Kurdish Studies
Apr 2023
Volume: 11, No: 2, pp. 5634-5648
ISSN: 2051-4883 (Print) | ISSN 2051-4891 (Online)
www.KurdishStudies.net

Received: May 2023 Accepted: June 2023
DOI: https://doi.org/10.58262/ks.v11i2.410

The Impact of Oil Revenues on Banks' Performance and Loan Quality: The Case of Saudi Banks

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Abstract

The study aimed to analyze the impact of oil revenues on the performance and the quality of the loan portfolio of banks registered on the Saudi capital market (TASI) for the period 2013-2022. The study used the panel data approach with the least squared regression models and fixed-effect regression models to analyze the data and test the study's hypotheses. The results indicated that oil revenues had no direct impacts on the accounting -based indicators However, oil revenues had positive impacts on market -based indicator. In addition, oil revenues did not have direct impacts, on average, on the quality of loans. However, negative oil prices had direct impacts on the decline of the loan quality. Moreover, oil revenues had direct and positive impacts on the gross domestic production, which channeled the impacts of oil revenues to accounting-based performance indicators. The results of the study added to the current literature as it investigated the impacts of oil prices from different perspectives and the study explained the way oil revenues have affected the performance of banks. Therefore, the results of the study have positive benefits to several stakeholders including not limited to bank management and policy makers as it helps them understand the way oil revenues affect bank performance.

Keywords: *Share Price- Return on Equity- Non-Performing Loans- GDP – Panel Data*

I. Introduction

It is known that the economic and financial performance of rich exporting –countries such as the Saudi Arabia is a function of oil price movements. As banks play a vital role as financial intermediaries between lenders and borrowers of money. In addition, measuring the performance of banks in oil-exporting countries such as Saudi Arabia is vital for many stakeholders, including not limited to the regulatory, shareholders, investors, and the society, as movements in oil prices are among the external and exogenous factors that affect the performance of banks. As the sharp movements in oil prices in oil-exporting countries lead to multiple negative effects, including increases in bad debts, decreases in deposits, deteriorations in the quality of assets, and decreases in the volume of operations Osuma, et al. (2019).

Recently oil prices witnessed sharp fluctuations in response to geopolitical conflicts and health disasters, as oil prices witnessed sharp declines during the Corona pandemic in 2019-2021, while they witnessed noticeable increases in response to the Russian and Ukrainian war that broke out in February 2022. Increasing oil prices in the exporting countries enhances government spending, achieves economic stability, increases bank profits, and Increases stock prices. However, the decline in oil prices affects the quality of loans due to the inability to pay

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the principal and interest due to the contraction of the private sector's contracts with the government. In addition, the decline in oil prices result in decreases in credit ratings, increases in cost of capital due to the risk premium, increased default rates and increases in non-performing loans Husain et al. (2015).

The economic growth in the Kingdom of Saudi Arabia depends on oil revenues, as oil revenues affect public revenues, Public expenses and bank's liquidity levels. Oil revenues play a vital role in enhancing the economic growth and financial markets performance. However, in non-exporting oil nations increasing oil prices adversely affect the performance of banks in terms of capital adequacy, liquidity, profits, and the operational efficiency. However, the negative effects can be absorbed through achieving the economic and the political stability. Morana (2017); Chi-Chuan & Lee (2019);Al-khazal & Mirzaei (2017) pointed out that the increases in oil prices adversely affect the performance of banks due to the increase in defaults, corporate failures, and the increase in non-accrual loans i.e. non -performing. Poghosyan & Hesse, (2016) explained that the increase in oil prices could affect the economic growth of oil-exporting countries through direct and indirect effects, as loan levels for oil-related and other activities increase, which supports bank profits and in turn supports the state's public finances. Osamah, et al. (2017) confirmed that fluctuations in oil prices had significant impacts on the non-performing loans.

2. Literature Review and Hypotheses Development

2.1 Literature Review

Bugshan, et al. (2023) conducted a study on the impact of fluctuations in oil prices on the performance of conventional and Islamic banks in the Gulf Cooperation Council countries for the period 2005-2019. Using fixed-effect regression models, the results indicated that fluctuations in oil prices had negative and statistically significant impacts on the performance of both Islamic and conventional banks, but the impact was greater on the Islamic banks.

Saif-Alyousfi, et al. (2020) Conducted a study on the impact of fluctuations in oil prices on the performance of banks in the Gulf Cooperation Council countries for the period 2000-2017 using the return on assets ,the return on equity and Toni's Q as proxies for banks' performance. The results indicated that fluctuations in oil prices had direct impacts on the performance of banks under study through increasing oil related lending. However, the negative impacts of fluctuations in oil prices were greater than the positive impacts, and the conventional banks benefited more than the Islamic banks, which were vulnerable to the negative effects of oil price fluctuations.

Esmaeil, et al. (2020) conducted a study on the impact of fluctuations in oil prices on the performance of conventional and Islamic banks in the Gulf Cooperation Council countries. The results indicate that oil prices measured by the real price of OPEC had positive and statistically significant effects on the rerun on equity (ROE), the return on assets (ROA) and the net interest margin as proxies for profits in the long and short term for both conventional banks and Islamic banks.

Osuma, et al. (2019) conducted a study on the impact of oil prices on the performance of (10) banks in Nigeria. The study used profits after tax, current ratio, and net interest margin as proxies for bank profits and average annual crude oil price as the independent variable. The study found negative and statistically significant effects of oil prices on the performance indicators during the period of price declines.

Effendi (2019) conducted a study on the impact of oil prices on the performance of Islamic banks along with macroeconomic factors for the period 2007-2016. The study conducted on (48) Islamic banks in seven countries: Saudi Arabia, Iraq, Kuwait, Bahrain, Iran, Qatar, and UAE.The results did not find impacts of oil prices on the performance of the Islamic banks due to their low market share compared to the conventional banks. The study used ROA, ROE as proxies for bank performance, and oil prices measured as price, t-price t-1/price t-1. The results for the Saudi Islamic banks did not find direct effects of oil prices on ROA, AOE. However, oil prices had direct impacts on the gross domestic production rate (GDP), which had impacts on the performance indicators.

El-Chaarani (2019) conducted a study on the impact of fluctuations in oil prices on the performance of banks using ROA ,ROE as proxies for profitability in (8) oil producing and exporting countries in the Middle East regions for the period from 2012-2017. The results found direct impacts of the fluctuations in oil prices on the financial performance of the countries of Bahrain, Oman, and Iran, while it did not find direct impacts in the countries of Jordan, Kuwait, Qatar, Saudi Arabia, and the Emirates.

El-Chaarani (2019) found that negative fluctuations in oil prices had greater impacts on the stock returns than the positive effects of oil prices in the countries of Bahrain and Saudi Arabia. **Ajala, et al., (2021)** pointed out that the impact of oil prices on stock prices was not symmetrical in the short and long term. **AROURI, et al., (2010) showe**d that according to the theory, fluctuations in oil prices would affect stock returns through macroeconomic variables which impact on future cash flow especially share price is a function of the discounted future cash flow.

Mokni (2020) conducted a study on the impact of oil price shocks on stock returns during the period 1999-2018. The results indicated that stock returns respond to demand shocks greater than supply shocks, and demand shocks had positive impacts on stock returns in oil-exporting countries and negative impacts in oil-importing countries.

Kilian and Park (2009); Wang et al. (2013) pointed out that the reaction of stock markets to the increase in oil prices may be positive or negative. As the reaction of stock markets to fluctuations of oil prices might be positively or negatively, and this depends primarily on the structure of the economy for both oil-exporting countries and oil-importing countries. It also depends on the reasons for the increase, whether it was due to an increase in the real demand or was due to factors related to the supply.

Lippi and Nobili (2012); Rapaport (2013) supported the argument by **Kilian and Park (2009)**; **Wang et al. (2013**) as the reaction depends on the underlying causes of changes. The negative response of stock markets to the increase in oil prices is explained from the microeconomic perspective by the fact that companies that depend on oil as a factor of production will have their profits and dividends affected if they do not pass on these increases to the consumers **Sadorsky (1999).** On the other hand, from the macroeconomic perspective, increasing oil prices affects consumers through an inflation tax. **Basher and Sadorsky (2006).** However, in rich oil-exporting countries, the stock market responds positively to the increase in oil prices due to the increase in public spending on mega projects and investments in infrastructure **Kilian and Park (2009).**

Osamah, et al. (2017) conducted a study on the impact of fluctuations in oil prices on the quality of the loan portfolio. The study used fixed-effect regression dynamic and GMM models for the period 2000-2014 including 2,310 commercial banks operating in(30) oil-exporting

countries. The results indicated that movements in oil prices have significant impacts on the non-performing loans. **Alodayni (2016)** confirmed that declines in oil prices as exogenous variable had negative impacts on the non-performing loans.

Saif-Alyousfi, et al. (2018) conducted a study on the impact of fluctuations in oil and gas prices on the non-performing loans of the commercial and Islamic banks in Qatar for the period 2000-2016. The results indicated that fluctuations in oil and gas prices did not directly affect the non-performing loans but macroeconomic -specific factors and bank -specific variables transferred the impact of oil and gas prices to the non-performing loans.

Chin, et al. (2023) conducted a study on the impact of the fluctuations in oil prices for (18) banks for the period 2009-2020 on the non-preforming loans of banks in Kazakhstan. The results found an inverse relationship. i. e. negative oil prices reduced the credit quality and vice versa. **IDRİS, NAYAN (2017)** confirmed an inverse relationship between increases in oil prices and the non-performing loans.

2.2 Hypotheses Development

The study developed hypotheses to reflect the direct impacts of the fluctuations in oil revenues without adding any additional explanatory variables-moderating variables or control variables - either at the bank level or at the macroeconomic level to avoid the Interaction of oil prices with any additional independent variables. Therefore, based on the literature review the study developed the following hypotheses.

a. Oil revenues have direct impacts on the accounting- based performance indicators of Saudi banks.
b. Oil revenues have direct impacts on the market -based performance indicator of Saudi banks.
c. Oil revenues have direct impacts on the non-performing loans of Saudi banks.
d. Oil revenues have positive impacts on the GDP in Saudi Arabia.
e. GDP has direct impacts on the accounting- based performance indicators of Saudi banks.

3. Methodology

3.1-Sample and Data Collection

The study conducted on all (10) banks registered on the Saudi Stock Exchange (TASI) for the period 2013-2022, where the study collected data on the return on assets, the return on equity, loans, and non-performing loans from the annual financial reports. In addition, the study collected oil revenue and GDP data from the official sources of the Ministry of Finance of the Kingdom of Saudi Arabia and the study collected share prices from TADAWUL website.

3.2 Study Method

The study used the panel data method with time series and cross section with fixed effect regression models and least squared regression models to test the study's hypotheses and achieving the study objectives.

3.3. Variables Definition and Measurement

Since the study applied only to the Saudi banks registered on Saudi Arabia stock market (TASI), the study did not use any additional explanatory variables. The study needs to investigate the direct impacts of oil revenues on the accounting -based and the market- based indicators as well as the impacts on loans quality without any interactions with other control variables.

Variable Code	Variable Definition and Measurement
ROA	The study measured the Return on assets as the income after tax divided by the average assets as a proxy for accounting-based profit indicator.
ROE	The study measured the return on equity as Income after tax divided by the average equity as a proxy for accounting -based profit indicator.
SP	The study measured the share price for each bank at end of the year as a proxy for market - based indicator
GDP	The study used the Gross Domestic Production % (GDP %)
Oil revenues	The natural logarithm of the annual oil revenues in SAR billion. The study used that measure as a proxy for oil prices in the basic analysis.
NPL	Non-performing loans at the end of the year in SAR.
Dummy variable	The study used the Dummy variable to measure the impact of negative oil revenues as years with negative rates in oil revenues take (1) and years with positive rates in oil process take zero.
% Oil	The study used the annual increases and decreases rates of oil revenues as a proxy for oil prices in the robustness analysis. Oil revenues % for t period = Oil revenues t- Oil revenues t-1/ Oil revenues t-1*100.

Source: Based On the Previous Literature.

Results of regression models give the net influence of the fluctuations of oil revenues i e. Average. Therefore, the study will not capture the impact of negative prices on the dependent variables. Therefore, the study used the dummy variable to distinguish between the impacts of years with negative prices and years with positive prices separately. The study used the natural logarithm of oil revenues for the basic analysis, and then used the percentage increases and decreases in oil revenues to check robustness.

3.4 Model Specification

ROA it= β0 + β1oil revenues t + Dummy t+ μit (1)
ROA it= β0 + β1oil revenues t+ Dummy t + μit (2)
SP it= β0 + β1oil revenues t + Dummy t + μit (3)
GDP t = β0 + β1oil revenues t+ Dummy t + μit (4)
ROA it= β0 + GDP t + μit (5)
ROE it= β0 + β1 GDP t + μit (6)
SP it= β0 + β1 GDP t + μit (7)
NPLit = β0 + β1NPLit-1+ β2 oil % t+ Dummy t+ μit (8)
Where i = 1, N t = 1… T

3.5. Empirical Results

3.5.1 Basic Results

Table (1) showed the descriptive analysis of the study variables, where the mean of the non-performing loans recorded 2.3 billion Saudi riyals while the average total loans recorded SAR 141 billion Saudi riyals, account for 1.6 %, of total loans, which is internationally accepted ratio. On the other hand, the mean of the allowance for loan losses recorded 3.7 billion Saudi riyals account for 2.7% of total loans. The study period witnessed sharp fluctuations in oil revenues,

recorded maximum 913 billion Saudi riyals and minimum SAR 324 billion Saudi riyals with a high standard deviation of SAR 324 billion Saudi riyals because of the demand shock for years 2020-2021, then the increase during 2022 due to the supply shock. GDP was volatile, as the minimum and the maximum value recorded -0.04 and 0.087 respectively. The standard deviation of ROE is high due to the large differences between the maximum and the minimum value, which recorded 6.340000 % and -2.01% respectively.

Table (1) Descriptive Analysis.

	NPL	**TOTA LOANS**	**ALL**	**Oil Revenues**	**GDP**
Mean	2334530.	1.41E+08	3370572.	598.5455	0.022492
Median	1517374.	1.21E+08	2641498.	562.0000	0.027000
Maximum	9881072.	5.76E+08	11407864	913.0000	0.087000
Minimum	302482.0	2855263.	328487.0	324.0000	-0.041400
Std. Dev.	2138342.	1.07E+08	2431543.	196.8612	0.031969
Skewness	1.842676	2.004898	1.088738	0.344471	-0.027527
Kurtosis	6.299209	7.876524	3.854195	1.727412	3.436282
	OIL%	Share price	ROA	ROE	
Mean	0.077176	25.21384	0.112572	2.383535	
Median	0.088423	21.17000	0.116536	2.050000	
Maximum	0.152262	88.64000	0.219083	6.340000	
Minimum	-0.031373	10.00000	-0.082101	-2.010000	
Std. Dev.	0.059912	13.83306	0.047654	1.362446	
Skewness	-0.652156	1.824286	-0.798859	0.497167	
Kurtosis	1.981315	7.738306	5.038986	3.923245	

Eviews Software.

The results of the regression model (1) did not find any statistically significant impacts of oil revenues on ROA according to the least squares model and the fixed effects model and as per the value of Probability. Therefore, the study rejected the alternative hypothesis and accepted the null hypothesis. i. e. Oil revenues had no direct impacts on ROA. See table (2)

Table (2) Model (1).

	Panel Least Squares		**Panel Fixed Effects Tests**	
	R-squared	0.417770	R-squared	0.009016
	Adjusted R-squared	0.344992	Adjusted R-squared	-0.011630
	S.E. of regression	0.038997	S.E. of regression	1.370345
	Sum squared residual	0.133824	Sum squared residual	180.2732
	Log likelihood	188.9261	Log likelihood	-170.1429
	F-statistic	5.740280	F-statistic	0.436686
	Probability(F-statistic)	0.000001	Probability(F-statistic)	0.647451
Variables	t-Statistic	Probability	t-Statistic	Probability
Oil Revenues	1.130418	0.2614	0.567205	0.5719
Dummy	-0.436351	0.6637	-0.455239	0.6500
C	6.727408	0.0000	3.960778	0.0001

Dependent ROA- Eviews Software.

The results of the regression model (2) did not find statistically significant impacts of oil revenues on ROE according to the least squares model and the fixed effects model. Therefore, the study accepted the null hypothesis and rejected the alternative hypothesis. i e. Oil revenues had no direct impacts on ROE. See table (3)

Table (3) Model (2).

	Panel Least Squares		**Panel Fixed Effects Tests**	
	R-squared	0.707415	R-squared	0.009016
	Adjusted R-squared	0.670421	Adjusted R-squared	-0.011630
	S.E. of regression	0.782166	S.E. of regression	1.370345
	Sum squared residual	53.22512	Sum squared residual	180.2732
	Log likelihood	-109.7557	Log likelihood	-170.1429
	F-statistic	19.12267	F-statistic	0.436686
	Probability(F-statistic)	0.000000	Probability(F-statistic)	0.647451
Variables	t-Statistic	Probability	t-Statistic	Probability
Oil Revenues	1.130418	0.2614	0.567205	0.5719
Dummy	-0.436351	0.6637	-0.455239	0.6500
C	6.727408	0.0000	3.960778	0.0001

Dependent ROE- Eviews Software.

The results of the Panel Least Squared regression model (3) found positive and statistically significant impacts of oil revenues on the share price. In addition, the dummy variable showed an inverse and statistically impact on the share price, that is, negative oil prices decreased share price. However, Panel Fixed Effects model did not find statistically significant impacts on the share price. Least squared regression models were better than fixed effect models to capture the impact oil revenues on the share price. See table (4). The study accepts the alternative hypnosis i. e. oil revenues had direct impacts on the share price.

Table (4) Model (3).

	Panel Least Squares		**Panel Fixed Effects Tests**	
	R-squared	0.600561	R-squared	0.074825
	Adjusted R-squared	0.550631	Adjusted R-squared	0.055749
	S.E. of regression	9.285615	S.E. of regression	13.46024
	Sum squared residual	7587.594	Sum squared residual	17574.28
	Log likelihood	-358.3488	Log likelihood	-400.3449
	F-statistic	12.02809	F-statistic	3.922502
	Probability(F-statistic)	0.000000	Probability(F-statistic)	0.023007
Variables	t-Statistic	Probability	t-Statistic	Probability
Oil Revenues	1.715291	0.0898	1.183302	0.2396
Dummy	-2.697760	0.0084	-1.861063	0.0658
C	6.079555	0.0000	4.194011	0.0001

Dependent Share Price- Eviews Software.

The study did not provide empirical evidence on the direct impacts of oil revenues on the accounting based- indicators i.e. ROA, ROE. Therefore, the study investigates whether oil revenues have indirect impact on ROA, ROE by GDP. To achieve that the study first investigates the impact of oil revenues on GDP and then investigates the impact of GDP on ROA, ROE.

The results of the least squared regression model and the fixed effect regression models found positive and statistically significant impacts of oil prices on GDP i.e., the increase of 1% of oil revenues increases GDP of 5.7 % as per t-Statistic. In addition, the dummy variable had an inverse and statistically significant impact on GDP, i.e. The dummy variable showed that negative oil prices decrease GDP. Panel Fixed Effects had more explanatory power than Panel Least Square. See table (5). Based on the results, the study accepts the alternative hypnosis i. e. oil revenues had direct and positive impacts on GDP.

Table (5) Model (4).

	Panel Least Squares		**Panel Fixed Effects**	
	R-squared	0.391715	R-squared	0.391715
	Adjusted R-squared	0.315679	Adjusted R-squared	0.379173
	S.E. of regression	0.026360	S.E. of regression	0.025107
	Sum squared residual	0.061146	Sum squared residual	0.061146
	Log likelihood	228.0894	Log likelihood	228.0894
	F-statistic	5.151730	F-statistic	31.23236
	Probability(F-statistic)	0.000003	Probability(F-statistic)	0.000000
Variables	t-Statistic	Probability	t-Statistic	Probability
Oil Revenues	5.700550	0.0000	5.984961	0.0000
Dummy	-2.252166	0.0268	-2.364530	0.0200
C	-2.022473	0.0462	-2.123378	0.0363

Dependent Variable GDP- Eviews Software.

Table (6) showed that GDP had positive and statistically significant impacts on ROA as per t-Statistic and the Probability and the Panel Least Squared model was better than the Panel Fixed Effects in terms of the explanatory power as per Adjusted R-squared, which recorded 0.882570 against 0.325300. The study accepts the alternative hypnosis i. e. GDP had direct and positive impacts on ROA.

Table (6) Model (5).

	Panel Least Squares		**Panel Fixed Effects**	
	R-squared	0.908050	R-squared	0.330776
	Adjusted R-squared	0.897787	Adjusted R-squared	0.330097
	S.E. of regression	0.011987	S.E. of regression	0.030688
	Sum squared residual	0.127455	Sum squared residual	0.927633
	Log likelihood	3018.633	Log likelihood	2039.099
	F-statistic	88.48018	F-statistic	486.8543
	Probability(F-statistic)	0.000000	Probability(F-statistic)	0.000000
Variables	t-Statistic	Probability	t-Statistic	Probability
GDP	8.080138	0.0000	22.06478	0.0000
C	27.62704	0.0000	7.525768	0.0000

Dependent ROA- Eviews Software.

Table (7) showed that GDP had positive and statistically significant impacts on ROE as per the probability and t –statistic and the Panel Least Squared model explained 0.919830 of changes in ROE , while the Panel Fixed Effect model explained only 0.305413 of changes in ROE as per Adjusted R-squared. Therefore, Panel Least Squared models were better than Panel Fixed Effect models in capturing the impact of GDP on ROE. The study accepts the alternative hypotheses, That is, GDP had direct and positive impacts on ROE.

Table (7) Model (6).

	Panel Least Squares		**Panel Fixed Effects**	
	R-squared	0.927888	R-squared	0.306118
	Adjusted R-squared	0.919830	Adjusted R-squared	0.305413
	S.E. of regression	0.236617	S.E. of regression	0.696470
	Sum squared residual	49.60488	Sum squared residual	477.3097
	Log likelihood	74.78316	Log likelihood	-1041.406
	F-statistic	115.1554	F-statistic	434.1096
	Probability(F-statistic)	0.000000	Probability(F-statistic)	0.000000
Variables	t-Statistic	Probability	t-Statistic	Probability
GDP	9.425749	0.0000	20.83530	0.0000
C	28.92945	0.0000	6.795947	0.0000

Dependent ROE - Eviews Software.

Table (8) showed that GDP had positive and statistically significant impacts on the share price according to the probability and t Statistic. Both least squared and fixed effect regression models were statistically significant. In addition, the results showed that Panel Least Squared models was better than Panel Fixed Effects as it explained 0.882570 of changes in the share price compared to 0.325300 for the fixed effect regression model as per the Adjusted R-squared. The study accepts the alternative hypothesis, That is, GDP had direct and positive impacts on the share Price.

Table (8) Model (7)

	Panel Least Squares		**Panel Fixed Effects**	
	R-squared	0.894360	R-squared	0.325984
	Adjusted R-squared	0.882570	Adjusted R-squared	0.325300
	S.E. of regression	3.025150	S.E. of regression	7.251233
	Sum squared residual	8117.407	Sum squared residual	51791.68
	Log likelihood	-2440.344	Log likelihood	-3354.908
	F-statistic	75.85313	F-statistic	476.3900
	Probability(F-statistic)	0.000000	Probability(F-statistic)	0.000000
Variables	t-Statistic	Probability	t-Statistic	Probability
GDP	9.870091	0.0000	21.82636	0.0000
C	23.89341	0.0000	6.951569	0.0000

Dependent Share Price- Eviews Software.

The results of both the least squared regression and fixed effect regression models did not find any direct and statistically significant impacts of oil revenues on the non-performing loans as a proxy for loan quality. The study rejected the alternative hypnosis and accepted the null hypothesis, that is, oil revenues did not have direct impacts on the non-performing loans as a proxy for loan quality. However, the negative oil prices as dummy variable had direct impacts on the non-performing loans. See table (11) Robustness Checking

Table (9) Model (8).

	Panel Least Squares		**Panel Fixed Effects**	
	R-squared	0.849259	R-squared	0.835123
	Adjusted R-squared	0.828468	Adjusted R-squared	0.829971
	S.E. of regression	881141.9	S.E. of regression	877272.5
	Sum squared residual	6.75E+13	Sum squared residual	7.39E+13
	Log likelihood	-1503.828	Log likelihood	-1508.310
	F-statistic	40.84585	F-statistic	162.0843
	Probability(F-statistic)	0.000000	Probability(F-statistic)	0.000000
Variables	t-Statistic	Probability	t-Statistic	Probability
NPL t-1	13.99884	0.0000	21.93313	0.0000
Oil Revenues	-1.338428	0.1842	-1.381361	0.1704
Dummy	-0.451570	0.6527	-0.250677	0.8026
C	2.242969	0.0274	1.721014	0.0885

Dependent Variable NPL- Eviews Software.

3.5.2 Robustness Checking

To check the robustness of the results and investigate whether the results were sensitive to the measurement of oil revenues as the study used oil revenues in SAR billions in the basic analysis. Therefore, the study used the annual percentage of increases and decreases in oil revenues. Therefore, the study re proceeded all models to compare the results. The results of Robustness checking confirmed the results of the basic analysis i.e. The study did find direct impacts of oil percentage on ROA, ROE as per the probability. See tables (10, 11)

Table (10) Model (1).

	Panel Least Squares		**Fixed Effects Tests**	
	R-squared	0.410688	R-squared	0.006024
	Adjusted R-squared	0.337024	Adjusted R-squared	-0.014470
	S.E. of regression	0.039233	S.E. of regression	0.048531
	Sum squared residual	0.135452	Sum squared residual	0.228463
	Log likelihood	188.3216	Log likelihood	162.1838
	F-statistic	5.575157	F-statistic	0.293956
	Probability(F-statistic)	0.000001	Probability(F-statistic)	0.745971
Variables	t-Statistic	Probability	t-Statistic	Probability
Oil %	-0.746861	0.4571	-0.603767	0.5474
Dummy	-0.398155	0.6915	-0.321870	0.7482
C	16.90043	0.0000	13.66240	0.0000

Dependent ROA- Robustness checking- Eviews Softwa**re.**

Table (11) Model (2).

	Panel Least Squares		**Fixed Effects Tests**	
	R-squared	0.709884	R-squared	0.016221
	Adjusted R-squared	0.673203	Adjusted R-squared	-0.004274
	S.E. of regression	0.778858	S.E. of regression	1.365354
	Sum squared residual	52.77589	Sum squared residual	178.9625
	Log likelihood	-109.3362	Log likelihood	-169.7817
	F-statistic	19.35276	F-statistic	0.791443
	Probability(F-statistic)		Probability(F-statistic)	0.456125
Variables	t-Statistic	Probability	t-Statistic	Probability
Oil %	-1.424523	0.1579	-1.013506	0.3134
Dummy	-0.637012	0.5258	-0.505195	0.6146
C	18.42645	0.0000	10.74809	0.0000

Dependent ROE- Robustness checking- Eviews Software

The results of Robustness checking confirmed the results of the basic analysis that showed positive and statistically impacts of oil revenues on the share price and the negative oil revenues resulted in decreases in the share prices as per t- statics of the dummy. See table (12)

Table (12) Model (3).

	Panel Least Squares		**Fixed Effects Tests**	
	R-squared	0.723148	R-squared	0.197412
	Adjusted R-squared	0.688542	Adjusted R-squared	0.180864
	S.E. of regression	7.730527	S.E. of regression	12.53682
	Sum squared residual	5258.973	Sum squared residual	15245.66
	Log likelihood	-340.0199	Log likelihood	-393.2379
	F-statistic	20.89633	F-statistic	11.92951
	Probability(F-statistic)	0.000000	Probability(F-statistic)	0.000023
Variables	t-Statistic	Probability	t-Statistic	Probability
Oil %	6.573472	0.0000	4.053374	0.0001
Dummy	-5.807630	0.0000	-3.581136	0.0005
C	16.71123	0.0000	10.30458	0.0000

Dependent Share Price - Robustness checking- Eviews Software.

The results of Robustness checking confirmed the results of the basic analysis that showed positive impacts of oil revenues on GDP as pert-Statistic of oil %. In addition, the negative oil rates resulted in decreases in GDP as per the parameter of t-Statistic of the dummy variable. See table (13)

Table (13) Model (4).

	Panel Least Squares		**Panel Fixed Effects**	
	R-squared	0.219091	R-squared	0.219091
	Adjusted R-squared	0.121477	Adjusted R-squared	0.202990
	S.E. of regression	0.029867	S.E. of regression	0.028447
	Sum squared residual	0.078498	Sum squared residual	0.078498
	Log likelihood	215.5986	Log likelihood	215.5986
	F-statistic	2.244471	F-statistic	13.60710
	Probability(F-statistic)	0.018622	Probability(F-statistic)	0.000006
Variables	t-Statistic	Probability	t-Statistic	Probability
Oil %	2.420730	0.0175	2.541505	0.0126
Dummy	-4.778178	0.0000	-5.016570	0.0000
C	5.090702	0.0000	5.344686	0.0000

Dependent Variable GDP Robustness checking- Eviews Software.

Robustness checking showed negative oil rates had direct impact on NPL as per t-Statistic and the Probability of the dummy variable. i. e. Negative growth rates in oil revenues increased the non-performing loans.i.e. Negative growth rates in oil revenues reduced loans quality. See table (14).

Table (14) Model (5).

	Panel Least Squares		**Panel Fixed Effects**	
	R-squared	0.850064	R-squared	0.832624
	Adjusted R-squared	0.829384	Adjusted R-squared	0.827394
	S.E. of regression	878785.5	S.E. of regression	883896.1
	Sum squared residual	6.72E+13	Sum squared residual	7.50E+13
	Log likelihood	-1503.560	Log likelihood	-1509.062
	F-statistic	41.10412	F-statistic	159.1863
	Probability(F-statistic)	0.000000	Probability(F-statistic)	0.000000
Variables	t-Statistic	Probability	t-Statistic	Probability
NPL t-1	1.506056	0.1357	0.668028	0.5057
Oil %	-0.403238	0.6878	0.122675	0.9026
Dummy	11.88229	0.0000	20.41560	0.0000
C	1.855429	0.0669	0.748788	0.4558

Dependent Variable NPL Robustness Checking.

4. Conclusions and Discussions

The study aimed to investigate the impacts of oil revenues on bottle accounting -based and the market- based performance indicators as well as the impacts on loan quality of banks registered on the Saudi stock market (TASI) for the period 2013-2022. The study collected secondary data from the annual financial reports and the official websites of the Saudi Arabian Stock Exchange (Tadawul) and ministry of finance of the kingdom.

The study used the panel data methodology and both the ordinary least squared regression models, fixed effect regression models to analyses the data and test the study's hypotheses. The study used the natural logarithm of the oil revenues as a proxy for oil prices in the basic analysis and rates of annual increases and decreases in robustness checking along with a dummy variable to capture the impact of negative oil revenues on the dependent variables. The study used ROA and ROE as proxies for the accounting -based profit indicators and the share price as a proxy for market-based indicators to serve as dependent variables.

The results of the basic analysis indicated that oil prices did not have direct impacts on ROA, ROE. The results supported the results of Effendi, (2019); El-CHAARANI, (2019). While the study did not support results of Esmaeil, et al. (2020) who found positive impacts and results of Osuma, et al. (2019) who found negative impacts.

However, oil prices had direct impacts on the share price i.e., Saudi stock market reacted positively to the positive oil prices and negatively to negative oil prices and these results supported the argument by Basher , Sadorsky(2006) ;Kilian and Park (2009). The study investigated whether oil prices indirectly affect ROA, ROE by GDP, i.e. Oil revenues affect GDP and then GDP affect ROA, ROE. The results showed oil revenues had positive impacts on GDP and GDP had positive impacts on ROA, ROE. That is, oil prices had indirect positive impacts on ROA, ROE through GDP.

The results found that oil revenues did not have direct impacts on the non-performing loans as a proxy for loan quality –on average- in the basic analysis. However, the robustness analysis found that the dummy variable that captured negative oil revenues contributed to decreases in

loans quality. The results supported the results of Saif-Alyousfi, et al. 2018) and did not support the results of Osamah, et al., (2017) who found direct impact.

The results of robustness check that used the annual rates of increases and decreases in oil prices as a proxy for oil prices confirmed the results of the basic analysis. However, it provided empirical evidence that negative oil revenues had direct impacts on loans quality. Negative oil prices decreases loan quality or increase the non-performing loans. The results supported the results of Chin, et al. (2023); IDRİS, NAYAN (2017)

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