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Macroeconomic Factors and the Performance of the Saudi Banking Sector: Does Oil Price Matter?

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Abstract: This paper aims to identify the relationship between macroeconomic factors that could be potential sources of concern for the banking sector in Saudi Arabia. To achieve this, the ARDL cointegration approach was used in light of economic theory and the literature. Oil prices, interest rates, inflation, government spending, and GDP were identified as independent variables. The results showed a significant positive impact of oil prices and GDP on the performance of Saudi banks, while the performance of banks is negatively affected by interest rates and government spending. The study revealed that the most important determinants of bank performance are oil prices and interest rates. Therefore, this study suggests that banks should link and manage their loan portfolio in proportion to oil price shocks.

Keywords: Banking sector, Oil prices, Interest rate, Total asset, Total deposit.

1. Introduction

The banking sectors globally face heightened macroeconomic risks, leading to financial instability and the potential for new banking crises (Bougheas and Kirman, 2018; Liu et al., 2022). As banks' risk exposures relate to macroeconomic structures, managing risks from oil price volatility and interest rates is critical (Von la Hausse et al., 2016). Geopolitical events like regional conflicts can also impact oil prices significantly, increasing banks' credit risk exposures, market disruptions, and economic/political risks in oil-producing countries.

Given recent Middle East conflicts reshaping regional geopolitics and alliances (Abdullah, 2020; Kazem and Hashem, 2016), economic stability in Gulf states like Saudi Arabia is threatened. Saudi Arabia has implemented economic reforms through Vision 2030 and the National Transformation Program to buffer oil revenue shocks. As the banking sector comprises 10.3% of Saudi GDP (SAMA, 2021) and mobilizes savings for economic growth, it has a key role in these reforms.

This paper analyses how macroeconomic factors affect the Saudi banking sector's performance. Key risks include oil price fluctuations indirectly impacting banks via macroeconomic channels (Hesse and Poghosyan, 2009) and interest rate risks influencing income and asset valuations as financial instruments fluctuate (Mudanya, 2018). Our study contributes in several ways. First, we explore how macro factors impact Saudi banks' performance, going beyond existing research on internal risks. Second, we apply ARDL cointegration modeling not previously used in this context. Finally, given the oil dependence of Saudi banks, we specifically assess oil price effects.

2. Literature review

These studies show how oil price shocks can impact banks through credit risk, loan defaults, provisions for loan losses, reduced profitability, the quality of assets, and broader economic impacts. This emphasizes how crucial it is for banks to control their exposure to the energy industry and to keep diversified loan portfolios to reduce the risks brought on by fluctuations in oil prices.

Ma Yu et al. (2021) the paper aims to determine the impact of oil price shocks on banking risk using monthly data collected from 16 banks in China for the period 2011-2019. This paper relied on the panel vector autoregression model (PVAR) for oil shock analysis. The results showed an increase in banking risks affected by the oil supply shock. While the demand shock for oil reduced the risks of the banking sector. The oil speculation shock led to an increase in banks' risk levels. On the other hand, the study found that private sector banks are more sensitive to oil shocks compared to state-owned banks.

Wang (2021) the purpose of this study was to determine how oil price shocks affected domestic US banks. According to the study's findings, banks connected to the oil industry have seen a significant drop in short-term deposits, a rise in depositor withdrawals, and delays in loan repayment. Additionally, it reported more loan losses. Furthermore, in order to replenish liquidity in the face of extreme liquidity pressures, banks were compelled to sell off liquid assets and raise interest rates on deposits. However, the findings supported the notion that banks with a sufficient branch network are less harmful when exposed to oil shocks.

Saif-Alyousfi et al. (2020) the study aimed to identify the impact of oil price shocks on the performance of banks in the Gulf Cooperation Council countries during 2000-2017. The study concluded that the performance of banks is directly affected by the rise in oil prices through the channel of bank deposits induced by business-related lending. Lower oil prices have a greater detrimental effect on the bank's performance than higher prices do. The study showed that conventional and Islamic banks are disproportionately affected by the volatility of oil prices. The higher cash flow brought on by rising oil and gas prices benefits conventional banks more than Islamic banks. While conventional banks typically gain more from positive price shocks, Islamic banks are typically more susceptible to adverse oil price shocks.

Killinsa and Mollickb (2020) the study sought to identify the factors that affect the profitability and quality of assets in Canadian banks through the use of quarterly data for the period 1996-2018. The study showed that capital adequacy, non-interest income and the volume of non-performing loans are major determinants of banks' profitability. On the other hand, the study concluded that there is a positive relationship between the profitability of banks and oil prices. Oil prices directly affect banks' profitability by increasing non-interest income from more banking transactions such as derivatives and service fees. The study also confirmed that the increase in oil prices reduces the volume of bad loans provisions and thus improves the quality of banks' assets.

Miyajima (2020) argues that banking lending is positively affected by the increase in oil prices in Saudi Arabia. Zaccheaus and ajuwon (2019) the study is an attempt to find out the impact of oil price shocks on the profitability of Nigerian banks using the generalized moment method (GMM). The study relied on data from 12 commercial banks, representing 76% of the assets of the Nigerian banking sector during 2006-2015. The study concluded that there is a direct impact of oil prices on the profitability of Nigerian banks. The direct effect is generated through the concentration of lending on the oil and gas sector. The study emphasizes the importance of diversifying the loan portfolio and developing a strategy to diversify revenues in order to reduce dependence on interest income from the loan portfolio. Banks need to manage and keep pace with the cyclical fluctuations in the loan portfolio in proportion to the positive and negative oil price shocks.

Katırcıoglu et al. (2018) the study tested the presence of direct or indirect effects of oil prices on the profitability of commercial banks in Turkey as a developing oil importing country. The causality test showed that there is a unidirectional effect that goes from oil prices to inflation and from inflation to the profitability of commercial banks, and therefore there is an indirect effect of oil prices on the profitability of banks. On the other hand, the study found a direct and negative impact of oil prices on the profitability of banks resulting from the decrease in commercial lending linked to oil.

Hasanov et al. (2018) the study aimed to identify the internal and external determinants of the profitability of commercial banks in Azerbaijan as a country dependent on oil, using the generalized moment method (GMM). The results showed a positive relationship between banks' profitability and each of the bank's size, loan volume, capital, the economic cycle, oil prices and inflation levels. On the other hand, the profitability of banks is negatively affected by the liquidity risks, the volume of deposits and the depreciation of the exchange rate. The study confirms the importance of having a department within banks that specializes in analyzing and forecasting macroeconomic indicators such as oil prices. Hesse and Poghosyan (2016) this paper examined the impact of oil price shocks on the performance of banks in several oil-exporting countries. The study used data from 145 banks in 11 countries in the Middle East and North Africa region during 1994-2008. The study showed that there is an indirect effect transmitted from oil price shocks towards the profitability of banks through the macroeconomic channels specific to each country. The study found a direct effect, but very little. Conventional and Islamic banks are less harmful than investment banks when exposed to oil price shocks. The profitability of banks is indirectly affected by the drop in oil prices through the decline in government revenues and thus the decline in GDP growth and the decline in stock and real estate prices. All of this leads to pressure on banks' balance sheets, followed by a decline in credit growth for the private sector. In this case, the state must intervene to stop the decline in banks' profitability by injecting liquidity into banks, guaranteeing deposits or buying shares.

Khandelwal et al. (2016) this study aimed to identify the existence of links between fluctuations in international oil prices and economic and financial cycles in the GCC countries using dynamic models of Panel data. The results revealed that there are strong links between oil price movements and both asset prices and the balance sheets of commercial banks. Capital and bank allocations are going in the opposite direction of oil price movements. The paper emphasized that the quality of banks' assets is greatly affected by fluctuations in oil prices and the economic cycle in the country. Determining capital adequacy ratios and loan loss provisions and linking them to indicators of economic and financial cycles contributes to strengthening the position of banks to face the decline in global oil prices.

Poghosyan and Hesse (2010) This study examined the relationship between the performance of commercial banks and oil price shocks in the countries of the Middle East and North Africa, using annual data covering 145 banks from 11 countries during 1994-2008. The tests were conducted according to two hypotheses: the hypothesis of direct impact of oil price shocks, and the hypothesis of indirect influence. Where a set of variables was used, which include macro and internal variables for banks. The performance of banks was expressed as the rate of return on assets ROA as a dependent variable. The GMM method was used to analyze the panel data aggregate data from three levels, this method takes into account the stability in the profitability of banks despite the heterogeneity of the sample, as it is strong against the bias resulting from the problem of deleting an important variable in the model. Oil price shocks were measured using three measures: daily Brent oil point, oil price deviation from its primary trend, and Hamilton's net oil price increase measure. The results showed that the impact of oil price shocks is transmitted to the banking sector through the indirect channel of macroeconomic variables. The study also confirmed that the greatest impact of oil price shocks may be on investment banks and the investment activity of these countries. According to the results of the study, banks can link banking capital to oil price shocks to alleviate bank lending during recessions. The study emphasizes the importance of hedging against the risks of oil price shocks, as it is one of the systematic risks that affect the sector as a whole.

Commercial banks that depend on interest income (traditional activities such as taking deposits and lending) are less vulnerable to oil price shocks than banks that rely heavily on income from investment activities and venture capital (Brunnermeier et al., 2012). Trenca et al. (2015) confirm the effect of inflation on the liquidity of the banking system, as it is considered a major determinant of the liquidity level of 40 banks in Europe. Interest rates positively affect the performance of 30 Indonesian banks (Fahrul and Rusliati, 2016). There is a positive relationship between banks' performance and each bank's size, loan volume, capital, economic cycle, oil prices, and inflation levels. On the other hand, the performance of banks is negatively affected by the depreciation of the exchange rate in Azerbaijan. The study confirms the importance of having a department within banks that specializes in analysing and forecasting macroeconomic indicators such as oil prices (Hasanov et al., 2018). Market risks in Saudi Arabia arise from many variables, the most important of which are the volatility and decline in oil prices, which affect various sectors, including the banking sector, which is affected indirectly through macroeconomic variables according to the hypothesis of indirect effect (Hesse & Poghosyan, 2009).

3. Methodology

In this research, autoregressive distributed lags (ARDL) for cointegration are used, which enables the testing of the relationship between study variables in the long and short term. Additionally, the CUSUM test is used to test the stability of the relationship. It is more important to ensure that the model is free from problems of heteroskedasticity and autocorrelation. E-views 12 programs were used for analysis. The data include two dependent variables and five independent variables. The time series for the variables were collected from the annual reports of the Saudi central bank (SAMA) and World Development Indicators (WDI) during 1984-2020.

3.1 Variables definition

The research variables include two dependent variables and five independent variables, as shown in the following table.

Table 1. Definition of the research variables

Symbol	Variable	Measurements	Source
Dependent variables			
DEP	Banking Deposits	Growth rate of Deposits	SAMA
ASSET	Banking Assets	Growth rate of Assets	SAMA
Independent variables			
OIL	Oil prices	Average annual price for the OPEC basket	SAMA
GDP	Gross Domestic Product	Growth rate of GDP	SAMA
INF	Inflation	Consumer Price Index (CPI)	WDI
INT	Interest Rate	Interest rates on bank deposits	SAMA
G	Government Expenditure	Total Expenditure	SAMA

3.2 Model specification

The model used in this research includes two dependent variables and five independent variables. The ARDL model is characterized by its strength against the autocorrelation problem so that the presence of the autocorrelation problem does not affect these estimators, and it is also natural that there is a problem of heteroskedasticity in this model in which the variables are integrated at different levels, such as I(0) or I(1) (Shrestha and Chowdhury, 2005). The general form of the study can be formulated with the following equation:

$$\boldsymbol{DEP_t = \propto + \beta_1 OIL_t + \beta_2 GDP_t + \beta_3 INF_t + \beta_4 INT_t + \beta_5 G_t + \varepsilon_t} \quad \ldots\ldots(\mathbf{1})$$

Where DEP is banking deposits, OIL is the average annual price for the OPEC basket, INF is inflation, and INT is the interest rate. According to the previous theoretical basis, it is expected that all independent variables will have a positive effect on the performance of the banking sector in Saudi Arabia, with the exception of inflation, which may negatively affect the performance of the banking sector. From the previous model, the ARDL model can be formulated as follows:

$$\boldsymbol{DEP_t = \propto_0 + \sum_{i=1}^{p} \beta_i\, DEP_{t-i} + \sum_{i=0}^{q} \beta_j\, OIL_{t-i} + \sum_{i=0}^{q} \beta_j\, GDP_{t-i} + \sum_{i=0}^{q} \beta_j\, INF_{t-i} + \sum_{i=0}^{q} \beta_j\, INT_{t-i} + \sum_{i=0}^{q} \beta_j\, G_{t-i} + \gamma_1 OIL_{t-1} + \gamma_2 GDP_{t-1} + \gamma_3 INF_{t-1} + \gamma_4 INT_{t-1} + \gamma_5 G_{t-1} + \varepsilon_t} \quad \ldots(\mathbf{2})$$

From the last model, the error correction model (ECM) of the previous model can be obtained as follows, where the variables are in the case of differences (Pesaran et al., 2001).

$$\boldsymbol{\Delta DEP_t = \propto_0 + \sum_{i=1}^{p} \beta_j\, \Delta DEP_{t-i} + \sum_{i=1}^{q} \beta_j\, \Delta OIL_{t-i} + \sum_{i=0}^{q} \beta_j \Delta\, GDP_{t-i} + \sum_{i=1}^{q} \beta_j\, \Delta\, INF_{t-i} + \sum_{i=1}^{q} \beta_j\, \Delta INT_{t-i} + \sum_{i=0}^{q} \beta_j\, \Delta G_{t-i} + \hat{\rho}\, ECM + \varepsilon_t} \quad \ldots(\mathbf{3})$$

Where ρˆ represents the residuals from the long-run relationship estimation and is given by the following formula:

$$\boldsymbol{\gamma_0 ASSET_{t-1} = \gamma_1 + \gamma_2 OIL_{t-1} + \gamma_3 INF_{t-1} + \gamma_4 INT_{t-1} + \gamma_5 DPOLI_{t-1}} \quad \ldots(4-a)$$

$$(4-\mathrm{b})\boldsymbol{\hat{\rho} = ASSET_{t-1} - \left(\frac{\gamma_1}{\gamma_0} + \frac{\gamma_2}{\gamma_0} OIL_{T-1} + \frac{\gamma_3}{\gamma_0} INF_{t-1} + \frac{\gamma_4}{\gamma_0} INT_{t-1} + \frac{\gamma_5}{\gamma_0} DPOLI_{t-1} \right)} \ldots$$

where ρˆ represents the estimated residuals from the long-term relationship estimation. The second equation can be written in the same way as the other dependent variable, which is a total asset (ASSET) instead of total deposits (DEP).

4. Result and Discussion

4.1 Unit Root Tests

The first step in the application of the ARDL approach is unit root tests. It is necessary to identify the behavior of the variables if they are stable or not using the augmented Dickey–Fuller test, and Table (3) shows the results of this test.

Table 2. Results of Stability tests using ADF and PP.

Variable	At Level				At 1st Deference				Rank
	ADF		PP		ADF		PP		
	Trend and intercept	intercept	Trend and intercept	intercept	Trend and intercept	intercept	Trend and intercept	intercept	
DEP	-1.51	2.40	-1.27	2.01	-3.73*	-	-	-	I(1)
ASSET	-3.80	-	-	-	-5.95*	-	-	-	I(1)
OIL	-4.60*	-	-	-	-	-	-	-	I(0)
GDP	-6.75*	-	-	-	-	-	-	-	I(0)
INF	-2.95	-2.95	-2.91	-2.80	-8.89*	-	-	-	I(1)
INT	-4.55*	-	-	-	-	-	-	-	I(0)
G	-4.81*	-	-	-	-	-	-	-	I(0)
	Critical values				Critical values				
1%	-4.24	-3.63	-4.24	-3.63	-4.24	-3.63	-4.24	-3.63	
5%	-3.54	-2.94	-3.54	-2.94	-3.54	-2.94	-3.54	-2.94	
10%	-3.20	-2.61	-3.20	-2.61	-3.20	-2.61	-3.20	-2.61	

**stable at level 5%. **stable at the 10% level.*

The results of unit root tests using the Augmented Dickey–Fuller test and Phillips Perron test showed that the dependent variables are not stable at the level, but they are stable at the first difference, which means that the variables are integrated at the first degree I (1). While the independent variables are stable at the level, they are integrated at level I (0), except for INF, which is stable at the first degree I (1). Therefore, we can test the existence of a cointegration relationship between the variables using the ARDL approach, which is characterized by the possibility of applying it when the variables are integrated to different degrees.

4.2 Determine the optimal number of lags

To determine the optimal lag length for the two study models, the Akaike Info Criterion (AIC) is used, where the model is chosen in which the value of the criterion is the lowest. The following figures show that the two best models are ARDL (4, 2, 0, 2, 1, 1) for model (1) and ARDL (1, 0, 1, 2, 0, 0) for model (2).

4.3 Cointegration Test

The ARDL method can be applied to test the existence of a cointegration relationship between the variables (Pesaran et al., 2001) by performing the bound test of the null hypothesis:

$$\boldsymbol{H_0}: \ \boldsymbol{\beta_i = \gamma_i = 0} \qquad\qquad \boldsymbol{i = 1, 2, 3, \dots, K+1}$$

The result of the bound test through the calculated value of the F statistic showed the existence of a cointegration relationship between the variables in the long run in both models, as is evident from the following table:

Table 3. Results of Cointegration using Bound Test

Regressions	lags	F Sta.	Result
DEP, OIL, GDP, INF, INT, G	(4,2, 0, 3, 2, 1)	4.97	Cointegration
ASSET,OIL, GDP, INF, INT, G	(1, 0, 1, 2, 0, 0)	4.33	Cointegration
Critical Value Bound		I(0)	I(1)
10%		2.33	3.41
5%		2.80	4.01
1%		3.90	5.41

The results illustrate through the value of the F statistic that there is a long-run equilibrium relationship in the two regressions, which indicates that there is a cointegral between the study variables. Then, it can estimate a long- and short-run relationship between the variables according to equation No. (3), where DEP and ASSET are the dependent variables. First, estimate the long-run relationship as following:

Table 4. Result of long-run relationship

Variable	Model 1 (DEP)		Model 2 (ASSET)	
	Coefficients	t-sta. (Prob)	Coefficients	t-sta. (Prob)
OIL	0.225*	2.64 (0.016)	0.175*	2.08 (0.047)
GDP	-0.073	-0.24 (0.809)	0.906*	2.11 (0.045)
INF	0.225	0.39 (0.698)	-1.081	-1.38 (0.178)
INT	-0.930*	-2.21 (0.040)	0.180	0.24 (0.806)
G	0.071	0.77 (0.448)	-0.126*	-2.27 (0.031)
C	11.002*	4.36 (0.000)	0.127	0.02 (0.982)
Obs.	33		35	
Adjust R-square	0.60		0.33	
LM - test	0.362	(0.701)	0.006	(0.993)
Normality JB	0.825	(0.661)	6.125*	(0,046)
ARCH test	0.329	(0.848)	1.472	(0.479)

** Significant at the 0.05 level. ** Significant at the 0.10 level*

P- Value in parentheses.

The results in both models indicate a positive and significant impact of oil price on both total deposits and assets in Saudi Arabia. If oil prices change by 1%, it will lead to a change in total deposits of 0,225, while if oil prices change by 1%, it will change total assets by 0.175%. Despite the decline in oil prices globally, the impact of oil prices remained positive on the performance indicators of the banking sector. This justifies that Saudi Arabia has an excess production capacity through which it can absorb shocks in oil prices. There is a positive and significant effect of GDP on total assets, while it showed any effects on total deposits in the first model. This result is compatible with the economic theory that acknowledges the existence of a positive impact of GDP on assets and deposits. The results showed that inflation had no effect on either bank assets or deposits in Saudi Arabia. This result can be attributed to the fact that Saudi Arabia enjoys relative stability in general prices, as evidenced by the statistics published by the competent authorities, and thus low inflation rates and its lack of impact on banking assets and deposits.

Interest rates negatively affect total bank deposits in the first model, while there is no effect on total assets, as the increase in interest rates paid on deposits means an increase in the demand for bank deposits as an opportunity cost. Saudi Arabia follows a conservative monetary policy according to a fixed exchange rate system, which is usually linked to US interest rates. Therefore, we note that interest rates in Saudi Arabia decreased during the study period, which led to a negative impact on the performance of commercial banks. On the other hand, we find that the decline in interest rates in Saudi Arabia is pushing investors to withdraw their money from banks and redirect it towards the more profitable financial markets in the form of stocks and bonds. Bank performance in Saudi Arabia is affected by government expenditures, as the results indicate a negative impact of government expenditures on total assets. Government spending in Saudi Arabia is affected by fluctuations in oil prices, which is reflected in the performance of commercial banks in financing government spending. This justifies the negative impact of government spending on bank performance. The most important determinants of bank performance are oil prices and interest rates.

Table 5. Results of Error Correction models

Variable	Model 1 (DEP)				Model 2 (ASSET)		
	Coefficient	t-Stat.	Prob.	Variable	Coefficient	t-Stat.	Prob.
D(DEPG(-1))	0.008	0.05	0.954	D(GDP)	0.408*	4.74	0.000
D(DEPG(-2))	0.502*	3.03	0.007	D(INF)	0.425	1.23	0.229
D(DEPG(-3))	0.444*	3.60	0.002	D(INF(-1))	0.625**	1.76	0.090
D(OILG)	0.109*	3.73	0.001	CointEq(-1)*	-0.715*	-6.12	0.000
D(OILG(-1))	-0.056**	-2.05	0.055				
D(INF)	1.174*	4.12	0.000				
D(INF(-1))	0.982*	3.04	0.007				
D(INT)	0.253	0.40	0.687				
D(G)	-0.068*	-2.94	0.009				
CointEq(-1)*	-1.002*	-6.85	0.000				

** Significant at the 5% level. ** Significant at the 10% level.*

The diagnostic tests in Table (5) indicate that the model is free from estimation problems. The most important of these is the Lagrange multiplier test, which indicates that there is no autocorrelation problem between the residuals estimated in the two models. The Arch test indicates that there is no heteroskedasticity problem. The Jarque-Pera test indicates that the estimated residuals are normally distributed. The R statistic indicates that the independent variables explain 60% of the change in the bank's performance.

In the next stage, estimated residuals in the previous regression are used to estimate the error correction model (ECM) according to equation no. (4), which shows the error correction parameter (ρ̀) in both models. The results are shown in table (6).

This model illustrates the dynamic behavior of the ARDL model, as it measures the effect of the current values of the independent variables and the past values of the dependent and independent variables on the dependent variable and shows the dynamic correlation between the long-run coefficients and the short-run coefficients. The results in model (1) indicate that the total banking deposits in Saudi Arabia are affected by its previous values and the current and previous values of the explanatory variables, while the results did not show an effect of previous values of GDP. The results of model (2) indicate that total assets are not affected by its previous values but are affected by current and previous values of GDP and inflation, while the results do not show any effect on the previous values of oil prices, interest rates, inflation, and government spending. The results also indicate that the error correction parameter ECM_{t-1} fulfils the conditions indicating the existence of a valid cointegration relationship, as it found a negative and significant value. The error correction parameter shows the degree of adjustment from the short-run relationship to the long-run relationship, as its value was -1.00 in Model 1, which means that the distance from the equilibrium is corrected by approximately 100% every year as the data are annual, and the correction process takes approximately a year to reach a long-run relationship. In model 2, the error correction parameter ECM_{t-1} equals -0.71, which means that the distance from equilibrium is corrected by approximately 71% every year as the data are annual, and the correction process takes approximately two years to reach a long-run relationship.

4.4 Structural stability test for model coefficients

This test is used to monitor shifts and deviations in the average process over a period and the extent of stability and consistency of long-run parameters with short-run parameters (Brown et al., 2011). The cumulative sum of recursive residuals (CUSUM) is used to test the structural stability for the unconstrained ARDL model (UECM- ARDL). The structural stability of the estimated model parameters is achieved when the CUSUM statistic graph is confined within the critical graphic lines at the 5% level of significance. Therefore, it may reveal any process that is out of control by drifting up or down cumulatively outside the critical values (Bahmani-oskooee et al., 2002); (Jahangard et al., 2017). The following figures show the test results of CUSUM in both models.

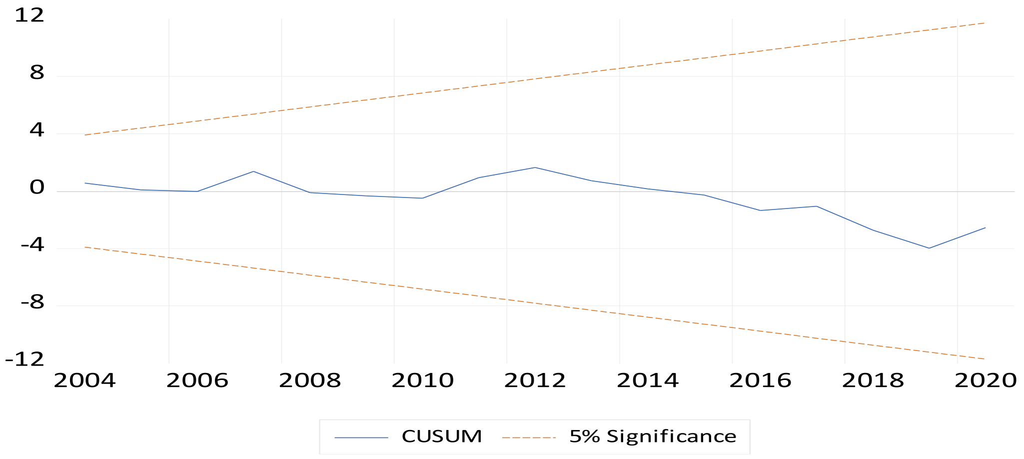

Figure 1. Plot of Cumulative Sum of Squares of Recursive Residuals for Model 1

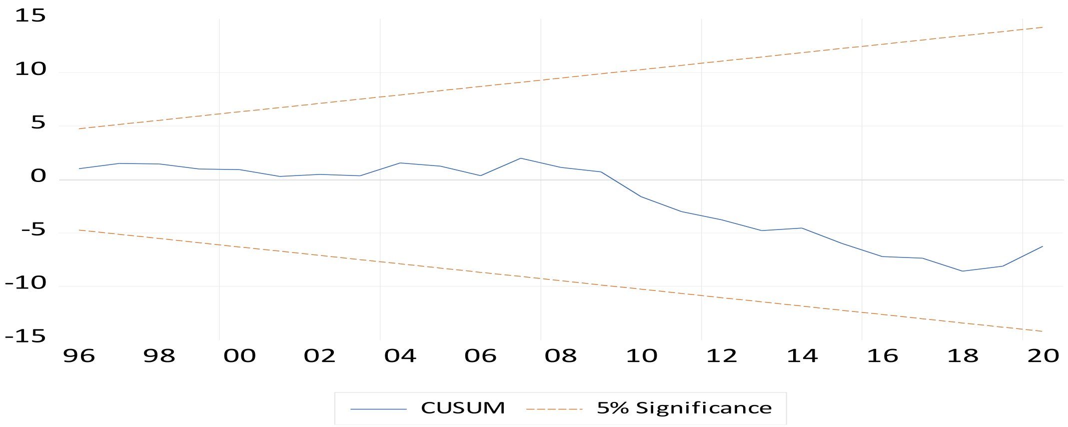

Figure 2. Plot of Cumulative Sum of Squares of Recursive Residuals for Model 2

It is evident from Figure (3) that the graph of the CUSUM statistic for Model 1 is located within the critical limits at the 5% level of significance, as it indicates that the estimated coefficients of the Unrestricted Error Correction Model (UECM) are structurally stable during the study period. In model 2, we notice that the CUSUM statistics diagram deviates from the critical values, and thus the instability of the coefficients of this model and their inconsistency with the long-run transactions. Therefore, we can say that Model 1 is the best representation of the relationship between macroeconomic factors and the performance of banking sector in Saudi Arabia.. Also, this model is valid for predicting the future relationship.

5. Conclusion

The banking sector in oil-dependent economies faces significant risks from oil price fluctuations and resulting economic instability, as evidenced by research on Middle East financial systems. This study aimed to analyse the impacts of macroeconomic factors on Saudi banks' performance from 1984 to 2020 using an ARDL cointegration approach. The conceptual framework was grounded in economic theory and literature reviewing links between oil prices, GDP growth, inflation, interest rates, government spending, and banking sector indicators like asset growth and deposit expansion.

The empirical results demonstrate that Saudi bank deposit growth maintains significant positive sensitivity to oil price movements, while interest rates exert negative effects on deposit funding. Meanwhile, total banking assets increase with oil prices and economic expansion, but diminish with greater government expenditures. Taken together, the findings indicate oil price cycles and interest rate policy represent the most influential performance drivers for Saudi banks.

These conclusions suggest important risk management and supervisory implications for Saudi financial institutions. Specifically, banks should actively correlate lending strategies to shifts in oil market conditions given the balance sheet linkages. Enhancing loan loss provisioning techniques using forward-looking indicators of oil prices and economic factors could strengthen bank resilience. Furthermore, capital adequacy policies could integrate frameworks to build buffers during credit upswings tied to petrodollar flows, while preserving lending capacity during energy downturns. Developing macro-financial surveillance with an emphasis on monitoring oil and interest rate exposures appears crucial for mitigating Saudi banking sector vulnerabilities to external shocks. The research underscores how real economic developments shape financial system performance in petroleum-based economies, necessitating proactive modeling, forecasting, and precautionary policy responses.

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