financial intermediation the result of economic growth, or does it also spur economic growth? Lucas (1988) argued that finance merely responds to changing demands from the "real sector." However, more recent evidence suggests that financial development precedes economic growth. For example, King and Levine (1993) show a strong relationship between initial financial development and growth. Rajan and Zingales (1998) show that industrial sectors that are relatively more capital intensive have been developed much more in countries where financial markets are already created.

A robust financial market has become one of the critical elements for economic development. Several driving forces have affected the financial market, including political stability, investment climate, macroeconomic policies, etc. The association between economic variables and the stock market is a rising concern, especially in light of the quick and sudden fluctuations at the world level (Ouma and Muriu, 2014). The main objective of this study is to investigate the effect of oil price changes on the financial market performance using the estimation of Auto-Regressive Distributed Lag (ARDL) technique in Saudi Arabia for the period 1980-2018.

2. LITERATURE REVIEW

Many theories have examined the relationship between macroeconomic variables and stock prices, such as the Quantitative Theory of Money (QTM), Cash Wallet Model (CWM), and the Efficient Market Theory (EMT). The QTM has not explicitly addressed the relationship between money supply and stock returns. The CWM has contributed to the development of the assumptions made by the QTM through the direct channel. Increasing the money supply disturbs the portfolio's balance, which leads the investor to search for a new equilibrium point by buying more shares. Thus, increasing the demand for stocks, which leads to higher share prices, or through the impact of policy expectations, where investor expects with the increase in money supply, the tendency of the monetary authorities to restrict credit and raise the interest rate, and thus, lower growth and drop in stock prices.

As the Efficient Market Theory (EMT) depends on information, Fama (1970) and (1981) stipulated that an efficient market does not have any cost on transactions in the market. All information has been an oasis for all dealers entirely and promptly. Also, he divided the market into three formulas based on information availability:

a) A market that is ineffective and relies only on previous information.
b) A semi-strong market that depends on prior knowledge and expected information about macro variables.
c) A stable market that depends on past and anticipated information about macro variables and private information about future share value.

This theory has become less prevalent due to the difficulty in maintaining efficient market conditions and predictable patterns of stock prices. Furthermore, the Capital Asset Pricing Model (CAPM) can give better prediction in the form of a linear equation explaining the relationship between the expected return of a financial asset or a business portfolio and the expected risk for this asset or this portfolio, for both the chance of diversification and the risk of non-diversification. This model marks the beginning of the emergence of capital asset pricing theories and the Arbitrage Pricing Theory (APT) in the pricing of capital assets presented by Ross (1976).

Since the theories had different points of view, there is no agreement on the effect of macroeconomic variables on stock prices except for the interest rate. There is almost no agreement on its opposite effect on stock prices. In contrast, the rest of the variables differ. Some studies see that their influence reversed, while others see their impact as direct, depending on the nature of the economy, market efficiency, and other factors. However, several macroeconomic variables have appeared in many studies such as exchange rate, inflation, interest rate, and oil price. Furthermore, financial market performance was measured in some studies by stock prices of those countries or by using the financial market efficiency index (FME) to proxy for financial market performance. Some previous studies of economic and finance theories indicated the opposite effects of economic variables on the performance of financial markets. For example, Lang and Auer (2020) provided a structured review of crude oil price dynamics. Specifically, they summarized evidence on important factors determining oil prices, cover the impact of oil market shocks on the macro economy and the stock market. Also, they discussed how the financialization of crude oil markets affects oil market functionality and efficiency.

Sedighi et al. (2019) investigated the nexus between crude oil price fluctuation after heavy oil upgrading and stock returns of petroleum companies in the U.S. Stock Exchange for the years 2008 to 2018. They found out that the oil price fluctuations caused by the removal of asphaltenes influence the stock returns of petroleum companies.

Lin and Wang (2021) investigated not only the impacts of coal prices on Chinese financial institutions' performance through the CAMEL indicators, they also analyzed the potential impact mechanism of coal price shocks. Considering the energy consumption structure in China, and discussed the impacts of electricity price control on coal price shocks. They discovered that the coal price shocks have adverse impacts on Chinese financial institutions. And also found that different industries play different roles in the transmission process of coal price shocks

Mokni et al. (2021) examined the causal relationships between oil prices and the MSCI stock index of G7 countries between September 2004 and October 2020. Their results suggest an asymmetric causality between the two markets expressed by different patterns regarding positive and negative oil shocks. The results also indicate symmetric causality during the COVID-19 pandemic.

Khalifa et al. (2021) examined the relationship between oil returns and systemic risk of financial institutions in major petroleum-based economies. By estimating Delta CoVaR. They observed the presence of remarkable increases in risk levels during the financial crises and achieve a better risk measurement when oil returns are included in the risk functions.

Zhukov et al. (2021), investigated the role of Saudi Arabia in the world oil market and in the world economy for a long period of time. The study showed that strategically behavior of Saudi Arabia always was and continues to be subordinated to ensuring the stable supply of oil into the world oil market.

Miller and Ronald (2009), Rashid (2008) examined the association between macroeconomic variables and stock market performance. Such studies are considered of particular interest for economic policymakers, investors, and economists alike. Understanding the nature of this relationship allowed researchers and practitioners to manage financial portfolios, considering the risks that could come from the macroeconomic variables surrounding the financial markets. These studies also found that oil prices play an intermediating role in explaining the effect of the real exchange rate on stock prices. The impact of fluctuations in fuel prices and exchange rates is known to distress stock markets, but that effect varies from country to country, depending on whether that country is an exporter or importer of oil. For instance, oil-exporting countries benefit from any increase in the world price of oil, leading to an improvement in trade balances, current account surpluses, and these countries' net foreign assets position. In contrast, for oil-importing countries, an increase in the prices of global crude oil will lead to a trade imbalance which, in turn, plays an essential role in creating a deficit in the current account and trade deficit, which will lead to a slowdown economic growth in general. Moreover, Ross (1976) examined the effect of four economic variables: inflation, gross national product, investor confidence, and a change in the previous return on stock prices. He recommended that the knowledge should not limit these four variables but rather include other variables, according to the nature of the money market and the economy in which the study was conducted.

Studying the relationship between exchange rate, interest rate, oil price, inflation, crude oil, and stock prices has concerned many scholars' interest in the past. Studies that dealt with the effect of macroeconomic variables on the financial market got varied results depending on the variables considered. Thus, further exertions to discover in-depth different countries mobilizing new data sets. Early studies, by Miller and Ronald (2009), Cong et al. (2008), Gerben and Benjamin (2008), focusing on estimating the impact of oil prices on the financial market found a positive relationship between oil prices and financial market performance. However, investigating such relationships in developing countries classified as oil importers required using new variables that have not been discussed in the past (Barakat et al., 2016). Mishra and Swaroop (2018) investigated the association between global crude oil price, exchange rate, inflation, and a stock market in the Indian economic scenario. The analysis shows a negative relationship between the stock index and inflation and a positive association between the exchange rate and WTI crude oil price. Idrisov et al. (2015) explained the positive effects of oil prices on the Russian economy. Based on the theoretical approach, the oil-rich country describes how the increase in oil prices encourages economic growth based on the Keynesian model. He stated that at first, the rise in oil prices would ascend the income of the actors in the economy, these income increases will increase the demand for both domestic goods and services and imported products, as well as investments in the economy, will increase, and all this will enhance total output.

Many studies support the WTI theory and include findings related to a positive relationship between oil prices and economic growth. Eltony and Al-Awadi (2001) investigated the Kuwaiti economy and examined that oil prices affect macroeconomic indicators by affecting state expenditures. Ayadi et al. (2000), who studied the Nigerian economy, and Berument et al. (2010), who analyze effects of oil price on the economies of Algeria, Iran, Iraq, Kuwait, Libya, Oman, Qatar, Syria, and U.A.E. countries got findings that the increase in oil prices was causing an increase in total output of the stated countries. The results obtained by Ghalayini (2011) based on the data of G7, OPEC countries, and Russia, India, and China economies show that oil prices have a positive (negative) effect on economic growth for oil-exporting (oil-importing) countries. Emami and Adibpour (2012) stated that the increase (decrease) in oil revenues had a positive (negative) effect on the growth in total output in the study in which they examined the Iranian economy. However, the researchers concluded that the decrease in oil revenues is more significant than the increase in oil revenues. Studying the effect of oil prices on the Russian economy, Rautava (2004) found that a 10% increase (decrease) in oil prices will cause a 2.2% increase (decrease) on Russian GDP in the long run.

Kilian, L., and Cheolbeom Park (2009) investigated the influence of oil price shocks on the US financial market. It revealed that the actual stock dividend response in the United States caused by an oil shock varied greatly on whether the oil price alteration was driven by demand or supply shocks in the oil market. In addition, they discovered that demand and supply shocks are pounding the global crude oil market account for 22% of the long-run variation in the U.S. actual stock returns. Miller and Ronald (2009) investigated the long-run relationship between the world price of crude oil and international stock markets throughout 1971:1-2008:3 via a cointegrated Vector Error Correction Model (VECM). They found indications for discontinuities after 1980:5, 1988:1, and 1999:9. Basher (2010) estimated Structural Vector Auto Regression to examine the dynamic association between oil price, exchange rate, and stock price. They calculated the Impulse Responses in two ways via Standard and Projection-based methods. Their study revealed that positive shocks to oil prices be inclined to lower emerging market stock prices and US Dollar exchange rates in the short run. Moreover, using a quantitative analysis of the possible influence of the rise in oil prices on the Chinese economy carried out by Zaouali (2007), The results revealed that the increase in international oil prices caused an economic cost to the Chinese economy and decreased welfare. Cong et al. (2008) examined the collaborative associations between oil price shocks and Chinese Stock Markets using Multivariate Vector Auto Regression. They found that Oil Price Shocks do not reveal a statistically substantial impact on the actual stock returns of most Chinese stock indices. Meanwhile, Gerben et al. (2008) confirmed the effect of increasing oil prices, which significantly drops future stock yields of developed economies. In essence, Ayadi et al. (2000) estimated the impact of oil price shocks and exchange rates on Nigeria's actual stock returns. Their empirical findings exhibited immediate and negative actual stock returns to oil price shock in Nigeria. Driesprong et al. (2008) investigated whether the impact of changes in oil prices predict stock market returns worldwide. And they found significant predictability in both developed and emerging markets.

In summary, it is observed from the literature review that the studies investigated the relationship between macroeconomic variables (oil prices, exchange rate, interest rate, and inflation) and financial market performance have produced varying results. Some studies concluded a positive relationship between macroeconomic variables and financial market performance; others discovered a negative association, while others no ties.

Saudi Arabia possesses around 17% of the world's proven petroleum reserves. The oil and gas sector accounts for about 50%

of gross domestic product, and about 70% of export earnings. The oil and gas sector is, by a significant margin, the most important contributor to the Kingdom's economy, which traditionally runs a significant annual current account surplus, as well as a major source of the country's global financial and political influence. Therefore, this research paper will shed light on knowing the impact of the change in oil prices on the effectiveness of the financial market in the Kingdom of Saudi Arabia.

3. EMPIRICAL ANALYSIS

3.1. Methodology

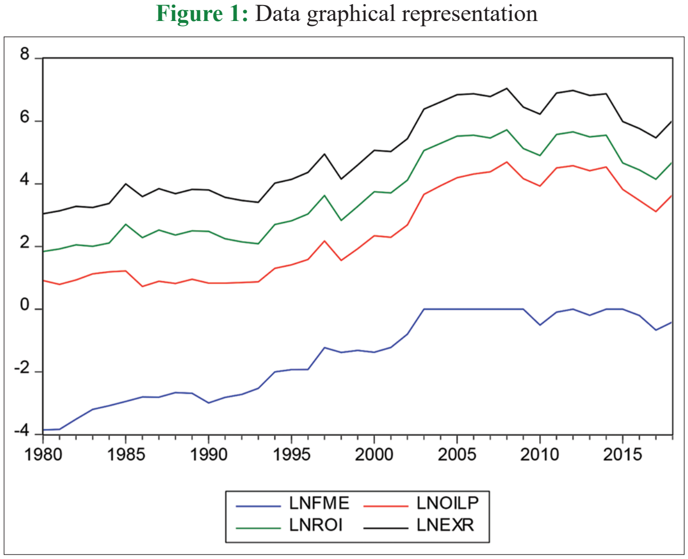
Before proceeding the empirical analysis, few critical remarks need to be stated. First, we need to check whether the time series is stable or not. If a unit root is present, it is essential first to differentiate the variables, thereby eliminating the unit root and achieving stationarity before estimating the model. For this purpose, the Phillips and Perron1 (988) test and the Durbin-Watson Statistic suggested by Sargan and Bhargava (1983) determine whether the time series are stationary in first differences or levels. Second, a cointegration test was used to determine whether a long-run equilibrium relationship among Financial Market Efficiency (FME), Exchange Rate (EXR), Return on Investment (ROI), as a proxy for interest rate and Oil Price (OILP) do exist or not. Third, assist the dynamic adjustment of the model; the autoregressive distributed lag model is used. Fourth, estimation of the short-run and long-run causality effects among variables. Fifth, stability tests were conducted.

3.2. Data

Data related to the variables of the study was obtained from the World Bank and International Monetary Fund databases for the period 1980-2018. Figure 1 shows the plotting variables under analysis.

In Figure 1, it can be noticed that all three explanatory variables behave in the same manner over time giving an initial idea that they exercise a significant impact on the dependent variable (Financial Market Efficiency).

Figure 1: Data graphical representation



3.3. Research Variables

This study investigates the impact of oil price among other macroeconomic variables on financial market efficiency in Saudi Arabia. The economic market efficiency is represented by the financial market efficiency index (FMI) as a dependent variable. The macroeconomic variables under consideration as independent variables consist of the Saudi Rial/USD exchange rate as a proxy for the Exchange Rate, Return on Investment, a rep for interest rate, and Oil Prices.

3.4. The Initial Model

Following the line of study that investigated the impact of macroeconomic variables (the most relevant macroeconomic variables), including oil price, on financial market efficiency.

$$\text{fme}_t = \varphi_0 + \varphi_1 \text{exr}_t + \varphi_2 \text{roi}_{t-1} + \varphi_3 \text{oilp}_{t-1} + \mu_t \quad (1)$$

Fame: Financial Market Index
Exr: Official Exchange Rate
ROI: Return on Investment
Oilp: Oil Price
u_t: Error term
φ_i: Coefficient
t: Time.

3.5. Unit Root Test

It is known in econometrics that many macroeconomic variables are non-stationary. And to ensure that the data are stationary, the Unit Root Test was conducted first before Co-integration Test. Thus, this test was implemented to avoid spurious regression. In this study, Dickey and Fuller (1979) (ADF) tests were applied. The outcomes are shown in Table 1 below.

In Table 1 above, the ADF tests are non-parametric unit root tests modified such a serial correlation does not affect their asymptotic distribution. This reveals that all variables are integrated of order one, both with and without linear trends and intercept terms, except the Exchange Rate is stationary at level. It can be concluded that all variables, Except Exchange Rate, are non-stationary at the level with intercept or intercept and trend (with t-statistics less than the critical values at 1%, 5%, and 10%). After taking the first difference, the variables became stationary, intercept, or intercept

Table 1: Unit root test results

Variable	A.D.F. value (constant included)		A.D.F. value (constant and linear trend had)	
	Level	First differenced	Level	First differenced
LFME.	−1.713272	−5.845494	−1.040540	−6.176422
LEXAR	−5.502459		−5.000408	
LORI	−2.070224	−5.504777	−2.829205	−5.461274
LOOP	−2.176569	−5.839580	−2.377640	−5.900396
Critical values				
1%	−3.615588	−3.621023	−4.219126	−4.226815
5%	−2.941145	−2.943427	−3.533083	−3.536601
10%	−2.609066	−2.610263	−3.198312	−3.200320

* Significant at 1% or rejection of the null of no unit root at the 1% level. **Significant at 5% or rejection of the null of no unit root at the 5% level. *** Significant at 10% or rejection of the null of no unit root at the 10% level

Table 2: Optimal lag Selection Results

Lag	LogL	LR	FPO	AIC	SC	HQ
0	−149.8057	NA	0.060405	8.544763	8.720710	8.606173
1	−29.81206	206.6558	0.000188	2.767336	3.647069*	3.074387
2	−3.685798	39.18939*	0.000111*	2.204767*	3.788286	2.757457*
3	7.538287	14.34189	0.000159	2.470095	4.757400	3.268426

*Lag order selected by the criterion, LR: Sequential modified L.R. Test statistic (each test at 5% level), FPE: Final prediction error, AIC.: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

and trend (with t-statistics greater than the critical values at 1%, 5%, and 10%). Therefore, the variables are integrated at I(0) and I(1), and none of them is I(2), then we can apply ARDL after determining the optimal lag first.

3.6. Optimal Lag Selection

The multivariate information criteria are used to determine the optimal lag length of the estimated VAR model. Furthermore, the three commonly used information criteria are Akaike Information Criterion (AIC), Schwarz Bayesian Information Criterion (SBIC), and Hannan-Quinn Information Criterion (HQIC) (Akaike, 1974; Hannan and Quinn, 1979; Schwarz, 1978). The unrestricted VAR system over the variables was ran and the outputs revealed that the AIC criterion has the lowest value, thus, we used it in the selection process and came up with three lags, as reported in Table 2 below.

It can be seen from the VAR estimation that the AIC criterion has the most negligible value (2.204767*) indicating the optimal lag is two lags.

3.7 ARDL Model

The following ARDL model was formulated:

$$\Delta \text{lnfme}_t = a_0 + \sum_{i=1}^{n} b_1 \Delta \text{lnfme}_{t-i} + \sum_{i=1}^{n} b_2 \Delta \text{lnexr}_{t-i} + \sum_{i=1}^{n} b_3 \Delta \text{lnroi}_{t-i} + \sum_{i=1}^{n} b_4 \Delta \text{lnoilp}_{t-i} + \varphi_1 ln\text{fme}_{t-1} + \varphi_2 \text{lnexr}_{t-1} + \varphi_3 ln\text{roi}_{t-1} + \varphi_4 \text{lnoilp}_{t-1} + \mu_t \quad (2)$$

Where:

φ_1, φ_2, φ_3, φ_4 show the coefficients of the long-run relationship between the series;
∂_0 is the constant term
b_1, b_2, b_3, b_4, Show the coefficient of the short-run relationship between the series.
Ln: natural log
u_t: error term
Δ: Represent the first difference operator.
t: time
i: number of lags
Fame: financial market efficiency
Exr: official exchange rate
Roi: Return on investment
Oilp: oil price

The results of the model testing are presented in Table 3.

The value of the *F*-test (3.257305) is firmly higher than the upper limit at 10% significance levels. The results indicate that the presence of long-run Cointegration between the Financial Market Efficiency (LnFME) and Oil price (LnOilp). Furthermore, the long-run coefficient of LnOilp is statistically insignificant (*P*-value = 0.4617), and the error correction term is negative (−0.114527) and statistically significant. The error correction factor of −0.114527 indicates that there is a very rapid error correction factor for the system to return to equilibrium of 11.4% annually, meaning it is possible to return to the long-term equilibrium (less than a year) after the short-term shocks occur. The coefficient of ECM indicates the speed of LnFME to come back to long run equilibrium with LnOilp, and the rest of the explanatory variables.

Table 3: F-Bound test, long-run coefficient, and error correction term

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LnFME	−0.114527	0.078457	−1.459747	0.1599
LnEXR	23.14397	20.73090	1.116400	0.2775
LnROI	0.432759	0.604414	0.715997	0.4823
LnOilp	0.161191	0.214760	0.750563	0.4617
C	−31.69117	26.97363	−1.174895	0.2538
F-Bounds Test		**Null Hypothesis: No levels relationship**		
Test Statistic	**Value**	**Signif.**	**I (0)**	**I (1)**
			Asymptotic: n=1000	
F-statistic	3.257305	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D (LNOILP)	−0.202730	0.213307	−0.950415	0.3532
CointEq(−1)*	−0.114527	0.025906	−4.420841	0.0003
EC = LNFME − (202.0832*LNEXR + 3.7787*LNROI + 1.4075*LNOILP = −276.7137				

*Significant at 10%

Figure 2 shows the results of the top 20 ARDL estimations of the Null Hypothesis: No levels relationship, which came consistent with the F-Bounds Test reported in Table 3 above.

3.8. Residual Tests

To test the model quality, we examined the Serial Correlation, Heteroscedasticity, and Stability of the relationship in the long-run. Results of the Breusch-Godfrey Serial Correlation LM Test and ARCH test are shown in Table 4.

The results showed that there is no Serial Correlation in the model. The probability of F in the Breusch-Godfrey Serial Correlation LM Test was higher than 5%. So, we cannot accept the null

Figure 2: The Results of the Top 20 ARDL Estimations

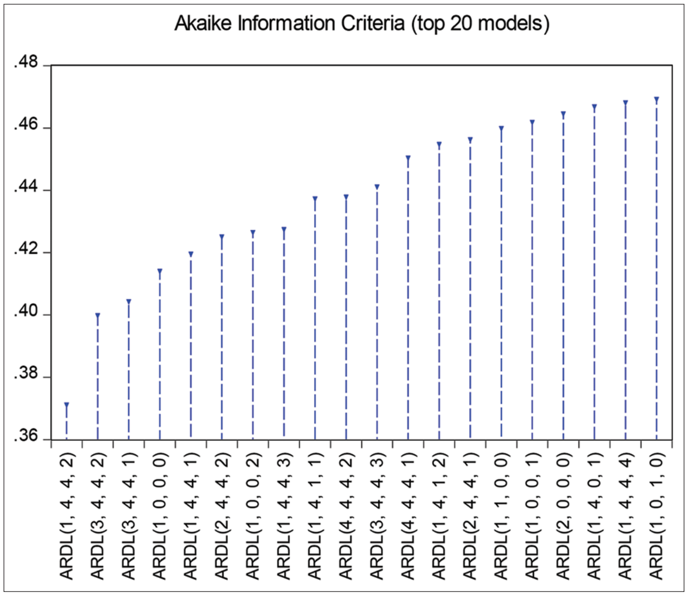


Figure 3: The plots for the CUSUM statistics

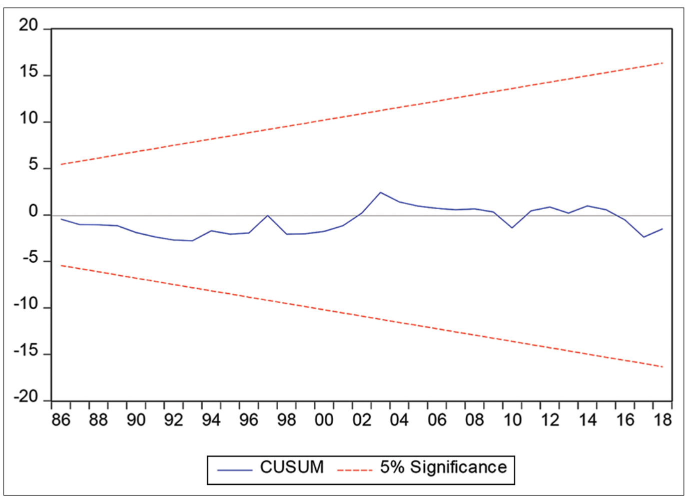


Table 4: Serial correlation and heteroscedasticity

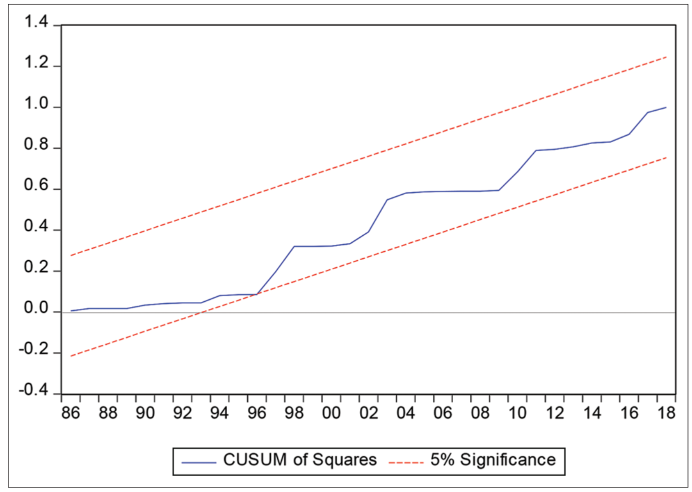
Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.504197	Prob. (2,31)	0.6089
Obs*R-squared	1.197153	Prob. Chi-Square (1)	0.5496
Heteroscedasticity Test: ARCH			
F-statistic	0.524940	Prob.F(4,33)	0.7181
Obs*R-squared	2.273258	Prob. Chi-Square (4)	0.6856

hypothesis of the Breusch-Godfrey Serial Correlation LM Test, which indicates the presence of serial correlation. Furthermore, the results showed the absence of Heteroscedasticity in the model. The probability of F in the ARCH test was higher than 5%. So, we cannot accept the null hypothesis.

3.9. Model Stability

To check whether our model stable over time, CUSUM and CCUSUMQ stability tests were performed as shown in Figures 3 and 4 below:

Figure 4: CUSUM of squares



Based on Figures 3 and 4, the results of recursive residuals for the CUSUM statistics and CUSUM squares tests indicate stability in the model.

4. CONCLUSION

The impact of macroeconomic variables on the financial market efficiency has been a hot topic for decades. Many previous studies indicate the crucial role that the exchange rate, inflation, and interest rate play in influencing financial market performance. Besides, there is another line of researchers who believe that oil price cannot be overlooked in affecting financial markets. The researchers considered this from two angles, the first if the country is an oil exporter, and here the effect of the increase in oil prices is positive on the performance of financial markets. Still, in oil-importing countries, any rise in oil prices will negatively affect the performance of those countries' negative markets. Even though the long-run causality existed between the independent variables towards the dependent variable, in the short run, only inflation and interest rates have a short-term reason on financial market performance, and the exchange rate and oil price do not have causality running to financial market performance.

As a recommendation, both the short-run and long-run causality effects should be considered guidelines to be followed by policymakers to avoid any misleading macroeconomic strategies in future strategic planning. The results from the estimation of the vector error correction model indicated that R-squared is 0.710 more than 60%, so we accept the model. The F statistic P-value is 0.020 <5%, meaning that F statistics are significant, and our data fitted well. Besides, the Durbin-Watson stat is 2.02, meaning no serial correlation among the time series. The observed R-squared is 25.43, and the P-value is 18.54%, which is higher than 5%, which means that we cannot reject the null hypothesis; instead, we accept the alternative, saying that there is no Heteroskedasticity in the residual and that is desirable. Finally, the model was stable using the CUSUM statistic test but with some deviation from stability with the CUSUMQ statistics.

REFERENCES

Ayadi, O.F., Chatterjee, A., Obi, C.P. (2000), Autoregressive vector analysis of an oil-dependent emerging economy-Nigeria. OPEC Review, 24(4), 329-349.

Barakat, M.R., Elgazzar, S.H., Hanafy, K.M. (2016), Impact of macroeconomic variables on stock markets: Evidence from emerging markets. International Journal of Economics and Finance, 8(1), 195-207.

Basher, S.A. (2010), Has the Non-Oil Sector Decoupled from Oil Sector? A Case Study of Gulf Cooperation Council Countries. MPRA Paper No. 21059.

Berurnent, M.H., Ceylan, N.B., Dogan, N. (2010), The impact of oil price shocks on the economic growth of eelected MENA1 countries. The Energy Journal, 31(1), 150-176.

Cong, R.G., Wei, Y.M., Jiao, J.L., Fan, Y. (2008), Relationships between oil price shocks and stock market: An empirical analysis from China. Energy Policy, 36(9), 3544-3553.

Dickey, D.A., Fuller, W.A. (1979), Distribution of the estimators for autoregressive time series with a unit root. Journal of the American Statistical Association, 74(366), 427-431.

Driesprong, G., Jacobsen, B., Maat, B. (2008), Striking oil: Another puzzle? Journal of Financial Economics, 89(2), 307-327.

Eltony, M.N., Al-Awadi, M. (2001), Oil price fluctuations and their impact on the macroeconomic variables of Kuwait: A case study using a VAR model. International Journal of Energy Research, 25(11), 939-959.

Emami, K., Adibpour, M. (2012), Oil income shocks and economic growth in Iran. Economic Modelling, 29(5), 1774-1779.

Fama, E.F. (1970), Efficient capital markets: A review of theory and empirical work. The Journal of Finance, 25(2), 383-417.

Fama, E.F. (1981), Stock returns, actual activity, inflation, and money. American Economic Review, 71(4), 545-565.

Ghalayini, L. (2011), The interaction between oil price and economic growth. Middle Eastern Finance and Economics, 13(21), 127-141.

Goldsmith, R.W. (1969), Financial Structure and Development. New Haven, CT: Yale University Press.

Idrisov, G., Kazakova, M., Polbin, A. (2015), A theoretical interpretation of the oil prices impact on economic growth in contemporary Russia. Russian Journal of Economics, 1(3), 257-272.

Khalifa, A., Caporin, M., Hammoudeh, S. (2021), Systemic risk for financial institutions in the major petroleum-based economies: The role of oil. Energy Journal, 42(6), 247-274.

Kilian, L., Park, C. (2009), The impact of oil price shocks on the US stock market. International Economic Review, 50(4), 1267-1287.

King, R.G., Levine, R. (1993), Finance and growth: Schumpeter might be right. The Quarterly Journal of Economics, 108(3), 717-737.

Lang, K., Auer, B.R. (2020), The economic and financial properties of crude oil: A review. North American Journal of Economics and Finance, 52, 100914.

Lin, B.Q., Wang, C.H. (2021), Impacts of coal prices on the performance of Chinese financial institutions: Does electricity consumption matter? International Review of Economics and Finance, 76, 884-896.

Lucas, R.E. (1988), On the mechanics of economic development. Journal of Monetary Economics, 22(1), 3-42.

Miller, J.I., Ratti, R.A. (2009), Crude oil and stock markets: Stability, instability, and bubbles. Energy Economics, 31(4), 559-568.

Mishra, S., Swaroop, D. (2018), Analysis of interaction between global crude oil price, exchange rate, inflation, and stock market in India: Vector auto regression approach. Journal of Management, 14(1), 120-133.

Mokni, K., Nakhli, M.S., Mnari, O., Bougatef, K. (2021), Symmetric and asymmetric causal relationship between oil prices and G7 stock markets. Journal of Economic Integration, 36(4), 718-744.

Ouma, W.N., Muriu, P. (2014), The impact of macroeconomic variables on stock market returns in Kenya. International Journal of Business and Commerce, 3(11), 1-31.

Rashid, A. (2008), Macroeconomic variables and stock market performance: Testing for dynamic linkages with a known structural break. Savings and Development, 32(1), 77-102.

Rautava, J. (2004), The role of oil prices and the real exchange rate in Russia's economy: A co-integration approach. Journal of Comparative Economics, 32(2), 315-327.

Ross, S.A. (1976), The arbitrage theory of capital asset pricing. Journal of Economic Theory, 13(3), 341-360.

Sargan, J.D., Bhargava, A. (1983), Testing residuals from least squares regression for being generated by the gaussian random walk. Econometrica, 51(1), 153-174.

Schumpeter, J.A. (1911), The Theory of Economic Development. Cambridge, MA: Harvard University Press.

Sedighi, M., Mohammadi, M., Farahani Fard, S., Sedighi, M. (2019), The nexus between stock returns of oil companies and oil price fluctuations after heavy oil upgrading: Toward theoretical Progress. Economies, 7(3), 71-80.

Tobin, J. (1984), On the Efficiency of the Financial System. Fred Hirsch Memorial Lecture, New York.

Zaouali, S. (2007), Impact of higher oil prices on the Chinese economy. OPEC Review, 31(3), 191-214.

Zhukov, S.V., Kopytin, I.A. and Reznikova, O.B. (2021), Saudi Arabia in the world oil market. Mirovaya Ekonomika I Mezhdunarodnye Otnosheniya, 65(9), 98-107.

Zingales, L. (1998), Corporate governance. In: The New Palgrave Dictionary of Economics and the Law. New York: Palgrave Macmillan.