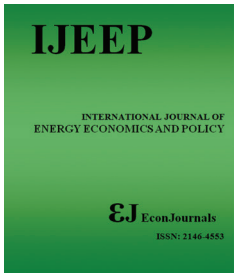

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Oil Shocks, Monetary Policy, and Stock Returns: A Case of Oil-based Economy

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ABSTRACT

This paper investigates the dynamic effects of oil price shocks on the Saudi stock market. It differs from previous work by examining the role of monetary transmission of oil shocks to stock returns via interest rate and credit channels. A structural vector autoregressive model (SVAR) is used to trace the impacts of the underlying shocks. The results provide robust evidence in favor of a positive relationship between oil price volatility and stock market returns, which is aligned with the prevailing view on the oil impact in net oil-exporting countries. Variance decomposition results indicate that oil shocks are the key source of fluctuations in stock markets as they explain more than 25% of stock return variations. On the other hand, a weak over-all effect of monetary policy is concluded by this study using the two monetary policy channels. Unlike interest rate, credit channel is found to be relatively effective in the monetary policy transmission to stock market. The response of stock returns showed a positive significant impact of credit shocks, but a negligible effect of interest rate shocks. The outcome of this paper is considered plausible in an oil-based economy with fixed-exchange rate regime.

Keywords: Structural Vector Autoregressive, Oil Schocks, Stock Markets, Monetary Policy, Saudi Arabia
JEL Classifications: C51, E52, G10, Q43

1. INTRODUCTION

Fluctuations in oil prices may significantly disrupt economic activities considering the role of oil as a vital production factor. The economic effect of oil prices has a huge literature that can be historically traced back to the early 1980s, when increased attention was given to the oil shocks following the first oil crisis in 1973 and the consequent recession in the US economy. Since the seminal work of Hamilton (1983), numerous empirical studies have been conducted to examine the effect of oil shocks on macroeconomic fundamentals (e.g., Antonakakis et al., 2017; Choi et al., 2018; Balcilar et al., 2018; Cheng et al., 2019; Nguyen et al., 2020; Osintseva, 2022). Research on the economic effect of oil shocks on stock markets is mainly devoted to the developed oil-importing countries, whereas little attention is paid to the emerging oil-exporters. In this regard, Saudi Arabia can be presented as a distinguished case of oil-exporters for two reasons. First, Saudi economy heavily relies on oil, and this dependence tends to be deeply inherited in the underlying dynamics of macroeconomic variables and relations. The country has been trying to diversify its economic base away from oil since the 1970's; however, it still accounts for nearly 80% of total exports, 70% of fiscal revenues, and more than 40% of GDP. Given such an economic structure, excessive volatility of oil prices can substantially affect the whole state of the Saudi economy, which poses a serious challenge for policy makers. Second, Saudi Arabia plays a vital role in the global economy through its crucial influence on the oil market as the world's largest exporter and the leader of the Organization of the petroleum exporting countries (OPEC). OPEC countries produce around 40% of the world' oil supply and possess about 80% of the world's proven oil reserves. This role extends beyond the oil industry via the active participation in major world economic

organizations such as the World Bank and the International Monetary Fund (IMF). In addition, in 2003 Saudi Arabia joined the (G20) group that represents the world' largest economies. As it continues to expand, the nominal GDP of Saudi Arabia reached to its all-time high value of nearly $793 billion in 2019.

Saudi stock market exchange (Tadawul) is the largest in the Middle East and North Africa (MENA) region, and more than ever it is now in the interest of international investors due to the recent developments in its market structure, regulations, and international financial standards. For instance, the market adopted new corporate governance rules in 2017 to enhance the rights of shareholders and board members, and to provide greater clarity and transparency. In addition, a parallel equity market (Nomu) was launched in the same year with lighter listing requirements suitable for the small and medium enterprises (SMEs) to offer more diverse investment opportunities and instruments for investors. Moreover, Tadawul has recently joined some of the leading global indices such as the FTSE Russel, the MSCI, and the S&P Dow Jones Emerging Market Indices seeking more foreign fund inflows. By the end of 2019, the market capitalization increased substantially reaching a record-high value of $2.5 trillion after the initial public offering (IPO) Saudi Aramco, the world's largest oil company. Tadawul is now the world's 9th largest stock market exchange, ranked after the London Stock Exchange and ahead of Canada's Toronto Stock Exchange, according to World Federation of Exchanges (WFE) data[1].

This study attempts to re-evaluate the relationship between oil prices and Saudi stock market at this important point of time. The main objective is to examine the impact of oil price shocks on stock returns from a macroeconomic perspective. In addition, it goes on to explore the extent to which monetary policy transmission takes place in this relationship. The present paper employs the most recent monthly data prior to the Covid-19. A 20-year sample period from 1999 to 2019 on oil prices and the Saudi stock exchange, Tadawul All-Shares Index (TASI), along with two control variables, namely the interest rate and the bank credit to private sector. These two monetary variables are utilized to explore the monetary policy transmission to financial market. Furthermore, the sample period covers major local and global events such as the Saudi stock market collapse in 2006, the global financial crisis of 2008–2009, and multiple oil market shocks.

Previous studies on oil-stock market linkage in Saudi Arabia have been mostly presented using conventional methods such as Granger causality, GARCH models, and cointegration analysis to examine this issue in the context of causality or interdependence among the markets in the region. Vector autoregression (VAR) model is one of most successful econometric methods for the analysis of multivariate time series. Some studies have been recently conducted on oil-exporting markets using the oil-market SVAR model suggested by Kilian (2009), which differentiates oil shocks into three parts: oil supply, aggregate demand, and oil specific demand shocks (oil price shocks). Although this approach has been followed by various studies, it might not be relevant in the case of Saudi Arabia considering its influential role and market power in global oil market. Hence, it seems more appropriate to analyze this issue in Saudi Arabia considering domestic macroeconomic, rather than global oil market factors.

The main contribution of this study is twofold. First, it adds to the relatively sparse literature on emerging net oil-exporting economies by examining the oil-stock market linkage in the largest oil-exporting country. The study would also enrich the literature on the Saudi stock market by analyzing the market dynamics based on a recent dataset that covers the latest significant market developments. Second, it provides some insight into the neglected role of monetary transmission of oil shocks to stock markets in Saudi Arabia. Given the dominant position of fiscal policy in Saudi Arabia, this issue has not received attention in empirical research, which will be addressed in this study. To the best of my knowledge, the proposed approach to capture the combined impact of oil price and monetary policy on the Saudi stock market has not been presented before, which differentiates this paper from previous research. The research findings should provide useful information that can be very supportive to policy makers and investors by identifying the risk associated with oil price and exploring the monetary transmission mechanism in Saudi Arabia.

The remainder of this paper is organized as follows. Section one reviews the related literature, and section two describes the data and methodology. Section three summarizes the results while section four concludes the study.

2. LITERATURE REVIEW

Stock markets can be directly affected by oil prices on the microeconomic level through the stock valuation channel. Theoretically, this is explained in economics and finance by the Discounted Cash Flow (DCF) method based on the concept of time value of money. That is, the value of a firm today is equal to the discounted sum of its expected future cash flows. For instance, when a company announces good news, such as large profits, this information will be recognized by the market in a forward-looking view as a strong potential for the company and its future stock price. The higher expected future value will consequently put an upward pressure on the current stock price which ends up at a higher level today. The Saudi stock market is expected to follow the general economic trend, in which the whole state of the economy would move in the same direction of oil price change. The expected increase in oil-generated revenues would typically be injected into the Saudi economy via government spending leading to higher levels of aggregate demand and economic activities. The private sector in Saudi Arabia is highly dependent on government spending, and thus investment and cash flows of firms will increase resulting in higher stock prices. Monetary policy, on the other hand, is expected to have a negative impact on stock prices with monetary tightening (interest rate shocks), and a positive effect with monetary easing (credit shocks). For instance, an increase in interest rate implies a higher discount rate and hence a lower level of cash flows for firms, which causes a decline in their stock value. Meanwhile, an

1 https://www.reuters.com/article/us-saudi-tadawul/saudi-stock-exchange-to-launch-environmental-index-with-msci-ceo-idUSKCN2582IA

increase in bank lending, as a major source of external financing, stimulates private investment leading to more cash flows, and consequently higher stock prices.

The relationship between oil prices and stock markets has a rich literature. In fact, a large volume of research has rapidly emerged after the global financial crisis in 2008 to examine this issue with diverse methodologies and inconclusive findings. The dominant viewpoint about this issue in developed and industrial economies is that oil shock has a negative impact on stock markets. This relationship has been empirically examined and most studies found that oil price shocks have a negative impact on stock returns For instance, a significant negative effect of oil shocks has been reported on stock markets in advanced economies such as the US (e.g., Kang et al., 2015; Phan et al., 2016; Rahman and Serletis, 2019; Sakaki, 2019), some European countries (Cunado and de Gracia, 2014), and the G7 countries (Bastianin et al., 2016). Similarly, this negative impact has been concluded in some emerging economies such as the BRICS economies, Mexico, Malaysia, Thailand, Chile, and Indonesia (Raza et al., 2016). In contrast, some studies conclude a positive effect of oil prices on stock markets, mainly in net-oil exporting countries (e.g., Marashdeh and Afandi, 2017; Awartani et al., 2018; Mohanty et al., 2018; Banerjee et al., 2023). In fact, it is argued that the relationship between oil and stock markets is positive for oil-exporters and negative for oil-importers (Wang et al., 2013). For instance, Ashfaq et al. (2019) conducted a study on three major Asian oil exporting countries (Saudi Arabia, United Arab Emirates, and Iraq) and four oil importing countries (China, Japan, India, and South Korea) to examine the volatility spillovers between stock exchanges and oil returns. Using multivariant GARCH models on daily data from September 2009 to August 2018, they found that oil price shock was more evident in oil exporting countries. A positive impact of oil shocks on GCC stock markets was reported by Nusair and Al-Khasawneh (2018) using quantile regression on daily data from January 2004 to February 2016. Wong and El Massah (2018) employed VAR and Granger causality to study the stock–oil nexus in the GCC countries during 2005-2015 using weekly data from the S&P Broad Market Index. The study results from impulse response analysis find that all GCC markets are affected by oil shocks, while the Granger causality analysis show that only Saudi Arabia, UAE, and Kuwait are significantly affected by oil price shocks. Based on structural VAR and time-varying parameter regression models, Mokni (2020) finds positive impact of oil price shocks on stock returns in four oil-exporting countries, namely Russia, Norway, Venezuela, and Mexico. Basher et al. (2017) employed structural VAR and Markov-switching models to test Oil and stock prices linkage for oil exporting countries using monthly data. They found that oil demand shocks influence stock returns significantly in Saudi Arabia. Another study by Rahman (2020) used VAR to examine the relation of oil price changes with stock market prices for the period from 2000 to 2017. The results suggest a long-run association between oil price and stock prices, but no short-run association is found between them. More recently, a study by Banerjee et al. (2023) utilizes VAR using monthly data on Abu Dhabi stock index for the period 2006-2019, and it concludes evidence of positive long-term linkage between oil and stock index.

Research on the relationship between monetary policy and financial markets has experienced a noticeable surge in the last two decades, especially for the developed countries. Adrian and Liang (2016) examine this relationship in the United States, and they find that the impact of monetary policy on asset prices is complex and varies depending on the type of asset and the state of the economy. Their finding was that monetary policy has a more significant impact on equity prices during times of economic stress, while it has a greater impact on bond prices during normal economic times. Galí and Gambetti (2015) estimate the response of US stock prices to monetary policy shocks using a time-varying coefficients VAR and they find that positive monetary policy shocks have a positive impact on equity prices. Grabowski and Stawasz-Grabowska (2021) also found that the European Central Bank's monetary policy also affected the equity markets of the Czech, Hungary, and Poland. Muroyiwa et al. (2017) examined the interdependence between monetary policy and stock market performance in South Africa using structural vector autoregression (SVAR). The study concluded that there is a high interdependence between interest rate setting and stock prices. A study by Galloppo and Paimanova (2017) attempted to investigate the influence of Central Authorities (ECB, FED, BoE, BoJ, PBoC) on the stock index returns of major sectors in BRIC countries. Although few members of BRIC were found to have a reaction to policy announcements, the results didn't support any regular pattern. For oil-based economies, few studies have been conducted to investigate this linkage. For instance, Abouwafia and Chambers (2015) investigate the impact of monetary policy and exchange rate shocks on stock markets in three GCC countries (Saudi Arabia, Kuwait, and Oman), Egypt, and Jordan using SVAR model. The results indicate significant short run impact of monetary policy on stock prices only in the cases of Egypt and Kuwait, which according to their argument can be attributed to having a relatively more independent monetary policy and flexible exchange rates in these two countries. Another strand of research attempts to examine the underlying dynamics of stock returns when combining both the oil price shocks and the monetary policy shocks. In this scarce literature, some studies have empirically examined this issue in advanced economies. One study by Rahman (2008) investigates the long-run and short-run dynamic effect of broad money supply and oil price on the S&P 500 index. It shows evidence of short-run causal flows from these variables to stock market in Granger Causality sense. However, it finds that money supply and oil price unleash no long run converging causal effect on the U.S. stock market. Filis and Chatziantoniou (2014) applied a structural VAR model to investigate the financial and monetary policy responses to oil price shocks in four oil-importers (UK, Germany, France and Portugal) and two oil-exporters (Norway and Russia). The impact of oil shocks on stock markets was found negative for oil-importers, and positive for oil-exporters, while a negative impact of interest rate shocks on stock markets was found for all countries. They also argued that the response of interest rates to oil shocks depends heavily on the monetary policy regime of each country. It can be noticed that literature on this topic exhibits a considerable lack of empirical work, and this shortage represents a good research opportunity. Given the economic structure with its heavy reliance on oil, it is worth exploring the financial and monetary policy interaction in Saudi Arabia. The case of Saudi Arabia would represent not only

emerging oil-based economies, but also emerging economies that adopt an exchange-rate targeting monetary policy. This policy anchor is implemented by many developing countries, and it is a dominant framework in the MENA region.

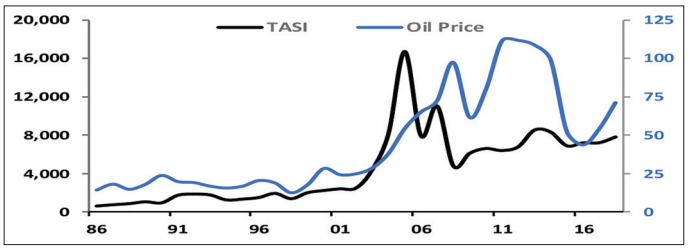
3. DATA AND METHODOLOGY

3.1. Data and Preliminary Analysis

This paper employs monthly data of TASI, domestic short-term interest rate (IR), domestic bank credit to private sector (BCR), and WTI crude oil price (OP) over the period from January 1999 to December 2019. The data is obtained from Monthly Bulletins issued by Saudi Arabian Monetary Agency (SAMA) and the U.S. Energy information administration (EIA). Monetary policy variables represented by the interest rate and the bank credit to private sector are chosen since they are found to be the most effective monetary policy transmission channels in Saudi Arabia (e.g., Prasad and Espinoza, 2012; Ziaei, 2012; Cevik and Teksoz, 2013). Moreover, compared to other money supply measures, bank credit to private sector may better serve the purpose of capturing the liquidity impact on stock markets since it distinguishes the credit issued to the private sector from those issued to governments and public enterprises.

The co-movement of oil prices and TASI index is depicted in Figure 1, which indicates how closely they move over time, except for the market crash period (2006-2007). Figure 2 plots the levels and percentage change of the four variables used in the model while Table 1 presents descriptive statistics for these variables over the 252-month sample period. The distributions of TASI and interest rate are moderately skewed to the right, but they are approximately symmetric for oil price and bank credit. Based on the Jarque-Bera test for normality, the hypothesis of normal distribution is rejected for the variables at all levels of significance.

Figure 1: Co-movement of Oil Price and TASI



The kurtosis statistics indicate a leptokurtic distribution of TASI, and platykurtic distributions for the other variables relative to the normal distribution. The results from the Pearson correlation matrix are presented in Table 2. It indicates a high degree of positive correlation between oil price and TASI. Oil price is positively correlated with bank credit, and negatively correlated with interest rate, at the same moderate correlation degree of 0.42. On the other hand, the correlation between TASI and the two monetary channels is relatively weak, but with properly presumed direction.

For the data to be consistent with the identification procedure of the SVAR, the four variables should be difference stationary or I(1). To test for stationarity, Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests are employed, and the results are displayed in Table 3 below. All variables are non-stationary in levels at 1% significance level, and only oil price is stationary at %5 significance level using ADF and PP tests. However, the first differences of the four series are stationary at 1% and 5% significant levels.

3.2. Methodology

Vector autoregressive (VAR) model is a framework for multivariate time series analysis that was first introduced by Sims (1980).

Table 1: Descriptive statistics

Statistic	OP	IR	BCR	TASI
Mean	59.735	2.585	729,161	6,730.705
Median	57.170	2.068	711,357	6,894.975
Maximum	133.880	7.052	1,490,833	19,502.650
Minimum	12.010	0.600	138,473	1,323.200
Std. Dev.	27.092	1.846	461,104	3,254.072
Skewness	0.359	0.896	0.206	0.714
Kurtosis	2.247	2.619	1.583	4.606
Jarque-Bera	11.354	35.254	22.855	48.518

OP: Oil price, IR: Interest rate, BCR: Bank credit to private sector, TASI: Tadawul all-shares index

Table 2: Correlation matrix

Series	OP	IR	BCR	TASI
OP	1			
IR	−0.42	1		
BCR	0.42	−0.52	1	
TASI	0.55	−0.14	0.39	1

OP: Oil price, IR: Interest rate, BCR: Bank credit to private sector, TASI: Tadawul all-shares index

Figure 2: The plots of the time series, each is in levels vs change (%)

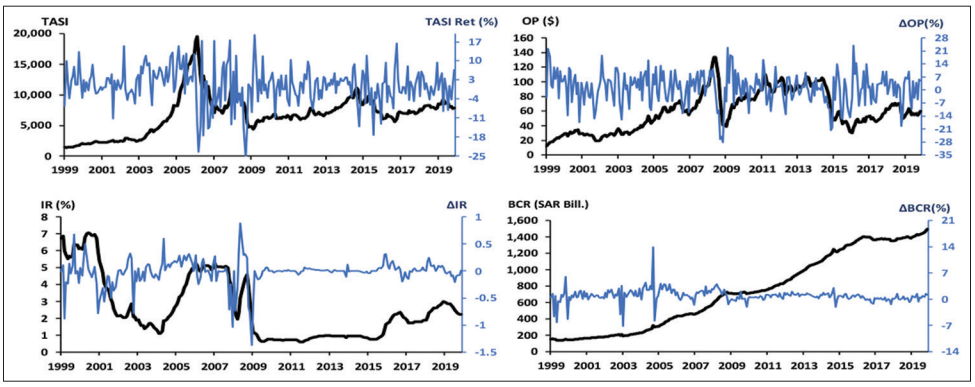


Table 3: Unit root tests

Series	ADF		PP		KPSS	
	Level	1st Difference	Level	1st Difference	Level	1st Difference
OP	−3.13*	−11.92**	−2.91*	−11.93**	1.03**	0.23
IR	−2.15	−8.77**	−2	−8.77**	0.76**	0.16
BCR	−1.35	−7.5**	−1.35	−16.67**	1.97**	0.4
TASI	−2.61	−13.27**	−2.4	−13.46**	0.97**	0.25

The 1% and 5% critical values are−3.432, −2.862 for ADF, −3.433, −2.863 for PP, and 0.739, 0.463 for KPSS respectively. "*" and "**" denotes the rejection of the null at 1% and 5% level of significance, respectively. ADF: Augmented Dickey-Fuller, PP: Phillips-Perron, KPSS: Kwiatkowski-Phillips-Schmidt-Shin, OP: Oil price, IR: Interest rate, BCR: Bank credit to private sector, TASI: Tadawul all-shares index.

VAR has been increasingly used in a wide application range as a powerful and reliable tool for describing the dynamic behavior of economic and financial variables. One of the VAR's main advantages is the ability to simultaneously model and capture the dynamics of multiple time series. This study employs a structural VAR (SVAR) approach to capture the dynamics of the model with focus on the role of exogenous shocks generated by the oil price movements.

Let's define the stationary vector $Z_t = [\Delta OP_t, \Delta IR_t \Delta BCR_t, R_t]'$, where OP_t is oil price, IR_t is the domestic interest rate, BC_t is bank credit to private sector, and R_t is stock market returns $Rt = ln(P_t) – ln(P_{t-1})$, where P_t is stock market price at time t. The reduced form from VAR is obtained by:

$$A(L)Z_t = v_t \quad (1)$$

Where L is the lag operator and $A(L)$ is a matrix of lag operator such that, $A(L)=\sum_{j=0}^{\infty} A_j L^j$,and v_t is the VAR innovations with covariance matrix Ω.

The moving average representation (MAR) of equation (1) can be written as

$$Z_t = B(L)v_t \quad (2)$$

Where $B(L) = A(L)^{-1}$

The structural model is obtained by assuming orthogonality of the structural shocks and imposing some plausible restrictions on the elements in $B(L)$. Following the literature, the relationship between the reduced form innovations (v_t) and structural disturbances (ε_t) is given by $V_t = S\varepsilon_t$.

The Wold representation theorem implies a reduced form MAR for Z_t:

$$Z_t = C(L)\varepsilon_t \quad (3)$$

where $B(L)S = C(L)$.

By inverting $C(L)$, we can estimate the equation (3) using ordinary least squares (OLS) to obtain the VAR. To identify the structural model from the reduced form VAR, one needs to impose suitable restrictions on the S matrix. By normalizing the covariance matrix of the structural shocks ε_t, we can achieve the restrictions on S, where the normalization implies that $SS' = \Omega$. Instead of imposing contemporaneous restrictions, the study utilizes long-run restrictions as first proposed by Blanchard and Quah (1989). Imposing long-run restrictions instead of the often-used contemporaneous ones has some advantages. Firstly, the model does not consider any judgments about short run rigidities, but instead the restrictions imposed according to general assumptions that are firmly grounded in economic theory. Secondly, these assumptions allow the identification scheme to be more flexible and applicable to various models. In view of that, it is plausible to assume that oil price is exogenously determined in this model. It is also assumed that monetary policy and stock market shocks do not have permanent impacts on oil prices. Similarly, stock market shocks do not have permanent impact on monetary policy in the Saudi economy. Having said so, we can identify the restrictions as in the form:

$$C(1)=\sum_{j=0}^{\infty} C_j = \begin{bmatrix} c(1)_{11} & 0 & 0 & 0 \\ c(1)_{21} & c(1)_{22} & 0 & 0 \\ c(1)_{31} & c(1)_{32} & c(1)_{33} & 0 \\ c(1)_{41} & c(1)_{42} & c(1)_{43} & c(1)_{44} \end{bmatrix} \quad (4)$$

The model is now just identified, and we can estimate the structural VAR model under the restrictions given in (4). After estimating the model, we can generate the structural impulse response function (IRF) along with the structural variance decomposition (VD).

4. RESULTS AND DISCUSSION

The VAR is estimated with two lags based on the Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ). Furthermore, Table 4 shows the results of VAR stability condition check which indicates the stability of the estimated VAR.

The following part presents the results of the SVAR model and its most important tools of IRFs and VDs. The IRFs show the impact of one standard deviation of one variable on other variables in the model, while the VDs indicate the relative importance of the underlying shocks in explaining variations in the other variables.

Responses to oil price shock (Figure 3) show that oil price increase has a positive impact on stock returns, where one standard deviation of oil price shock causes the stock returns to rise significantly in the 1st month. In the following periods, the effect tends to fade away gradually before it converges to its long-term equilibrium. As mentioned earlier, it is highly expected to have a positive effect of oil shocks on the Saudi stock market, considering the vital economic role of oil as the sole source of export revenues. The increased oil revenues provide the bulk of foreign exchange earnings that would significantly stimulate the aggregate demand and economic activities through the major effective channel

of government spending. As expected in the counter-cyclical approach, the government would react to the higher oil prices by injecting oil-generated revenues into the economy through higher spending that positively affects the private sector activities and thereby increases corporate wealth and dividends. The montary policy response to oil shock shows a significant positive impact on interest rate in the long run. The response magnitude starts at less than 1% in the 1st month, but it then increases substantially between the 2nd and 5th months and stays close to 6% level thereafter. The response of bank credit, however, is insignificantly positve where it initially fluctuates and fades after 7 months.

Monetary policy shocks, as presented by the interest rate and credit channels in Figure 4, have diverse impacts on stock market returns. The impact of interest rate on stock returns is insignificant, which responds positively in the 1st month, but the response turns negative between the 2nd and 7th month and diminishes thereafter. The credit channel, on the other hand, tends to be relatively more effective than the interest rate in transmitting monetary policy. The response of stock returns to a one standard deviation of credit shocks shows a significant impact starting at 2% in the 1st month and gradually diminishing and fading away after the 4th period. The reason behind such weak influence of the policy rate can be attributed to the fixed-exchange rate adopted by Saudi Arabia where domestic interest rate follows the US federal fund rate. Thereby, one can assert that such a passive monetary policy is usually formulated regardless of the stock market movements. This fixed- exchange rate policy has a limited influence and usually reacts, but does not act, according to the anchor policy decisions.

The structural variance decompositions of the stock market returns are presented in Table 5. For stock returns, its own shock is the dominant factor in both the short and long run. It explains more than 68% of stock returns variation in the 1st month, and this effect decreases slightly over time to nearly 65%. Unsurprisingly, oil price shock is the most determinant factor among the three variables, which confirms the prevailing view on the role of oil in Saudi Arabia as a key source of fluctuations in economic activities. Oil volatility explains about 24% of the stock return variations in the 1st month and it increases marginally over time. The monetary policy shocks appear to have a relatively weak impact on stock

Table 4: Vector autoregressive stability condition check

Roots of characteristic polynomial	Modulus
0.96774	0.96774
0.596965	0.596965
−0.587001	0.587001
0.511151−0.117365i	0.524452
0.511151+0.117365i	0.524452
−0.025611−0.275339i	0.276528
−0.025611+0.275339i	0.276528
−0.168091	0.168091

No root lies outside the unit circle, and VAR satisfies the stability condition

Table 5: Variance decomposition of TASI

Period	OP	IR	BC	TASI
1	24.54	0.16	6.86	68.45
2	26.73	0.45	7.05	65.77
3	27.40	0.63	7.05	64.92
4	27.41	0.74	7.04	64.82
5	27.39	0.80	7.03	64.78
6	27.38	0.83	7.03	64.76
7	27.38	0.84	7.03	64.75
8	27.38	0.85	7.03	64.74
9	27.38	0.85	7.03	64.74
10	27.38	0.86	7.03	64.73

OP: Oil price, IR: Interest rate, BCR: Bank credit to private sector, TASI: Tadawul all-shares index

Figure 3: Responses of TASI, Interest Rate, and Bank Credit to Oil Price Shocks

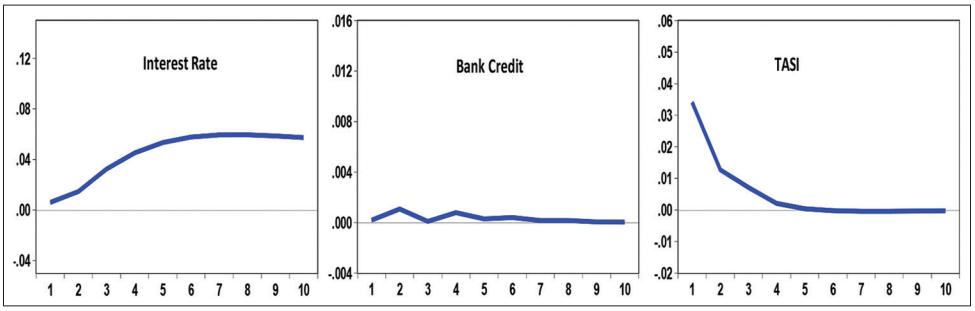
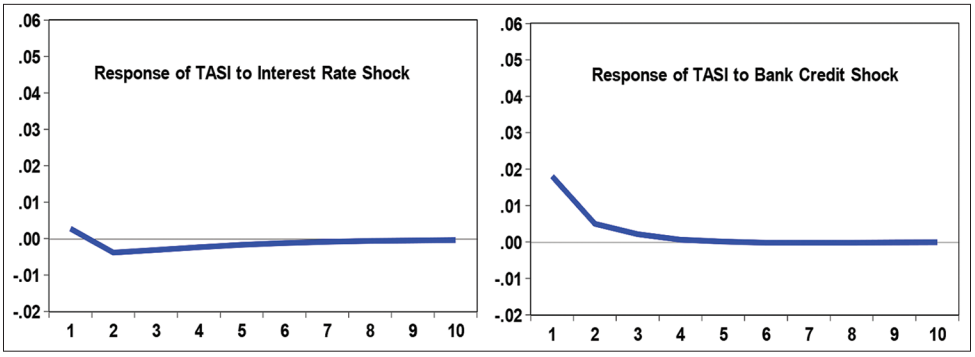


Figure 4: Response of TASI to Monetary Policy Shocks



returns. In this regard, the interest rate showed a negligible effect at all-time horizons, while bank credit seemed to be the only effective monetary policy channel in explaining the forecast error variance of stock returns.

In contrast with previous research, the study reveals positive impact of oil shocks on the Saudi stock market, that is consistent with the empirical findings on net oil-exporters by studies such as Marashdeh and Afandi (2017), Awartani et al. (2018), and Banerjee et al. (2023). Moreover, the present paper finds an overall weak impact of monetary policy on the stock market. In particular, the interest rate is found to have insignificant impact on stock returns, which is aligned with the findings of Abouwafia and Chambers (2015). In fact, this result is supportive to the argument that policy rate has a limited, or even a negligible role, in countries with pigged exchange rate regime. On the other hand, bank credit appeared to be relatively more significant and effective in monetary policy transmission with a positive impact on the stock market. This finding on the impact of domestic credit is quite relevant in the literature. For instance, it confirms the earlier finding by Ziaei (2012) that the credit channel is the most important monetary transmission channel in Saudi Arabia. In addition, some studies use bank credit to GDP as one of bank-based measures of financial development. This measure has been reported to have a positive and significant effect on stock market capitalization in Saudi Arabia (Ben Naceur et al., 2007).

5. CONCLUSION

This paper examines the impact of oil price and monetary policy on the Saudi stock market returns using recent monthly data from January 1999 to December 2019. It employs structural autoregressive model (SVAR) with long-run restrictions, which provides more accurate estimates compared to the unrestricted VAR. Two main findings are concluded by the study. Firstly, oil price shock has a short-lived positive impact on stock market returns that gradually fades away before converging to long-term equilibrium. In addition, oil price shock explains significant portions of the stock return variation, and this impact tends to increase over time. Secondly, monetary policy shocks indicate a diverse impact on the stock market, in which the monetary transmission is found weak by the policy rate channel, but significant with low magnitude by the credit channel. The results show an initial positive response of stock returns to credit expansion, but it quickly diminishes over short periods. Furthermore, the structural variance decompositions show that credit shocks explain a considerable portion of variations in stock returns, whereas interest rate seems to have a negligible role in the monetary transmission to stock market. In this regard, credit channel appears to be relatively more effective in the monetary policy pass-through to the financial market in Saudi Arabia.

Although this paper is mainly intended to examine the oil shocks and stock market relationship in Saudi Arabia, it also explores the monetary policy transmission mechanism, a topic that has been rarely touched in literature. The finding on this issue, which indicates the relatively effective role of credit channel, brings more attention to the viability of alternative monetary policy tools, and this can be extended further by future research. Considering the fast-paced financial development and economic reforms, monetary policy transmission can be examined using some monetary policy instruments such as required reserve ratio, repos, and other macroprudential tools that affect liquidity and credit conditions.

The revealed findings of this study have important implications for market participants and policymakers. Investors and portfolio managers should be aware of the associated risk of oil price uncertainty when they use oil to hedge and diversify equities. In addition, the research outcome on the monetary policy is quite helpful to the policy makers by providing a good assessment on the monetary policy transmission mechanism in Saudi Arabia.

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